

14th Health Sciences Research Assembly (HSRA)

February 28-March 2, 2023

HSRA is an annual event to showcase the research of
faculty and students of AKU



ABSTRACT BOOK



THE AGA KHAN UNIVERSITY

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Message from Vice Provost, Research

Forty years ago, the Aga Khan University embarked on a journey to enhance the standards of health and education in Pakistan, eventually expanding its efforts across three continents. While we continue to provide services of great value to diverse communities, the creation and preservation of knowledge, as clearly articulated by our Chancellor, is what will maintain our University's global footprint for decades and centuries to come.

The Health Sciences Research Assembly is one of the multitude of events where faculty, students and researchers are brought together under the common goal of creating and sustaining a transparent culture of research across several disciplines. While we may conduct strenuous work in our own spheres and disciplines, coming together and active discourse allows us to form robust ideas and advance multidisciplinary research efforts. This assembly is an opportunity for us all to learn from our colleagues and expand our understanding of the concerted efforts that create meaningful impact.

I would like to take this opportunity to acknowledge the laborious efforts of the organizing committee and wish them a successful conference ahead. All the best to the presenters and many congratulations to the upcoming awardees for their achievements.

Salim S. Virani, MD PhD
Vice Provost, Research
Aga Khan University



Message from Dean, Medical College

The Health Sciences Research Assembly is an integral part of the research calendar at the medical college, and I am thrilled to see it going from strength to strength each year.

The time and energy we expend today has long-lasting and transformational impact tomorrow and for decades to come, and this scientific discovery is what propels humanity forward.

Events like the HSRA are critical to that process as they train the future generation of researchers, giving them an opportunity to showcase their work at this level while learning from the best in the field.

Congratulations to the entire team for putting together the 14th HSRA which is a testament to our commitment to the Chancellor's vision of being a research-led university and leveraging the powerhouse of talent we have within our walls.

Dr Adil Haider

Dean, Medical College
Aga Khan University



Message from Associate Dean, Research

The Health Sciences Research Assembly is one of the most celebrated events in the annual calendar of the Health Sciences. Junior and senior researchers, including students, trainees, and faculty, all get to share their research with their peers. Awards are given to the most productive faculty, trainee researchers, and research groups.

The organizing committee has developed a rich and engaging program this year, and I think this year's HSRA will be one of the most engaging ever. All faculty, trainees, and students should use this forum to highlight their research. I am very much looking forward to it!

Dr Asad Ali

Associate Dean, Research
Aga Khan University

Organising Committee



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Nasir Uddin
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Department of Biological & Biomedical Sciences

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SCREEN TIME USAGE AND ASSOCIATED HEALTH-RELATED LIFESTYLE FACTORS AMONG SCHOOL GOING ADOLESCENTS IN KARACHI, PAKISTAN

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Introduction: Approximately 1.2 billion people, or 1 in 6 of the world's population, are adolescents aged 10 to 19 years, and 70 percent of these young people live in developing countries. In Pakistan, there is a dearth of information regarding the total time spent on screen and its immediate and long-term effects on the well-being of school going, children and adolescents.

Objectives: To determine the average screen time and adequate knowledge regarding the health effects of excessive screen viewing of school-going adolescents aged 13-18 years in Karachi and to compare recreational time, sleep duration, and physical activity with excessive screen time (>2 hours/day) of school going adolescents aged 13-18 years in Karachi.

Methods: 472 school-going adolescents were included in the analysis. A multistage sampling technique was used in this study. Data was collected on socio-demographic characteristics, screen time, knowledge of the students, and PA. Descriptives were reported and Chi-square was done to determine the association of excessive screen time with gender, PA and knowledge. Logistic regression was applied to determine the association of excessive screen time with covariates.

Results: Most of the participants belonged to the age group 15-16 years (53.20%) and less than half belonged to the age group 13-14 (41.70 %). Also, in this study around 50.2% of participants were girls and 49.8% were boys. On the multivariable model fathers' higher education (AOR:4.03; 95% CI: 1.33,12.25), mothers' having Govt. Jobs (AOR:13.02; 95% CI: 1.03,16.18), having 1-2 siblings (AOR:3.60; 95% CI: 1.27,10.23) were significantly associated with excessive screen time of > 2 hours.

Conclusions: Although we have made efforts to assess screen time, but further interventional studies are needed to objectively measure screen time and Physical activities among adolescents.

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TRANSLATIONAL POTENTIAL OF CURRY LEAVES (MURRAYA KOENIGII) AS AN ANTI-HYPERTENSIVE AGENT*Hasan Salman Siddiqi, Mahwish Fatima, Amber Hanif Palla, Rayyan Qureshi**Department of Biological & Biomedical Sciences & Medical College, Aga Khan University*

Introduction: The prevalence of Hypertension is on the rise resulting in detrimental outcomes. There is lack of compliance to current management that requires lifelong therapy. This situation warrants search for new treatment that includes medicinal herbs as a favourable option.

Objective: The study was aimed at investigating the traditional use of Curry leaves (*Murraya koenigii*) as an anti-hypertensive agent by testing the pharmacological effects of its aqueous ethanolic extract on isolated guinea pig atria and rat aorta.

Methods: The extract (Mk.Cr) was prepared from plant leaves. Aortae from Sprague-Dawley rats and spontaneously beating atria from guinea pigs were placed in isolated tissue bath assembly, filled with Krebs's buffer (37°C) bubbled with carbogen and connected to a force transducer and PowerLab attached with a computer. All the graphing, calculations and statistical analyses were performed using Graph-Pad Prism software version 4.00 for Windows.

Results: On spontaneously beating right atria, Mk.Cr showed negative inotropic and chronotropic effects by inhibition of force as well as rate. On phenylephrine (PE, 1 μ M) and K⁺ (80 mM)-induced vasoconstrictions, it caused concentration-dependent relaxation similar to a known Ca⁺⁺ antagonist (verapamil). The calcium channel blocking activity was further endorsed when pretreatment of tissue with Mk.Cr shifted Ca⁺⁺ Concentration-Response Curves (CRCs) to the right comparable to verapamil.

Conclusions: These data indicate that the vasodilator effect of Mk.Cr is mediated through inhibition of alpha-receptors as well as by inhibition of Ca⁺⁺ influx via voltage-gated membranous Ca⁺⁺ channels which also accounts for its negative inotropic and chronotropic effects. A right ward shift of CRCs verifies the calcium channel blocking activity. Further studies are required to elaborate the blood pressure lowering activity of the plant.

3

ROLE OF BUTTON MANGROVE AS A PROBABLE BLOOD PRESSURE LOWERING AGENT

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Department of Biochemistry, University of Balochistan*

Introduction: Hypertension is considered to be a major risk factor attributed to global mortality and morbidity. Its prevalence is rising despite advancements in anti-hypertensive therapies. The situation demands alternative treatment strategies to combat the condition. Exploration of medicinal herbs is a favourable option.

Objective: The study was aimed at investigating the traditional use of Button mangrove (*Conocarpus erectus*) as an anti-hypertensive agent by testing the pharmacological effects of its methanolic extract on isolated guinea pig atria and rat aorta.

Methods: The extract (Ce.Cr) was prepared from plant leaves. Aortae from Sprague-Dawley rats and spontaneously beating atria from guinea pigs were placed in isolated tissue bath assembly, filled with Krebs's buffer (37°C) bubbled with carbogen and connected to a force transducer and PowerLab attached with a computer. All the graphing, calculations and statistical analyses were performed using Graph-Pad Prism software version 4.00 for Windows.

Results: On spontaneously beating right atria, Ce.Cr showed partial negative inotropic and chronotropic effects by inhibition of force as well as rate. On phenylephrine (PE, 1 μ M) and K⁺ (80 mM)-induced vasoconstrictions, it caused concentration-dependent relaxation similar to verapamil which is a known Ca⁺⁺ antagonist. The relaxation in case of K⁺ (80 mM)-induced vasoconstriction was partial.

Conclusions: These data indicate that the vasodilator effect of Ce.Cr is mediated through inhibition of alpha-receptors as well as by inhibition of Ca⁺⁺ influx via voltage-gated membranous Ca⁺⁺ channels which also accounts for its negative inotropic and chronotropic effects. However, the calcium channel blocking effect is weak in comparison to that of verapamil. Further studies are required to elaborate the blood pressure lowering activity of the plant.

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POTENTIALLY CARDIO-PROTECTIVE NEEDLES OF ALEPPO PINE (PINUS HALEPENSIS MILL)

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Introduction: Hypertension is considered to be a major risk factor attributed to global mortality and morbidity. Its prevalence is rising despite advancements in anti-hypertensive therapies. The situation demands alternative treatment strategies to combat the condition. Exploration of medicinal herbs is a favourable option.

Objective: The study was aimed at investigating the traditional use of needle-like leaves of *Pinus halepensis* as an anti-hypertensive agent by testing the pharmacological effects of its methanolic extract on isolated guinea pig atria and rat aorta.

Methods: The extract (Ph.Cr) was prepared from needle-like leaves of the plant. Aortae from Sprague-Dawley rats and spontaneously beating atria from guinea pigs were placed in isolated tissue bath assembly, filled with Krebs's buffer (37°C) bubbled with carbogen and connected to a force transducer and PowerLab attached with a computer. All the graphing, calculations and statistical analyses were performed using Graph-Pad Prism software version 4.00 for Windows.

Results: On spontaneously beating right atria, Ph.Cr showed negative chronotropic effect as the rate was decreased but the force of contraction initially increased followed by partial decrease; thus showing mixed inotropic effect which differs from the effects of verapamil which is a known Ca⁺⁺ antagonist. On phenylephrine (PE, 1 µM) and K⁺ (80 mM)-induced vasoconstrictions, it caused concentration-dependent relaxation similar to verapamil.

Conclusions: These data indicate that the vasodilator effect of Ph.Cr is mediated through inhibition of alpha-receptors as well as by inhibition of Ca⁺⁺ influx via voltage-gated membranous Ca⁺⁺ channels which also accounts for its negative inotropic effect. The mixed chronotropic effect requires further investigations to ascertain its impact on cardiac output and hence on blood pressure.

5

MORPHOLOGICAL CHANGES IN THE EXPERIMENTAL MODEL OF POLYCYSTIC OVARY SYNDROME AND EFFECTS OF VITAMIN D TREATMENT*Arfa Azhar, Ghulam Haider, Zehra Naseem**Department of Biological and Biomedical Sciences and Medical College, Aga Khan University*

Aim: This research was designed to develop an animal model by inducing polycystic ovary syndrome (PCOS) with dehydroepiandrosterone (DHEA) and observe reproductive and morphological changes after treatment with vitamin D.

Materials and Methods: Thirty pre-pubertal female Sprague-Dawley (SD) dams were recruited. The animals were distributed 10 each in control, PCOS and vitamin D-treated groups. In control group 0.2 ml of sesame oil was given. PCOS group was administered DHEA by the daily dose of 6 mg/kg for 30 days. In vitamin D-treated group, animals were injected 6 mg/kg/day DHEA daily and 120 ng 1, 25(OH) 2D₃/100 g subcutaneously once a week. The occurrence of reproductive phenotypic PCOS was evaluated by estrous cycle, morphology and histological changes of ovary, uterus on light microscope.

Results: The results of this study showed significant weight gain, obesity, and estrous irregularity in PCOs group as compared to control and vitamin D-treated group.

Conclusion: Administration of vitamin D (120 ng 1, 25(OH) 2D₃/100) improved the cycle characteristics, reduced body weight and morphological features in PCOS induced animals. The results support the effect of vitamin D treatment for metabolic and reproductive characteristic features in PCOS females.

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ANALYSIS OF DIFFERENTIAL GENE EXPRESSION OF PRO-INFLAMMATORY CYTOKINES IN THE NASOPHARYNGEAL MILIEU OF MILD AND SEVERE COVID-19

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Introduction: A subset of individuals with COVID-19 can suffer from a severe form of the disease requiring breathing support for respiratory failure and even death due to disease complications. COVID-19 disease severity can be attributed to numerous factors, where several studies have associated changes in the expression of serum pro-inflammatory cytokines with disease severity. However, very few studies have associated the changes in expression of proinflammatory changes in the nasopharyngeal milieu with disease severity. Therefore, in the current study, we performed differential gene expression analysis of various pro-inflammatory cytokines in the nasopharyngeal milieu of mild & severe COVID-19 cases.

Material and Method: For this retrospective, cross-sectional study, a total of 118 nasopharyngeal swab samples, previously collected from mild and severe (based on the WHO criteria) COVID-19 patients were used. A real-time qPCR was performed to determine the viral loads and also evaluate the mRNA expression of eight cytokines (IL-1, IL-2, IL-4, IL-6, IL-10, IFN- γ , TGF- β 1, and TNF- α). Subsequently, an unpaired T-test was applied to compare the statistical difference in mean expression of viral loads and each cytokine between the mild and severe groups, while the Pearson correlation test was applied to establish a correlation between disease severity, viral load, and cytokines expression. Similarly, a multivariable logistic regression analysis was performed to assess the relationship between different variables from the data and disease severity.

Results: Out of 118 samples, 71 were mild, while 47 were severe. The mean viral load between the mild and severe groups was comparable (mild group: 27.07 ± 5.22 ; severe group: 26.37 ± 7.89). The mRNA expression of cytokines IL-2, IL-6, IFN- γ , and TNF- α was significantly different in the two groups ($p < 0.05$), where the Log₂ normalized expression of IL-2, IL-6, IFN- γ , and TNF- α was found to be 2.2-, 16-, 2.3-, and 1.73-fold less in the severe group as compared to the mild group. Furthermore, we also observed a significant positive correlation between all the cytokines in the severe group. The multivariate analysis showed a significant relationship between age, IL-6, and disease severity.

Conclusion: This decreased expression of certain cytokines (IL-2, IL-6, TNF- α , and IFN- γ) in the nasopharyngeal milieu may be considered early biomarkers for disease severity in COVID-19 patients.

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SELF-REGENERATING POTENTIAL DEPENDS ON SOX2/OCT4 INTERACTION, AND IT ALSO EVOLVED IN DIFFERENT SPECIES*Yasmeen Rind**Department of Biological and Biomedical Sciences, Aga Khan University*

Background: Stem cell presence predicts the Self-regenerating capability of any tissue or organism. The pluripotency of these stem cells relies on a few core master transcriptional factors. These core TFs regulators are SOX2, OCT4, and NANOG. From embryogenesis to pathogenesis (cancer stem cells) This work aims to see how sox2 and oct4 interact with each other and how they form complexes with DNA. Compared to lower animals and plants humans have weaker self-regenerating potential, for example: “Undying HYDRA “which can regenerate itself in almost 3 and 4 days so it’s important to explore this phenomenon in different species by phylogenetic analysis.

Method: With different Bioinformatics tools Such as Ensembl, NCBI, UniProtKB database, PrositeScan, and Blast tool, we will analyze the phenotype and genotype of SOX2 and OCT4 as transcriptional factors for the pluripotency of stem cells. SOX2/OCT4 coordination/interaction was confirmed by using STRING, PYMOL, and PDB tools. We see diversification of oct4 and SOX2 in different species during genome evolution by using MEG11 tools.

Results: Through this study we found OCT4 and SOX2 interaction and their alignment with each other and but their binding site on DNA still shows variation. With the phylogenetic evolutionary tree, we proved the series of sequence conservation between various species, which dispersed in the course of evolution.

Conclusion: Our results proved that some interaction exists between SOX2 and OCT4. It interacts with each other and is also Aligned with each other at 241-266 AA region in OCT4. And SOX2 aligned site found at 53-75 AA region. OCT4 DNA binding region in the locations, 230-289AA. Sox2 DNA binding site Location -109AA. These proteins have undergone a complex stepwise evolution, which will open new phenomena to be understood.

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IDENTIFICATION AND FUNCTIONAL ANALYSIS OF HOMOZYGOUS DCLRE1C NOVEL VARIANT AND CORRELATION WITH THE CLINICAL PHENOTYPE OF SEVERE COMBINED IMMUNODEFICIENCY*Sohana Nadeem Hashmi¹, Rabab Ibrahim², Fizza Akbar³, Salman Kirmani⁴, Ambrin Fatima⁵**1 (Department of Biological and Biomedical Sciences, AKU)**2 (Department of Biological and Biomedical Sciences, AKU)**3 (Department of Paediatrics and Child Health, AKU)**4 (Department of Paediatrics and Child Health, AKU)**5 (Department of Biological and Biomedical Sciences, AKU)*

Severe Combined Immunodeficiency (SCID) is an inherited primary immunodeficiency, characterized by deficiency or dysfunction of T cells and in some types, B cells and NK cells. Therefore, due to defective immune response, the affected individuals are susceptible to severe and recurrent life threatening infections, leading to progressive failure to thrive, which makes SCID a pediatric emergency. SCID exhibit genetic heterogeneity. Among the genetic defects that cause SCID, are mutations in the gene DCLRE1C (DNA Cross-Link Repair 1C). DCLRE1C encodes ARTEMIS which is a nuclease, having essential role in overhang processing in non-homologous end-joining (NHEJ) mediated DNA double strand break repair and in T and B cell development where it is involved in opening hairpins, which arise as intermediates during V (D) J recombination of the immunoglobulin and T-cell receptor genes. Patients with ARTEMIS deficiency exhibit autosomal recessive mode of inheritance, usually presenting with severe combined immunodeficiency (SCID) with increased cellular radio sensitivity - OMIM 602450.

In this study we report a consanguineous Pakistani family, identified with SCID. The aim of the study includes genetic and functional characterization of the disease identified in the family.

Using gene panel sequencing, novel, missense, homozygous variant, c.767G>A (p. Cys256Tyr) of the gene DCLRE1C was identified, segregating in the family with autosomal recessive mode of inheritance. We also found that the variant has pathogenic potential as indicated by Insilco computational predictive programs. Our current clinical, immunological and genetic findings as well as Insilco predictions add further information to the wide genetic spectrum of the disease. Therefore in order to establish genotype-phenotype correlation by uncovering the pathophysiological mechanisms associated with the variant c.767G>A (p. Cys256Tyr), we have developed wild type construct of DCLRE1C gene with vector pAcGFP1-N1 using restriction cloning as well as mutant construct by Site Directed Mutagenesis (SDM) which will be used for functional studies in future.

MANAGEMENT OF NEUROPSYCHOLOGICAL DECLINE IN MURINE MODEL THROUGH HERBAL INTERVENTION

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Background: Neuropsychological decline includes depression, anxiety leading to cognitive deficits. Chronic states often become progressive and irreversible characterized by impaired cognition, behavioral disorders, and difficulties in daily life activities. The mobility of tryptophan, a precursor of serotonin, is decreased through blood brain barrier in neuropsychological deficits. Various allopathic medications are available for treatment of these disorders; however, these are expensive and pose serious side effects. Cost-effective home-grown food ingredients with minimal side effects and better therapeutic outcomes are required for the management. Two herbs saffron (*Crocus sativus* (CS)) and chamomile (*Matricaria chamomila* (MC)) with known medicinal benefits were considered for the management of diabetes associated AD and dysmorphia symptoms.

Aim of the study: The present study was aimed to determine the effects of oral administration of 2 herbs on psychoneurological impairment subsequent to allaxon-induced diabetes in rats.

Methodology: 40 rats were randomly divided into 4 groups of healthy control, disease control and 2 treatment groups. All animals were induced with diabetes to ensue neurological deficits through intra-peritoneal administration of STZ. Herbal extracts of combined CS+MC was given to 2 different groups separately as methanolic extract and water decoction. Behavioral analysis was done by open field test (OFT), and light and dark box test (LDBT) for assessment of neurological-decline symptoms; rats were sacrificed, and quantitative analysis of plasma tryptophan was done through ELISA. Results were statistically through One-way ANOVA using SPSS v20 & alpha value < 0.01 was considered significant.

Results: Results showed that the behavioral analysis in herbal treated rats were found to be significantly improved when compared to diseased controls. Tryptophan levels were also estimated in all groups and results showed significant improvement in herbal treated rats after oral administration of the extracts.

Conclusion: These herbs are beneficial in treating neurodegenerative allowing augmented entry of tryptophan in brain leading to synthesis of serotonin.

Keywords: psycho-neurological disorders, tryptophan, STZ induced diabetes, saffron, chamomile

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HOMOZYGOUS NONSENSE VARIANT IN SACS GENE CAUSES AUTOSOMAL RECESSIVE SPASTIC ATAXIA OF CHARLEVOIX-SAGUENAY IN A CONSANGUINEOUS PAKISTANI FAMILY

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Introduction: Autosomal recessive spastic ataxia of Charlevoix-Saguenay is a diverse group of neurodegenerative disorders that affect both the central and peripheral nervous systems and sometimes referred to as ARSACS, affects muscles movement. Individuals who are suffering from ARSACS typically have irregular straining of the muscles (spasticity), difficulties with equilibrium and coordination (cerebellar ataxia), and decreased sensation and weakness in the arms and legs (peripheral neuropathy). Frequent cause of recessive early onset ataxia is primarily by the inherited condition of homozygous mutation.

Method: We investigated consanguineous family with six individuals with clinical presentation of early onset ataxia. We performed whole exome sequencing and subsequent bioinformatic analysis to reveal the underlying cause of ataxia in this family.

Result: Whole exome sequencing revealed a nonsense variant in the SACS gene; g.23 355 411 G>A, (c.1202 G>A) (p. R401*) that segregates with the disease status in the family. SACS gene include 10 exons spanning 12.8kb which codes saccin that is involved in the organization of proteins into bundles known as intermediate filaments. Intermediate filaments provide cells support and strength. In nerve cells (neurons), specialized intermediate filaments known as neurofilaments form the structural framework that determines the size and shape of nerve cell extensions known as axons, which are required for nerve impulse transmission to other neurons and muscle and unstable production of saccin protein will deteriorate its function.

Conclusion: Clinical features of the patients in this study fairly overlapped with the already reported phenotype of SACS gene with some additions to the clinical diversity and progressive symptoms. The identified novel variant introduces stop codon in saccin protein. Current study raised the total number of ARSACS implicated variants in SACS to two patients reported so far. Our findings further widen the clinical, genetic and ethnic spectrum of ARSACS.

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EVALUATION OF THE EFFECTIVENESS AND EFFICIENCY OF CARIES REMOVAL BY CHEMO-MECHANICAL METHOD VERSUS ATRAUMATIC RESTORATIVE TECHNIQUE (ART) : AN IN-VITRO EXPERIMENTAL STUDY

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Introduction: The era of advancement in minimally invasive dentistry has led to modifications in the approaches to treat dental caries by maximum preservation of sound dentin capable of remineralization.

Background: Rotary instruments have been the mainstay in caries excavation in dentistry. However, due to certain limitations, approaches in restorative dentistry utilizes conservative methods for caries removal.

Objectives: The study aim to evaluate effectiveness and efficiency of conventional Atraumatic Restorative Technique (ART) versus chemomechanical methods using a papain-based gel (BRIX-3000) in the removal of caries in extracted human teeth.

Material and Methods: A total of 50 extracted human permanent molars with Class I cavity and ICDAS score 5 were selected. Each tooth was sectioned from the centre of the carious lesion to obtained equal sized caries and were randomly assigned to two groups (n=25); Group I: ART group and Group II: Chemo-mechanical removal (BRIX-3000). The time taken and number of applications was noted and the effectiveness was determined by the scoring criteria for caries removal. Data was analysed using SPSS (IBM version 23.0). The level of significance will be kept at <0.05.

Results: The time taken for caries removal observed that Brix 3000 (4.69 ± 1.22) was more efficient than ART (5.89 ± 1.27) ($p < 0.05$). Moreover, there was a significant difference in number of applications required to complete caries removal with Brix 3000 revealed better outcomes ($p < 0.05$). However there was no significant difference in the effectiveness in both groups ($p > 0.05$).

Conclusion: The results of the study concluded that Brix 3000 was more efficient in caries removal than conventional ART. However both the techniques were equally effective.

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A NOVEL HOMOZYGOUS VARIANT IN ZNF142 CAUSES A COMPLEX NEURODEVELOPMENTAL DISORDER WITH INTELLECTUAL DISABILITY, DYSTONIA AND SEIZURES IN A CONSANGUINEOUS PAKISTANI FAMILY

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Neurodevelopmental disorders (NDD) are a group of disorders affecting brain development and function, with heterogenous origins¹. Neurodevelopmental disorder with impaired speech and hyperkinetic movement (NEDHISM) is a subgroup of NDD associated with global intellectual delay, speech disorders and movement disorders such as dystonia². We have identified a Pakistani family with three affected siblings born to consanguineous parents, presenting intellectual disability, speech impairment, dystonia and seizures. Whole Exome Sequencing (WES) was employed for genetic categorization of affected individuals, revealing a novel recessive variant in the ZNF142, segregating with the disease status of the patients. The variant was categorized as pathogenic based on the standards for variant interpretation, recommended by ACMG. The ZNF142 gene, located on chromosome 2q35, encodes a zinc finger protein 142, with 31 C2H2-type zinc finger domains^{2,3}. The C2H2 motif include a vast group of cellular effectors with a wide range of functions, including signal transduction, transcriptional regulation and DNA repair². Recently, pathogenic variants in the ZNF142 gene have been associated with autosomal recessive neurodevelopmental disorders such as NEDHISM^{2,3}. We then developed a construct using CRISPR/cas9 technology to knock out ZNF142 in a neuroblastoma cell line (SHSY5Y). To understand pathogenicity of loss of function mutations, we aim to perform functional analysis assays examining cell growth, cell proliferation and dendritic outgrowth assays. Results from functional analysis assays will assist in determining pathophysiological mechanisms of the mutation, to improve clinical diagnoses and potentially develop novel therapies.

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HOMOZYGOUS MISSENSE VARIANT IN BBS12 GENE CAUSES AUTOSOMAL RECESSIVE BARDET BIEDL SYNDROME IN A CONSANGUINEOUS PAKISTANI FAMILY.*Lubaba Khalid¹, Naveed Iqbal², Haq Nawaz Khan, Zafar Iqbal³, Shahid M. Baig¹, Ambrin Fatima¹**¹ Department of Biological and Biomedical Sciences, Aga Khan University**² Balochistan University of Information Technology and Management Sciences, Quetta Pakistan**³ Department of Neurology, Oslo University Hospital, Oslo, Norway*

Abstract: Bardet Biedl syndrome is an autosomal recessive condition linked with multiorgan non-motile ciliopathy in which multiple distinct genes involved in ciliary structure/function. It is characterized by shared clinical features that include truncal obesity, cystic kidney, mental retardation, polydactyly, retinal defect and testicular hypogonadism. Inherited homozygous mutation in BBS gene in an autosomal recessive pattern are a leading cause of early onset Bardet Biedl Syndrome in identified patients.

Methodology: We investigated a consanguineous Pakistani family with two individuals presented shared clinical features of syndactyly, delayed speech, impaired learning and progressive obesity. Whole exome sequencing was performed followed by data analysis that revealed candidate variant involved in the underlying cause in this family.

Results: Whole exome sequencing revealed missense variant in the BBS12 gene. g.122,743,126G>T (c. 1234G>T) (p. Val412Phe) that segregate with the disease status in the family. The in-silico prediction tools CADD (score=22.6), Mutation tester (score=0.822), Polyphen (0.844) and SIFT (0), predicted the variant to be deleterious. BBS12 genes reported to cause Bardet Biedl Syndrome with great clinical and genetic heterogeneity.

Conclusion: Clinical features of the patients in this study fairly overlapped with the already reported phenotype of BBS gene with some additions to the clinical diversity and progressive symptoms. The identified novel variants altered the amino acid in BBS12 protein. Current study raised the total number of Bardet Biedl Syndrome implicated variants in BBS12 gene to two patients reported so far. Our finding further widen the clinical, ethnical and genetic spectrum of BBS.

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STRUCTURAL BIOINFORMATICS ANALYSIS OF THE SARS-COV-2 SPIKE GLYCOPROTEIN MUTATIONS FROM STRAINS PREVALENT IN PAKISTAN*Umar Bin Adnan¹, Dr. Arooj Shafiq²**1 Department of Biosciences, Salim Habib University,**2 Department of Biological and Biomedical Sciences, Aga Khan University*

Introduction: SARS-CoV-2 is an enveloped, single stranded RNA virus that possesses four structural proteins; surface glycoprotein (S), nucleocapsid phosphoprotein (N), membrane (M) and envelope (E). The S protein is the target of various antibody treatments and vaccines. The aim of this study is to analyze the S protein mutations of the SARS-CoV-2 strains found in Pakistan.

Methodology: In this study, 467 Pakistani amino acid sequences and the Wuhan sequence were downloaded from the NCBI database in December 2022. Multiple sequence alignment (MSA) was performed using the Clustal Omega software. The mutations were grouped according to their lineages and classified based on their associated variants. Effect of mutations on structural stability was analyzed using DynaMut2 and molecular effects of the mutations were predicted using MutPred. The S protein structure of each variant of concern was modelled using VMD, docking of variant models with the ACE2 receptor was performed using HDOCK and their respective binding energies were predicted using PRODIGY.

Results: 12 Wildtype, 18 Alpha, 1 Beta, 3 Delta Variant and 205 Omicron sequences were present in the sample while 229 belonged to other variants. 142 amino acid mutations of SARS-CoV-2 spike glycoprotein were found. D614G was the most frequent non-synonymous mutation, found in 439 sequences. 15 mutations had a stabilizing effect on the closed state structure while 14 mutations had a stabilizing effect on the open state structure of the surface glycoprotein. Furthermore, 16 surface glycoprotein mutations were found to have molecular and phenotypic impacts. Lastly, The Beta (-14.5 kcal/mol) and the Omicron variants (BA.5) (-14.3 kcal/mol) showed the maximum binding affinities with the ACE2 receptor.

Conclusion The results of this study can be used as a template for future studies within and outside the region for the constant monitoring of COVID 19 spike glycoprotein mutations and observing their effects on various biophysical properties.

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COMPREHENSIVE CLINICOPATHOLOGIC ANALYSIS OF ALVEOLAR SOFT PART SARCOMA: A CASE SERIES OF 46 CASES.

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Background: Alveolar soft part sarcoma (ASPS) is a rare high-grade sarcoma of uncertain histogenesis. It commonly occurs in young female adults and affects lower extremities, followed by trunk, head and neck and internal organs as slowly growing painless mass.

Design: We retrieved and reviewed H&E and IHC slides of ASPS cases diagnosed between 2008-2022 (n=46). Follow up was taken.

Results: There were 24 males and 22 females. Age range was 2 to 49(Meanage25)years. Tumor size ranged from 2-14 (Mean 7) cm. Tumor affects lower extremity (20) followed by head and neck (09), upper extremity (04) and spine (04). Histologically, 44 cases had organoid (along with sheeting in 6) growth pattern. All were composed of polygonal cells with abundant granular cytoplasm (clear cytoplasm in 4). Cytoplasmic PAS positive diastase resistant crystals seen in 28 tumors. TFE-3 was positive in all cases. Myo-D1 and desmin were positive in 19 and 8 cases respectively. Follow up was available in 15 patients. 8 patients died of disease .7 were alive on a follow up of 12-180 (Mean 82) months. Surgical excision with adjuvant chemoradiotherapy was given in 2 casesandsurgery with radiotherapy in 4 patients. 5 patients presented with metastatic disease at diagnosis and treated with palliative chemoradiation.

Recurrence was observed in 4 patients. Metastasis occurred in 6 patients. Most common metastatic sites were lungs and brain/spine. Recurrence and metastases were seen in tumors with lymphovascular invasion and necrosis.

Conclusion: ASPS is a high-grade sarcoma with a propensity to occur in distal extremities of young adults. A slight male predominance is seen in our cohort in contrast to female preponderance in literature. Lymphovascular invasion and necrosis were associated with high recurrence and metastasis.

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IDENTIFICATION OF RISK ALLELES IN INFERTILE FEMALES WITH POLYCYSTIC OVARY SYNDROME: VALIDATION OF GENOME WIDE ASSOCIATION STUDIES (GWAS) IN PAKISTANI POPULATION

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Polycystic Ovary Syndrome (PCOS) a multifactorial genetic disorder associated with adverse reproductive, endocrine, metabolic, cardiovascular and psychological outcomes. Association of PCOS with infertility is well studied and is thought to be responsible for 40% of female infertility. There is limited genetic data available on PCOS associated with infertility in the Pakistani population. We have selected the statistically top hits; DENND1A and ERBB4 from the meta-analysis of PCOS genomewide association study to check the association of rs9696009 (DENND1A) and rs2178575 (ERBB4) in the Pakistani population.

The objective is to find an association of rs9696009 (DENND1A) and rs2178575 (ERBB4) with phenotypic presentation of the syndrome in infertile Pakistani females. This is a case-control study which included infertile women with PCOS as cases and infertile women with no evidence of PCOS as controls. The genotyping of the SNPs rs9696009 (DENND1A) and rs2178575 (ERBB4) was done by Polymerase Chain Reaction-Restriction Fragment Length Polymorphism (PCR-RFLP) which is cost-effective genotyping technique.

The results of the RFLP were further validated by gold standard DNA Sanger Sequencing. To evaluate the association of PCOS polymorphisms rs9696009 (DENND1A) and rs2178575 (ERBB4) with infertility, the Chi-square test was performed. The results revealed that rs2178575 (ERBB4) was significantly associated with infertility ($\chi^2=10.282$, $p=0.005852$) while rs9696009 (DENND1A) did not show any significant association ($\chi^2=3.10$, $p=0.212036$). Multinomial logistic regression analysis was carried out to confirm that either the SNPs rs9696009 (DENND1A) and rs2178575 (ERBB4) increases the risk of infertility in PCOS women or play a protective role. Results of regression analysis indicated that rs2178575 (ERBB4) heterozygous genotypes (GA) and mutant genotypes (AA) increases the risk of infertility by 0.541 times (OR=0.541, 95% CI=0.314-0.930, $p=0.026$) and 0.416 times (OR= 0.416, 95% CI=0.228-0.757, $p=0.004$) respectively, compared to wild type genotype (GG). The significant association of ERBB4 variant with infertile women with PCOS suggests that ERBB4 (rs2178575) increases the risk of infertility in females with PCOS.

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EPIDEMIOLOGY AND DEMOGRAPHICS OF SARS-COV2 OMICRON VARIANT DURING FIFTH COVID19 WAVE IN PAKISTAN*Ali Raza Bukhari, Javeria A. Razzak, Akbar Kanji**Department of Pathology and Laboratory Medicine, Aga Khan University*

Background: The COVID-19 pandemic in Pakistan saw a fifth wave of cases in December 2021, when the Omicron variant of the virus was detected. To better understand the relationship between the virus and the pandemic, genomics surveillance was conducted in Pakistan from December 2021 to August 2022.

Methods: The COVID-19 positivity and mortality data for Pakistan were obtained from the John Hopkins University COVID-19 data repository [1]. Province-specific analysis of cases was conducted, and the genomes of 1041 individuals (including approximately 300 genomes from the Aga Khan University Hospital) were analyzed using data from GISAID. The data set included complete, low coverage excluded sequences from December 2021 to mid-August 2022.

Results: From December 2021 to August 2022, Pakistan reported 276,525 cases of COVID-19 and 1,766 deaths. Sindh had the most cases (115,472, 41.75% of total cases) and deaths (33.07% of total deaths). The highest case fatality rate (CFR) was observed in Balochistan (1.5%), followed by KPK (1.11%). The CFR in other provinces was less than 0.5%. Of the analyzed SARS-CoV-2 sequences, five lineages were identified, including the Delta lineage (AY, n=47, 4.5%) and the Omicron lineage (BA.1, n=184, 17.6%; BA.2, n=349, 33.5%; BA.4, n=36, 3.4%; BA.5, n=396, 38.0%). Statistical analysis showed that the younger age group (≤ 40 years) was more affected by each variant compared to the older age group (≥ 40 years; $p < 0.001$). The BA.2 and BA.5 sub-lineages of the Omicron lineage were predominant across all regions. COVID-19 cases were more common among males compared to females in all regions.

Conclusion: KPK and Balochistan were disproportionately impacted by the severity of COVID-19, as reflected by their higher CFR. The BA.2 and BA.5 sub-lineages of the Omicron lineage were predominant across different regions of Pakistan. In every region, younger individuals were more likely to be affected by each variant

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COMPLIANCE TO DONNING AND DOFFING OF PERSONAL PROTECTIVE EQUIPMENT AMONG DENTAL HEALTHCARE PRACTITIONERS DURING THE CORONAVIRUS PANDEMIC: A QUALITY IMPROVEMENT PLAN, DO, STUDY AND ACT (PDSA) INITIATIVE

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Introduction: With the emergence of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-Cov-2), the Centers for Disease Control and Prevention (CDC) defined mandatory guidelines for donning and doffing personal protective equipment (PPE) among dental healthcare professionals. The study's objective was to improve the compliance of the donning and doffing protocols for PPE among dental practitioners by the plan, do, study, and act (PDSA) cycle.

Materials and Methods: A quasi-experimental study was conducted on a sample of dental healthcare professionals using non-probability purposive technique. In the first planning stage, compliance with CDC-approved donning and doffing was assessed on the clinical premises. In the second stage, an educational session was arranged with all the healthcare professionals to explain stepwise guidelines of donning and doffing in order to improve quality of donning and doffing compliance. In the third stage, improvement in the quality outcome was then assessed after the session. Data were normally distributed. Qualitative variables for all the steps of donning and doffing are reported as frequency and percentages. Pareto charts were made to assess the non-compliance rate for donning and doffing protocols among dental healthcare professionals.

Results: There was an improvement of 44.55% in the hand hygiene practices before wearing the PPE after the second step of the PDSA cycle. A percentage improvement of 7.4% was recorded for removing jewelry, wearing the gown, and wearing a surgical cap. No improvement was seen in securing the mask/ respirator ties, washing hands after wearing the respirator, placing the goggles, or face shield practices.

Conclusions: PDSA cycle improved the overall compliance to PPE donning and doffing practices. Most of the protocols were followed by the dental healthcare professionals; however, some of them remained the same or worsened due to ease in SARS-CoV 2 restrictions.

Keywords: Covid-19, Personal Protective Equipment, Dentists, Quality improvement

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COMMON HYPERGLYCEMIA SUSCEPTIBILITY LOCI IN METABOLIC SYNDROME PATIENTS FROM PAKISTAN

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Introduction: More than 75 genetic susceptibility loci have been implicated with hyperglycemia, making the genetic predisposition among different populations, extremely complex and intricate. SNPs in genes linked with satiety, homeostasis, insulin sensitivity, BMR (Adiponectin, FTO and MC4R) and inflammation and autoimmunity (TNF- α) have been shown to have a relationship with metabolic syndrome.

Objective: Therefore, this study aimed to measure the frequency of ADIPOQ, FTO, MCR4, and TNF SNPs in metabolic syndrome patients and controls and to assess association of these genes with hyperglycemia and adiposity status.

Methods: A case-control study was conducted in the UGME research course 2022. Baseline investigations including lipid profiles, blood glucose levels, BMI calculation were conducted for n=113 Metabolic Syndrome and n=47 healthy controls. Tetra ARMS PCR and gel electrophoresis was conducted for Adiponectin rs266729, Adiponectin rs1501299, FTO rs9939609, MCR4 rs1297013 and TNF rs1800629. Statistical analysis was performed using SPSS version 26.

Results: Difference was observed in lipid profiles (including LDL, triglycerides, and cholesterol but not HDL), body fat percentage ($p=0.034$) and both fasting ($p=0.000$) and random ($p=0.000$) blood glucose levels among metabolic syndrome patients versus controls. Out of all polymorphisms, only Adiponectin rs1501299 and MCR4 showed genotype frequency difference between groups. Spearman's correlation was applied to test any association of risk allele with study variables and MCR4 rs1297013 showed an independent association with Fasting Blood Glucose Level ($r=0.234$; $p=0.026$) irrespective of age or gender in our study.

Conclusion: MCR4 rs1297013 polymorphism is an independent risk factor leading to hyperglycemia in study population. Contrary to available literature from the Caucasian population, common SNP's do not have a major role in development of obesity or metabolic syndrome in a subgroup of Pakistani population. A large-scale genome wide population specific studies are required to identify the unique set of genes for our population.

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SARS-COV-2 DELTA VARIANTS WERE PREDOMINANT AMONGST BREAKTHROUGH INFECTIONS IN BBIBP-CORV VACCINATED INDIVIDUALS DURING 2021

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Background: Vaccination against COVID-19 has played a key role in reducing infections caused by SARS-CoV-2. A number of different vaccine types has been introduced and currently over 5.51 billion people, that is about 71.8% of world population has been vaccinated (08 Jan 2023). In Pakistan, 132,430,936 people have been fully vaccinated (up until 13 Jan 2023). Sinopharm's inactivated whole virus vaccine, BBIBP-CorV has been the most widely used in Pakistan.

Objective: In this study, we characterized the SARS-CoV-2 genomes isolated from respiratory swabs of BBIBP-CorV vaccinated healthcare workers who developed COVID-19 during the period of May to September 2021.

Methods: Fifty-one SARS-CoV-2 PCR positive nasal swabs from vaccinated individuals were identified at AKUH laboratory. Individuals were selected after informed consent based on convenience sampling.

RNA was extracted from samples and library preparation for whole genome sequencing was done using NEBNext® ARTIC SARS-CoV-2 RT-PCR Module and thereafter Oxford Nanopore sequencing technology was employed.

Variant identification through phylogenetic analysis was done using NextClade.

Results: The mean age of individuals with break-through infections was 35 years. 37% were females. 16 % were ≥ 50 years. All had mild COVID-19 symptoms. There were 45 delta, 3 beta, 2 alpha and 1 20A variants identified. 88% of COVID-19 cases were infected with the Delta variant. There was no difference in gender or age in variant distribution. The largest number of samples were collected in the month of July. July was the peak of five-month variant distribution, with 65% being of delta variant.

Conclusion: We studied COVID-19 cases with mild disease and observed that the majority of individuals infected after vaccination with BBIBP-CorV were infected with the delta variant. Most cases were seen in the month of July which was coincident with the peak of the 2021's July-October wave of the pandemic in Pakistan. BBIBP-CorV vaccination likely played a role in preventing severe disease in these individuals. More research needs to be conducted to investigate immunity in the study participants.

MIDENTIFICATION OF GENETIC VARIATIONS OF SARS-COV-2OMICRON STRAIN AND THEIR CLINICAL SIGNIFICANCE IN KARACHI, PAKISTAN

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Background: SARS-CoV-2 omicron variant was first detected in South Africa in November 2021 and raised major public health concern. Omicron variant in Pakistan gained significant importance due to high transmissibility, severity of the symptoms and clinical outcome. Objective: The present study aims to investigate the genomic variability and structural diversity of omicron variant in Karachi, Pakistan along with its clinical significance.

Methods: The nasopharyngeal swabs from 66 SARS-Cov-2 positive patients were enrolled under UWARN study at Aga Khan University Hospital, Pakistan between May,2021 to July,2022. Sequencing was performed using Illumina DNA prep kit for Illumina Miseq instrument (Illumina, CA, USA) and raw reads were analyzed through bioinformatics tools.

Results: The protocol encompasses novel mutations and phylogenetic analyses with already available genomes from Pakistani (n=124), South African (n=945) and United Kingdom strains (n=1194). The Omicron strain was found to be highly abundant, and their phylogenetic analysis showed close association with the Omicron isolates from other countries. Moreover, three novel missense mutations such as T547K, N856K, N969K were identified in the S1 and S2 subunit of spike protein, which may alter viral infectivity and interaction with host immunity. Also, we discovered these mutations within the critically ill patients attributing towards disease severity. Moreover, the conformational stability of the mutated S protein may prevent the binding of neutralizing antibodies to the RBD domain and may not mimic the viral entry.

Conclusion: In conclusion, our study provides deeper insights into the clinical features, significant mutations and its possible effect at the structural level to understand disease transmission process and viral spread in Southeast Asian region. In future, the inhibitory effect of anti-SARS-CoV2 monoclonal antibodies can be checked through binding prediction using molecular docking and Molecular Dynamics (MD) simulation strategies.

EXTRACTION OF HIGH-QUALITY GENOMIC DNA (GDNA) FROM MATERNAL/NEONATAL SAMPLES FROM THE ALLIANCE FOR MATERNAL AND NEONATAL HEALTH IMPROVEMENT (AMANHI) BIOREPOSITORY

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The Alliance for Maternal and Neonatal Health Improvement (AMANHI) is a multi-center collaboration between Pakistan, Bangladesh, and Tanzania, under the management of WHO, that set out to build the first in-country, population-level biorepositories in low-income settings. Recently, AMANHI was successfully incorporated into the Multiomics for Mothers and Infants (MOMI) consortium, an initiative that aims to address complex health issues by predicting new genetic and biological markers of adverse pregnancy outcomes (APOs). To identify distinct genetic variations associated with APOs, the primary step is to extract high-quality genomic DNA (gDNA) from diverse maternal/neonatal sample types (buffy coats, clotted and unclotted umbilical cord blood, and saliva) that could be subsequently sequenced. For this purpose, Roche's MagNA Pure 24 instrument along with the MagNA Pure Total NA isolation kit was used. For Next Generation Sequencing (NGS), it is imperative to perform a quality check (QC) of the extracted DNA samples. Herein, QC data of the DNA samples extracted from maternal (buffy coats), and neonatal (buffy coats and umbilical cord blood) samples are reported. A260/A280 ratios and concentrations of the extracted DNA samples were determined using NanoDrop analyzer and Qubit fluorometer 4.0. As per the A260/A280 ratios and concentrations, the extracted DNA samples were pooled as; Pool 1 (Concentration ≥ 50 ng/ μ l; A260/A280 1.7-1.9), Pool 2 (Concentration ≥ 50 ng/ μ l; A260/A280 < 1.7), Pool 3 (Concentration ≥ 50 ng/ μ l; A260/A280 > 1.9), Pool 4 (Concentration < 50 ng/ μ l; A260/A280 1.7-1.9), Pool 5 (Concentration < 50 ng/ μ l; A260/A280 < 1.7) and Pool 6 (Concentration < 50 ng/ μ l; A260/A280 > 1.9). Majority of the samples ($\sim >95\%$) contained ≥ 500 ng of DNA in the total elution buffer and have passed the quality assessment for downstream sequencing (1X low-pass Whole Genome Sequencing; lpWGS). In future, gDNA will be extracted from other sample types including clotted cord blood, and neonatal saliva with stringent QC.

PHARMACOLOGICAL EVALUATION OF ROSAMARINUS OFFICINALIS (ROSEMARY) FOR GUT MOTILITY DISORDERS.

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Background: Chronic gut motility disorders are life debilitating and natural products could be of therapeutic use owing to their safety profile. Rosmarinus officinalis commonly known as rosemary (Urdu name: Akleel e Kohistani) is a flavonoid enriched aromatic herb traditionally used to treat GI ailments (2). However, the pharmacological basis for its medicinal use have not yet been explored. We aim to determine effectiveness in gut motility disorders with possible pharmacological rationale.

Objective: To study the effect of ethanolic aqueous crude extract of Rosemary (Rs.Cr) in isolated tissue preparations, invivo antidiarrheal effect in mice, and antianxiety effect using Elevated Plus maze assay in rats.

Method: Rs.Cr was tested in isolated rabbit jejunum and guinea pig ileum tissues using tissue assembly setup. Invivo antidiarrheal effect was determined against castor oil-induced diarrhea model, enteropooling and charcoal meal assay in BALB/c mice and antianxiety effect was assessed in Sprague Dawley rats using Elevated plus maze assay.

Results & Discussion: Rs.Cr produced a dose-dependent inhibition of spontaneous contractions in isolated rabbit jejunum, whereas, the spasmogenic component was evident in the chloroform portion from 0.01-1 mg/mL, followed by relaxation at 3 mg/mL. Rs.Cr inhibited low K⁺-induced contraction at a lower dose (3mg/ml) as compared to the high K⁺ mediated contraction, signifying the K⁺ channel opening activity (KCO) with involvement of predominant ATP-sensitive K⁺ channels followed by nonspecific and voltage gated K⁺ channels respectively. Rs. Cr reduced the diarrheal score in mice by 71.2% (4.2±1.31), 36.64% (9.25±2.23) and 84% (2.3±1.2) at the respective doses of 200, 400 and 600 mg/kg by reducing both the secretions and gut motility. Antianxiety effect was observed at tested dose of 400 and 600 mg/kg, given orally.

Conclusion: Rs.Cr has potential to be explored for functional motility disorders owing to its antispasmodic, anti-anxiety and dual effect against constipation and diarrhea.

CORONARY HEART DISEASE RISK STRATIFICATION AND METABOLIC SYNDROME SCREENING IN THE PAKISTANI POPULATION: A SINGLE CENTRE CROSS-SECTIONAL STUDY

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Background: Almost 80% of premature deaths associated with coronary heart disease (CHD)-related deaths occur in developing and underdeveloped countries. Screening programs have been shown to reduce CHD morbidity and mortality in different countries, though cardiovascular disease risk stratification is often neglected.

Objective: This study aimed to stratify the 10-year CHD risk by metabolic syndrome status in a cohort of healthy Pakistani adults using the Framingham Risk Scoring (FRS) algorithm.

Methods: A cross-sectional analysis of a cohort of conveniently sampled patients from the outpatient department of the Aga Khan University Hospital was conducted, with all analyses being performed on SPSS Version 23.

Results: A total of 246 subjects were screened, of which 151 were male and 95 were female. The mean age of study participants was 46.5 ± 10 years. 56.1%, 22.8% and 21.1% of participants were at low, moderate and high risk (respectively) of developing CHD in the next 10 years using the FRS algorithm. Amongst the low, moderate, and high risk subjects, 45.7%, 76.8%, and 96.2% individuals were diabetics respectively. There was no significant difference between the FRS-calculated CHD risk in obese versus non-obese individuals ($p=0.193$). Interestingly, there was no significant difference in MetS positivity between obese and non-obese individuals ($p=0.169$) either. However, 24.6% of individuals predicted to be low risk had a MetS severity Z-score of greater than 1, which corresponds to 84.1% of the US population.

Conclusions: While the FRS algorithm can help identifying those at increased risk for developing CHD in the Pakistani population, it can miss MetS patients who also bear CHD risk and may under-predict risk in such individuals. Validation studies to modify existing risk-score calculators for the Pakistani population are required, especially because South Asian populations are predisposed to central obesity and hypertriglyceridemia, both of which are not included in existing risk-score calculators.

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NOVEL METHOD OF EXOSOMES ISOLATION FOR TREATING PHILADELPHIA-POSITIVE LEUKEMIA*Fawad Ur Rehman, Rida e Maria Qazi, Zahra Sajid and Afsar Ali Mian**Centre for Regenerative Medicine and Stem Cell Research, Aga Khan University*

Background: Exosomes are extracellular vesicles having less than 200 nm size, secreted extracellularly by almost all types of cells. They regulate intercellular communication by delivering RNAi, proteins, viruses, and soluble factors as inherited payloads. In recent years, the application of exosomes to deliver small molecules have been widely investigated in tissue regeneration, therapeutics, as well as diagnostics. However, the isolation of exosomes has remained challenging mainly due to limitations of specialized instruments and the least cost-effective reagents. In this study, we developed a novel method to isolate exosomes from cultured cells.

Experimental: The supernatant from cultured cells was collected and subjected to lyophilization after low-speed centrifugation. The characterization and quantification of exosomes were performed using Bradford assay. Scanning Electron Microscopy (SEM) and Nanoparticles Tracking Analysis (NTA) were carried out for shape and size distribution. Western blot was performed for the evaluation of the exosome specific surface markers (CD63, CD9, CD81, calnexin, HSP70, and TSG101). The as-isolated exosomes were loaded with commercial dyes (Cy5, Eosin) for the evaluation of their drug delivery properties. Furthermore, their drug loading and release were confirmed by loading tyrosine kinase inhibitors (TKIs) as a payload. Finally, the anti-leukemic drugs (dasatinib and ponatinib) were loaded on the isolated exosomes for targeting leukemia cell line i.e., K562 and BCR-ABL expressing Ba/F3 cells in in vitro model, using MTT assay for cell proliferation and Annexin-V/PI for apoptosis detection.

Results: Here we found that the isolated exosomes have round shape with an average size of ~130 nm. They expressed known exosome markers including CD63, CD9, CD81, calnexin, HSP70, and TSG101. These exosomes could efficiently target and deliver dyes (Eosin and Cy5) and TKIs (dasatinib and ponatinib) to K562 and Ba/F3-cells expressing BCR-ABL. The TKIs-loaded exosomes inhibited the growth of leukemic cells and induced apoptosis in a dose dependent manner.

Conclusion: We claim the development of a new method for active exosome isolation from cell culture. These exosomes could qualify for all the essential characterization, drug loading, and release ability by harnessing proliferation and inducing apoptosis in Ph⁺ leukemia cells.

TREATING HEMOGLOBINOPATHIES BY TARGETED DELETION OF BCL11A GENE USING CRISPR-CAS9 TECHNOLOGY

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Background: In humans, the β -like globin genes are encoded from a single locus comprising five globin genes (ϵ -, $G\gamma$ -, $A\gamma$ -, δ -, and β -globin in sequence) and their expression is under developmental control. The γ -globin genes ($G\gamma$ - and $A\gamma$ -) are expressed during fetal life and replaced by adult β -globin after birth. Mutations in the β -globin gene cause β -hemoglobinopathies such as sickle cell disease (SCD) and β -thalassemia. The clinical severity of SCD and β -thalassemia can be mitigated by elevated fetal hemoglobin (HbF) levels, which have been found in individuals with the benign hereditary persistence of fetal hemoglobin (HPFH) syndrome. Thus, reactivating the expression of γ -globin genes is an attractive treatment strategy for β -hemoglobinopathies. Reactivation of γ -globin expression by disrupting the binding of the BCL11A transcriptional repressor complex to the γ -globin gene promoter, provides a novel approach for inducing fetal hemoglobin.

Methodology: The BCL11A binds a 5'-TGACCA-3' element (spanning nucleotides -118 to -113) of globin genes using its three C-terminal Zinc fingers (Znf). The binding efficiency of Znf4, Znf5, and Znf6 was predicted by using in silico tools (SIFT, SNAP, PolyPhen-2, PANTHER, I-Mutant, PROVEAN, SNPs&GO, mCSM, and PhD-SNP), molecular dynamic simulation and homology modelling. K562 cells were electroporated with CRISPR-Cas9 targeting the BCL11A Znf4.

Results: The binding energy scores illustrate that deleting Znf5 and Znf6 decreased the binding affinity by ~3.7-fold, whereas deleting Znf4 decreased the affinity by > 70-fold. Using CRISPR-Cas9 genome-editing strategy, we deleted Znf4 (260bp genomic region) within the BCL11A in K562 cell lines. Znf4 deletion resulted in a readily detectable γ -globin increase with a preferential increase in G-gamma.

Conclusion: Altogether, our findings highlight the valuable insights for improving gene editing therapy strategies by either deleting Znf4 of BCL11A or the TTGACCA motif to disrupt the interaction between BCL11A and other interacting partners and the γ -globin gene promoter. Complete failure in the protein-protein interactions with functional partners and to the γ -globin gene promoter revealed that Znf4 is a suitable target for disrupting BCL11A-mediated haemoglobin switching.

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PHILADELPHIA CHROMOSOME-POSITIVE (PH+) LEUKEMIA: RESISTANCE MECHANISM AND MOLECULAR TARGETING*Afsar A. Mian**Center of Regenerative Medicine and Stem Cell Research Aga Khan University Hospital Karachi*

Chronic myelogenous leukemia (CML) and Philadelphia chromosome-positive acute lymphatic leukemia (Ph+ ALL) are caused by the t(9;22) translocation. The resulted translocation leads to the oncogenic fusion gene known BCR-ABL. Targeting BCR-ABL with tyrosine kinase inhibitors (TKIs) is a proven concept for the treatment of BCR-BL positive leukemia. The major clinical challenge in the treatment of Ph+ leukemia is either kinase domain mutations in ABL or non-mutational mechanisms. The “gatekeeper” mutation T315I confers resistance against all approved TKIs except ponatinib. However, ponatinib has multiple off-target effects that may be responsible for cardiovascular issues. Moreover, compound mutations confer resistance to ponatinib and all other approved drugs. Therefore, a selective option for the treatment of resistant Ph+ leukemia is urgently needed. We aimed to find the mechanism of drug resistance in Ph+ leukemia, we focused on the development new ABL kinase inhibitors, novel allosteric inhibitors, oligomerization inhibitors, signal transduction pathways inhibitors and targeting BCR-ABL using CRISPR-Cas9 approach for the treatment of resistant Ph+ leukemia patients. We were able to develop novel inhibitors with the characteristics of i.) inhibiting potently un-mutated BCR-ABL as well its resistance mutations; ii.) achieving a high selectivity to improve safety; and iii.) overcoming non-mutational resistance in Ph+ leukemia.

These novel inhibitors inhibited un-mutated BCR-ABL as well as resistant mutations including “gatekeeper” mutation (T315I) and compound mutation, (T315I-E255K) at low concentrations in cell lines and patient derived cultures. They significantly prolonged survival of the mice with BCR-ABL and its mutations.

To sum up, this work establishes a novel approach for the molecular targeting of BCR-ABL positive leukemia and explains the clinical behavior of patients with un-mutated and mutated BCR-ABL.

COMPARATIVE STUDY OF CRUDE AQUEOUS AND CRUDE ETHANOLIC EXTRACT OF ROSAMARINUS OFFICINALIS (ROSEMARY) FOR GUT MOTILITY DISORDERS.

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Background: Rosmarinus officinalis commonly known as rosemary is a flavonoid enriched aromatic herb traditionally used to treat GI ailments. Our group provided pharmacological validation of its crude aqueous methanolic extract (Rs.Cr). However, for translational aspect, aqueous extract holds more promise and therefore we aimed to compare the ethanolic extract (Rs.Cr) with aqueous (Rs.Aq) extract.

Objective:

1. Compare the effect of Rs.Cr and Rs.Aq in isolated tissue assembly.
2. Compare antidiarrheal effect of Rs.Cr and Rs.Aq against castor oil-induced diarrhea, enteropooling and charcoal meal assay in BALB/c mice, and antianxiety effect in Elevated Plus maze (EPM) assay in Sprague Dawley rats.

Method: Rs.Cr and Rs.Aq were tested against spontaneous, low K⁺ (25 mM) and high K⁺ induced contractions in isolated tissue assembly setup using rabbit jejunum and guinea pig ileum tissue preparations. Castor oil-induced diarrheal model, enteropooling assay and charcoal meal assay and EPM was used for antianxiety effect.

Results: Rs.Cr exhibited both spasmogenic and spasmolytic contractions in isolated guinea pig ileum and rabbit jejunum respectively, whereas, Rs.Aq exhibited spasmolytic activity. The spasmolytic effect of Rs.Cr was mediated by K⁺-channel opening (KCO) like activity. Rs.Aq and Rs.Cr both exhibited relaxation against high K⁺-induced contractions with a downward ward shift against Ca²⁺-induced contractions, similar to the control verapamil.

Both Rs.Cr and Rs.Aq reduced the diarrheal score against castor oil induced diarrhea significantly with Rs.Cr exhibiting slightly greater effect at 600 mg/kg dose given orally. Rs.Cr reduced both the secretions and gut motility more effectively than Rs.Aq. The antianxiety effect was evident in both the fractions however, there was difference in effectiveness with Rs.Aq producing significant antianxiety effect at tested dose of 600 mg/kg whereas Rs.Cr produced antianxiety effect at 400 mg/kg.

Conclusion: Rosemary herb has beneficial effects against gut motility and anxiety and owing to the effectiveness in aqueous portion, translational aspects could be fruitful.

WNT INHIBITION AND APOPTOSIS IN MICE MYOCARDIAL INFARCTION AND ISCHEMIA REPERFUSION INJURY MODELS

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Introduction: Ischemic heart disease (IHD) is among the notorious causes of mortality and morbidity worldwide. Myocardial infarction (MI) and ischemia reperfusion injury (IR) are the most common manifestations of IHD. Wnt/beta-catenin signaling pathway is activated post MI and IR and there are conflicting reports in literature regarding its role in the post MI and IR sequel.

Objective: This study aims to analyze the role of the Wnt/beta-catenin pathway and apoptosis in post-MI/IR models of mice. It also examines the role of Wnt inhibitor (pyrvinium pamoate) on Wnt/beta-catenin pathway signaling and its role in apoptosis.

Materials and Methods: Male BALB/c mice were pretreated with a Wnt pathway inhibitor pyrvinium pamoate (PP). Experimental murine IR and MI models were developed, and samples were collected after 1 week. Masson trichrome staining was apt to calculate the infarct size and expansion index. Immunohistochemistry, enzyme-linked immunosorbent assay and western blotting were employed to study the expression of beta-catenin and various biomarkers of apoptosis; Bax/Bcl2, Bcl-xL and cleaved caspase-3, in left ventricle heart samples.

Results: Our results show that Wnt/beta-catenin signaling is activated in 1 week post MI and IR groups as compared to sham operated animals. Infarct size was increased in the MI group (30.92 ± 3.43) and IR group (18.64 ± 1.48) as compared for SHAM operated mice group (1.68 ± 1.05). Upregulation of beta-catenin in MI (1.95 ± 0.66) and IR (1.03 ± 0.9) vs SHAM (0.91 ± 0.1) and cleaved caspase 3 in MI (81.33 ± 115.8) and IR (4.35 ± 11.69) vs SHAM (0.55 ± 1.7) was observed.

Conclusion: Pyrvinium Pamoate treatment decreased infarct size and expansion index in 1 week post MI and IR hearts. It also caused a decrease in the expression of apoptosis markers in post MI and IR hearts. These observations suggest a cardioprotective role of pyrvinium pamoate in mice after MI and IR.

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ZINGIBER OFFICINALE: A NEW TREATMENT OPTION FOR DRUG RESISTANT EPILEPSY

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Introduction: Epilepsy is a neurological disorder in which the patient suffers with two or more unprovoked seizures. Temporal lobe epilepsy with hippocampus sclerosis (TLE-HS) is the most common form of drug resistant epilepsy. Objectives: Therefore, new treatment options are required for TLE-HS. Herbal extract obtained from Zingiber officinale is a promising treatment option for TLE-HS.

Methods: In the current study, Sprague Dawley rats are used as an animal model to test the efficacy of herbal extract. To develop model for TLE-HS, Lithium-Pilocarpine is injected intra-abdominally to induce seizures in rats for 1 hour. After that the rats are allowed to recover for 2 weeks. During this time hippocampal sclerosis occurs. After this treatment the rats have spontaneous recurrent seizures at a frequency of 6-7/ week for the rest of their lives. After two weeks, we treated the rats with herbal extract daily for next two weeks, while recording their Video/EEG for analysis of seizures. After the completion of recording, rats were tested for short-term memory loss and depression using behavioral tests; included novel object recognition test and force swim test. After the completion of these tests, the rats were sacrificed and transcardial perfusion with 4% PFA was performed to conduct Nissl staining and IHC on brain slices.

Results: Our preliminary results have shown that Zingiber officinale extract reduces the frequency of seizures, improves memory, and reverses the sclerosis of hippocampus in TLE-HS model of rats.

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METHYLATION OF PROOPIOMELANOCORTIN IS LINKED WITH HIGH SUSCEPTIBILITY TO DEVELOP GESTATIONAL DIABETES*Syeda Sadia Fatima, Asad Sualat Fatimi, Manzar Abass, Nuruddin Mohammed**Department of Biological and Biomedical Sciences, Medical College and Department of Obstetrics and Gynecology, Aga Khan University*

Background: Obesity and Type II diabetes mellitus (T2DM) have become a major public health concern in Pakistan. It is believed that apart from the commonly known lifestyle and environmental factors, genetic factors also play an imperative part in pathophysiology of the disease. Proopiomelanocortin (POMC) regulates satiety and insulin sensitivity. POMC methylation blocks transcription and leptin effect and decreases insulin sensitivity. Therefore, we measured methylation levels in Proopiomelanocortin (POMC) in women who have been diagnosed with gestational diabetes (GDM) and those with normal glucose tolerance as per the IADPSG guidelines along with newborn babies born to these mothers.

Method: Thirty-three GDM and 33 control women were recruited from two medical centers. After informed consent, participants were followed from 12-15 weeks of gestation till post-partum. Five ml maternal and cord blood samples were collected. Fasting serum Advance glycation end product (AGE), HbA1c and serum cortisol levels were measured. Bisulphite conversion and Methylation specific PCR was performed to assess the methylation status of POMC genes.

Results: Compared to controls, participants with GDM had higher serum AGE levels (499.55 ± 161.38 versus 418.99 ± 70.16 ng/L; $p < 0.001$). GDM cases also had higher cortisol levels (340.89 ± 212.26 versus 257.21 ± 182.35) compared to controls. Moreover, high levels of methylation were observed in POMC genes in GDM versus controls mothers was reported. Methylation of 1 allele of POMC, relative to both alleles being unmethylated increased the risk of developing GDM by 98% (P value = 0.000157). Similarly, babies born to GDM mothers showed higher methylation status of at least 1 allele of POMC gene as compared to control ($p < 0.01$).

Conclusion: Environmental stresses such as GDM may cause methylation of genes that have protective affects against obesity and diabetes; and POMC may have a role to play in these mutations. This genetic influence may lead to the development of early childhood obesity.

INVESTIGATION OF ANTI-INFLAMMATORY POTENTIAL OF ISOLATED PURE COMPOUND(S) FROM MELIA AZEDARACH (L). FLOWER IN CARRAGEENAN-INDUCED PAW EDEMA MODEL

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Background: Inflammation is the body's defense response against harmful stimuli or tissue injury. If acute inflammation continues due to inadequate immune response; it may lead to chronic inflammation. Inflammatory disorders can be treated with a variety of anti-inflammatory drugs but their long-term use damages GI tract, kidney, and cardiovascular system. Due to such adverse effects, there is a need for alternative therapies. The aim of this study was to investigate the potential anti-inflammatory activity of Melia azedarach flowers by examining the pharmacological effects of its pure compounds on carrageenan-induced rat paw edema model, followed by the measurement of TNF- α levels.

Study Design and Method: The pure compounds were given to wistar rats orally 30 minutes before the carrageenan injection. To develop inflammatory paw edema model, rats were injected with carrageenan (S/C) in right paw. The average paw volume of each rat was measured from 0 to 4 hours by plethysmometer, and the percentage inhibition of paw volume was determined. TNF- α levels in rat paw tissue were determined using ELISA.

Result: The pure compounds displayed interesting anti-inflammatory results against carrageenan-induced paw edema. Pure compounds 1 and 2 at 50 mg/kg reduced paw edema significantly, with maximum reductions of 76.4% and 74.1%, respectively, after 3 hours. When compared with diclofenac sodium which is a known anti-inflammatory drug, significant reduction in paw edema volume was seen. TNF- α concentration in treatment group (361.5 ± 0.8) were significantly lower than in the control group (483.3 ± 2.5) in ELISA.

Conclusion: The results indicated that both the pure compounds exhibit anti-inflammatory properties when tested against standard treatment. The anti-inflammatory effect of pure compounds is mediated via inhibition of inflammatory cytokine (TNF- α) levels. In future, additional studies will be required to further elaborate the molecular mechanism of action responsible for the inhibition of inflammatory response.

Key words: Melia azedarach, flowers, anti-inflammatory, carrageenan-induced paw edema model, TNF- α .

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ASCIMINIB ACTIVATES ERYTHROID DIFFERENTIATION IN K562 CELL LINE

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Background: Asciminib an allosteric tyrosine kinase inhibitor (TKI), was recently approved by the FDA for managing Philadelphia-positive chronic myeloid leukemia (CML) patients in chronic phase who had failed to respond to previous TKIs.

Methods: In this study, we investigated the effect of asciminib (5-20nM) with and without imatinib (50-200nM) in differentiating the erythroleukemic cell line K562 towards erythroid lineage. K562 cells were cultured over a 12 days period in basic (IMDM) media and an EPO-based differentiation media to select optimal medium conditions. The EPO-based differentiation media provided a better survival advantage to the cells.

Results: K562 cells treated with 20nM asciminib enhanced glycophorin A (GPA) levels (>90%), hemoglobin production, and GATA-1 targets. Furthermore, incubating cells with asciminib (20nM) resulted in 90% GPA expression on day 3, while imatinib (400nM) took 12 days to reach a similar expression level.

Conclusion: In this study we have shown that asciminib can potentiate erythroid differentiation in the K562 cell line, a novel action with potential clinical application.

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BUILDING UP A GENOMIC SURVEILLANCE PLATFORM FOR SARS-COV-2 IN THE MIDDLE OF A PANDEMIC- EXPERIENCE FROM A LOWER MIDDLE-INCOME SETTING*Waqasuddin Khan, Furqan Kabir**Department of Pediatrics and Child Health, Faculty of Health Sciences and Medical College
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Next generation sequencing technology has revolutionized pathogen surveillance over the last two decades. However, the benefits are not equitably distributed with developing countries lagging far behind in the acquisition of required technology and analytical capacity. Recent declines in the cost associated with sequencing – both equipment and running, has created an opportunity for broader adaptation. During the COVID-19 pandemic, this revolution in sequencing allowed for the timely availability of a reference genome, and eventually RT-PCR-based diagnostic assays. In addition, this technology enables genomic surveillance to identify the variants of SARS-CoV-2 circulating in communities at a particular time. Consistently accumulated genomic sequences on open-access global platforms are utilized by the research community to infer comparative analysis for effective genomic examination of the evolving SARS-CoV-2 strains. This is crucial to understand how SARS-CoV-2 variants may impact public health. Socioeconomic inequalities substantially impact the ability to sequence SARS-CoV-2 strains and undermine a developing country's pandemic preparedness, quickly and continuously. In particular, lower middle-income countries face challenges in the establishment, maintenance, and expansion of genomic surveillance. We present our experiences of establishing a genomic surveillance system at the Aga Khan University (AKU), Karachi, Pakistan. Despite being at a leading health sciences research institute, we encountered major challenges while establishing technological frameworks in-house. These were related to the collection of standardized contextual data for SARS-CoV-2 samples, procurement of sequencing reagents and consumables, challenges with library preparation, sequencing, and submission of high-quality SARS-CoV-2 genomes. During the implementation of the bioinformatics pipeline, several technical roadblocks ensued which were discussed and resolved by collaboration with the PHA4GE consortium. All genome sequences were then deposited to open-access platforms in line with the best practices. Subsequently, these efforts culminated in deploying the first SARS-CoV-2 phylosurveillance map of Pakistan as a Nextstrain build. Our experience offers lessons for the successful development of Genomic Surveillance Infrastructure in resource-limited settings struck by a pandemic

GENETIC ASSOCIATION OF VITAMIN D RECEPTOR GENE WITH FEMALE INFERTILITY

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Introduction/Background: Infertility is defined as failure to achieve clinical pregnancy after 12 months of unprotected intercourse. It affects 15% couples globally and 22% in Pakistan. Female infertility can be caused by genetics and unexplained reasons. The prevalence of vitamin D deficiency among adult population was reported to be 14-59% with a higher prevalence in Asian countries. Furthermore, Expression of Vitamin D receptor (VDR) can play a vital role in reproductive organs of females.

Objective: In the present study our objective was to study VDR polymorphism in infertile females and find its association with the female infertility.

Methods: This was a cross sectional study and was conducted on 292 female subjects in two groups of fertile (n=116) and infertile females (n=176). Blood samples were collected for genotyping of VDR FokI (rs2228570), TaqI (rs731236), ApaI (rs7975232) and BsmI (rs1544410) was performed by PCR based RFLP assay. Statistical Analysis was performed by using Statistical Package for Social Sciences (SPSS) software, version 20

Results: Genotype indicated that FokI, TaqI and ApaI are associated with infertility ($p=0.004^*$, $p=0.013^*$ and $p=0.033^*$, respectively). However, BsmI did not show any significance. Multinomial regression analysis indicated that FokI heterozygous genotypes increases the risk of infertility by 2.5 times (hetero: OR= 2.5, 95%, $p=0.001^*$) as compared to wild type. While the heterozygous genotypes of TaqI and ApaI play protective role and reduce the risk of infertility by 58 % and 52%, respectively [TaqI: OR= 0.42, 95%, $p=0.004^*$, ApaI: OR= 0.48, 95%, $p=0.01^*$, respectively] as compared to wild type. Multinomial logistic regression analysis was also performed for allelic data as well.

Conclusion: Thus, it could be summarized that among the studied polymorphisms of VDR FokI SNP greatly increased risk of infertility. While TaqI and ApaI genotypes protect from infertility. However, BsmI do not influence risk of infertility in Pakistani females.

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ANIMAL MODELING OF ALZHEIMER'S DISEASE AND NOVEL DRUG INTERVENTION TO PREVENT MEMORY LOSS*Shabina Jabeen**Department of biological and Biomedical sciences, Aga Khan University*

Alzheimer's disease (AD) is a neurodegenerative disorder, affecting ~ 60 M people globally. Disease symptoms appear decades later than its molecular onset, thus treatment mainly remain ineffective. To date, we have only 4 FDA-approved drugs to provide symptomatic relief, however, none of these could restore, reverse, or prevent AD. Dementia is rapidly spreading and posing huge financial burden worldwide. Therefore, early, and cost-efficient drug treatment is essential. Cl-amidine is a synthetic organic molecule that inhibits calcium dependent PAD enzyme. This enzyme is responsible for protein deamination and may cause neuroinflammation and neurodegeneration. Though deemed effective in other diseases, Cl-amidine efficacy in AD has not been tested yet. This current study aimed to test the efficacy of Cl-amidine for the reduction of neuronal loss and restoration of memory in Alzheimer's model. To achieve our goal, 8-12 months old, 32 Balb/c mice (N=10 for the pilot phase and N=22 for the study phase) were recruited. AD like symptoms were induced by intraperitoneal administration of D-galactose + AlCl₃ for four weeks. The control group were given saline instead. After successful disease induction, drug was given for 2 weeks. Behavioral tests for anxiety, depression, and memory alteration were performed at baseline, mid-line, and end-line. Histological changes in hippocampus were studied through Nissl staining. Western blotting was used to track tau and amyloid proteins levels. Data was analyzed via SPSS. The pilot phase initial results showed that Alzheimer's disease model was successful in Balb/c mice where AD was induced via D-galactose and AlCl₃. And our proposed drug Cl-amidine was effective in treating the AD like symptoms in Balb/c mice such as memory alteration and neuronal loss. Downstream analysis results showed the presence of phosphorylated tau in the diseased group as compared to control.

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SERO-INCIDENCE OF SALMONELLA TYPHI IN LOW AND HIGH ENDEMICITY AREAS OF SINDH, PAKISTAN.

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Introduction: Clinical surveillance through blood culture-confirmed positive cases is an important approach for determining enteric fever burden in catchment area population but it has its own limitations which underrate the true burden of disease.

Objective: The current study aimed to determine immune responses against Hemolysin E (HlyE) and Salmonella Typhi (S. Typhi) lipopolysaccharide (LPS) for acute enteric fever diagnosis.

Methodology: A cross-sectional sero-survey was conducted in high endemicity areas of Karachi, and in low endemicity areas of Matiari. Age-stratified dried blood spots (DBS) samples of individuals aged 0 to 100 years from Matiari and 0 to 25 from Karachi were randomly selected. A total of 494 baseline samples from Karachi with 3- and 6-months follow-up (360 and 350 samples respectively) were collected, while 300 baseline samples from Matiari have been collected with 6 months follow-up samples (269). Indirect Enzyme-Linked Immunosorbent Assay was performed to test the presence of HlyE and LPS antigen.

Results: From baseline high endemicity samples, a single participant was positive for HlyE IgA, whereas 9 and 7 subjects were positive for LPS IgA and IgG respectively. 2 participants showed seropositivity for LPS IgG among low endemicity baseline samples. The antibody response declined from baseline to 3- or 6-month samples. The highest rate of positivity was seen in the age group 5-9 (07 positives) for either LPS IgA or IgG. Although the total sero-positivity of S. Typhi in this cross-sectional survey was low, the S. Typhi LPS IgG/IgA response was more in high endemicity as compared to low endemicity areas.

Conclusion: The decreasing pattern of antibody response over timepoints can be further investigated at a cellular level using immunoassays measuring memory B- and T-cell levels. We need better, highly sensitive and more robust serological tools for monitoring the sero-incidence of S. Typhi among the population.

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CARDIAC TROPONIN I MUTATION IN CONSANGUINEOUS PAKISTANI FAMILY WITH RECESSIVE HYPERTROPHIC CARDIOMYOPATHY: CLINICAL, GENETIC, AND FUNCTIONAL CONSEQUENCES

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Aims/Objectives: Hypertrophic Cardiomyopathy (HCM) is one of the most common forms of genetic cardiac disease and occurs in approximately 1/500 people, affecting 0.2% of the general population. The cardinal manifestation of HCM is left ventricular hypertrophy, the disease of the myocardium. There are more than 30 genes linked with hypertrophic cardiomyopathy, harboring thousands of variants shared by different categories of disease mainly found in major sarcomeric proteins genes. In this study, a Pakistani family was reported, in which patients showed severe disease phenotype characterized by HCM. The family history and clinical analysis of the family suggested that HCM was segregated in autosomal recessive inheritance mode.

Methods: In this study, we investigated a consanguineous Pakistani family comprised of eight affected individuals with HCM. A cardiovascular imaging/CMR exam was performed on selected individuals. We applied whole exome sequencing (WES) and co-segregation analysis to identify and validate the pathogenic variant. The behaviors of mutant and native protein were compared by performing all-atom long-term molecular dynamics simulations.

Results: A synonymous biallelic missense variant c.439G>C (p.Val147Leu) in Troponin I3 encoding gene TNNI3. was identified in the highly conserved domain of the cardiac troponin. Molecular dynamics simulations revealed hypertrophic cardiomyopathy-associated mutation Val147Leu has resulted in a faster relaxation compared to the wild type, because the variant stabilized the open conformation of cardiac Troponin.

Conclusions: These findings suggest p.Val147Leu to be a pathogenic variant. Our study provides insights into how the variant perturbs the TNNI3 structure-function relationship, leading to a disease state.

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IDENTIFICATION OF IEM IN TWO SIBLINGS: USING ADVANCED METABOLOMICS AND GENOMICS TECHNIQUES

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Guanidinoacetate methyltransferase (GAMT) deficiency is a creatine deficiency disorder and an inborn error of metabolism presenting with progressive intellectual and neurological deterioration. As most cases are identified and treated in early childhood, adult phenotypes that can help in understanding the natural history of the disorder are rare. We describe two adult cases of GAMT deficiency from a consanguineous family in Pakistan that presented with a history of global developmental delay, cognitive impairments, excessive drooling, behavioral abnormalities, contractures and apparent bone deformities initially presumed to be the reason for abnormal gait. Exome sequencing identified a homozygous nonsense variant in GAMT: NM_000156.5:c.134G>A (p.Trp45*). We also performed a literature review and compiled the genetic and clinical characteristics of all adult cases of GAMT deficiency reported to date. When compared to the adult cases previously reported, the musculoskeletal phenotype and the rapidly progressive nature of neurological and motor decline seen in our patients is striking. This study presents an opportunity to gain insights into the adult presentation of GAMT deficiency and highlights the need for in-depth evaluation and reporting of clinical features to expand our understanding of the phenotypic spectrum

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CHARACTERIZING BDQ RESISTANT MYCOBACTERIUM TUBERCULOSIS (MTB) ISOLATED FROM BDQ NAÏVE MDR TB PATIENTS FROM PAKISTAN.

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Background: Mutations in the *rv0678*, *pepQ* and *atpE* genes of *Mycobacterium tuberculosis* (MTB) have been reported to be associated with reduced antimycobacterial susceptibility to BDQ. Resistance conferring mutations in treatment naïve MTB strains is likely to have implications for BDQ based new drug regimen that aim to shorten treatment duration. We therefore investigated the genetic basis of resistance to BDQ in MTB clinical isolates from BDQ naïve TB patients from Pakistan. Available Information on the growth response of clinical BDQ resistant MTB isolates is limited. Therefore, the growth characteristics of bedaquiline (BDQ) resistant isolates was studied under BDQ drug pressure

Methodology: We studied 48 MTB clinical isolates from BDQ naïve TB patients. These isolates included 38 MDR/pre-XDR/XDR and 10 pan drug susceptible MTB isolates. All strains were subjected to whole genome sequencing and genomes were analysed to identify variants in *rv0678*, *pepQ*, *atpE*, *rv1979c*, *mmpLS* and *mmpL5* and other functional genes. To further understand the role of *rv0678*, BDQ resistant clinical MTB isolates with (n = 6) and without (n = 3) variants in *rv0678* gene were selected. Using time kill assays, growth inhibition; taken as the relative change in log average colony forming unit (CFU)/ml at selected time points (24-96 h), was studied at Minimum Inhibitory Concentrations (MICs): 0x, 1x, 2.5x, 5x, 7.5x, 10x for these isolates. Growth inhibition was then analyzed using Kruskal Wallis and Kolmogorov Smirnov tests in PRISM vr.9.

Results: Of the BDQ resistant and intermediate strains 44% (8/18) had variants in *rv0678* including missense mutations; S63R/G, L40F, R50Q and R107C and three frameshift mutations; G25fs, D64fs and D109fs. Further, during the 24-96 h lag phase isolates with and without variants in *rv0678* showed a similar growth inhibition pattern. No difference was noted in growth inhibition between BDQ resistant isolates and H37Rv.

Conclusion: These findings suggest that role of alternate mechanisms in establishing BDQ tolerance needs to be explored.

ISOLATION AND IN-VITRO PROLIFERATION OF HEMATOPOIETIC STEM CELLS FROM PERIPHERAL BLOOD

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The foremost challenge is to find non invasive source for stem cells with potential long-term repopulating hematopoietic stem cells and progenitors (HSCPs) for the functional studies both in normal and pathological conditions. Normal and patient derived HSCs are differentiated effectively into mature erythroid lineage so that pure adult and functional RBCs are produced as an end product.

Hematopoietic stem cells obtained from peripheral blood of patient were isolated by centrifugation on Lymphoprep density gradient. The mononuclear cells were then enriched for CD34+ cells by positive selection using anti-CD34-tagged magnetic beads in MACS LS columns. CD34+ cells were cultured in media for 21 days in different conditions (proliferation, expansion, and differentiation). Precisely, cells were expanded in the presence of stem cell factor (SCF), Fms Related Receptor (FLT-3), and Thrombopoietin (TPO) with dexamethasone. They were further characterized at distinct time points by a flow cytometer till day 21 of cultures. Cells were cultured in 1st differentiation media containing Erythropoietin (EPO) from day 7 till 14 to observe early erythroblast cells and then transferred to 2nd differentiation media with EPO and holo-transferrin till the 21st day of culture to observe terminally differentiated erythroid cells. In all the conditions, FACs analysis showed the highest recovery of CD34+ at day 3 of culture. Pro-erythroblasts were observed on day 7 and mature erythroblasts on day 14-21. In conclusion, this culture condition and method provides a high number and purity of erythroid cells produced from a small amount of peripheral blood, which serves as a valid model of human erythropoiesis in vitro. This offers a great impact in studying either normal or pathological erythropoiesis and in testing new therapeutic strategies.

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ESTABLISHMENT OF BRAIN ORGANOID MODEL FOR STUDYING EARLY CORTICAL BRAIN DEVELOPMENT*Jahan Salma, Karim Ruknuddin, Areeb Ahmed**Centre for Regenerative Medicine and Stem Cell Research, Aga Khan University*

Introduction: Brain development is a very fascinating and complex process, which requires precise expression of genes in a temporal and spatial manner that requires neural stem cells to self-organize, differentiate and migrate to create precise layers in developing cortex. Deficits in neural stem cell differentiation have been implicated in many neurodevelopmental disorders, such as microcephaly and autism. To date, most studies have been restricted to animal models and postmortem brain tissues, but human samples are not always available. Recent advances in iPSCs-derived organoid technology allows for detailed cellular studies during the progression of neural stem cell differentiation in the dish which recapitulate the early human cerebral cortex development.

Objective: Developing human cortical organoids from hiPSCs for understanding early brain development.

Method: Previously established iPSC lines are expanded and disassociated into single cells. 10,000 cells were plated in low-adhesion micro-wells with neural induction media. After 18 days, organoids were transferred to 6 well-low adhesion plates and moved to a rotating orbital shaker at 90 rpm. Their media was changed on alternate days throughout their culture, and they were collected at various time points. Organoids were fixed with 4% paraformaldehyde and embedded in 30% sucrose followed by serial-sectioned using a cryostat. Immunohistochemistry was performed using specific markers to confirm the development of human cortical organoids.

Results: Early brain development markers, Sox2, Pax6, Ctip2 & FOXG were strongly expressed in human cortical organoids from week five. Neural differentiation & maturation were also observed by staining with Tuj III and GPAP as neuronal and astrocytes markers respectively at weeks 14 and 16.

Conclusion: This research work will allow to identify human brain developmental map which may provide fundamental insight into key developmental processes and to characterize the genetic pathways that drive brain development.

Keywords: Human induced Pluripotent Stem Cells (iPSCs), cortical organoids, early brain development, cortex.

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TO ELUCIDATE THE MECHANISM OF INTESTINAL PERFORATION CAUSED BY S. TYPHI INFECTION

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Background: Typhoid fever, caused by the consumption of contaminated food or water. As per WHO reports, 14.3 million cases of infection and 222,000 deaths are reported every year. If untreated, it may lead to the further complications including septic shock, gastrointestinal bleedings, typhoid intestinal perforation (TIP) and peritonitis. Among these, TIP is most serious complication that causes disruption of intestinal integrity and effusion of the lumen contents into the peritoneal cavity leading to peritonitis multiple organ failure. Mortality rate of TIP is 15.4% with regional difference of 5%-80%. Current study is to identify the molecular mechanisms that provoke typhoid related complications, specifically intestinal perforation.

Objective: Identification of host related factors responsible for TIP and to study the transcriptome of intracellular S. Typhi from co-culture experiments with enteroids developed from tissues collected from S. Typhi-associated perforation (TIP +ve) and S. Typhi– uninfected patients (control).

Methods: Intestinal tissue will be collected from patients undergoing surgery for intestinal perforation caused by S. Typhi infection or any other reason. These tissue samples will be used for two purposes. 1) RNA sequencing 2) To develop enteroids followed by S. Typhi infection assay that will be subjected for RNA sequencing for transcriptome analysis of infected vs uninfected organoids.

Results: Transcriptomics data of tissue samples will be compared to identify genes and pathways contributing in development of intestinal perforation. Transcriptome of intracellular S. Typhi will also be studied from co-culture experiments with enteroids developed from both group.

Conclusion: Intestinal epithelium of TIP +ve individuals may responds differently to S. Typhi infection compared to control. We anticipate that single S. Typhi strains responds differently in both groups based on differences in host response in the intracellular milieu.

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USE OF ENTEROIDS MODEL TO ACCESS SARS-COV-2 VIRAL INFECTION IN MALNOURISHED AND WELL-NOURISHED CHILDREN'S GUT

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Background: SARS-CoV-2 is the cause of coronavirus disease-2019 (COVID-19). Despite respiratory tract, intestine is a potential site of SARS-CoV-2 replication because of the presence of its targeted receptors. Infected enterocytes strongly upregulate viral response genes and host-cell membrane-bound serine proteases. TMPRSS2 and TMPRSS4 were found to cleave the SARS-CoV-2 spike protein to facilitate viral entry. Age and nutritional status are among the greatest risk modifiers of clinical outcomes in COVID-19. Importantly, no organoid studies have yet been performed on tissue from donors in low-resource settings, which tend to have both younger populations and a higher prevalence of undernutrition.

Objectives: To understand the impact of SARS-CoV-2 on ACE2 signaling and NAD metabolism and its impact in adults vs. young children and healthy vs. EED derived enteroids +/- nutritional deficiency states on metabolism and viral replication.

Methods: Enteroids from healthy and malnourished children will be generated from gut biopsies of healthy and EE children who underwent gut endoscopy. These biopsy-derived human small intestinal organoids (enteroids) will be infected with SARS-CoV-2 and will be subjected for RNA extraction and qPCR analysis to calculate viral titre in culture medium as well as in organoids. Functional viral titers will be determined by plaque assay of culture supernatant. Nucleic acids, protein, and spent media will also be collected from the relevant time points for RNASeq, ACE2 /TMPRSS2/TMPRSS4 pathway through Western blotting, and metabolomics profiling.

Expected Results: Results obtained from transcriptomic and metabolomics data will be used to identify differences of SARS-CoV-2 infection in healthy vs malnourished children enteroids lines. We anticipate that healthy and EE enteroids are phenotypically and genotypically different from each other. Intestinal stem cell exhaustion and apoptosis is expected to occur more readily in older enteroids, whereas intestinal stem cells from younger patients will self-renew more readily and support higher levels of viral replication.

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EVALUATION OF INTESTINAL ORGANOID FITNESS FOR THE ROTAVIRUS REPLICATION

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Background: Rotaviruses are double-stranded RNA viruses belonging to the Reoviridae family and are identified as the most common cause of gastroenteritis in infants and children >5 years of age.

Objectives: To evaluate the ability of primary cell platforms to mimic human rotavirus infection and investigate the effects of rotavirus infection on host immune responses to compare different primary cell models.

Methods: In the present study, small intestinal enteroids (derived from EED and control patient biopsies) will be adapted for growth using four different organoids platforms. i.e. apical-in orientation in matrigel domes (conventional method), mixed polarity (apical-in and apical-out orientation), monolayers and 96 well format utilizing Mimetas Organoplate System. Small intestinal enteroids will be grown and differentiated in its specific culture medium and divided into control and treatment groups. Treatment group will be co-cultured with Human rotavirus (Wa strain) for 2 hours however; control group will be treated with vehicle. Enteroids will be allowed to grow for another 24 hours in fresh culture medium. Plaque assay will be performed for viral titre and barrier integrity will be determined using FITC-dextran. Cellular immune responses to infection will be evaluated by analyzing cytokine levels in cell supernatants using Luminex cytokine panel and expression of genes downstream of the IFN signaling pathways using qPCR on RNA isolated from infected cells. Proteomic and metabolomics profiles will also be assessed,

Expected Results: Infection with rotavirus is expected to stimulate inflammatory cytokines and IFN-regulated gene expression. This will entail comparisons across platforms of viral replication, cellular responses to infection, and proteomic and metabolic changes. It will set the groundwork for future investigation of the biological features driving rotavirus susceptibility and vaccine failure in undernourished populations.

Conclusion: This study will evaluate each cell platform as a potential model of viral infection and the reproducibility of each model across experiments.

SUBSTITUTION SPECTRA OF SARS-COV-2 GENOME IN PAKISTAN DEPICTING REGIONAL PREVALENCE OF VOCS

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Objective/Background: The impact of the COVID-19 pandemic has been variable in different populations. This can be attributable to population specific differences, vaccinations and to variations in SARS-CoV-2 strains. Here we investigated the mutation rates of SARS-CoV-2 genomes through the pandemic in Pakistan from 2020 until 2022.

Methods: A total of 1637 SARS-CoV-2 genomes submitted in GISAID were analyzed using the Augur phylogenetic pipeline. Substitution rates and entropy of genomes was calculated year wise for 2020, 2021 and 2022.

Results: The SARS-CoV-2 substitution rate observed in 2020 was 6.06×10^{-4} subs per site per year, as compared with 9.74×10^{-4} subs per site per year in 2021 and 5.02×10^{-4} subs per site per year in 2022 periods. The mutation rate of SARS-CoV-2 genomes increased between 2020 and 2021, with a reduction in 2022. The rate of genome-wide entropy was also the highest in 2021, compared with 2020 and 2022. In particular, mutation rates in the Spike glycoprotein were increased. By 2022, mutations across the SARS-CoV-2 genome were increased however, the rate of entropy was reduced. This is evidenced by decreasing entropy in Spike mutations such as E484K, K417N associated with immune escape which were reduced between beta/delta and omicron variants.

Conclusions: The evolution of the virus has important implication in prevention of SARS-CoV-2 epidemic. Mutational trajectories for Pakistani sequences, in different time frames showed substitutions rate can be linked to pathogenicity and severity of the infection. Higher substitution rate in 2021 could be a cause of greater pathogenicity and transmission in the period. The trend of substitution rate is stabilizing with the passage of time in 2022, and it can be seen in lowered pathogenicity in the current wave of COVID-19 driven by Omicron.

**EARLY ONSET COLORECTAL CANCER AMONG PAKISTANI POPULATION:
RESULTS FROM A HOSPITAL CANCER REGISTRY**

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Background: There is an increase in the early onset colorectal cancer (CRC) incidence and mortality in both High-Income Countries (HICs) and Low to Middle income (LMICs). However, local data on colorectal cancer (CRC) in the Pakistani population remains under studied. Objectives: The objective of this study was to study and compare the epidemiology of CRC including sociodemographic profile and tumor characteristics of early onset CRC (CRC < 50 years of age) and late onset CRC (>50 years of age).

Methods: Data was acquired from Aga Khan University Cancer Registry where CNEXT Registry Software is used for standard cancer reporting. A total of 450 patients diagnosed with CRC between 2017 and 2019 who met the inclusion criteria were included in the final analysis. Adjusted odds ratios (aOR) and their 95% confidence intervals (CIs) were estimated using a multivariable logistic regression model.

Results: Of 450 patients with CRC, 209 (46%) were early onset CRC. The mean age of the early onset CRC group was 37.1 years (SD ±9.3). When compared to late onset, the early onset CRC group was more likely to present with advanced stage disease (aOR 1.78, 95% CI: 1.05, 3.00), and poorly differentiated (aOR 5.96, 95% CI: 2.67, 13.26).

Conclusion: Early onset CRC among Pakistani population is a significant public health problem and is associated with late stage at diagnosis and poor grade. Larger and comprehensive studies on modifiable risk factors like diet and other newly recognized molecular and genetic factors are needed to help us better understand etiology of early onset CRC in our population

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XPert MTB/RIF ULTRA ASSAY FOR DIRECT DETECTION OF MYCOBACTERIUM TUBERCULOSIS COMPLEX IN SUSPECTED EXTRAPULMONARY TUBERCULOSIS PATIENTS*Ayman Talha**Clinical Microbiology, Aga Khan University*

Objectives /Introduction: To determine the sensitivity, specificity, positive predictive value and negative predictive value of Nucleic acid amplification assay (Xpert/MTB ultra Rif) for extrapulmonary samples in patients with suspected tuberculosis compared to mycobacterial culture.

Material and Methods: We retrospectively reviewed the data from May-July 2022 for mycobacterial culture and GeneXpert Ultra (Xpert® MTB/RIF assay) run on non-respiratory samples (31 pus, 52 tissue and 32 CSF) of 115 patients with suspected tuberculosis. The sensitivity, specificity, PPV and NPV of GeneXpert Ultra were calculated using Liquid culture on MGIT tube for Mycobacterium tuberculosis as gold standard.

Results: Of the 115 samples, 10 (8.8%) were positive for MTB by both methods and 22 by Xpert Ultra only, and 3 by mycobacterial culture only. The overall sensitivity, specificity, PPV and NPV of GeneXpert Ultra were 76.9 %, 78.43%, 31.2% and 96.3% respectively for extra pulmonary samples. For rifampicin resistance was not detected on Xpert Ultra or mycobacterial drug susceptibility testing (DST).

Conclusion: We determined that Xpert MTB/RIF Ultra can be useful for rapid detection of Tuberculosis. It is especially useful in a country endemic for Tuberculosis like Pakistan, where extrapulmonary TB has high morbidity and mortality. GeneXpert has a much shorter turn-around time compared to culture, hours instead of weeks. However, the MTB culture remains the gold standard because it allows the full range of DST on the strains.

DIFFERENCE IN PERCEPTION OF FACIAL ATTRACTIVENESS BETWEEN ORTHODONTISTS & LAY PERSONS IN SUBJECTS WITH CANTED OCCLUSAL PLANE & CHIN DEVIATION - AN ANALYTICAL CROSS-SECTIONAL STUDY

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Introduction: Ideal orthodontic treatment in patients with chin deviation is surgical correction of asymmetry and orthodontic correction of canted occlusion. However, most patients do not prefer to go for surgical treatment therefore a camouflage treatment plan is preferred in these patients. The objectives of this study were to determine the range of occlusal plane cant that is acceptable in patients with deviated chin and to compare the esthetic scores (ES) of raters for different ranges of occlusal plane cant towards and away from chin deviation.

Materials and Methods: Seventy-two raters evenly distributed across two panels of raters (orthodontic residents (OR), and laypersons (LP)) participated in this cross-sectional study. Smiling frontal photographs of adult male and female subjects were modified using Photoshop software (Adobe Photoshop) to display varying degrees of occlusal cant along with chin deviation. Raters were given a visual analog scale (VAS) to make subjective assessments of facial attractiveness of the modified photographs. Independent t test was employed to compare ES between the raters. The ES between occlusal plane cant towards and away from chin deviation were compared using a paired t test.

Results: A statistically significant difference was observed in ES between the raters for photographs of male subjects towards chin deviation at 6° and 8° ($p \leq 0.05$) whereas females received significant esthetic scores towards and away from chin deviation at 2°, 4°, 6° and 8° ($p \leq 0.05$). Statistically significant differences were seen between ES given for 6° occlusal cant towards and away from chin deviation.

Conclusions: Orthodontists were more judgmental and gave lesser scores when compared to lay persons. Females received higher esthetic scores from lay persons as compared to orthodontists. Both orthodontists and laypersons rated the cant towards chin deviation as more aesthetically pleasing.

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STRENGTHENING THE NEONATAL RESUSCITATION SKILLS AMONGST HEALTHCARE WORKERS INVOLVED IN NEW-BORN RESUSCITATION AT A SECONDARY CARE HOSPITAL SETTING

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Background: This study was a part of a quality project which evaluated the knowledge gained by healthcare workers involved in neonatal resuscitation.

Methods: Knowledge attainment and retention of clinical steps was assessed by the administration of pre- and post- tests using a written examination. Thirty-five nurses completed the pretest and twenty did the post test. Seven doctors took the pre and the post-test. A clinical sign off was then conducted on seven doctors and eighteen nurses. The data was compared between pre and post-test and then analyzed using t tests.

Results: The percentage of items on the written evaluation in the expected high score category (>85%) increased from 19.1% pre-training to 66.7% post training (p-value 0.000). Improvement was shown in posttest examination scores when compared to pretest scores. Practical sign-off showed an average of >90% for all healthcare workers.

Conclusions: The results suggest that teaching, continuous training and reinforcement may lead to an increase in theoretical knowledge as well as clinical skills required for adequate neonatal resuscitation but actual efficacy in live scenario still needs to be assessed.

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DENGUE FEVER IN NEONATE PRESENTING AS ACUTE FEBRILE ILLNESS: A CASE SERIES FROM PAKISTAN

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Dengue fever is a mosquito-borne disease caused by flavivirus. It primarily infects people living in tropical and subtropical areas and can be transmitted vertically or horizontally to newborns. We discuss the clinical spectrum, treatment, and outcomes of five neonates who presented with dengue fever at Aga Khan Hospital for Women in Karimabad, Karachi, Pakistan, during the 2021 post-monsoon season (October to December). Dengue infection was confirmed via positive NS1 antigen test. All newborns had fever, flushing, and thrombocytopenia. Capillary leak syndrome and hemorrhagic complications occurred in one case. Two babies required oxygen support, with one mortality. Due to the severity of the disease in this population, we suggest that dengue fever be evaluated as a differential diagnosis in neonates with sepsis and thrombocytopenia, especially in high-risk or endemic areas. Critical management strategies for neonatal dengue fever are the same as those for other pediatric patients and include judicious use of intravenous fluids and inotropes.

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FIBULAR APLASIA, TIBIAL CAMPOMELIA, OLIGOSYNDACTYLY SYNDROME (FATCO) SYNDROME VARIANT IN A MALE INFANT - CASE REPORT

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Fibular aplasia, tibial campomelia, and oligosyndactyly (FATCO syndrome) comprising a rare, genetic, congenital limb malformation is characterized by unilateral or bilateral fibular aplasia, tibial campomelia, and lower limb oligosyndactyly involving the lateral rays.

A newborn male born at term via a cesarean section presented with malformations consisting of tibial campomelia, unilateral fibular hypoplasia, and oligosyndactyly, a FATCO variant case. On radiographic examination, an anterolateral shortened and bowed right lower limb at the distal third of the tibia, a rudimentary right fibula and absence of three rays on right foot were revealed.

Given the rarity of reports on this syndrome with unknown genetic basis and the lack of a uniform management approach, each case of FATCO syndrome must be reported. Proper parent counseling is a key aspect of this syndrome. Timely diagnosis and management with a multidisciplinary approach is essential to avoid lifelong disability, which can be a hurdle in a developing country.

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PREDICTORS OF PERI-INTUBATION CARDIAC ARREST IN CRITICALLY ILL PATIENTS PRESENTING TO THE EMERGENCY DEPARTMENT*Noman Ali**Department of Emergency Medicine, Aga Khan University Hospital*

Background: Rapid sequence intubation has become the standard technique to facilitate emergency airway management. Immediate complications after emergency airway management have been reported like failed intubation, hypoxemia, hypotension, and even cardiac arrest (CA).

Objective: The study was aimed to determine the risk factors associated with periintubation CA in patients presenting to the emergency department (ED).

Methods: This single center matched case-control study was conducted at the ED of the Aga Khan University Hospital from January 2017 to February 2022. All adult patients requiring emergency airway management in the ED were included. Cases were defined as; patients who developed peri-intubation CA i.e. CA within an hour after initiation of airway management. Each case was matched to four adult controls with regards to age and sex, who did not develop peri-intubation CA. Multivariable logistic regression was performed to identify the risk factors associated with peri-intubation CA considering p-value of ≤ 0.05 significant.

Results: A total of 47 cases and 188 controls were included during the study period. Multivariable regression analysis showed that the age >50 years (OR: 2.54; 95% CI: 1.11-5.80), preintubation MSI of 1.3 or more (OR: 5.61; 95% CI: 1.9-16.5), lactic acid of 2 mmol/L or more (OR: 4.24; 95% CI: 1.46-12.27), arterial blood PH <7.30 (OR: 2.58; 95% CI = 1.04-6.39), PaO₂ <55 mmHg (OR: 5.13; 95% CI: 2.39 -10.31), septic shock (OR: 5.76; 95% CI: 2.93-17.18), and cardiogenic pulmonary edema (OR: 5.76; 95% CI: 2.31-15.13) were independently associated risk factors for peri-intubation CA.

Conclusion: The study identified various risk factors of peri-intubation CA in critically ill patients presenting to the emergency department of our hospital. Therapeutic interventions are required to mitigate these risk factors to avoid periintubation CA

PREVALENCE OF AND FACTORS ASSOCIATED WITH GENITO-PELVIC PAIN/PENETRATION DISORDER IN WOMEN, IN A TERTIARY CARE HOSPITAL, KARACHI, PAKISTAN.

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Background: Genito-Pelvic Pain/Penetration Disorder (GPPPD) is a major issue among females during their first sexual contact. The American Psychiatric Association's most current version of the DSM-V integrated dyspareunia and vaginismus into a unified GPPPD diagnosis. It has been determined that GPPPD has a detrimental impact on women's lives in general.

Purpose: The current study sought to investigate the frequency and the associated variables of Genito-Pelvic Pain/Penetration Disorder in married women, in a gynecological setting, at a private tertiary care hospital in Karachi, Pakistan.

Method: An analytical cross-sectional study was conducted at the gynecological outpatient facility of a private tertiary care hospital in Karachi, Pakistan, from May to August 2022. A sample size of 145 was achieved via purposive sampling. The data was collected using Binik's GPPPD assessment tool, Female Sexual Function Index, and a demographic questionnaire. Data were analyzed by applying logistic regression in SPSS version 26.

Findings: The results showed the prevalence of GPPPD to be 22.8%. Moreover, the final multivariate logistic regression model revealed that after adjusting for other variables, low sexual satisfaction (OR 21.18), a history of sexual abuse (OR 6.09), medical co-morbidity (OR 21.44), and the existence of any sexual dysfunction (OR 6.64) were found to be the associated factors for the incidence of GPPPD.

Conclusion: An accurate diagnosis of GPPPD is critical. The study proposes that healthcare professionals, educators, and researchers develop tools, guidelines, and management strategies for women in need of sexual health assistance, particularly GPPPD, in the Pakistani culture. More research, however, is required to better evaluate and determine the relationship of various variables with the GPPPD, based on cultural and religious peculiarities unique to Islamic societies.

Influence of Facial Structures on the Perception of Smile Attractiveness between Laypersons and Orthodontists – A Cross-sectional Analytical Study

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Introduction: During social interactions, a person concentrates on facial components such as the eyes, therefore, it can be considered that factors other than smile parameters can influence an attractive smile.

Objective: To determine the role of facial structures on perception of an attractive smile between laypersons and orthodontists

Methods: Seventy-four raters evenly distributed across two panels [orthodontic residents and orthodontists (OD), and laypersons (LP)] participated. Smiling frontal photographs of adult male and female subjects, zoom in smile photographs of the same subjects were shown to the above – mentioned groups who were then asked to make subjective assessments of smile attractiveness using a visual analog scale (VAS). Mann – Whitney U test was employed to compare smile attractiveness between the raters. Linear regression was used to determine the factors influencing smile attractiveness with & without facial structures.

Results: LPs found all 4 photographs equally attractive, and their rating was reported with a median of 6(4,9). ODs found the female subject photographs equally attractive and those were reported with a median of 6 (5,8), female frontal smile with a greater IQR as compared to zoom in photograph. There was no significant difference between the ratings of the two groups. ODs were most critical while rating zoom in smile male photographs, it was reported with a median score of 4 (3,5). Young raters were less critical while rating the photographs

Conclusion: Facial structures may not play an important role in judgement of an attractive smile. With the increase in age, people are more critical towards judgement of smile of especially male individuals. However, the immanent facial features may have played a role towards rating and that could have led to a critical rating by the participants.

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ORAL MUCOSITIS AND ORAL HEALTH RELATED QUALITY OF LIFE (OHRQOL) IN WOMEN UNDERGOING CHEMOTHERAPY FOR BREAST CANCER IN KARACHI, PAKISTAN: A MULTICENTER HOSPITAL BASED CROSS-SECTIONAL STUDY*Dr Asad Allana**Community Health Sciences, Aga Khan University*

Background: Oral mucositis is an inflammatory condition of oral cavity which is a common and serious side effect of cancer treatment. Severe oral mucositis compromises basic functions like eating and swallowing causing malnutrition also affecting overall patient's oral health related quality of life.

Objective: The aim of the study was to find the frequency of oral mucositis in breast cancer patients during their chemotherapy, the factors associated with it & the overall patient's oral health related quality of life. Methods A cross-sectional study was conducted and a total of 160 women diagnosed with breast cancer, receiving chemotherapy and who had undergone at least one cycle of chemotherapy were recruited from two hospital settings. In-person interviews were done after which oral examination was done to assess presence or absence of oral mucositis, using World Health Organization oral mucositis tool. Oral Health Related Quality of Life was assessed using Oral Health Impact Profile-14 questionnaire.

Results: Our results showed that out of 160 patients 88 (55%) of the breast cancer cases developed oral mucositis during chemotherapy. The mean Oral Health Impact Profile -14 scores in patients with oral mucositis was high 18.36 ± 0.96 showing poor Oral Health Related Quality of Life. Occasional frequency of brushing was significantly associated with oral mucositis (Prevalence ratio: 2.26, 95%_CI 1.06 - 4.84) compared to those patients who brushed once and twice daily. Low level of education showed negative association with oral mucositis (Prevalence ratio: 0.52, 95%_CI 0.31 - 0.88).

Conclusion: Our study showed significant positive association of occasional brushing with OM and protective association of low level of education with the development of OM. Emphasis should be given to oral hygiene instructions and dental education to cancer patients in oncology clinics with the prescription of mouth washes, gels and tooth paste to patients to decrease OM during chemotherapy

COMPARISON OF CRITICAL ILLNESS SCORE IN PATIENTS ADMITTED TO INTERMEDIATE CARE UNITS OF A TERTIARY CARE HOSPITAL: A LONGITUDINAL OBSERVATIONAL STUDY FROM PAKISTAN

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Background & Aim: Intermediate care units (IMCUs) serve as step-up units for emergency department patients and as step-down units for critically ill patients transferred from intensive care units.(1) Sequential Organ Failure Assessment (SOFA), Simplified Acute Physiology Score II (SAPS II) and Acute Physiology and Chronic Health Evaluation II (APACHE II) are common critical illness scores used in intensive care units.(2) This study compares the critical illness scores of acutely ill patients and the predictive accuracy of four different scoring systems in predicting mortality.

Methodology: A comparative cross-sectional study on patients aged 18 or above admitted to IMCU of the medical ward of Aga Khan University Hospital from 2017 to 2019. All patients admitted to IMCU from the emergency room were included in the study. The patient's files were reviewed for demographic data, physiological and laboratory parameters. Critical illness scores were calculated from these variables for each patient.

Results: A total of 1192 patients were admitted to the IMCU during the study period, of which 923 medical records were finally analyzed. The mean (SD) age of participants was 62 years and 469 (50.8%) were women. The overall hospital mortality rate of patients managed in IMCU was 6.4% (59/923 patients).

The median scores of APACHE II, SOFA, SAPS II and MEWS were 16 (IQR 11–21), 4 (IQR 2–6), 36 (IQR 30–53) and 3 (IQR 2-4) points respectively.

The AUC for SAPS II was 0.742 (95% CI: 0.67-0.80), for SOFA score was found to be 0.720 (95% CI: 0.64-0.79) and for MEWS score it was 0.718 (95% CI: 0.67-0.80). The lowest ROC curve was 0.62 (95% CI: 0.50-0.65) for APACHE II.

Conclusion: In conclusion, our study found that SAPS II, together with SOFA and MEWS scores, provided accurate discrimination in stratifying critical illness in tertiary care university hospitals in Pakistan.

MEDICATION ADHERENCE IN HYPERTENSIVE PATIENTS- A CROSS-SECTIONAL STUDY FROM A TERTIARY CARE CENTER

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Hypertension is an established risk factor for cardiovascular disease. Non-adherence to antihypertensive medications results in poorly controlled hypertension and also increases the risk of hypertensive crisis. The aim of our study was thus to estimate the frequency of adherence to antihypertensive medication and to analyze if there is an association between adherence and hypertensive crisis. This cross-sectional study was undertaken on patients admitted to Aga Khan University Hospital between July 2020 and March 2022. All patients with uncontrolled hypertension with systolic blood pressure (BP) > 140 and diastolic BP > 90 were included. Systolic BP over 180mm Hg or diastolic BP over 120mm Hg, with or without end organ damage, was labelled as hypertensive crisis. Adherence was assessed using the 4 item Morisky Green Levine scale. A cumulative score of ≥ 3 signified adherence while a score of 0, 1 or 2 was classified as non-adherence. We found that 64% of the cohort were adherent to their medications while 93(36%) were non-adherent. Depression was seen in 133(51.2%) while 147(56.5%) had anxiety. When stratified by adherence, similar rates were seen amongst males (49.1%) and females (50.9%). The highest level of adherence was seen in the 61-75 years age group (34.9%). We also found statistically significant associations of adherence to antihypertensive medications with anxiety (p value= 0.048). In the hypertensive crisis group, 40.7% of the patients were adherent to their antihypertensive medications while 54.8% were found to be non-adherent, with p value reaching statistical significance (p value=0.028). We found a higher rate of adherence (64%) in this inpatient hypertensive population as compared to previous studies. We also found that non adherence is a risk factor for the development of hypertensive crisis. Therefore, physicians should assess adherence to antihypertensive medications at clinic visits to prevent the development of a hypertensive crisis.

PROPHYLACTIC RISK REDUCING MASTECTOMY (PRRM): A SET PRACTICE OR CATCH-22 SITUATION IN LMIC. A SINGLE-CENTRE PROSPECTIVE COHORT STUDY.

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Pakistan's hereditary breast cancer (HBC) has shown higher-than-average prevalence. The acceptability of Prophylactic Risk Reducing Mastectomy (PRRM) still needs to be determined in our region, where genetic testing still needs to be offered to all eligible. The aim is to determine the number of women presenting to our centre who availed of PRRM after positive genetic tests and the main reasons restraining them from considering PRRM.

This is a Single-centre, prospective cohort study. Data from 95 females from the last five years (2017-2022) was collected, who are BRCA1/BRCA2 and other (P/LP) genes-positive patients/carriers. We collected information from patients after verbalising informed consent on Pro-forma. Data analysed using SPSS-23.0. We presented continuous variables as means \pm SDs with 95% CI and categorical variables in percentages. A p-value of less than 0.05 was significant.

Patients eligible for genetic testing were 477. Only 95(20.12%) had a positive result. BRCA 1/2 was positive in 70 cases, while P/LP variants were positive in 24 cases. Only 32.6% of eligible families underwent genetic testing, and 54.8% had positive results. Overall, 92.6% of patients had BRCA-related cancers. Only 25/95(26.3%) individuals availed of PRRM (p-value: 0.45). The majority had Contralateral Risk Reducing Mastectomy (CRRM) 68%. Only 20% availed of reconstruction.

The main reasons to decline PRRM where the majority have a false belief of not having any disease (57.44%), followed by family/spouse pressure (51%), body appearance/societal perception (42.5%), fear of complications/quality of life (34%), and not counselled by primary physician/surgeon (23.4%).

Genetic testing and its implications are still a grey area for LMICs, primarily due to the scarcity of centres offering genetic testing to eligible populations, followed by prevalent perceptions about prophylactic surgeries among the masses. Addressing relevant issues in LMICs is the need of time.

FACTORS ASSOCIATED WITH LIP INCOMPETENCY IN SKELETAL CLASS II MALOCCLUSION – A CROSS-SECTIONAL STUDY

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Objectives: The study aimed to identify the dental, skeletal and soft tissue cephalometric variables that are associated with lip incompetency in patients with skeletal class II malocclusion.

Materials and Methods: A cross-sectional study was conducted on a sample of 40 class II subjects, aged 18-35 years. The subjects were categorized into two groups based on the facial photographs. Soft tissue Holdaway cephalometric variables were measured to evaluate the factors which may predict the increased risk of lip incompetency in class II patients.

Results: There were statistically significant differences found between the two study groups for inter-incisor angle (IIA) ($p < 0.001$), S-line to upper ($p < 0.001$) and lower lip ($p = 0.009$), E-line to upper ($p = 0.006$) and lower lip ($p = 0.005$), prominence of upper lip ($p < 0.001$) and lower lip ($p = 0.015$), upper lip thickness ($p = 0.008$) and strain ($p = 0.031$). Cox regression analysis showed that IIA (HR = 0.952, CI: 0.920, 0.985), E-line to lower lip (HR = 1.165, CI: 1.001, 1.379), S-line to upper lip (HR = 1.276, CI: 1.030, 1.580), upper lip prominence (HR = 1.451, CI: 1.067, 1.974) statistically significantly lip competency.

Conclusions: Subjects with incompetent lips exhibited a retruded mandible, hyperdivergent and convex profiles with a protruded dentoalveolar pattern compared to those with competent lips. Upper lip prominence and strain, overjet, upper sulcus depth, E-line to the lower lip, S-line to upper lip were found to be associated with lip incompetency in adult skeletal class II subjects.

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EASE OF INTUBATION WITH MCGRATH VIDEOLARYNGOSCOPE AND INCIDENCE OF MAJOR ADVERSE EVENTS DURING EMERGENT OR URGENT TRACHEAL INTUBATION IN ADULT COVID-19 PATIENTS: A PROSPECTIVE OBSERVATIONAL STUDY.

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Background: Tracheal intubation in critically ill patients remains high-risk despite advances in equipment, technique, and clinical guidelines. Many patients with COVID-19 were in respiratory distress and required intubation that is considered an aerosol-generating procedure (AGP). We evaluated the ease of intubation, success rate, use of accessory maneuvers and adverse outcomes during and 24 hours after intubation with the McGrath videolaryngoscope.

Methods: This was a prospective, observational single center study approved by hospital ethics committee, conducted at non-operating room locations. We included all adults (>18 years old) with suspected or confirmed COVID-19 infection who were intubated by McGrath videolaryngoscope. The anaesthesiologist who performed tracheal intubation were requested to fill online data collection form.

Results: Between October 2020 and December 2021, a total of 105 patients were included in our study. Patients were predominantly male (n=78; 74.3%), their COVID status was either confirmed (n=97, 92.4%) or suspected (n=8, 7.6%). Most were intubated in the COVID ward (n=59, 56.2%) or COVID ICU (n=23, 21.9%). The overall success rate of intubation with McGrath in the first attempt was 82.9%, followed by 13.3% of patients who were intubated on second attempt and only 2.9% of patients required more than two attempts. The glottic view was either full (n=85, 80.95%), partial (n=16, 15.24%) or none (n=4, 3.81%). Within 24 hours of intubation, pneumothorax occurred in 1.9%, cardiac arrest and return of spontaneous circulation in 6.7% and mortality in 13.3% of patients.

Conclusion: These results portray the ease and utility of the McGrath videolaryngoscope for tracheal intubation in COVID-19 patients. Its disposable blade is of significant value to certain physician groups like anaesthesiologist, intensivists, and emergency physicians being particularly high risk of getting infected during tracheal intubation.

AN ENSEMBLE FOR THE DETECTION OF PERIAPICAL PATHOLOGY AND ITS RELATION TO TEETH ON ORTHOPANTOMOGRAMS – A VALIDATION STUDY

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Introduction: The field of medicine and dentistry are beginning to integrate Artificial Intelligence (AI), especially deep Learning (DL) in diagnostics, thereby eliminating subjectivity and improving accuracy. Current evidence on pathology detection on Orthopantomograms (OPGs) either indicate the presence or absence of disease in the entire image; literature on the relation of pathology to causative tooth is lacking.

Objectives: To develop a DL model for the segmentation of periapical pathology and its relation to teeth on OPGs. And to create an ensemble of our previously trained teeth segmentation and numbering model with the current lesion detection model.

Methods: 250 OPGs were manually annotated by subject experts to lay down the ground-truth for training a DL AI model for segmentation of periapical pathology. An untrained U-net algorithm was trained and validated on the labelled dataset. Our previously trained model on teeth segmentation and numbering tasks was also further trained on 250 labelled OPGs to improve performance and accuracy of teeth segmentation and numbering tasks. Both models were then integrated via code composed specifically for the task of combining our previous and current algorithms running in parallel. This led to the creation of an ensemble of all our AI algorithms.

Results: The performance of the existing teeth segmentation and numbering model was further improved as indicated by the following performance metrics including accuracy=98.1%, precision=91.8%, re-call=93.3%, F-1 score=92.5%, dice index=90.1% and Intersection over Union (IoU)=82.1%. The performance metrics of lesion segmentation carried out by the current model are as follows: accuracy=98.1%, precision=84.5%, re-call=80.3%, F-1 score=82.2%, dice index=75.2% and IoU=67.6%.

Conclusions: Our ensemble performs the task of lesion detection and its relation to the causative tooth on OPG with comparable results to that laid down in the ground-truth.

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FREQUENCY OF EPIDURAL CATHETER-INCISION CONGRUENCY AND EFFECTIVENESS OF POSTOPERATIVE ANALGESIA FOR ADULT PATIENTS AFTER MAJOR ABDOMINAL SURGERY: AN OBSERVATIONAL STUDY IN LMIC

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Introduction: Epidural analgesia (EA) is an important component of multimodal analgesia and is the perioperative analgesic technique of choice for most open abdominal surgical procedures. Effective postoperative epidural analgesia depends on siting the catheter correctly in the epidural space.

Objectives: The primary objective of this study was to observe the frequency of appropriate epidural catheter insertion site in adult patients scheduled for major abdominal surgeries and secondary objectives were to observe the frequency of ineffective postoperative analgesia with continuous epidural infusion, side effects, and complications.

Methods: This retrospective study was conducted for a period of three months after the approval from the DRC and ERC. All adult patients who underwent elective major abdominal surgery under general anaesthesia with an epidural catheter placed for postoperative pain management were included in this study.

Results: One hundred and eighty-two patients were included in this study. Ninety-six (52.75%) of patients were male and eighty-six (47.25%) were female. The epidural catheter was inserted at T10/T11 interspace or above in forty-three (23.6%) patients, below T11 but till L1 in seventy-three (40.15%) of patients, and below L1 in sixty-six (36.3%) patients. Only forty-three (23.6%) of patients had appropriate placement of epidural catheter as congruent to surgical incision. In the postoperative period, overall effective epidural analgesia was observed in seventy-nine (43.4%) of patients. Motor block was observed in sixty-six (36.26%) of patients in the immediate postoperative period.

Conclusion: The frequency of appropriate epidural catheter insertion was found in 23.6% of patients. The frequency of ineffective postoperative analgesia was found in 56.6% of patients.

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DERIVATION OF THE PHYSIOLOGICAL DIFFICULT AIRWAY PREDICTION SCORE (DAPS) IN ADULTS UNDERGOING ENDOTRACHEAL INTUBATION IN THE EMERGENCY DEPARTMENT.

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Background: In this study, we aim to develop a score that may be used to predict a physiologically challenging airway in critically ill adults by using clinical and laboratory data collected prior to intubation.

Method: This single center analytical cross-sectional study was conducted in the Emergency Department of Aga Khan University from 2016 to 2020. The airway score was derived using the transparent reporting of a multivariable prediction model for individual prognosis or diagnosis (TRIPOD). To gauge the model's performance, train-test split technique was utilized. The discrete random number generation approach was used to divide the dataset into two groups: development (training) and validation (testing). The validity of the score was checked using ROC analysis and area under the curve (AUC). By computing the Youden's J statistic using the metrics sensitivity, specificity, positive predictive value (PPV), and negative predictive value, the discriminating factor of the additive score was determined.

Results: The mean age of the 1021 patients who needed endotracheal intubations was 52.2 (\pm 17.5), and 62% (632) of them were male. In the development dataset, there were 527 (64.9%) instances of physiologically difficult airways, 298 (36.7%) instances of post-intubation hypotension, 154 (19%) cardiac arrest, 347 (42.7%) shock index $>$ 0.9, and 456 [56.2%] pH $<$ 7.3, respectively. There were 143, 33, 41, and 87 in the validation dataset (68.4%, 15.8%, 19.6%, and 41.6%, respectively). There were 14 variables in the physiological difficult airway prediction score (DAPS), and the DAPS with a score of 11 had an area under the curve of 0.753 (0.68–0.82). The accuracy of DAPS was 75.12% (between 68.69% and 80.83%), sensitivity was 74.83%, and positive predictive value was 86.99%.

Conclusion: DAPS has demonstrated strong discriminating ability for anticipating physiologically challenging airways.

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COMPARISON OF EFFICACY OF SONIC IRRIGATION (SI-ENDOACTIVATOR) VERSUS PASSIVE ULTRASONIC IRRIGATION (PUI) ON REMOVAL OF SMEAR LAYER FROM THE APICAL THIRD OF ROOT CANAL SPACE: AN IN-VITRO EXPERIMENTAL STUDY

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Introduction: The endodontic treatment success depends on proper debridement of root canal system using chemo-mechanical methods. During mechanical instrumentation, a residual layer composed of organic and inorganic components is formed which is called the smear layer and it prevents deeper penetration of chemicals into dentinal tubules thereby reducing their disinfecting efficacy. Therefore, complete elimination of smear layer is considered to be the key component for successful endodontic treatment.

Objective: To compare the efficacy of SI (EA) versus PUI on removing the smear layer from the apical third of root canal system using dye penetration measured in millimeter square (mm²) under stereomicroscope at 25.6x magnification.

Methods: It was an in-vitro experimental study. Forty six single rooted teeth were decoronated, and instrumented with ProTaper Next rotary file system upto size X3. Then, the specimens were divided into 2 groups according to the final irrigation activation technique: Group 1: Sonic Irrigation (SI-EndoActivator); Group 2: Passive Ultrasonic Irrigation (PUI). After immersion in 1% methylene blue dye, the teeth were sectioned at apical 3mm and observed under stereomicroscope (magnification X25.6) for dye penetration. Images were captured with a DSLR camera and imported to Fiji ImageJ software to measure the area of dye penetration in millimeters square. The area of dye penetration between the inner and outer canal circumference was recorded. Mann-Whitney U test was applied to compare the mean difference in dye penetration measurements in the two study groups. A p-value of < 0.05 was taken as statistically significant.

Results: Sonic Irrigation showed dye penetration of 1.08 ± 1.36 , whereas Passive Ultrasonic Irrigation showed dye penetration of 1.72 ± 1.74 at the apical third (3mm) of root canal system. There was no statistically significant difference among the groups ($p > .05$) in terms of smear layer removal from apical one third of root canal system.

Conclusions: Both the irrigation techniques (SI & PUI) were equally effective in smear layer removal from apical third of root canal system.

FACTORS INFLUENCING THE UPTAKE OF POST-ABORTION FAMILY PLANNING SERVICES AMONG MARRIED COUPLES, FROM PUBLIC HEALTH FACILITIES IN HYDERABAD, SINDH, PAKISTAN

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Background: Pakistan is a country with high population growth rate, currently it is on fifth rank in the world. It has the high total fertility rate of 3.6%, with contraceptive prevalence rate of 34%. Moreover, 17% of married couple has unmet need for family planning which results in unwanted pregnancies and abortion. In Pakistan of every 100 pregnancies 14 ended in induced abortion. This situation is alarming to health care sectors in Pakistan and is burden for country. Post-abortion family planning services and program can be helpful to overcome these challenges.

Purpose: The purpose of this study is to identify the factors that influence the married couples for uptake of post-abortion family planning in public health facilities, in Sindh region, Hyderabad, Pakistan.

Method: A qualitative exploratory study design is used to explore the perceptions of married women regarding PAFP and to identify the factors for non-usage of family planning services. Purposive sampling method was used. Data was collected from the participants, meeting the study inclusive criteria using semi structured interview guide. Content analysis was performed using Creswell's six step to obtain themes and categories from participants' responses.

Findings: The study discovers gender inequality, low socioeconomic status, perceived or actual side effects of contraceptives, negative past experiences of women, religious beliefs and women empowerment are sociocultural barriers in the uptake of PAFP services. While limited FP counselling, service inaccessibility and provider attitude highlighted as health care system factors as hinderance for couples in the uptake of post-abortion family planning services. The study also suggested the need for upgrading the education of community regarding FP and initiative and continuity of FP program in communities to sensitize the discussion.

Conclusion: The study has explored the factors hindering married couples from the uptake of PAFP services. Moreover, this study also identified some recommendations for future service strengthening.

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KNOWLEDGE, ATTITUDE, AND PRACTICES OF PHYSICIANS AND DENTISTS ON MEDICATION-RELATED OSTEONECROSIS OF THE JAW (MRONJ): A CROSS-SECTIONAL SURVEY

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Background: Bisphosphonate medication can cause osteonecrosis of the jaw, which is an uncommon but a serious complication. This survey explores the knowledge, attitudes and practices of dentists and physicians regarding medication-related osteonecrosis of the jaw (MRONJ).

Methods: A cross-sectional study was conducted among physicians and dentists of the secondary and tertiary care hospitals in Pakistan between March and June 2021. Data were collected through a web-based questionnaire distributed among the eligible clinicians involved in prescribing bisphosphonates to the patients or management of osteonecrosis. SPSS 23.0 was used for the data analysis. The frequencies and proportions of the descriptive variables were reported.

Results: A response rate of 29% was achieved. Only six dentist's (n=6/61, 9.8%) were aware that m-TOR inhibitors could lead to osteonecrosis. Only a third (n=9/26, 34.6%) of physician's informed their patients about the possible side effects of bisphosphonates. The most identified risk factor among them was the duration of the drug (n=77/87, 88.5%) and the least identified was gender (n=34/87, 39.0%).

Conclusions: Our study revealed a deficient knowledge among the respondent's related to the recent updated established guidelines available on MRONJ. Majority of physician's don't refer the patients to the dentists before prescribing bisphosphonates and other associated medications.

Keywords: Osteonecrosis; Bisphosphonate-Associated Osteonecrosis of the Jaw; Jaw.

GRADE ADOLPMENT OF CLINICAL PRACTICE GUIDELINES AND CREATION OF REFERRAL PATHWAYS FOR PSYCHIATRIC CONDITIONS IN PAKISTAN

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Background: Pakistan has approximately 400 psychiatrists across a population of around 220 million. As disease burden increases, management of mental illnesses increasingly becomes a responsibility of general physicians (GPs).

Objective: We aim to develop clinical practice guidelines (CPGs) and primary care referral pathways for GPs for the management of adult Psychiatric conditions in Pakistan.

Methods: An adaptation of the GRADE-ADOLPMENT method was followed for the creation of CPGs. Adolpment encompasses 3 key elements of adoption (use as is), adaptation (contextual modifications), and development. 10 CPGs developed by the American Psychiatric Association and 1 by the European Federation of the Neurological Societies were selected as source CPGs by a panel of local psychiatry experts. Recommendations from the source CPG were either adopted, excluded, or adapted. Recommendations were also added based on the best-evidence review process. Management and referral algorithms were derived using recommendations found in CPGs.

Results: We developed 10 CPGs using the GRADE-ADOLPMENT method and 10 primary care referral pathways for management of ten psychiatric disorders. A total of 19 recommendations were added across 10 CPGs to ensure pertinent counselling and standardize care provision as deemed necessary. 2 recommendations were adopted with minor changes and 48 were excluded due to unavailability of drugs, inapplicability to the existing health-care system of Pakistan or different target audience.

Conclusion: This study used the GRADE-ADOLPOMENT process to create 10 CPGs for the management of psychiatric disorders in Pakistan. The added recommendations will help to bridge the gap in care provision and aid GPs to treat patients holistically. 10 primary care referral pathways were also created for use by GPs for a smooth referral process. These referral pathways and CPGs will enable GPs to identify and address mental health needs in the community.

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ADHERENCE TO MEDICATION AND ITS ASSOCIATED FACTORS AMONG PATIENTS WITH HEART FAILURE IN A TERTIARY CARE HOSPITAL, KARACHI, PAKISTAN: A PROSPECTIVE STUDY

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Background: Heart Failure (HF) is a significant universal issue. Its prevalence has drastically increased due to an upsurge of risk factors, such as aging, elevated blood pressure, and ischemic heart disease (IHD). Adherence to the medication regimen is the most important self-care behavior for HF management. While, the level and pattern of medication adherence are well known in the west, there is little information about medication adherence and its associated factors among HF patients in Pakistan.

Purpose: To assess the level of medication adherence and its associated factors among patients with HF in Karachi, Pakistan.

Method: The study used a prospective cohort study design. A non-probability consecutive sampling method was used to recruit 124 HF patients. Medication adherence was assessed at baseline, four weeks (time 1), and eight weeks (time 2), through the General Medication Adherence Scale (GMAS).

Findings: The overall, medication adherence increased over time from 89% at baseline to 90% at four weeks and approximately 91% at eight weeks. Moreover, subgroup analysis indicates that the key reasons for nonadherence were patient behavior such as remembering to take medication, forgetfulness, busy schedule, feeling well, and side effects (10.48%), and financial constraints (8.06%). Whereas, additional disease and pill burden of medication did not contribute to medication nonadherence. In addition, income was a substantial predictor of medication adherence among heart failure patients.

Conclusion: The results of the present study provide important insights into medication adherence in the Pakistani population. Patient behavior and financial constraints are the main reasons for nonadherence. These issues need to be adequately addressed to improve overall patient outcomes. Future longitudinal studies are needed to test these results in a large population or among impoverished societies.

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DIFFERENTIATING BETWEEN DENGUE FEVER AND MALARIA USING THE HEMATOLOGICAL PARAMETERS.*Anila Zafar, Dr Bushra Moiz**Department of Hematology, Aga Khan University and Hospital*

Objectives /Introduction: Dengue fever and malaria are the two major public health concerns in tropical countries such as Pakistan. Early differentiation between dengue and malaria could help clinicians to identify patients who should be closely monitored for signs of dengue hemorrhagic fever or severe malaria. This study aims to build knowledge on hematological parameters and morphological findings which can discriminate these two infections.

Material and Methods: A cross sectional retrospective study was conducted at Aga Khan hospital in section of Hematology in September 2022. Subset for malarial parasite for malaria positive and dengue were made and differentiated on basis of hematological parameters and morphology in total no. of CBC samples received in September 2022. Out of 100698 of samples, 230 were included in study which demonstrated reactive lymphocytes and were correlated with the results of dengue antigen (NS1), 2403 results of Malaria parasite were received during study period, and was included in study.

Results: In group of reactive lymphocytes 180 (78%) sample were positive for dengue antigen, 50 (22%) were negative. Out of 2403 Malaria parasite request, 110 come out to be positive, *P. vivax* 102 sample while *P. falciparum* was only seen in 8 sample, 2293 samples results were Malaria not seen.

Conclusion: This study concluded that several hematological parameters could differentiate dengue fever from malaria. A decision that using observing malaria parasite in peripherals film and hematological parameters, such as low platelets count, neutropenia, and lymphocytosis and morphological findings (reactive lymphocytes with left shift neutrophils) can discriminate patient with dengue and malaria infection.

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EFFECT OF PSYCHOLOGICAL DISTRESS ON THE EMERGING CAUSE OF INFERTILITY*Faiza Kausar**Department of Surgery, Agha Khan University Hospital and Department of Physiology, University of Karachi*

Background: Infertility is a growing issue of the recent era, and it represents significant crisis for most couples. Psychological distress has often been suggested as a cause of unexplained infertility. Male infertility accounts for 40% of all infertility problems, while female infertility accounts for 40% of all infertility problems; others are unexplained. Previous studies have indicated that stress and depression negatively impact various infertility parameters in both partners.

Objectives: To determine the relationship between infertility and psychological distress and the level of different types of stress among infertile couples, and also to relate the significant stressors responsible for worsening infertility or vice versa.

Methodology: This cross-sectional observational study was conducted on 50 couples. Data collection was done by the department of Gynecology of Atia General Hospital Malir Kalaboard. Subjects were evaluated through a self-designed questionnaire, while stressors were assessed through a stress evaluation tool, i.e. Sadaf Stress Scale (SSS). Data were analyzed using SPSS version 22.0.

Results: Results show stress levels in infertile couples, i.e., emotional, mental, psychosocial stress and chemical stress, elevated with some minor differences in both partners. Stress, and anxiety increases as the duration of infertility increases. Participants in our study had also experienced reproductive problems in their medical history, like a female with endometriosis, PCOs, pelvic infections and a male with low testosterone, and genital infections, so these reproductive problems can also worsen their stress level and infertility.

Conclusion: Infertility-related stress has direct and indirect effects on both partners, especially on mental health which can cause depression, anxiety etc. Although this study found more similarities than differences in how men and women experience infertility stress, the linkage between infertility stresses in men was surprising because men tend to report less anxiety. Stress and psychological factors are correlated with each other.

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NEONATAL OUTCOMES OF PREGNANT WOMEN WITH OR WITHOUT COVID-19 EXPOSURE DELIVERING AT A TERTIARY CARE HOSPITAL IN KARACHI: A COHORT STUDY

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Background: COVID- 19 infection was declared a global pandemic by WHO on March 11th, 2020, affecting millions of people. Previous research has shown that outbreaks put vulnerable populations, such as pregnant women, newborns, and the elderly.at a relatively high risk of developing adverse outcomes. The primary goal of this study was to see if being exposed to SARS-CoV-2 during pregnancy increased the incidence of newborn ICU admissions.

Methods: This was a prospective cohort research that compared neonatal outcomes in pregnant women who had been exposed to SARS-CoV-2 with pregnant women who had not been exposed to SARS-CoV-2 enrolled from two tertiary care hospitals in Karachi that is Aga Khan Hospital and Jinnah hospital starting in the period of May 2022. The rapid antigen test, Serology Rapid Antigen Test, Serology (IgG/IgM) antibody test, and RT-PCR (reverse transcriptase-polymerase chain reaction) were used to assess exposure at screening so that patients could be divided into exposed and unexposed groups later.

Results: The average maternal age of the women who participated in our study was 27.69 years \pm 5.49. The average gestational age of the exposed group was 30.7 \pm 8.4weeks, women compared to 22.85 \pm 11.48 weeks in unexposed women. With our small sample size, we were unable to find any evidence that COVID-19 exposure alters NICU admission, which requires confirmation from investigations with bigger sample sizes.

Conclusion And Public Health Implications: Given the current circumstances, it is challenging to determine whether children born to mothers who were exposed to COVID-19 had a higher probability of needing NICU hospitalization. The need for critical care and the number of ICU admissions have increased, according to certain research. It will take more research with larger sample sizes to confirm these conclusions.

Keywords: COVID-19, Pregnancy, Neonate, Novel coronavirus

GRADE-ADOLOPMENT OF CLINICAL PRACTICE GUIDELINES FOR MANAGEMENT OF CHRONIC RESPIRATORY CONDITIONS IN PAKISTAN

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Background: As the burden of chronic respiratory conditions increase in Pakistan, there is an immense need for the creation of local evidence-based clinical practice guidelines (CPGs) particularly at the primary care level.

Objective: We aimed to develop CPGs and referral care pathways for the primary care management of chronic respiratory conditions in Pakistan.

Methods: 4 source CPGs were identified by a group of local pulmonology experts. The source CPGs selected covered idiopathic pulmonary fibrosis, asthma, chronic obstructive pulmonary disorders, and bronchiectasis. We employed a modification of the GRADE-ADOLOPMENT process to adopt (retain as is), adapt (modify according to local context), adopt with minor changes (adopt with small modifications), or exclude (omit due to lack of local relevance) recommendations from the identified source CPGs. Recommendations were added based on the best evidence review process where gaps were identified.

Results: Across the 4 CPGs, 12 recommendations were adopted with minor modifications and 99 recommendations were excluded due to their content being deemed out of scope for the primary care level. 7 recommendations were added pertaining to counselling, interventions for modifiable risk factors and the use of home oxygen therapy for hypoxemic patients and management of comorbid GERD. In addition, referral care pathways were designed for the four chronic respiratory conditions, explicitly delineating the role of primary care practitioners in the diagnosis, basic management, and timely referral of patients.

Conclusion: We employed the GRADE-ADOLOPMENT process to create 4 CPGs for chronic respiratory diseases and derived 4 primary care referral pathways from it. The CPGs and referral pathways will help standardize care provision for chronic respiratory disease patients in Pakistan.

THE QUALITY OF LIFE AMONG THE EXTUBATED PATIENTS DISCHARGED FROM TERTIARY CARE HOSPITAL, KARACHI

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Background: Mechanical ventilation, where a life-saving treatment, it also has potential complications during and post-extubation that affects the quality of life of the patients, and health professionals could make strategies to subside the complication to improve the quality of life of the patients. Studies done globally have revealed changes in QoL so, the study was desired to discover the experiences of patients who received mechanical ventilation to evaluate their quality of life.

Purpose: The study aimed to determine the quality of life of patients, six months after discharge who have undergone mechanical ventilation and were successfully extubated in a tertiary care hospital in Karachi, Pakistan.

Methodology: The qualitative exploratory descriptive study design was used to assess the quality of life of the patients who have received mechanical ventilation and extubated at six months of their discharge. The purposive sampling method was utilized to choose the study participants. The data collection was done through interviews following a semi-structured interview guide. Thematic analysis was done to obtain themes, categories, and sub-categories.

Results: The thematic analysis was done from the collected information that came from the semi-structured interview guide which headed to form two themes that are pain and suffering for a new life and changes in quality of life after extubation. The findings showed that the participants had faced problems in physical, psychological, social, sexual, and spiritual domains during their recovery period after their discharge from the hospital. Our study findings suggest that patients had suffered from problems in all domains, but the physical, psychological, and sexual quality of life has been affected a lot.

Conclusion: The quality of life of the patient which is mostly affected in physical, psychological, and sexual domains has improved to some extent after six months, but they are still dealing with the issues. Moreover, having problems the participants were found satisfied and adjusting themselves to the current quality of life.

ASSESSMENT OF MESIODISTAL ROOT ANGULATION OF TEETH BY THREE DIFFERENT RADIOGRAPHS FOR IDEAL BRACKET POSITIONING IN ORTHODONTIC PATIENTS - A CROSS-SECTIONAL STUDY

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Introduction: Accurate bracket positioning is required for proper root parallelism and for stable orthodontic treatment outcomes. This study aimed to determine the difference in mesiodistal root angulation of teeth measured on three different radiographs.

Materials and Methods: A cross-sectional study was conducted using orthopantomogram (OPG), panoramic images of cone beam computed tomography (Pan-CBCT) and cone beam computed tomography (CBCT). An occlusal plane was constructed in OPG and Pan-CBCT for angular measurements. The axial and sagittal views were used for assessing the mesiodistal root angulation on CBCT. Mesiodistal root angulation differences among three radiographs were assessed using the Kruskal Wallis test. Mann-Whitney U test was applied for pairwise comparison and multinomial logistic regression was used to determine the association of gender dimorphism with the direction of root angulation.

Results: On comparing the mesiodistal root angulation in degrees (DE) among all three groups, upper right (UR2) and left lateral incisors (UL2) were found to be statistically significant with $p = 0.033$ and $p = 0.050$ respectively. On pair-wise comparison, we found a statistically significant difference for upper right lateral incisor (UR2) between OPG and Pan-CBCT ($p = 0.045$). Upper left lateral (UL2) ($p = 0.024$) was significant in OPG and Pan-CBCT while upper left first molar (UL6) ($p = 0.043$) in OPG and CBCT group. On gender-wise comparison in the direction of root angulation, females showed a greater tendency of mesial root angulation (5.62) times for upper right second premolar (UR5) as compared to males.

Conclusions: There were no significant difference in mesiodistal root angulation between panoramic CBCT and CBCT. Upper lateral incisors' angulation was found to be significant between OPG and panoramic CBCT, whereas upper right lateral incisor and left first molars' angulation in OPG and CBCT. Based on gender dimorphism females showed a greater mesial angulation of teeth as compared to males.

Keywords: Mesiodistal root angulation, bracket positioning, radiographs

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INFLUENCE OF NASOLABIAL ANGLE ON FACIAL AND SMILE ATTRACTIVENESS - A CROSS-SECTIONAL STUDY*Dr. Afeefa Abul Barakaat**Department of Surgery, Section of Dentistry, Aga Khan University Hospital*

Background: A smile can mask the discrepancies in the nasolabial angle (NL) at rest and can improve facial attractiveness. This study aimed to identify the effect of the NL angle on smile and facial profile attractiveness.

Materials and Methods: A cross-sectional study was conducted at a tertiary care hospital using profile photographs of adult male and female subjects at rest and on smile. Those photographs were altered by Photoshop software to NL angle of (85°, 90°, 95°, 100°, 105°, and 110°) both at rest and smile. These photographs were shown to a panel of 23 raters comprising of three groups, laypersons (LP), general dentists (GD) and orthodontists (OD) and they were asked to rate each picture on a Likert scale with 1 being extremely unattractive and 7 being extremely attractive. Kruskal Wallis test was used to compare the NL angle scores among raters. Mann Whitney U test for pairwise comparison between groups and gender-wise comparison of raters. Wilcoxon signed-rank test to analyze the effect of smile on the NL angle.

Results: Statistically significant differences ($p \leq 0.05$) were seen between rest and smile scores in all three groups of raters. NL angle of 110° was found to be statistically significant for males ($p = 0.009$) and females ($p = 0.005$). LP gave the highest scores to 95° for males ($p < 0.001$) and females ($p = 0.011$). GD found 90° for males ($p = 0.009$) to be most attractive on smile whereas for females 90° ($p = 0.014$) and 95° ($p = 0.025$) got the highest scores. OD gave the highest scores to 95° for both males ($p < 0.001$) and females ($p = 0.002$). Smile scores were higher as compared to the rest and 90° and 95° were most attractive on smile.

Limitations: Ethnic variability should be considered as we took subjects from the Asian population only.

Conclusions: There was a significant difference in preference of nasolabial angle between male and female raters. All three groups of raters gave the highest scores to smiling photographs which explained improvement in smile scores and facial attractiveness. Smile compensated the nasolabial angle and increased the facial profile attractiveness.

Keywords: Nasolabial angle, smile, facial attractiveness

COUNTING THE NEUROLOGICAL COST OF COVID-19

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Introduction: The neurological deficits caused by COVID-19, which were first reported in the early months of 2020, continue to intrigue neurologists and healthcare professionals worldwide. Despite multiple reports of neurological deficits in patients with COVID-19 from across the world, the precise incidence of these manifestations has remained unknown, these manifestations are frequent and are expected to increase the burden of morbidity and mortality in the acute and chronic phases of COVID-19.

Objective: To gauge the frequency with which neurological deficits are emerging in the current pandemic as reported recently

Method: Analyzing the most up-to-date research finding being reported regarding neurological deficits in COVID-19 and Long-COVID

Results: Accumulating evidence on neurological sequelae in patients with COVID-19 and Long-COVID was found to be surging in the current pandemic and is a cause for concern. Analyzing data from 55 countries, it was found that 41 neurological manifestations can occur in conjunction with COVID-19. Up to one-third of individuals with COVID-19 were estimated to exhibit at least one of these manifestations. Antibodies against the SARS-CoV-2 spike protein in serum samples from 556 consecutive patients who had undergone neural antibody testing as part of the diagnostic evaluation for autoimmune encephalitis were examined and 18 (3%) of the patients tested positive for antibodies against SARS-CoV-2. Overall, the number of individuals with post-COVID-19 autoimmune encephalitis encountered by the researchers in their clinic was low, representing only 0.05% of patients with COVID-19-related diagnoses.

Conclusion: Without proper care and treatment, patients with these neurological manifestations might be permanently debilitated. Moreover, the continuation of neurological symptoms of long COVID could overwhelm already fractured healthcare systems. Consequently, we urgently need to understand and respond to the covert yet potentially incapacitating neurological consequences of COVID-19 in the acute and chronic phases of the disease.

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EARLY RECOGNITION AND MANAGEMENT OF MATERNAL SEPSIS IN PAKISTAN: A FEASIBILITY STUDY OF THE IMPLEMENTATION OF FAST-M INTERVENTION

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Background: The World Health Organization and partners developed a maternity-specific sepsis care bundle called ‘FAST-M’ for low-resource settings. However, this bundle has not yet been studied in Asia. Our study sought to determine the feasibility of the FAST-M intervention in a low-resource setting in Pakistan and evaluate the perceptions of healthcare providers about its implementation.

Methods: A mixed-methods study with a before and after design was used. The study was conducted in two phases at the LUMHS hospital, Hyderabad. In the first phase, the bundle-care tools were adapted in the local context through baseline assessment and qualitative interviews with HCPs. In the second phase, the feasibility of the FAST-M intervention was evaluated. Quantitative analyses were done to assess comparisons made before and after the implementation of the intervention. Qualitative analyses were done to evaluate the outcomes of intervention by conducting focus-group discussions with healthcare providers involved in the management of maternal sepsis patients in the study setting.

Results: Following the FAST-M intervention, significant changes were observed when compared to baseline practices. Improvements were seen in the monitoring of important parameters such as oxygen saturation measurements [25.5% vs 100%; difference: 74%; 95% CI:68.4%-80.5% p<0.01], fetal heart rate assessment [58% vs100%; difference:42.0%; 95%CI: 33.7% to 50.3%; p=<0.01], and measurement of urine output [76.5% vs 100%; difference 23.5%; 95%CI: 17.6% to 29.4%; p<0.01]). Women with suspected maternal sepsis received all components of the FAST-M treatment bundle within one hour of sepsis recognition following the FAST-M intervention [0% vs70.5%; difference 70.5%; 95%CI: 60.4% to 80.6%; p<0.01]. However, the qualitative evaluation found an additional improvement in overall patient monitoring and outcomes as reported by healthcare providers.

Conclusions: Implementation of the FAST-M intervention in a low-resource setting in Pakistan is feasible and significantly improved the quality of maternal sepsis care, including enhanced early identification and its management.

INFLUENCE OF DENTAL MIDLINE DEVIATION WITH RESPECT TO FACIAL FLOW LINE ON SMILE ESTHETICS: A CROSS-SECTIONAL STUDY.

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Introduction: To achieve optimal smile esthetics, numerous guidelines have been proposed. A contemporary concept states that deviating the dental midlines towards the midline structures of the face can mask the compromised smile esthetics due to dental midline discrepancy. This study aims to identify a range of midline deviation that can be varied towards or away from the facial flow line.

Materials and Methods: A cross-sectional study was conducted at a tertiary care hospital where frontal smile photograph of a female was altered on photoshop software. The subject's dental midlines were deviated by 2 mm, 4 mm and 6 mm towards and away from the facial flow line (FFL). These pictures were shown to a panel of raters comprising of two groups, laypersons (LP) and dental professionals (DP). 43 raters in each group were asked to rate each picture in order of least attractive to most attractive using a Visual analogue scale (VAS). Independent t-test was used to compare the perception of dental midline deviation between LP and DP.

Results: Highly statistically significant differences ($p \leq 0.05^{**}$) were seen between mean attractiveness scores between LP and DP for pictures 1 (2 mm towards FFL), 2 (4 mm towards FFL) and 5 (4 mm away from FFL) with DPs having a better perception of midline deviation. Higher esthetic scores were consistently seen when the midline was deviated towards FFL.

Conclusions: LP could not perceive the midline deviations up to 4 mm while DP were able to perceive deviations above 2 mm. 2-4 mm of ML deviation towards FFL can be tolerated by the LP and DP.

Keywords: Midline, Facial flow line, Smile esthetics

HEALTH-RELATED QUALITY OF LIFE (HRQOL) OF CHILDREN AND ADOLESCENTS WITH TYPE-I DIABETES MELLITUS (T1DM): A QUANTITATIVE CROSS-SECTIONAL ANALYTICAL STUDY AT A TERTIARY CARE HOSPITAL IN KARACHI, PAKISTAN

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Background: Type-I diabetes mellitus (T1DM) is a chronic metabolic disorder which require long-term management for good glycemic and metabolic control. Studies from high income countries (HICs) have reported that T1DM affects the health-related quality of life (HRQoL) in these children and adolescents. However, there is a lack of evidence and data from low and middle income countries (LMICs) such as Pakistan where the sociodemographic and the available resources are very different compared to HICs.

Purpose: This research study aimed to assess the HRQoL of children and adolescents (2-18 years) with T1DM, at a tertiary care hospital in Karachi, Pakistan.

Methodology: A quantitative cross-sectional analytical study design was utilized for this research study to assess the HRQoL of children and adolescents with T1DM from the patients' perspective and their parents' / primary care givers' perspective as a proxy (for patients' of 2-4 years), by utilizing the Pediatric Quality of Life Inventory™ (PedsQL™) generic-specific, Generic Core Scale (GCS) Version 4.0, and the disease-specific, Diabetes Module Version 3.2 (English and Urdu).

Results: The overall generic-specific and diabetes-specific HRQoL was found to be poor in all the domains of the GCS and diabetes module. For generic-specific HRQoL, no associations were found between the predictors and the GCS module in multiple linear regression analysis. For diabetes-specific HRQoL, age, female gender, increase in the frequency of monitoring of blood glucose, were found to be statistically significantly associated with the diabetes module in multiple linear regression analysis.

Conclusion: The ongoing assessment and evaluation of HRQoL of children and adolescents with T1DM is an important indicator for determining disease prognosis, detection of problems, and identification of complications that might affect HRQoL. The integrated educational program and awareness are important at home, school, hospital settings, and at the community level for providing support to the children and adolescents with T1DM, to improve their HRQoL.

EFFECT OF STORAGE MEDIA ON MATERIAL PROPERTIES IN EXTRACTED HUMAN TEETH – A SYSTEMATIC REVIEW

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Extracted teeth are commonly utilized in dental research for testing of dental materials. For this purpose, they are stored in different storage media suggested by literature such as distilled water, sodium hypochlorite (NaOCl), Formalin and more recently cryopreservation. The storage of teeth is required because leaving them in dry conditions can result in their dehydration and ultimately losing their structural integrity. Till date, a consensus hasn't been able to reach as to which medium is best in terms of maintaining the properties of materials being tested in an in-vitro setting. Therefore, the aim of this systematic is to study the effects of storage media on the results of materials being tested in an invitro studies on extracted teeth. An electronic search was in four databases PubMed, CINAHL Plus, Dent & Oral Science and Cochrane databases along with manual searching. The PICO was kept as following; Population- Extracted Human Teeth, Intervention: Different Storage media, Comparison: Comparison of storage media amongst themselves, Outcome(s): Material property testing, Setting: In-vitro experimental studies. A total of 131 articles were found out of which 39 duplicates were removed. 95 articles were then screened from which 19 articles were shortlisted based on title. A total of 13 articles were then shortlisted based on title from which 12 articles were included in the systematic review process. Quinn tool was utilized to assess the risk of bias of individual invitro studies, which revealed 2 studies out of 12 to be of low risk whereas remaining were of unclear risk. So far relatively fewer high quality studies are done which focus on the effect that storage media has on dental material properties. This review indicated that no material has yet found to be superior in terms of maintaining or improving the properties of tested materials. However, dry storage, formalin and cryopreservation were found out to be least affecting the properties of dental materials. Properly designed and controlled studies of higher quality are recommended to be conducted.

EXPLORING THE USE OF LOW FIELD PORTABLE MAGNETIC RESONANCE IMAGING OF BRAIN IN CRITICALLY ILL OR INJURED CHILDREN – AN EXPLORATORY STUDY

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Introduction: Timely neuroimaging is crucial in assessing acute brain injury (ABI) in critically ill children. However, transporting patients to magnetic resonance imaging (MRI) suites poses a risk of compromised care. Recently a portable low-field MRI (pMRI) system has been introduced.

Objective: To assess brain injury in critically ill children using a pMRI device at bedside and compare findings with standard neuroimaging (MRI/CT scan).

Study Design and Methods: Prospective, single center cohort study was performed from May 2021 to July 2022. pMRI was deployed at the bedside in pediatric critical care setting. Children, aged 0-18 years, with ABI, undergone neuroimaging - pMRI and Standard Imaging (MRI/CT Scan), within 48 hours window were enrolled. All unstable children (as determined by the clinician) were excluded. Images acquired from the pMRI scan were transferred to PACS for reporting along with standard neuroimaging (CT/MRI Scan). Radiological findings for both modalities were compared and Kappa-statistics computed to assess the degree of agreement between them.

Results: 73 patients were included in the final analysis. 46 (63%) were female, and mean age was 4.8 (± 5.2) years. Indication for neuroimaging were unexplained encephalopathy 29 (39.7%), seizure disorder 38 (52.1%), focal neurologic deficit 19 (26.0%), traumatic brain injury 6 (8.2%) and diplopia 2 (2.7%). Total scan acquisition time for pMRI was 51.3 minutes, lower than the standard MRI (1 hour 45 minutes for critically ill – includes both acquisition and transport time). Images obtained through pMRI; 57 (79.2%) T1W, 60 (83.3%) T2W and 59 (81.9%) T2 FLAIR had adequate quality with minor limitations to interpretation. Provisional diagnosis of edema 27 (37.0%), hydrocephalus 12 (16.4%), Infarction 13 (17.8%), midline shift 13 (17.8%), intra-parenchymal hemorrhage 7 (9.6%), and mass 4 (5.5%) was made through pMRI. Compared to a standard MRI/CT scan (n=50), where applicable, most pMRI findings were in agreement with an overall moderate to almost perfect agreement 73.91% (k 0.406, P 0.0003) noted between both modalities.

Conclusion: pMRI is safe and feasible modality with promising results for diagnosis and planning management for critically ill children based on imaging results.

SAFETY OUTCOMES OF ANTI-PLATELETS POST CORONARY ARTERY BYPASS GRAFT SURGERY: A META AND NETWORK META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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Background: Antiplatelet therapy is used to avoid graft failure post coronary artery bypass graft surgery (CABG).

Objective: We aimed to compare dual antiplatelet therapy (DAPT) with monotherapy as well as compare Aspirin, Ticagrelor, Aspirin + Ticagrelor (A+T) and Aspirin + Clopidogrel (A+C) to determine the risk of major and minor bleeding, postoperative myocardial infarction (MI), stroke, and all-cause mortality (ACM) to determine the safest antiplatelet therapy to use post-CABG via meta and network meta-analysis.

Methods: MEDLINE, EMBASE and Cochrane were used to perform the literature review from inception to August 10, 2022. Odds ratio (OR) and Absolute Risk (AR) were employed to assess the mean and standard deviation (SD) with 95% confidence intervals. Bayesian random-effects model was used for statistical analysis. The risk difference and Cochran Q tests were used to calculate rank probability and heterogeneity, respectively.

Results: We included 10 randomized controlled trials with 3926 patients. For risk of major and minor bleed, A+T and Ticagrelor showed the lowest mean value of 0.040 (0.043) and 0.067 (0.073), respectively, and the highest rank probability of being the safest group. While a direct comparison between DAPT and monotherapy resulted in an OR of 0.57 [0.34, 0.95] with an overall effect of 2.16 (p=0.03) for the risk of minor bleed. A+T was found to have the highest rank probability and the lowest mean value in terms of ACM, MI, and stroke.

Conclusion: No significant difference was found between monotherapy or dual-antiplatelet therapy for the risk of major bleeding. DAPT has a significantly higher rate of minor bleeding complications post-CABG. Although not significantly different, A+T was found to have the lowest ACM, MI, and stroke risk. As DAPT has been shown to significantly decrease the risk of graft occlusion post-CABG, despite the higher minor bleeding risk, it should be considered as the antiplatelet modality of choice post-CABG.

DIAGNOSTIC ACCURACY OF SMARTPHONE-BASED ARTIFICIAL INTELLIGENCE METHODS FOR DETECTING DIABETIC RETINOPATHY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Diabetic retinopathy (DR), affects approximately 95 million people worldwide and is primarily diagnosed by human experts. However, due to the high prevalence of DR it is important to find a more efficient screening method. Artificial intelligence (AI) is improving the accuracy of many diagnostic tests.

Objective: This systematic review aims to determine the diagnostic accuracy of smartphone-based AI programs for the diagnosis of DR.

Methods: A literature review was performed on MEDLINE, Embase, Scopus, CINAHL Plus, and Cochrane. Studies included involved the detection of DR in diabetic patients using a smartphone-based AI program for diagnostic test accuracy with an expert human grader as a reference test. A random-effects model was used to pool sensitivity and specificity as well as to calculate positive likelihood (LR+), negative likelihood (LR-), and diagnostic odds ratio (OR). A hierarchical summary receiver operating characteristic (HSROC) curve was constructed with a 95% confidence interval (CI). Referable DR (RDR) and any DR (ADR) were analyzed separately. The Quality Assessment of Diagnostic Accuracy Studies-2 (QUADAS-2) tool was used for quality assessment.

Results: A total of 968 title and abstracts were screened. 8 studies were included in the systematic review and 6 studies were included in the meta-analysis constituting 3931 patients. Most studies used Medios AI. For the diagnosis of RDR, the pooled sensitivity and specificity was calculated to be 98.5% and 83.8% respectively, with an OR of 201.6 ($p < 0.001$). For the diagnosis of ADR, the pooled sensitivity and specificity were calculated to be 89.4% and 92.8% respectively with an OR of 111.7 ($p < 0.001$).

Conclusion: This meta-analysis demonstrated high diagnostic test accuracy of smartphone-based AI programs in the detection of DR. However, the available literature on this topic is limited. High-quality studies with various smartphone-based AI models need to be conducted in the same population for a direct head-to-head comparison.

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CLINICAL SPECTRUM, TREATMENT AND OUTCOME OF CHILDREN WITH AUTOIMMUNE ENCEPHALITIS: USING MODIFIED RANKIN SCALE SCORE AS AN OUTCOME MEASURE

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Background: Autoimmune encephalitis (AE) includes a spectrum of immune mediated encephalopathies caused by antibodies directed against neuronal surface antigens. We assessed the clinical spectrum, treatment and outcome of the disease in this study.

Methods: It was a retrospective study including children < 18 years diagnosed with AE, between Jan 1, 2017 to Dec 31, 2021. Medical record was retrieved. Outcome was defined as modified Rankin Scale (mRS) score at 3 months follow-up, categorized as good(mRS 0-2) or poor(mRS 3-6) outcome. Risk factors were analyzed by regression analysis.

Results: Of the 33 patients; 13 (38.2%) were antibody-positive, while 20 (58.8%) were antibody-negative. Anti-NMDA receptor antibody was found in CSF in 12/13, one patient had anti-CASPR2 antibody. Mean age was 6.5 (± 4.48) years. Females were more 60.6% as compared to males 39.3%. Seizures (81.8%), behavioural abnormalities (84.8%), movement disorder (66.6%), psychiatric symptoms (63.6%) and mutism (33.3%) were the prominent symptoms. Abnormal EEG and MRI were present in 84.8% and 69.7%, and CSF-specific oligoclonal bands in 9% patients. Diffuse theta and delta slowing in EEG, and T2 / Flair hyperintense signals in white matter and cortex in MRI were common abnormalities found. Median (IQR) mRS score at admission was 5.00 (4.00-5.00). First line immunotherapy (steroid pulse, intravenous Immunoglobulin, plasmapheresis or combined therapy) was used in 30/33 (90.9%) and response was seen in 21/30 (70%) patients. Good outcome was seen in 14 (48.2%) and poor outcome in 15 (51.7%) patients. Patients with good outcome had better response to immunotherapy ($p=0.038$) and plasmapheresis was needed only in those with poor outcome ($p=0.044$). Multivariate regression analysis showed that age 5-10 years (OR 0.09, CI 0.01-0.83, P-value 0.034) and high CSF glucose (OR 0.09, CI 0.01-0.90, P-value 0.041) were protective factors for poor outcome at 3 months.

Conclusion: MRI brain can be normal in children with AE. Patients usually have good response to first line immunotherapy and response to first line therapy indicates good outcome. Moreover, we found that age 5-10 years is a protective factor for poor outcome.

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CLINICAL HETEROGENEITY, DIAGNOSTIC DILEMMAS AND CHALLENGING DISEASE COURSE: A CASE SERIES OF MYASTHENIA GRAVIS IN CHILDREN OF TODDLER AGE GROUP*Khairunnisa Mukhtiar, Mohammad Raza, Isbaah Tejani, Shahnaz Ibrahim**Department of Pediatrics and Child Health and Medical College, Aga Khan University*

Background: Juvenile myasthenia gravis (JMG) and congenital myasthenic syndrome (CMS), are rare disorders of neuromuscular junction characterized by ptosis and fatigable muscle weakness. We hereby present case series of four children with varied clinical presentation of myasthenia gravis at Aga Khan University hospital Karachi.

Results: The youngest of our patient was 10 months old. Three of the four cases had Juvenile myasthenia gravis, while one being congenital myasthenic syndrome. All of our patients had ptosis at presentation, other clinical features included signs of bulbar involvement, limb muscle weakness and facial diplegia. Child with CMS had global developmental delay along with ptosis. Presence of facial diplegia was a rare and unique finding in one of our cases, who was anti-Acetylcholine receptor (AChR) antibody negative on initial presentation but later on after 6 months became positive. Three cases were positive for AChR antibody, while Muscle-specific tyrosine kinase (MuSK) antibody was negative in all the cases. Repetitive nerve stimulation (RNS) test showed a significant decremental response in our two-and-half years old patient, who was negative for both antibodies (double seronegative). She had prolonged PICU stay and had good response to Plasmapheresis. In CMS patient, DPAGT1 homozygous mutation was identified on genetic analysis; and interestingly he also tested positive for AChR antibody. Three of our patients had good response to Pyridostigmine.

Conclusion: AChR antibodies can be negative at initial presentation in JMG. We recommend that genetic testing should be done in all children suspected to have Myasthenia Gravis in infancy and toddler age group.

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A CLUSTER RANDOMIZED CONTROLLED STUDY OF SECONDARY DISTRIBUTION OF HCV SELF-TEST TO SUPPORT MICRO-ELIMINATION IN KARACHI, PAKISTAN

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Background: HCV prevalence in Pakistan is 6% with majority of cases undiagnosed due to lack of comprehensive screening programmes. Self-testing has increased screening uptake in HIV due to its convenience and privacy advantage. This study aims to evaluate the acceptability and impact of a program enabling home delivery of HCVST using the oral-based OraQuick® HCV rapid antibody test.

Methods: This cluster randomized control study targeted persons missed during house-to-house screening in a micro-elimination study in two Union Councils in district Malir of Karachi. The neighborhoods were grouped into clusters and each member of a matched cluster pair was randomized to intervention or control. Individuals over 18 years who were not home were eligible for participation. In the intervention group, an HCVST was left with instructions for use explained to a senior household member. In the control group, a pamphlet was left with directions to visit the nearest clinic for HCV screening. Both groups were followed up to inquire if testing was completed and positive tests were linked for further management.

Results: 1184 participants were enrolled in the intervention group with 79% males and mean age 34 years. 1001 participants were enrolled in the control group with 81% males and mean age 35 years. Screening uptake was 87% in the intervention group compared to 22% in the control group. 16% (168/1026) of the participants who completed self-testing reported a positive result. 75% (125/168) of these completed RNA testing and 88% (30/34) of confirmed cases were started treatment. 7% (15/224) of the participants in the control group reported a positive result, 94% (14/15) of these completed RNA testing and 83% (10/14) started treatment. Nearly all (96%) participants who completed the test demonstrated willingness to perform HCVST in the future.

Conclusions: Results of this study demonstrate that HCV self-testing is acceptable in this setting with potential to increase testing uptake compared to standard HCV testing services especially in hard-to-reach populations.

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INCIDENCE AND RISK FACTORS OF HCV IN INDIVIDUALS PREVIOUSLY SCREENED NEGATIVE IN A HIGH-BURDEN AREA OF DISTRICT MALIR IN KARACHI

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Background: In Pakistan, on-going HCV transmission continues to contribute to the burden of infection, with limited surveillance of individuals who have tested negative. This study aimed to evaluate the incidence of HCV in anti-HCV negative population from district Malir in Karachi.

Methods: This study targeted 1000 individuals from two Union Councils (UC 9 and 11) in district Malir of Karachi where HCV prevalence was found to be 13% in both UCs from testing done as part of a micro elimination program from 2019-2022. Individuals who were over the age of 18 years and had a negative screening test within the past 12-18 months were eligible for participation. Door-to-door visits were done, and screening was performed using the SD bioline HCV RDT. Reflex blood draw was done for individuals with a positive result which was tested using GeneXpert or HCV core Ag. Risk factor data was collected. Those with a confirmed infection were linked for further management.

Results: 1008 anti-HCV negative individuals with mean age 33 years and 78% females were tested from 19th Jan 2022 to 10th June 2022. Average incidence of HCV infection was found to be 0.6% (6/1008) with 1% (5/499) in UC 9 and 0.2% (1/509) in UC 11. Mean age of those tested positive was 52 years with 83% (5/6) females. 2 of these 6 individuals (33.3%) who screened positive were found to have active viremia. Both individuals demonstrated no evidence of cirrhosis and were initiated on 12-week DAA therapy. All (6/6) individuals who tested positive had received injections in health care facilities in the last year. None of these individuals were intravenous drug users.

Conclusion: The transmission of HCV persists among general population in high burden areas highlighting the need for re-testing of individuals previously screened negative and increased efforts for prevention of new infection to achieve HCV elimination.

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DIABETES MELLITUS, MATERNAL ADIPOSITY, AND INSULIN-DEPENDENT GESTATIONAL DIABETES ARE ASSOCIATED WITH COVID-19 IN PREGNANCY: THE INTERCOVID STUDY*Brenda Eskenazi¹, Ghulam Zainab², Zulfiqar A. Bhutta³, Aris T. Papageorghiou⁴**1 University of California, Berkley**2 Aga Khan University Hospital, Pakistan**3 Aga Khan University Hospital, Pakistan**4 Oxford Maternal and Perinatal Health Institute*

Objective: This study aimed to determine whether diabetes mellitus and high body mass index are risk factors for COVID-19 in pregnancy.

Methods: A multinational study in 43 institutions from 18 countries, enrolling 2184 pregnant women; a total of 2071 women were included in the analyses. For each woman diagnosed with COVID-19, 2 nondiagnosed women delivering or initiating antenatal care at the same institution were enrolled. The main exposures were preexisting diabetes mellitus, high body mass index, and gestational diabetes mellitus in pregnancy. The main outcome was a confirmed diagnosis of COVID-19 based on a real-time PCR, antigen test, antibody test, radiological pulmonary findings, or 2 predefined COVID-19 symptoms at any time during pregnancy or delivery. Relationships of exposures and COVID-19 diagnosis were assessed using generalized linear models with a Poisson distribution and log link function. Furthermore, we conducted sensitivity analyses: (1) restricted to those with a real-time PCR or an antigen test in the last week of pregnancy, (2) restricted to those with a real-time PCR or an antigen test during the entire pregnancy, (3) generating values for missing data using multiple imputation, and (4) analyses controlling for month of enrolment.

Results: COVID-19 was associated with preexisting diabetes mellitus (risk ratio, 1.94; 95% confidence interval, 1.55e2.42), overweight or obesity (risk ratio, 1.20; 95% confidence interval, 1.06e1.37), and gestational diabetes mellitus (risk ratio, 1.21; 95% confidence interval, 0.99e1.46). The gestational diabetes mellitus association was specifically

among women requiring insulin, whether they were of normal weight (risk ratio, 1.79; 95% confidence interval, 1.06e3.01) or overweight or obese (risk ratio, 1.77; 95% confidence interval, 1.28e2.45). A somewhat stronger association with COVID-19 diagnosis was observed among women with preexisting diabetes mellitus, whether they were of normal weight (risk ratio, 1.93; 95% confidence interval, 1.18e3.17) or overweight or obese (risk ratio, 2.32; 95% confidence interval, 1.82e2.97).

Conclusion: Diabetes mellitus and overweight or obesity were risk

factors for COVID-19 diagnosis in pregnancy. Therefore, it is essential that women with these comorbidities are vaccinated.

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HCV ELIMINATION FROM A HIGHLY ENDEMIC, WELL-DEFINED DEMOGRAPHIC AREA OF PERI-URBAN KARACHI

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Background: Pakistan has one of the highest burden of HCV with a nationwide prevalence of 6% with recognized “hot spots” where prevalence and liver disease related mortality is reported to be much higher. The aim of this study was to achieve highest possible HCV elimination in an endemic district by scaling up and implementing lessons learnt from a prior pilot project of a low-cost community-based test-and-treat model that concluded in 2019.

Methodology: This study targeted 40,000 individuals over 12 years of age, across selected Union Councils (UCs) of Malir district, Karachi. HCV screening using finger-stick rapid-diagnostic test (RDT), began in October 2019 through door-to-door visits guided by community mapping. In those screened positive, reflex testing was done for confirmation of infection using GeneXpert, or HCV core antigen. Individuals with confirmed infection were given free of cost direct-acting antiviral (DAA) treatment after clinical evaluation during a house-visit by a physician. Follow up visits were done on monthly basis to deliver medication. RNA testing was done 12 weeks after last dose to assess sustained viral response (SVR).

Results: 40,811 individuals have been screened with mean age 31.35 ± 15.33 years, 64% being females. Of those screened positive, mean age is 48.37 ± 14.46 years with 69% females. Average seroprevalence in males and females is 10% and 12% respectively. 3694 individuals underwent HCV RNA testing of which 53% (1967/3494) had active viremia. 89% (1748/1967) of these patients started treatment of which currently 1527 have completed treatment with a drop out rate of 12% (176/1693). Sustained virologic response (SVR) rate is 90%.

Conclusion: This study demonstrates feasibility of HCV-micro elimination program using a low-cost community-based model which can be scaled up and implemented in diverse resource-limited settings.

PREECLAMPSIA AND COVID-19: RESULTS FROM THE INTERCOVID PROSPECTIVE LONGITUDINAL STUDY

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Objective: This study aimed to quantify any independent association between COVID-19 during pregnancy and preeclampsia

Methods: A longitudinal prospective observational study assessing the effect of COVID-19 during pregnancy on mothers and neonates. Two consecutive non-diagnosed women were enrolled immediately after each diagnosed woman, at any stage during pregnancy or delivery. The independent association between the 2 entities was quantified with the risk factors known to be associated with preeclampsia analyzed in each group. The outcomes were compared among women with COVID-19 alone, preeclampsia alone, both conditions, and those without either of the 2 conditions.

Results: We enrolled 2184 pregnant women; of these, 725 (33.2%) were enrolled in the COVID-19 diagnosed and 1459 (66.8%) in the COVID-19 not diagnosed groups. Of these women, 123 had preeclampsia of which 59 of 725 (8.1%) were in the COVID-19 diagnosed group and 64 of 1459 (4.4%) were in the not diagnosed group (risk ratio, 1.86; 95% confidence interval, 1.32e2.61). After adjustment for sociodemographic factors and conditions associated with both COVID-19 and preeclampsia, the risk ratio for preeclampsia remained significant among all women (risk ratio, 1.77; 95% confidence interval, 1.25e2.52) and nulliparous women specifically (risk ratio, 1.89; 95% confidence interval, 1.17e3.05). There was a trend but no statistical significance among parous women (risk ratio, 1.64; 95% confidence interval, 0.99e2.73). The risk ratio for preterm birth for all women diagnosed with COVID-19 and preeclampsia was 4.05 (95% confidence interval, 2.99e5.49) and 6.26 (95% confidence interval, 4.35e9.00) for nulliparous women. Compared with women with neither condition diagnosed, the composite adverse perinatal outcome showed a stepwise increase in the risk ratio for COVID-19 without preeclampsia, preeclampsia without COVID-19, and COVID-19 with preeclampsia (risk ratio, 2.16; 95% confidence interval, 1.63e2.86; risk ratio, 2.53; 95% confidence interval, 1.44e4.45; and risk ratio, 2.84; 95% confidence interval, 1.67e4.82, respectively).

Conclusion: COVID-19 during pregnancy is strongly associated with preeclampsia, especially among nulliparous women. Women with preeclampsia should be considered a particularly vulnerable group with regard to the risks posed by COVID-19.

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FREQUENCY OF NEURO-IMAGING IN THE EMERGENCY ROOM IN PATIENTS WITH VERTIGO: A CROSS-SECTIONAL STUDY*1Mirza Noor Ali Baig, 2Nazir Najeeb Kapadia, 1Ahmed Rahim, 1Madiha Ismail**1 Department of Emergency Medicine, Aga Khan University**2 MoH, Kuwait*

Background: The purpose of the study is to determine the frequency of neuro-imaging and the prevalence of positive findings in patients with vertigo visiting an emergency room of a low-middle-income-country, Pakistan. In addition, we also analyzed the cost-utility of neuro-imaging in these patients.

Methodology: This is a retrospective cross-sectional study conducted in an emergency room of a tertiary care hospital in Karachi, Pakistan. Data of the patients coming to the emergency room for the last 20 years (2000-2020) was collected. The frequency of neuro-imaging in patients visiting emergency room with vertigo, their findings and disposition was calculated in percentages. A cost-analysis was performed in Pakistani Rupees & US Dollars to estimate the financial burden.

Results: 159 (70.98%) of the patients visiting the emergency room with vertigo underwent neuro-imaging including CT scan, MRI or both. 64 (40.25%) of the patients had a positive finding including acute infarcts, hemorrhage, metastasis, space-occupying lesions and meningeal enhancement. 98 patients with negative findings beard a significantly higher cost of Rs.4,108,000 (\$ 22449) as compared to positive patients who beard Rs2,496,600 (\$13642).

Conclusion: The frequency of obtaining neuro-imaging tests in patients with vertigo were significantly high in the emergency room of a tertiary care hospital in Karachi Pakistan. In addition, there was a significant financial burden associated with neuro-imaging especially for a low-middle-income country like Pakistan.

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ESOPHAGEAL SQUAMOUS CELL CARCINOMA IN A PATIENT WITH BRCA1 MUTATION: A RARE ASSOCIATION

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Background: Esophageal neoplasms rank as the 7th most common cancers in the world. Squamous cell carcinomas of esophagus are the predominant subset, linked to a number of genetic alterations. Gene driven tumor pathways are being increasingly identified with the emerging role of next generation sequencing.

Objectives: BRCA1 mutation can be linked to a number of malignancies which rarely involves esophagus as shown in limited studies. We aim to strengthen the evidence of this association by introducing a case of esophageal squamous cell carcinoma with a pathogenic variant of BRCA1 in our country.

Case: We report a case of an 82-year-old male patient who was diagnosed with squamous cell carcinoma of the esophagus. To trace the family history of malignancy, a genetic test was carried out which turned out to be pathogenetic BRCA 1 variant

Discussion: Squamous cell carcinoma of esophagus arising in the context of known BRCA1 mutation have been rarely reported to date. Our patient was found to have a mutation that is usually encountered in female patients with breast or ovarian cancer and is rarely associated with primary esophageal malignancy.

Conclusion: Esophageal cancers may be infrequently associated with BRCA mutation. Testing for these mutations should be considered in patients who present with esophageal cancer, especially in the backdrop of familial neoplasms.

THE EFFECT OF TIRZEPATIDE ON LIPID PROFILE OF PATIENTS WITH TYPE 2 DIABETES MELLITUS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction: Normalization of lipid profiles is essential in the management of conditions like obesity, diabetes mellitus, and metabolic syndrome, to mitigate the development of morbid cardio and cerebrovascular complications. The aim of this systematic review and meta-analysis was to quantify the efficacy of Tirzepatide, a novel dual GLP-1 and GIP receptor agonist, in improving patients' lipid metabolism.

Methods: The Medline, Embase, Scopus, CENTRAL, and ClinicalTrials.gov databases were systematically searched. Relevant observational studies or randomized controlled trials were identified. Article screening, review, and data extraction were performed independently by two authors with conflicts resolved by a third. Poolable data were meta-analyzed using a random effects model and accompanying forest plots were generated. Study quality assessment was performed using the ROBINS-1 questionnaire.

Results: 15 articles were included in the review. Meta-analysis showed significant improvements in total cholesterol levels by 5,10, and 15 mg doses of tirzepatide when compared with placebo (tirzepatide 15mg : -6.15% [95% CI: -8.32, -3.98], Z = 5.55 (P < 0.00001)). For change in HDL levels, only when dosed at 15mg did tirzepatide produce a significant improvement over placebo (0.13mmol/L [0.07, 0.20], Z = 4.04 (P < 0.0001)). For reduction in LDL levels, the mean difference produced by tirzepatide (15mg) vs placebo was significant (-0.35mmol/L [-0.58, -0.12], Z = 2.99 (P = 0.003)) and was comparable to insulin degludec (0.00mmol/L [-0.22, 0.22], Z = 0.00 (P = 1.00)). Tirzepatide (15mg) was superior to both placebo (-24.82% [-36.98, -12.66], Z = 4.00 (P < 0.0001)) and insulin degludec (-0.83mmol/L [-1.52, -0.15], Z = 2.38 (P = 0.02)) in reducing serum TAGs.

Conclusion: Our results show tirzepatide therapy to be efficacious in the management of deranged lipid parameters. However, the forbidding cost of the drug and the need for regular subcutaneous administration raise questions regarding the practicality of its use in lower-income countries.

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HEAD AND NECK OSTEOSARCOMA: A CLINICOPATHOLOGIC STUDY OF 77 CASES*Dr. Alka rani, Dr. Madiha Bilal Qureshi, Dr. Muhammad Raza, Dr. Nasir-Ud-Din**Department of Pathology & Laboratory Medicine, Aga Khan University*

Introduction: Osteosarcoma (OS) is the most common primary high-grade sarcoma of bone, characterized by destructive growth pattern. It has a bimodal age distribution, affecting children more commonly than older adults. There is a slight male predominance. Head and neck osteosarcoma is rare and accounts for < 10% of all osteosarcomas. The most frequent site of involvement is jaw (mandible and maxilla). It usually presents in the third to fourth decades of life.

Objective: To describe the clinicopathologic features of osteosarcoma of head and neck.

Material and methods: Cases of head and neck OS diagnosed at Aga Khan University Hospital between years 2009-2022 were retrieved. Clinical and demographic data was obtained from database and follow up was taken.

Result: A total of 77 cases were diagnosed during the study period. There were 37 males and 40 females. Age range was 10-74 (Mean:40) years. Mandible (39/77) and maxilla (21/77) were the most common sites, followed by cranial bones (12/77), nasal bones (3/77), orbital bones (1/77) and larynx (1/77). Size range was 3-10 cms in greatest dimension. Conventional OS (59.7%) was the most common histologic pattern, followed by chondroblastic (28.5%), osteoblastic (9%), sclerosing (1%) and telangiectatic (1%). Follow-up was available for 46 patients. 11 patients were alive on a follow up duration of 6-120 (Mean: 28.6) months. 35 patients died of disease. 6 patients were treated with surgery alone, 22 patients with surgery and chemotherapy/ radiotherapy and 5 patients did not receive any treatment. Palliative chemotherapy was given to 2 patients. Recurrence was observed in 8/35 died patients within 3-24 months. Site of recurrence was mandible in 4, maxilla in 2 and cranium in 2 patients. 4 patients developed metastasis to lungs and lymph node 6-24 months post-treatment. 8 out of 11 alive patients were disease free. Among these patients, the common site of involvement was mandible, and 5 patients were treated with wide margin resection alone. Tumor size ranged from 1.5-4 cm. 3 patients had recurrent disease in which 1 patient had multiple recurrences of the same site (skull).

Conclusion: OS of the head and neck is a rare entity. It commonly affects jaw in young adults. Overall prognosis is very poor. Mandible as site of origin, tumor size less than 4 cm and wide margin resection are parameters associated with better prognosis and disease-free survival in this series.

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GRADE-ADOLOPMENT OF CLINICAL PRACTICE GUIDELINES AND CREATION OF REFERRAL PATHWAYS FOR DERMATOLOGICAL CONDITIONS IN PAKISTAN

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Background: In Pakistan, dermatological conditions result in a heavy disease burden and are amongst the most common presenting complaints in primary care.

Objective: We aimed to develop clinical practice guidelines (CPGs) and primary care management and referral pathways for the management of 10 common dermatological conditions in adults for general physicians to follow in Pakistan.

Methods: 16 source CPGs were selected due to their comprehensive set of recommendations and high-quality synthesis of available evidence by a panel of local experts. An adaptation of the GRADE-ADOLOPMENT process was used to adopt (assimilating existing recommendations as is), adapt (modification of applicable recommendations with critical review) or exclude (removing recommendations inapplicable to the local context), recommendations from the source CPGs. Recommendations were added based on best evidence review to fill any gaps in care provision. Management and referral algorithms for general physicians were derived using the recommendations from the CPGs.

Results: We created CPGs for 10 dermatological disorders and derived 10 primary care management and referral pathways from them. 2 recommendations were added across 10 CPGs highlighting cautious steroid prescription. 6 recommendations were adopted with minor changes and 35 were excluded due to different target audiences, unavailability of medicine, and inapplicability to the existing health-care system.

Conclusion: The GRADE-ADOLOPMENT process was used to create CPGs. The CPGs are supplemented with 10 primary care management and referral pathways for use by general physicians to streamline the referral process and to provide standardized care. The CPGs and referral pathways will help to improve the healthcare quality and attain the necessary health outcomes in lower-middle-income countries like Pakistan.

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PHOSPHINE GAS POISONING IN CHILDREN: A CASE SERIES STUDY FROM TERTIARY HEALTH CARE CENTER OF KARACHI, PAKISTAN*Dr Abid Ali Jamali, Dr Emad-Uddin Siddiqui**Department of Emergency Medicine, Aga Khan University Hospital*

Phosphine poisoning is an uncommon but hazardous public health issue. It is widely used as chemical insecticide and pesticide domestically and exposure to this chemical, mostly accidental among children, may lead to fatal symptoms if not managed immediately. Previous studies have explored the mechanism of its deleterious effect. However, literature on presentation of phosphine poisoning is sparse. We observed a short case series from a family who was exposed to phosphine gas from aluminum phosphide tablets that were used for fumigation purpose in bedroom. Family locked the house for six hours only and then used that bedroom without proper cleaning and removal of the chemical from the house. No adequate aeration of the room before use was done. Detail history from parents was taken and clinical details were identified however further details were noted from their medical records. We identified three cases of phosphine poisoning during this exposure. One of the babies was brought dead, with history of acute onset nausea and vomiting followed by increasing paleness, sweating and questionable seizure episode along with loss of body posture and unresponsiveness. Other two girls presented with generalized weakness, nausea, vomiting and lethargy since morning. Both sisters were admitted to pediatric intensive care unit for less than one week and were managed symptomatically along with magnesium sulfate. The objective of this case series study is to bring in attention of the families, health care community and the stake holders for the need to replace harmful insecticide fumigation practices with the safer ones, as phosphine gas can cause late onset of clinical feature and sudden death, probably because of fatal myocarditis as observed by echocardiography in both survived girls. Whenever fumigation is done parents/family members be provided with proper written guidelines that along with fumigation process and reuse of the house must mention possible side effects. Moreover, to increase public awareness, proper labeling and precautions should be written on all commonly sold pesticides and the constituent of hazardous compounds they contain

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FREQUENCY OF CHANGES IN TREATMENT PLANS DURING DAILY PEER REVIEW MEETINGS (PRM) IN RADIATION ONCOLOGY.

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Introduction/Background: Peer review is considered as means of feedback is a valuable tool central to quality assurance (QA) programs. Inter-observer variability in target volumes of radiation therapy has been demonstrated in multiple studies. Acknowledging the need for peer review in the radiation therapy planning process, peer review meeting (PRM) is held daily in the radiation oncology department of Aga Khan Hospital. All the patients who are being planned to receive radiation are routinely discussed in PRM after undergoing initial planning processes and contouring of target volumes which includes a review of the treatment by at least two radiation oncologists.

Objective: We aim to evaluate the frequency of changes in radiation treatment plans undergoing daily peer review meetings (PRM) in radiation oncology.

Material and Methods: Radiation treatment plans of 212 patients from April 2022 to September 2022 were discussed in departmental peer review meetings on a daily basis after being approved by primary radiation oncologist. During PRM each plan was reviewed by a team of radiation oncologists and their suggestions were documented as no change, minor change, major change, or missing contour. Changes were further stratified as changes in target volumes, treatment field, RT doses and treatment decisions.

Results: Out of 212 RT plans, 107 (50.4%) plans were suggested for changes. Minor changes were suggested in 70 treatment plans (33%) while major changes in 34 (16%), and 3 (1.4%) plans were having missing contours. Most of the changes were suggested in clinical target volumes (CTV), i.e. 25.9% followed by planning target volumes (PTV) and RT doses in 9.4% and 4.7% of the plans respectively.

Conclusion: Peer review is an important tool for quality assurance and can be used to overcome deficiencies in radiation treatment plans. It can also serve as an effective learning tool with a goal of improved and individualized patient care.

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CARDIAC SARCOMA: A RARE CASE OF PRIMARY CARDIAC SARCOMA

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Introduction: Primary cardiac sarcoma is a rare malignancy with a poor prognosis because of diagnostic delay, therapeutic difficulties, and high metastatic potential. The therapeutic approach includes surgery, chemotherapy, and radiation therapy, alone or in combination. However, there is a lack of evidence to guide the treatment.

Case presentation: We present a case of primary cardiac sarcoma. Our patient was presented in the department of emergency medicine (ED) in our institute with shortness of breath on exertion associated with orthopnea. Based on the history and cardiovascular examination, he underwent an echocardiogram, which revealed a sizeable echogenic density in the right ventricular outflow tract. He underwent surgical resection of the cardiac mass via median sternotomy and total cardiopulmonary bypass approach. The patient was eventually diagnosed with primary cardiac sarcoma, confirmed by tissue biopsy after surgical intervention.

Clinical discussion: Through this report, we highlight the rarity of primary cardiac sarcomas, the importance of multidisciplinary tumor board (MDT) discussion and provide evidence of surgical excision being the treatment of choice, followed by systemic chemotherapy in selected cases.

Conclusion: Cardiac sarcoma is a rare but highly malignant tumor with a poor prognosis. However, early diagnosis and surgical resection of a primary cardiac sarcoma can significantly increase the patient's survival and quality of life. Therefore, physicians should keep a high suspicion of a patient with clinical features suggestive of cardiac sarcoma, and echocardiography should be the diagnostic modality of choice in such patients.

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DIAGNOSTIC AND PROGNOSTIC ROLE OF CANCER STEM CELL BIOMARKERS IN ORAL SQUAMOUS CELL CARCINOMA; A SYSTEMATIC REVIEW*Faiza Ali¹, Tania Arshad Siddiqui¹, Rashna Hoshang Sukhia², Ayesha Maqsood³, Dinaz Ghandhi⁴**1 Section of Dentistry (Orthodontics), Department of Surgery**2 Foundation University College of Dentistry and Hospital**3 Foundation University College of Dentistry and Hospital**4 Section of Dentistry (Orthodontics), Department of Surgery,**5 Altamash Institute of Dental Medicine*

The head and neck squamous cell carcinoma include the cancer of the oral cavity, oro-, nasopharynx, and larynx and accounts for approximately 900,000 cases and 400,000 deaths annually worldwide. Diagnostic cancer stem cell biomarkers can be used to detect the cancer, whereas the prognostic cancer stem cell biomarkers are used to evaluate the cancer outcome such as survival rate, line of treatment and overall response to treatment. Therefore, with this systematic review we aim to evaluate the role of cancer stem cell biomarkers in diagnosis and prognosis of OSCC patients.

Materials and Methods: The search strategy was entered into PubMed NLM, EBSCO CINAHL, EBSCO Dentistry & Oral Sciences Source, Wiley Cochrane Library, and Scopus. The full text eligible studies (n=7) were assessed for their quality using the JBI Critical Appraisal Checklist to evaluate the methodological quality of the studies based on possibility of bias in its design, conduct, and analysis.

Results: A total of 432 studies were identified through the search strategy. A total of 306 records were removed before screening. The screened records were 126 out of which 104 were removed as they were not conducted on OSCC. Twenty-two reports were sought for retrieval, however, we could not find the full text of 3 studies. 12 studies were excluded because the biomarkers were not associated with cancer stem cells. The most common cancer stem cell biomarkers associated with OSCC were MCT1, VEGF-A, GD15, HIF1 α , Ki67, Hsp 70, Cyclin D1, and CD44.

Conclusions: Various stem cell biomarkers have been found to have diagnostic and prognostic role in oral squamous cell carcinoma such as Cyclin D1, VEGF-A, GD15, and CD44. They can be used to predict the overall survival rate, local progression-free survival rate, and distant metastasis-free survival rate in Head and Neck cancer patients.

Keywords: Oral cancer, Squamous cell carcinoma, Cancer stem cell biomarkers

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PATTERN AND ETIOLOGY OF EARLY CHILDHOOD EPILEPSY: AN EXPERIENCE AT A TERTIARY CARE UNIVERSITY CENTER

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Seizures are a prevailing condition worldwide and especially in Pakistan. Almost 10 out of 1000 people in Pakistan suffer from epileptic seizures. Children making a vast percentage of the population of Pakistan are at a significant risk of long-term morbidities and mortality due to the complications of seizures. Scarcely any literature exists about the prevalence of various types of seizures leading to late diagnoses and irreversible damage. The purpose of this study is to assess the cases of childhood epilepsy coming to AKUH Karachi to evaluate the types and burden of the numerous kinds of seizures to make the diagnosis and timely management easier for the health care professionals to minimize further morbidities in children. A prospective cross-sectional study was done in the inpatient and outpatient department of Aga Khan tertiary and secondary care centers. The data of children aging from 1 month to 14 years presenting with seizures from January 2019 to December 2019 (1 year) was collected on a structured proforma. The results were analyzed using SPSS version 23 software. Out of the 150 patient samples, the age with the most incidence of seizures was 13 months to 5 years while the ratio between males and females was more than 1.6. The most consistent etiology was idiopathic followed by global delay. Fever was the third most common leading to febrile seizures. The most common seizure in the current study was generalized seizures (85) followed by focal seizures (15). While these are the seizures which need urgent early diagnosis, children suffering from absence seizures are often misdiagnosed as ADHD or daydreaming or not even given attention. Seizures were more common in younger age groups presenting in the and lesser with increasing age signaling that more attention is needed towards younger pediatric patients who might show symptoms.

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IMPACT OF IMMUNE STATUS ON THE CLINICAL CHARACTERISTICS, TREATMENT OUTCOMES AND MORTALITY OF PULMONARY NOCARDIOSIS: A RETROSPECTIVE ANALYSIS IN A TERTIARY CARE HOSPITAL FROM A LOW TO MIDDLE-INCOME COUNTRY

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Objective: Nocardiosis is an opportunistic infection that primarily targets the immunocompromised. We investigate the differences in demographics and characteristics between immunocompromised and immunocompetent patients with nocardiosis in a tertiary care hospital in Pakistan.

Methods and Materials: Retrospective records were reviewed for patients diagnosed with pulmonary nocardiosis between 2003 and 2020. Immunosuppressed individuals were identified as those with autoimmune diseases, hematologic disease and malignancies, HIV, immunosuppressant therapy etc. Data collected included basic demographics, comorbid conditions, medication history, clinical presentation, radiological and microbiological data, and nocardiosis outcomes and complications.

Results: A total of 66 patients with nocardiosis were included in this study out of which 48 were immunosuppressed while 18 were immunocompetent. Both groups were compared for a number of variables including patient characteristics, underlying conditions, radiological findings, treatment regimen and outcomes. Past Pulmonary tuberculosis (TB) and weight loss were statistically significant characteristics ($p < 0.05$) as 10% of Immunosuppressed (ISP) and 39% of immunocompetent (ICP) patients had history of past Pulmonary TB and weight loss was the presentation in 12% ISP and 56% ICP patients.

Conclusion: Nocardiosis presents differently in patients with immunosuppressed and immunocompetent patients consistent with previous studies. Nocardiosis should be considered in any patient presenting with treatment-resistant pulmonary or neurological symptoms

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CHANGES IN CLINICAL PRESENTATION IN CHILDREN AND ADOLESCENTS PRESENTING TO CLINICS AT A TERTIARY CARE HOSPITAL: A CHART REVIEW

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Background: Time will tell how the increased mental health struggles in children and adolescents secondary to the Pandemic will affect their future wellbeing. Therefore, this study aims to compare the differences in sociodemographic and clinical presentation of children and adolescents presenting to psychiatry clinics pre and post COVID-19 at a tertiary care hospital in Karachi, Pakistan. This could help guide appropriate allocation of resources for mental health initiatives in developing nations.

Objective: This study aims to investigate the difference in sociodemographic and clinical characteristics of children and adolescents presenting to psychiatry clinic pre and post COVID-19 pandemic at a private tertiary care hospital.

Methods: This is a retrospective chart review. The data has been collected from documentation of initial assessments of children and adolescents presenting to outpatient clinics at The Aga Khan University Hospital. The patients presented in the year preceding COVID-19 (Feb 2019 to Feb 2020) and post COVID-19 (Mar 2020 to Mar 2021). Frequencies and percentages were calculated for categorical variables. Mean and standard deviation for numerical variables and chi square test was used while keeping p value of < 0.05 as significant.

Results: The study found girls frequenting the clinic more post COVID (41.6%) compared to pre COVID (34.2%) [p value 0.049]. Among symptoms, speech issues presented more post (20%) compared to pre COVID (10.4%) [[p value 0.001]. Anxiety disorders (31%) remained more prevalent post COVID [p value 0.014] while speech and language disorders (17.7%) were also seen more frequently post COVID [p value 0.003].

Self harm and suicidal ideas were less frequently reported post COVID (5.8%) compared to pre COVID (10.4%) [p value 0.032]. Frequency of abuse (including neglect, domestic violence, corporal punishments, harassment) decreased post COVID (15.8%) compared to pre COVID (32.2%) [p value 0.001].

Conclusion: This study highlighted a significant increase in anxiety and language disorders and a significant decrease in self harm behavior and reported abuse. Interventions aimed at improving wellness and anxiety can be helpful. At the same time protective factors that helped improve self-harm can be explored further, to encourage, as the world returns to a pre-Pandemic normal. One of the limitations of this study was that some information was missing in documented records.

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PINNING IN SUPRACONDYLAR FRACTURE OF THE HUMERUS IN CHILDREN: A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS*Syed Umar Hasan¹ and Alina Pervez²*¹ *Department of Ophthalmology, Aga Khan University*² *Centre for Clinical Best practices, Aga Khan University*

Background: Supracondylar humeral fractures (SCHFs) are the most common type of elbow fracture seen in the paediatric age group. However, there is a lack of agreement about the standard surgical procedure.

Objective: The objective of this meta-analysis is to compare the two most common surgical pinning techniques for SCHFs management i.e., cross pinning and lateral pinning methods. The outcomes selected for the comparison were intended to quantify the elbow functionality postoperatively which included, measuring the Baumann's angle, loss of carrying angle, elbow function assessed based on Flynn criteria, pin tract infection, and iatrogenic ulnar nerve injury.

Methods: An extensive literature search was done using PUBMED, Google Scholar, and The Cochrane Library from inception till November 2022, for randomized controlled trials (RCTs) comparing the two pinning methods and providing information on at least one of the outcomes mentioned previously. The statistical analysis and quality assessment was performed using Review Manager 5.4.1.

Results: A total of 1502 SCHF patients from 22 RCTs were included. Most patients had type II or type III Gartland fracture. 20 studies reported data for postoperative ulnar nerve injury, the standard mean difference was calculated to be 3.76 [1.75, 8.06] with 95% CI, the Z-score for the overall effect was 3.40 (P = 0.0007) and there was no significant heterogeneity (P

= 0.96, I² = 0%). The results show a significantly lower risk of iatrogenic ulnar nerve injury with lateral pinning. However, no significant difference was found between the techniques for the other parameters.

Conclusion: Compared to lateral pinning, cross pinning puts the patient at a significant risk of iatrogenic ulnar nerve injury. As the other outcomes are comparable between the two groups, lateral pinning should be considered as the surgical technique of choice for SCHF management.

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ACTIVITY OF A NOVEL ANTI-INFLAMMATORY AGENT F-3,6'-DITHIOPOMALIDOMIDE AS A TREATMENT FOR TRAUMATIC BRAIN INJURY

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Introduction: Traumatic brain injury (TBI) is a major risk factor for several neurodegenerative disorders, including Parkinson's disease (PD) and Alzheimer's disease (AD). Neuroinflammation is a cause of later secondary cell death following TBI, has the potential to aggravate the initial impact, and provides a therapeutic target, albeit that has failed to translate into clinical trial success. Thalidomide-like compounds have neuroinflammation reduction properties across cellular and animal models of TBI and neurodegenerative disorders. They lower the generation of proinflammatory cytokines, particularly TNF- α which is pivotal in microglial cell activation.

Objective: To observe the effects of F-3,6'-dithiopomalidomide (F-3,6'-DP) in TBI models

Methods: We developed F-3,6'-dithiopomalidomide (F-3,6'-DP) as a novel thalidomide-like compound to ameliorate inflammation. F-3,6'-DP binds to cereblon but does not efficiently trigger the degradation of the transcription factors (SALL4, Ikaros, and Aiolos) associated with the teratogenic and anti-proliferative responses of thalidomide-like drugs, as shown by experiments and docking prediction methods.

Results: F-3,6'-DP significantly mitigated LPS-induced inflammatory markers in RAW 264.7 cells, and lowered proinflammatory cytokine/chemokine levels in the plasma and brain of rats challenged with systemic LPS.

Conclusion: F-3,6'-DP represents a novel class of thalidomide-like drugs that do not lower classical cereblon-associated transcription factors but retain anti-inflammatory actions and possess efficacy in the treatment of TBI and potentially longer-term neurodegenerative disorders.

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UNDERLYING CAUSES AND TREATMENT MODALITIES FOR NEUROLOGICAL DEFICITS IN COVID-19 AND LONG-COVID*1 Abdul Mannan Baig, 2 Nigel H Greig , 3Joachim Gerlach**1Department of Biological & Biomedical Sciences, Aga Khan University**2 NIA-NIH, USA**3 HS-Germany*

Introduction: With reports of diverse neurological deficits in the acute phase of COVID-19, there is a surge in neurological findings in Long-COVID — a protracted phase of SARS-CoV-2 infection. Very little is known regarding the pathogenic mechanisms of Neuro-COVID in the above two settings in the current pandemic.

Objective: Herein, we hint toward the possible molecular mechanism that can contribute to the signs and symptoms of patients with neurological deficits and possible treatment and prevention modalities in the acute and chronic phases of COVID-19.

Methods: Inspection of underlying mechanisms promoting neurological deficits and brain damages were done. Analysis of the Nutraceutical compounds that can exert antioxidant and neuroprotective effects in prevention and treatment of NeuroCOVID caused by SARS-CoV-2

Results and Conclusions: Drugs like hesperidin, cinnamon, baicalin, curcumin, Rutin, glycyrrhizin, selenium, epigallocatechin gallate, and quercetin were found to be of possible benefits as neuroprotective and antioxidant agents to possibly treat NeuroCOVID caused by SARS-CoV-2

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DEXMEDETOMIDINE AS AN ADJUNCT IN FLUOROSCOPIC GUIDED STELLATE GANGLION BLOCK FOR COMPLEX REGIONAL PAIN SYNDROME (CRPS)*Haris Sheikh¹, Tanveer Baig²**Department of Anesthesiology, Aga Khan University*

Background: Complex Regional Pain Syndrome (CRPS) is a chronic pain condition characterized by pain out of proportion to the inciting event. The syndrome is caused by a multifactorial process with predominance of autonomic and inflammatory responses. Treatment strategies specifically targeting these responses alleviate symptoms for a longer period and are generally better tolerated with favorable outcomes.

Case Summary: A 28-year-old male, with no known co-morbid, presented to the pain clinic with history of RTA four months back resulting in left distal radius and left scaphoid fracture. He underwent fixation of left radius and scaphoid in the same admission and was discharged in stable condition. Post-surgery, he developed reduced functionality of left forearm with constant burning pain which increased at night. His pain aggravated with decrease in ambient temperature. On examination, he had hyperesthesia, redness and increased temperature in the left forearm as compared to the right, decrease range of motion of the left wrist, and new onset resting tremors in the left hand. Provisional diagnosis of Complex Regional Pain Syndrome (CRPS) was made, and the patient was booked for fluoroscopic guided Stellate ganglion block. The procedure was performed in Operating Room under all aseptic measures. Pulse Oximetry, ECG and blood pressures were monitored. C7 vertebra was identified under fluoroscopic guidance and CHIBA needle was used to inject 10 mg Ropivacaine, 40 mg Methylprednisolone and 10 microgram Dexmedetomidine in a total volume of 4 ml. Post-procedure, patient was shifted to PACU where he developed ipsilateral Horner Syndrome which resolved within two hours. His VAS score dropped to 2 from an initial score of 6 and he was discharged in stable condition. In our regular outpatient follow ups, patient's VAS score dropped to zero, burning, vasomotor and temperature changes subsided, and he slowly regained functionality of his left forearm and hand.

Conclusion: Complex Regional Pain Syndrome has multifactorial etiology. Early diagnosis and subsequent intervention often reverse the progression. Stellate ganglion block has long been used in the treatment of CRPS of the upper limbs. In combining Stellate ganglion block with Dexmedetomidine we were able to provide immediate and lasting relief to our patient.

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COMPARISON OF INTRAOPERATIVE INTRAVENOUS LIDOCAINE INFUSION AND TRANSVERSUS ABDOMINIS PLANE (TAP) BLOCK FOR POST-OPERATIVE ANALGESIA FOLLOWING LAPAROSCOPIC CHOLECYSTECTOMY: A RANDOMIZED CONTROL TRIAL.*Haris Sheikh, Hameed Ullah, Shakaib Zafar**Department of Anaesthesiology, Aga Khan University Hospital*

Introduction: Laparoscopic cholecystectomy has been associated with moderate to severe intensity pain, especially in the early post-operative period. Among pain modalities, the Transversus Abdominis Plane (TAP) block has favorable results and lesser associated adverse effects. Current evidence also reports intraoperative intravenous lidocaine infusion is effective in reducing acute post-operative pain and decreases overall opioid requirement. The objective of this study was to compare intraoperative intravenous lidocaine infusion and bilateral subcostal Transversus Abdominis Plane (TAP) block for post-operative analgesia following laparoscopic cholecystectomy.

Study Design: This is a single center, open label, randomized control trial conducted at the Aga Khan University Hospital. A total of 90 patients undergoing elective laparoscopic cholecystectomy were recruited out of which 30 each were randomized to either control group, lidocaine group or TAP block group. Intravenous lidocaine infusion at 1.5 mg/kg/hour was used intraoperatively after a 2mg/kg lidocaine bolus in the lidocaine arm while bilateral subcostal TAP block was placed in the TAP block arm as intervention. Data including pain scores, nausea/vomiting scores, rescue analgesic consumption and patient satisfaction was collected till 24 hours postoperatively.

Results: Comparative analysis between groups showed that VAS score was significantly decreased in lidocaine group at all time intervals as compared to control group ($p < 0.05$). Furthermore, VAS scores were significantly decreased in lidocaine group at 0 hours, 2 hours, 4 hours and 6 hours as compared to TAP block group ($p < 0.05$). Rescue analgesic consumption was minimal in the lidocaine group as compared to control group and TAP block group. Significant difference was observed in nausea and vomiting scores between lidocaine and TAP block groups except at 2 hours postoperatively ($p < 0.05$). Length of stay in hospital was significantly reduced in lidocaine group as compared to control group ($p < 0.05$). Patient satisfaction reached approximately 92.9% in lidocaine group which was significantly higher than TAP block and control group.

Conclusion: Intravenous lidocaine infusion is a superior modality for postoperative pain management in laparoscopic cholecystectomy as compared to TAP block or routine management. Lidocaine also helped decrease rescue analgesic consumption, reduced hospital stays and achieved better patient satisfaction.

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COVID-19 RELATED ISOLATION AND THE RISK OF POST-TRAUMATIC STRESS DISORDER IN PATIENTS PRESENTING TO CLINICS AT A PRIVATE TERTIARY CARE HOSPITAL IN KARACHI, PAKISTAN

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Background: The COVID-19 pandemic has had immense physical, psychological, and financial effects on individuals. Lockdowns implemented in most countries worsened the psychological consequences and lead to social isolation. Studies done worldwide have shown an increase in symptoms of including anxiety, depression, and symptoms of trauma.

Objective: Our objective was to assess the psychological impact of isolation on individuals with COVID-19 and to determine the experiences of people in isolation.

Study design: Cross-sectional study design.

Setting and selection of participants: All adults with COVID 19 who presented to the infectious disease tele-clinic were included; participants were sent the survey via email. Emails were sent to 146 people and 47 responses were received.

Method: IES-R questionnaire was submitted to all individuals on Day 7 of quarantine. A qualitative questionnaire was given along with information on basic demographics. We applied Urdu version of IES-R, which is available online on open access.

Results:

Quantitative results: The mean score on IES-R for all the respondents was 18.77 (Standard Deviation: 13.546). Out of 47 participants, 32 (68.1%) reported no symptoms of Post-Traumatic Stress Disorder, while for 6 (12.8%) PTSD was a clinical concern, 3 participants (6.4%) had a probable diagnosis of PTSD, and 6 participants scored high enough to suppress immune function.

Qualitative results: Majority of participants reported stress due to confinement in an isolated space, interruption in daily routine specifically work-related routine. Praying, meditation and having social support helped participants cope with the isolation.

Conclusion: The ongoing pandemic poses great challenge to mental health across the globe; our study showed isolation significantly impacted those who went through it. We were also able to identify coping strategies to promote better mental health.

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CLINICAL TRENDS IN DENGUE OUTBREAK 2021-2022, A HOSPITAL BASED CROSS-SECTIONAL STUDY IN PAKISTAN

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Background & Aim: Dengue virus belongs to Flavivirus family and is spread with the bite of *Aedes aegypti* mosquito. It is considered as one of the fastest emerging and most widespread vector-borne illnesses in the world today. Pakistan is one of the tropical countries with the highest burden of dengue with more than 19,000 cases being reported in the September of 2022 alone. This study aims to highlight the risk factors and clinical features associated with non-severe dengue infection.

Methods: A hospital based cross-sectional study was conducted between May 2021 to December 2022 at Aga Khan University Hospital under UWARN study.

Results: 319 cases assessed clinically and confirmed by dengue NS-1 antigen or dengue serology were enrolled. 72% of adults and 45% of children were either overweight or obese. Most patients (73%) were in the age strata of 16-45 years. 95% of all inpatients had thrombocytopenia (platelets <150000) whereas only 50% of outpatients had this finding. An interesting observation was the presence of pyuria or bacteriuria in 27% of patients without evidence of bacterial growth in urine culture. In addition, 25% of the hospitalized patients demonstrated microscopic hematuria (> 5 RBCs/HPF). Our study showed that a 20% or greater rise in hematocrit is associated with a significant increase in length of hospital stay (p=0.001). Finally, in terms of seasonality, the peri-monsoonal months had the highest cases reported, with an outbreak in September 2022 (90 patients or 28.2% of all cases). Mean temperature in this month ranged from 25 to 40°C while average humidity was 71%.

Conclusion: We observed thrombocytopenia and hematuria as major clinical findings, while the age group of 16 to 45 years, obesity, and a rise in hematocrit greater than 20% were observed as major risk factors for dengue.

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BBIBP-CORV (SINOPHARM) VACCINATION- INDUCED ANTIBODY RESPONSES ARE AFFECTED BY AGE AND PRIOR COVID-19 BUT LAST UP TO SIX MONTHS IN HIGH SEROPREVALENCE REGION

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Introduction: COVID-19 vaccinations have been successful in driving down the pandemic. Long-term solutions against SARS-CoV-2 infections require understanding immune protection induced by different vaccine formulations.

Objective: We investigated Sinopharm (BBIBP-CorV) induced humoral and cellular immunity in a region of high SARS-CoV-2 seroprevalence.

Methods: Between May and August 2021, blood samples were taken from 312 people who had received BBIBP-CorV vaccination. Subjects had a mean age of 40.7 ± 16.5 years; 74% were aged ≤ 50 years; 63% were females and 29% had a history of COVID-19. After a 24 week follow up, levels of IgG antibodies to spike protein and its receptor-binding domain (RBD) were determined. A multivariable model was used to analyze antibody responses.

Results: There was increasing seropositivity to spike protein and RBD at 4-, 8- 16- and 24-weeks post-vaccination (spike: 57%, 87%, 66% and 90%, RBD; 48%, 62%, 68% and 85%, respectively). Seropositivity was reduced in those over 50 years as compared with younger individuals. It was raised in females as compared with males. COVID-affected individuals had increased frequency and magnitude of IgG to SARS-CoV-2 than COVID-naïve individuals.

Conclusions: Post-vaccine specific IgG antibody responses to spike protein and RBD were impacted by age over 50 years, gender and prior COVID-19. This study supports recommendations for booster vaccinations especially in older individuals.

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OUTCOMES OF NON-SURGICAL PERIODONTAL THERAPY ON THE PERIODONTAL STATUS AMONG E-CIGARETTE SMOKERS, CONVENTIONAL SMOKERS AND NON-SMOKERS

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Background: Smoking (Conventional smoking CS and e-cigarette E-Cig) is known to increase the risk of periodontal disease. It increases the severity of periodontal disease and adversely affects the outcome of non-surgical periodontal therapy (NSPT). The liquid in E-Cig contains nicotine, flavoring agents, and chemicals. It is heated by a battery-operated smoking device to generate the vapors that are inhaled. Over the past few years, the knowledge of how electronic cigarettes affect periodontium has significantly increased. Although, there is still a lack of data regarding how E-Cig smokers respond differently to NSPT compared to conventional smoking.

Objectives: To compare the effect of NSPT on the status of periodontitis among E-cig, CS, and non-smoker (NS) groups per the 2017 periodontal classification.

Methods: It's an observational prospective cohort study comprising 44 participants in three groups. Six-point pocket charting, Bleeding on probing (BOP) and radiographic presentation were assessed for periodontal staging, grading, and stability as per the 2017 periodontal classification. Participants were evaluated post-NSPT after 12 weeks, to assess the improvement in periodontal condition. SPSS 23.0 was used for data analysis.

Results: Out of 44 participants, 29 (66%) were male and 15 (34%) were female. The mean age was 30.57 with \pm 8.8 years, 16 were NS, 12 were E-cig users and 16 were CS respectively.

This study showed that the % of BOP reduced from 35 % at baseline to 13 % at follow-up and the % of plaque reduced from 79% at the baseline to 55 % at follow-up.

Furthermore, there was a statistically significant association among (NS, CS, and E-cig) groups at baseline and follow-up with regards to staging ($p= 0.000$) with a correlation of 92 %, grading ($p = 0.000$) with a correlation of 85%, and stability ($p= 0.05$), disease extent ($p=0.001$), and gingivitis ($p= 0.000$) with a correlation of 80%

Conclusion: The study concludes that both E-cig and CS negatively affect the stage, grade, and distribution of periodontal disease.

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COVID-19 DIAGNOSTIC TESTING CONSTRAINTS UNDERESTIMATE CASES AMONGST FEMALES IN PAKISTAN

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Background: It is important to understand the trajectory of SARS-CoV-2 infections especially in populous, low-middle income Pakistan.

Methods: We conducted a retrospective cross-sectional analysis of respiratory specimens received for diagnostic SARS-CoV-2 polymerase chain reaction (PCR) tests at Aga Khan University Hospital, Karachi, Pakistan. The period February 2020 until February 2022 was studied. Demographic information was collected

Results: 440,000 pcr test results were analysed. twenty one percent of cases tested were positive for SARS-CoV-2. The mean age of COVID-19 cases was 39 ± 17 y. The majority of COVID-19 cases were males aged 21-40 years. However, significantly fewer females were tested : comprising 36 % of all tests in the first 6 months of the pandemic. This trend was observed across all age groups. When SARS-CoV-2 positivity was determined separately in females and males, the portion of COVID positive cases was comparable at about 35% for each gender in the first 6 months. COVID-19 positivity rates were comparable across all age groups. by 2022, the proportion of tests conducted for females increased to 45%.

Conclusions: Increased reporting of COVID-19 in Pakistani males could be attributed to a gender bias in testing. Females aged 15 years and under and those above 60 years were the least represented demographic. Our data highlights a bias in the demographics of testing, leading to under- surveillance and -reporting of SARS-CoV-2 transmission amongst women.

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CLINICAL UTILITY OF ROUTINE INVESTIGATIONS AND RISK FACTORS OF END ORGAN DAMAGE IN ASYMPTOMATIC SEVERE HYPERTENSION*Noman Ali, Umaira Aftab, Salman Soomar, Uzma Khan**Department of Emergency Medicine, Aga Khan University Hospital*

Background: Asymptomatic severe hypertension (ASH) is defined as systolic blood pressure of > 180 mmHg or diastolic blood pressure of >120 mmHg without any signs and symptoms of end-organ damage or dysfunction. In this study, we aimed to determine the utility of routine investigations and risk factors of end-organ damage (EOD) in patients presented to the emergency department (ED) with ASH.

Methods: This single-center, cross-sectional study was conducted at the ED of the Aga Khan University Hospital (AKUH), Karachi, Pakistan, from January 2018, to December 2020. All adult patients (age > 18 years) presented to the emergency department with a systolic blood pressure of > 180 or diastolic blood pressure of > 120 mmHg without any signs and symptoms of EOD (e.g. chest pain, unilateral limb or facial weakness, or hemiplegia, altered mental status, shortness of breath, decreased urine output, and sudden-onset of severe headache) were included. Routine investigations including complete blood count (CBC), basic metabolic panel, urine detailed report, electrocardiogram, and troponin-I were analyzed to detect new-onset EOD. Multivariable logistic regression was applied to identify the risk factors of EOD considering the significant p-value of < 0.05.

Results: A total of 180 patients were presented to the ED with ASH during the study period. Among the total patients, new-onset EOD was diagnosed in 37 patients (20.5%). The most common EOD was the kidney (81%) followed by the heart (19%). The multivariable logistic regression showed that age of more than 60 years, past medical history of diabetes, and cerebrovascular accident (CVA), were significantly associated with a higher risk of EOD organ damage (p<0.05)

Conclusion: The study identified a high incidence of abnormal routine investigations and EOD in patients presented to the ED with ASH. The study also identified the age of more than 60 years, past medical history of diabetes, and CVA as potential risk factors for EOD in these patients. We recommend performing screening tests to detect EOD in all patients presented to the ED with ASH in our population.

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SCREENING FOR LATENT TUBERCULOSIS AMONGST HEALTHY AND COVID-19 PATIENTS: COMPARISON OF INTERFERON GAMMA RELEASE ASSAYS*Uzair Abbas¹, Kiran Iqbal¹, Shama Qaiser¹, Tulaib Iqbal¹, Joy Fleming² and Zahra Hasan¹**1. Department of Pathology and Laboratory Medicine, Aga Khan University, Karachi.**2. Institute of Biophysics, Chinese Academy of Sciences, Chaoyang District, Beijing, China****Introduction:***

Pakistan ranks 5th amongst high tuberculosis (TB) burden countries worldwide. Mycobacterium tuberculosis (MTB) infections result in host immunomodulation and may impact outcomes in other diseases. Multiple risk factors have been associated with severity of SARS-CoV2 infections including, TB. Previous studies using tuberculin skin test (TST) have estimated that 50% of individuals in South Asia may be latently infected with TB. However, TST results are cross reactive in a BCG vaccinated population. More specific tools are required to identify MTB infection. We investigated the occurrence of latent TB infection (LTBi) using MTB antigen specific tests focusing on healthy controls (HC; with no history of COVID-19 disease) and individuals who had COVID-19.

Objectives:

We compared identification of LTBi by using two different IGRAs, QuantiFERON-TB Gold Plus (QFT-Plus- QIAGEN, Germany) and X.DOT-TB (TB Healthcare, China)

Methods:

42 samples were recruited after informed consent. 10 ml blood was obtained and processed for X.DOT-TB® assay (Cat. No.: XG5020000101). And QuantiFERON-TB Gold Plus (Cat. No. / ID: 623433) as described in flow charts

Results:

Out of 42 a total of 20 were tested positive and 21 were tested negative for latent TB on QuantiFERON, while 1 was tested indeterminate. On comparing these results with X DOT, we got 20 positive and 20 negative and 2 were found to be indeterminate. Calculated sensitivity of X DOT TB against QuantiFERON was 95% and specificity was 94.70%. Positive predictive value was 95% and negative predictive value was 94.70%.

Conclusion:

X DOT TB ELISPOT kit has a valid sensitivity and specificity for the detection of latent tuberculosis as compared to QuantiFERON.

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ASSESSING PATTERN OF THE PEDIATRIC MULTISYSTEM INFLAMMATORY SYNDROME (PMIS) IN CHILDREN DURING COVID-19 INFECTION: EXPERIENCE FROM THE EMERGENCY DEPARTMENT OF A LMICS TERTIARY CARE HOSPITAL*Surraiya bano¹, Saleem Akhter², Iqra Anis¹, Ahmed Raheem¹, Mohammad Tayyab Ihsan³**¹Department of Emergency Medicine, Aga Khan University**²Department of Pediatric, Aga Khan University**³MBBS student, Medical College, Aga Khan University*

Background: Pediatric multisystem inflammatory syndrome (PMIS) is a hyperinflammatory syndrome with multi organ involvement. Severe complications were reported with features similar to incomplete Kawasaki disease during later phases of Covid- 19.

Objectives: This study aimed to determine the frequency, pattern of presentation, and significant laboratory parameters related to PMIS in children presenting to the emergency department during COVID -19.

Method: This was a prospective observational study. Children (1 month -16 years) with symptoms suggestive of PMIS were included. A predesigned questionnaire was used to collect data on demographics, presenting complaints, performing investigations, offering treatment, and the outcome during the emergency stay. Besides using descriptive statistics, the Mann-Whitney U test compared the in-hospital mortality with triage vitals to see any significant differences between Alive and Expired. The Chi-square test or Fisher exact test was used for categorical data to see the association, and continuous outcomes were compared using a t-test.

Result: 56 patients, majority male (85.7 %), were diagnosed with the pediatric multisystem inflammatory syndrome with a mean age of 7.67 ± 4.8 (ranging from 1 to 16 years). COVID PCR was positive in only 18% (10) patients, whereas COVID antibodies were positive in 78.6% (44). The main presenting complaints were related to respiratory 70% followed by neurological 57% and Gastrointestinal 54% with the common clinical sign of delayed capillary refill time (93%) and low volume pulses (89%). Out of 12 patients with negative COVID antibodies, 10(83.3%) patients tested PCR positive, whereas only 2 (16.7%) patients had both antibody body and PCR negative. Based on the multivariate binary regression model indicated that the risk for mortality was higher in patients with ED Stay of more than 4 Hours (OR = 5.4, 95% CI: 1.27 to 22.9), a total hospital stays of more than five days (OR= 0.17, 95% CI: 0.02 to 0.64).

Conclusion: Most children with PMIS were found to have positive antibodies against COVID-19. An increased ED stay was associated with poor outcomes.

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MACHINE LEARNING AND SAMPLING TECHNIQUES TO ENHANCE RADIOLOGICAL DIAGNOSIS OF CEREBRAL TUBERCULOSIS

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Background: Cerebral tuberculosis (TB) is one of the neurological manifestations of tuberculous infections responsible for devastating sequelae and mortality. It is a challenging diagnosis as it mimics other infectious and neoplastic pathologies of the brain. There is a need for a rapid and accurate diagnostic approach to prevent the dismal outcomes arising as a result of delayed or incorrect diagnosis.

Objectives: We aim to develop a classifier to diagnose cerebral TB using various radiological features present on MRI brain with the help of machine learning.

Methods: 72 cases of cerebral TB and 146 cases of non-TB (including meningiomas, gliomas, brain metastasis, fungal and bacterial brain infection) presenting to Aga Khan University Hospital, Karachi, Pakistan, were included and divided into training and test datasets. : Features were selected using correlation, and besides age and gender included radiological features recorded from MRI brain i.e., ring enhancement, homogenous enhancement, basal meningeal enhancement, meningeal enhancement (not basal), homogeneous diffusion restriction, remote Infarcts, hydrocephalus, bilateral multi focal lesions, unilateral multi focal lesions and multiple lesions within the same lobe. After the application of Synthetic Minority Over-sampling Technique (SMOTE), SMOTE-Tomek Links, Edited Nearest Neighbor (ENN) SMOTE-ENN, and Adaptive Synthetic (ADASYN) techniques for balancing the datasets, classifier accuracy was tested using two models: logistic regression and random forest.

Results: Highest accuracy (90.9%) was achieved using logistic regression along with SMOTE+TOMEK with 95.4% Area Under the Curve with an F1 score of 92.8%. Accuracy was increased by 6.81% after application of SMOTE+TOMEK to Logistic Regression models.

Conclusion: Machine learning shows a promising role in clinical decision support systems for quickly and non-invasively diagnosing cerebral tuberculosis. These classifiers can form the basis for mobile apps to be used in clinical setups. Sampling techniques should be employed to boost the performance of classifiers.

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MACHINE LEARNING-BASED CLASSIFICATION OF LOWER GRADE TUMORS USING SHAPE FEATURES

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Background: Lower grade gliomas (LGG) encompass grade 2 and 3 tumors, and possess a spectrum of radiological and tumor morphological patterns. It has been shown that a classification based on circumscribed and infiltrating appearance on MRI brain has implications for disease course in these patients.

Aim: To classify lower-grade gliomas - circumscribed (cLGG) or infiltrative (iLGG), using shape-based features with the help of machine learning algorithms.

Methodology: Pre-operative FLAIR volume MRI scans of Grade 2 and 3 gliomas (n=63), acquired between January 2017 - and December 2019, were annotated for glioma lesions at AKU by clinical experts and classified into cLGG (n=26) and iLGG (n=37) cases. Handcrafted shape features were extracted by the application of Spherical Harmonics (SPHARM) and fed into Random Forests and Support Vector Machines (SVM) models.

Results and conclusion: Accuracy was 83.3% for Random Forests and 75% for SVM. Our preliminary results with a classical machine learning approach show reasonable accuracy, deep learning algorithms with a larger sample may improve the performance to create an objective classification criteria.

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STRUCTURAL PLASTICITY ASSOCIATED WITH GLIOMAS - A CASE-CONTROL STUDY.

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Background: Gliomas are increasingly being recognized for ‘neuroplasticity’ or reorganization of the remote brain areas exhibiting changes in structure and function. Implications for plasticity in these cases include post-lesional or pre-operative neurological deficits, surgical planning and the recovery post-operatively. Most studies have focused on functional plasticity, however, changes occurring at the structural level require further investigation.

Aims: We aim to identify and measure changes in the contra-lesional cortical thickness and subcortical structures’ volumes in pre-operative structural MRI of glioma patients in comparison with healthy controls.

Materials and Methods: In this study, patients with histologically confirmed cerebral gliomas (n=31) and healthy controls (n=18) matched for sex and age were recruited consecutively from the Aga Khan University Hospital between 2020 and 2021. The study was reviewed by the Institutional Review Board (IRB) of the Aga Khan University. Whole brain structural images acquired with a three dimensional (3D) T1-weighted MRI were run through standard FreeSurfer pipeline to calculate contralesional cortical thickness and subcortical volumes bilaterally.

Results: The patient group included WHO grade II (n=20) and WHO grade III (n=11) gliomas. For patients with gliomas on the right, mean left parahippocampal gyrus thickness was higher while mean left lateral occipital gyrus thickness, mean left lingual gyrus thickness and mean left transverse temporal gyrus thickness was lower in patients with glioma on the right compared to healthy controls. In patients with glioma on the left, mean right temporal pole thickness was higher compared to healthy controls. In all the patients, subcortical volumes were increased in the Hippocampi, Thalami and Amygdala bilaterally.

Conclusion: Our study showed variable changes in cortical thickness with an enlargement of hippocampus, thalamus and amygdala in glioma patients. Further correlation with tumor invasiveness and functional changes will enable better understanding of neuroplasticity.

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PATTERN OF REFERRAL OF COVID-19 PATIENTS FOR PSYCHIATRIC CONSULTATION: EXPERIENCE AT A MULTIDISCIPLINARY HOSPITAL IN KARACHI, PAKISTAN

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Background: Patients who are infected with COVID-19 are at a greater risk of developing psychological issues for a multitude of reasons.

Objectives: To determine the pattern of referral of patients who were hospitalized with a diagnosis of COVID-19, and underwent psychiatric consultation at a multidisciplinary hospital in Karachi, Pakistan.

Method: A retrospective chart review for psychiatric referrals generated during the in-patient stay of patients who are diagnosed with COVID-19 from a period of March 2020 to December 2021 at Aga Khan University Hospital, Karachi, Pakistan.

Results: The medical records of 82 patients were reviewed. Most patients were male 72% (n=59) as compared to females 28% (n=23). 42.7% (n=35) were less than 60 years as compared to 57.4% (n=47) above 60 years. The diagnosis of COVID-19 in the majority of the patients was primary 91.5% (n=75), only 7.3% (n=6) of the patients had a secondary diagnosis. Most of the patients who were referred for the consultation had more than one but less than three co-morbid medical conditions at baseline 63.4% (n=52). The most common laboratory investigation to diagnose COVID-19 was a PCR test 58.5% (n=48) followed by a rapid antigen test of 30.5% (n=25). The principal psychiatric diagnosis made by the consultation-liaison team was delirium due to another medical condition 40.4% (n=38), the second most common diagnosis was mental and behavioral disorders due to psychoactive substance use 14.9% (n=14) followed by adjustment issues 11.7% (n=11). The commonest psychiatric symptoms for which consultation was generated are agitation (n=32), agitation & confusion (n=21) followed by psychotropic adjustment (n=17).

Conclusion: The high frequency of psychiatric disorders associated with patients admitted for treatment of COVID-19 highlights the need for consultation-liaison services to work closely with medical services. Delirium is most commonly diagnosed so early identification and referrals will improve the overall management of the patient.

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IMPACT OF INTRAOPERATIVE FLUID ADMINISTRATION AND COMPLICATIONS IN HEAD AND NECK CANCER FREE FLAP SURGERY AT A TERTIARY CARE HOSPITAL OF A LOW-MIDDLE INCOME COUNTRY

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Introduction: Head and neck cancers are among the most common malignancy globally. The prevalence of head and neck cancer is higher in low-middle-income countries like Pakistan. Anaesthetic care has a fundamental role in intraoperative management. The impact of intraoperative fluid administration on postoperative complications has not yet been explored in low-middle-income countries.

Objective: The primary objective of this study was to evaluate the impact of intraoperative fluid administration and its correlation with postoperative complications in head and neck free flap surgeries. The secondary objective was to identify demographic, preoperative, and intraoperative factors predicting postoperative complications in this patient population.

Setting: This retrospective observational study was carried out at a tertiary care hospital in Pakistan. All adult patients with head and neck cancer-free flap surgery from January 2014 to December 2018 were incorporated.

Results: A total of 224 patients were included with a median age of 45 years. The majority of the population was male with an addiction history of smoking and betel nut. Buccal mucosa squamous cell cancer (83%) was the most common cancer while anterolateral thigh flap was the most routine procedure performed (46.4%). Ringer's lactate was most abundantly used (68.3%). The median intraoperative fluid of 5000 ml was associated with complications but results were not statistically significant. The number of medical complications was 67 and surgical complications were nearly half (n= 34). Acute kidney injury accounted for the most common complication in these patients.

Conclusion: The results of this study suggest that there was no significant association noted between patient characteristics and fluid administration with complications. The differences in demographics and access to health care, stresses more research from South Asian countries

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ELECTIVE ICU BOOKING FOR POSTOPERATIVE PATIENTS AND ACTUAL UTILIZATION

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Introduction: With the growing population, the surgical volume is perpetually increasing. The planned postoperative utilization of the intensive care unit decreases perioperative mortality. However, the preoperative request for ICU admission is made subjectively. Some high-risk elective procedures can get delayed or canceled due to the unavailability of the ICU bed. The American College of surgeons' national surgical quality improvement (ACS NSQIP) risk calculator estimates the likelihood of postoperative complications. Thus, the increased probability of postoperative complications can guide the physician to book ICU in advance to avoid unplanned ICU admission.

Objective: The primary objective was to determine the number of preoperative ICU requests generated and their utilization postoperatively after an elective or time-sensitive surgical procedure. The secondary objective was to evaluate the use of ACS NSQIP risk calculator and its effectiveness as a predictive tool for postoperative ICU admission.

Method: This was a retrospective study. All patients undergoing elective non-cardiothoracic surgical procedures from January 2019 till December 2020 were included. The emergency/ urgent cases and patients with in complete medical record were excluded.

Results: During the period, 395 requests were generated for the postoperative ICU admission, however, only 26 % (103 patients) ensued in ICU. Majority of ICU requests were generated by neurosurgery (39.7%) followed by obstetrics (14.1%). The patients who did not utilize ICU were from the surgical specialty of neurosurgery followed by obstetrics. General surgery accounted for the most optimum utilization of requests. One possible reason is the usage of ACS NSQIP calculator is part of their practice for every patient. Majority of postoperative ICU requests were generated by the for high risk of major adverse cardiac events. However, as per NSQIP calculator 54.6 % patients had below average risk of cardiac complications, depicting that for these patients, ICU booking was overutilized. During the study duration, 9 patients died in the perioperative period.

Conclusion: The number of postoperative ICU bookings was higher in comparison to the actual utilization. The ACS NSQIP calculator should be considered before request generation for postoperative ICU, especially in patients with high risk of cardiac complications.

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THE OUTCOME OF VACCINATED VS NONVACCINATED COVID-19 PATIENTS IN AN INTENSIVE CARE UNIT OF A TERTIARY CARE HOSPITAL IN A LOW-MIDDLE INCOME COUNTRY

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Introduction: Coronavirus disease 2019 (COVID-19) is a worldwide health problem. Literature has shown that vaccination decreases the chance of Covid-19 infection. The majority of the data is available from developed countries. The data from low-middle income countries like Pakistan is forthcoming. In Pakistan, vaccine is being injected into all people who are older than 18 years. However, still, people are getting infected and being admitted to ICU.

Objective: Our primary objective was to compare the mortality among the COVID-19 vaccinated vs. non-vaccinated patients admitted in the critical care unit. The secondary objective was to compare the length of hospital stay and to determine the complications in both cohorts.

Method: This was a retrospective study. All adult patients with severe or critical COVID admitted in COVID ICU from 1st July 2021 till 31st March 2022 were included. The data including demographics, clinical characteristics, infection during ICU stay, need for organ support and outcome was compared of both cohorts.

Results: Data of 133 patients was analyzed. The sample of both cohorts was comparable i.e. vaccinated 48.13% and non-vaccinated 51.87%. The vaccinated comprised of older individuals with comorbidities. The non-vaccinated patients required more organ support. Despite increased age and comorbidities in vaccinated patients the outcome of both cohorts was same. Advance age, comorbidities, septic shock on ICU admission, use of tocilizumab, raised ferritin, interleukin-6 and complications were significantly associated with in-hospital mortality.

Conclusion: The survival of patients admitted with Critical Covid is not affected by the vaccination status. However, multicenter studies with a large data set are required for validation. The presence of comorbidities and advance age (>60year) was associated with poor outcome.

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THE CHOICE OF STEROIDS IN SEVERE-CRITICAL COVID-19 AND OUTCOME: A RETROSPECTIVE COHORT STUDY FROM NORTHERN AREAS OF PAKISTAN

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Background: Covid-19 revealed as global pandemic during year 2020. Until July 2021, the death toll reached 4.15 million. The Recovery trial proved mortality benefit in group of patients who were treated with dexamethasone. However, methylprednisolone has better penetration and half-life in alveoli. There are some internationally published studies showing more beneficial effects in terms of fatality for using high dose methylprednisolone in comparison to dexamethasone.

Objective: The objective of this study was to see the difference in efficacy of two steroids i.e. dexamethasone

versus methylprednisolone in patients admitted in COVID-ICU Aga Khan Medical

Centre Gilgit, Northern Areas of Pakistan with severe-critical COVID.

Method: The medical records of all adult patients who were admitted to the ICU at Aga Khan Medical Centre Gilgit, Northern Areas of Pakistan with severe-critical COVID 19 were reviewed from September 2020 till August 2021 over a period of one year. Patients taking chronic steroid therapy, those with mortality within 24 hours of admission and patients with incomplete medical record were exempted.

Results: A total of 89 patients were enrolled during the study time. Along with the standard treatment, 54 patients were given dexamethasone and 27 patients were given methylprednisolone. A 3rd cohort of 8 patients received dexamethasone for the first two days followed by methylprednisolone. There was no significant difference between three groups in terms of demographics and clinical presentation. The overall mortality in this study was 29.2%. No statistical difference in terms of use of inotropic/

vasopressor support, assisted ventilation (invasive & non-invasive) and length of hospital stay were found.

Conclusion: Dexamethasone and methylprednisolone are both equally efficacious in treatment of severe-critical Covid-19 disease.

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EFFECT OF INTRAVENOUS PARACETAMOL COMBINATION WITH CAUDAL ROPIVACAINE ON QUALITY OF POSTOPERATIVE RECOVERY IN PEDIATRIC PATIENTS UNDERGOING HYPOSPADIAS REPAIR. A RANDOMIZED CONTROLLED TRIAL.

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Background: The role of intravenous paracetamol in cases where a caudal block is instituted is still unclear in pediatric perioperative pain management.

Aims: Our aim was to investigate whether the addition of intravenous paracetamol with caudal ropivacaine compared to caudal ropivacaine alone, lead to better quality of postoperative recovery as measured by reduction in postoperative analgesia requirement, quality of analgesia and sedation, in patients undergoing hypospadias repair under light general anesthesia.

Methods: Fifty nine children aged between three to ten years, ASA physical status I and II and scheduled to undergo hypospadias repair surgery were enrolled in this prospective, double-blind, randomized controlled study. The patients were assigned to either a placebo control group (group C), or intravenous paracetamol group (group P), by permuted block randomization. All patients were administered general anesthesia in a standardized manner. Caudal block was performed with a total volume of 1 ml.kg⁻¹ of 0.25% ropivacaine. Group P received intravenous paracetamol approximately an hour before the end of surgery in a dose of 15mg.kg⁻¹ over 15 to 20 minutes. Group C received an identical infusion of normal saline 0.9% in a blinded manner. Time of administering caudal block as well as study drugs was noted. The systolic and diastolic arterial pressures (SAP& DAP), heart rate (HR), oxygen saturation (SPO₂), respiratory rate (RR), sedation score, quality of analgesia using modified Children's Hospital of Eastern Ontario Pain Scale (CHEOPS) were recorded at 15 and 30 minutes, and 1, 2, and 4, hours following transfer to the post anesthesia recovery unit (PACU). Need for postoperative analgesia was observed for six hours postoperatively.

Results: Patients in both groups were comparable with respect to age (p 0.95), BMI (p 0.25), surgical time (p 0.29) and anesthesia time (p 0.15). Postoperatively, the need for rescue analgesia in first six hours was seen in 55% patients in the P group and 45% in the C group. No statistically significant differences was observed between the groups in CHEOPS pain scores and sedation score till four hours postoperatively.

Conclusion: We conclude that the quality of postoperative recovery was unaffected by the addition of perioperative intravenous paracetamol in patients undergoing hypospadias repair under a combination of light general and caudal anesthesia with 0.25% ropivacaine .

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ASSOCIATION OF SARS COV-2 VARIANTS WITH SEVERITY OF ILLNESS AT PRESENTATION AND IN-HOSPITAL MORTALITY IN A LOW-MIDDLE INCOME COUNTRY

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Objectives: We investigated the association of COVID-19 disease severity in the context of SARS-CoV-2 variants and the vaccination status of individuals.

Methods: A retrospective review of 197 adult COVID-19 patients admitted to the Aga Khan University Hospital, Karachi between April 2021 and February 2022 was performed. Clinical information including, vaccination status was collected and SARS-CoV-2 variants were identified.

Results: The median age of the patients was 55 years and 51.8% were males. Upon admission, 48.2 % of patients had non-severe disease, while 52.8% had severe/critical disease. 70% of patients survived and were safely discharged home. Hypertension (48%) and diabetes mellitus (41.3%) were most common. Variants identified were Omicron (55.3%), Beta (14.7%), Alpha (13.7%), Delta (12.7%) and Gamma (3.6%) amongst COVID-19 patients. The risk of having severe disease was significantly higher in patients aged above 50 years (OR 5.73; 95%CI [2.45-13.7]) and those who had diabetes (OR 4.24; 95% CI[1.82-9.85]). Full vaccination (OR 0.25; 95% CI [0.11-0.58]) and the presence of Omicron variant (OR 0.42; 95% CI[0.23-0.74]) were found to be protective against severe/critical disease. Age > 50 (OR 5.07; 95%CI [1.92-13.42]) and presence of myocardial infarction (OR 5.11; 95% CI[1.45-17.93]) was associated with an increase in mortality while, the Omicron variant (OR 0.22 95% CI 0.10-0.53]) was protective.

Conclusion: We found the Omicron variant to be associated with lesser disease severity at presentation and lesser mortality as compared to non-omicron variants, in patients hospitalized with COVID-19. Age of > 50 years was associated with severe disease and mortality whereas vaccination was protective against severe disease.

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EARLY COMPLICATIONS AFTER LIMB SALVAGE PROCEDURES: PROSPECTIVE CROSS SECTIONAL STUDY*Ziad Ali, Javeria Saeed, Masood Umer**Department of of Surgery Section of Othopedics, Aga Khan University Hospital*

Introduction: Sarcomas are tumors that are mesenchymal in origin involving bone and soft tissues occur in all age groups. Giant cell tumor, although benign, is locally aggressive and can also destroy the bone. Amputation was once considered primary treatment but now with advancements in diagnostic imaging modalities, surgical procedures and adjuvant therapies, limb salvage surgeries have become the preferred treatment modality. The primary objective of our study was to determine the incidence of early complications occurring within the first thirty days in patients who underwent limb salvage surgery at our hospital. The secondary objective was to assess the association of these complications with patient-related factors, surgical modality, tumor characteristics, and neoadjuvant therapy.

Methodology: All the patients with bone or soft tissue sarcoma and aggressive giant cell tumors of the extremities who underwent wide excision and limb salvage surgery from February 2020 to December 2021 were included in this study. Data were collected prospectively on follow-up visits in the clinic for one month. Data were compiled and analyzed using SPSS version 22. A p-value of <0.05 was considered significant throughout the study.

Results: A total of 60 patients were included in this study. The mean age of the patients was 39.90 years. Bone and soft tissue tumors were found in 35 and 25 patients respectively. A total of 13 patients experienced postoperative complications within 30 days of surgery. The association of these postoperative complications with gender distribution, prior comorbid conditions, type of tumor, anatomical location of The tumor and neoadjuvant therapy were found to be statistically insignificant.

Conclusion: The most frequently occurring postoperative complications are wound-related and the incidence of these complications is independent of the proposed risk factors. Research registry number: Research registry 4695.

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ELEVATED COBALT LEVELS IN A PATIENT WITH BILATERAL METAL ON METAL HIP PROSTHESIS.*Muhammad Akbar Baig 1, Joshua Nogar 2**1 Department of Emergency Medicine, Aga Khan University Hospital**2 Department of Emergency Medicine, NorthShore University Health System, Manhasset, NY, USA*

Background: Conventional total hip prostheses consists of a metal head that fits into a polyethylene cup. In an attempt to decrease wear at the interface of the articulation, metal-on-metal bearings, composed of cobalt and chromium, have gained widespread popularity and are being used extensively.

Objective: To report a case of bilateral hip arthroplasty with elevated cobalt levels.

Methods: A 66 Year old male with bilateral hip arthroplasty presented with elevated blood cobalt levels. He developed right hip stiffness five years ago, which began worsening in the past year. He also reported noticing a difficulty in registering information and in-coordination during fine motor tasks over the past month. X-rays showed a well fixed and aligned implant. An MRI scan of right hip showed minimal fluid accumulation surrounding the hip joint, and a serum cobalt level was elevated to 99.3 ug/L (normal 0–0.9 ng/mL) with a normal chromium levels. His orthopedist identified that his right hip implant (Smith and Nephew Acetabular Hip System) was recalled and would require revision. Patient underwent a successful right hip total revision arthroplasty during which black discolored tissue was identified around the modular neck. Following post operative recovery, patient pursued physical rehabilitation and had continued improvement.

Results: Corrosion of cobalt-chrome joint implantations can cause periprosthetic tissue inflammation or necrosis. Periprosthetic cobalt-chrome metallosis is disseminated systemically and may result in arthroprosthetic cobaltism. Increased cobalt levels are associated with neurological (hand tremor, incoordination, cognitive decline, depression, hearing loss and visual changes), cardiac (arrhythmias and cardiomyopathy) and endocrine symptoms. Clinical manifestations of cobaltism can occur many years following prosthetic implantation. Persistently elevated metal ion levels and symptoms require revision hip replacement to decrease the ion levels.

Conclusion: Cobaltism may be under-recognized, particularly if physicians are not aware of the details regarding patient's hip replacement and the potential for cobalt release in the cir

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ANALYSIS OF FACIAL PROPORTIONS IN SKELETAL CLASS II SUBJECTS TREATED WITH CLARK'S TWIN BLOCK APPLIANCE, FOLLOWED BY NONEXTRACTION FIXED MECHANOTHERAPY: A RETROSPECTIVE LONGITUDINAL STUDY

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Introduction: This study aimed to determine the influence of Clark's twin block (CTB) appliance therapy on achieving golden proportion in post-treatment facial profiles in skeletal Class II patients.

Methods: A retrospective longitudinal study was conducted on a sample of 44 skeletal Class II subjects treated with CTB, followed by nonextraction mechanotherapy. Ricketts' 13 dentoskeletal ratios were measured on pre- and post-treatment lateral cephalograms. Paired Student's t test was used to analyze the existence of golden proportion in the values of the pre- and post-treatment ratios. The influence of pretreatment variables was tested on post-treatment ratio 4 using simple and multiple linear regression analyses.

Results: A statistically significant difference in pre- and post-treatment values was found for ratios 4 ($P = 0.02$), 9 ($P = 0.04$), 10 ($P < 0.001$), and 13 ($P = 0.01$). Ratios 4, 9, and 13 moved closer to the golden proportion, whereas ratio 10 moved away from the golden proportion after CTB therapy. Simple linear regression analysis showed a statistically significant association of post-treatment ratio 4 with pretreatment ratios 1, 4, 8, 9, and 12. Multiple linear regression analysis showed a statistically significant association of post-treatment ratio 4 with pretreatment ratios 4 and 12.

Conclusions: Treatment with CTB appliance may well move various facial ratios in individual patients toward the published Ricketts ideals. Ricketts' published golden proportion may be used as one guide when planning for attempted dentofacial change in individual patients.

SKELETAL, DENTAL AND SMILE ESTHETIC CHANGES IN SKELETAL CLASS II PATIENTS TREATED WITH MAXILLARY PREMOLAR EXTRACTION AND NON-EXTRACTION MECHANOTHERAPY – A CROSS-SECTIONAL STUDY

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Introduction: An esthetic smile plays a significant role in lifting a person's confidence, which improves social interaction, and leads to an improved quality of life. This study aimed to compare smile esthetics in skeletal class II subjects who underwent fixed appliance therapy with maxillary premolar extraction (PME) and those who opted for non-extraction fixed mechanotherapy (NEF) with intermaxillary elastics. The secondary objective was to evaluate the perception of esthetic smiles among three panels of raters, including laypersons, general dentists and orthodontists.

Materials and Methods: A cross-sectional study was conducted on a sample of 36 skeletal class II subjects equally ideally planned for PME. Eight smile variables were measured on pre-and post-treatment frontal close-up smile photographs of two groups. Ten laypersons, general dentists and orthodontists evaluated those photographs on a visual analogue scale. An Independent t-test was applied to compare the post-treatment smile variables and scores between PME and NEF. Simple and multiple linear regression analyses were used to evaluate the factors associated with an esthetic smile.

Results: In a comparison of post-treatment photographs between the groups, a statistically significant difference was found in the values of arch form index (AFI) ($p = 0.01$) and overjet ($p = 0.006$). A statistically significant difference was observed in the perception of smile esthetics among the raters ($p < 0.001$).

Conclusions: Patients ideally planned for maxillary premolar extraction when treated with non-extraction fixed mechanotherapy using class II elastics did result in dental and soft tissue improvement but were not able to achieve ideal values at the end of treatment. Laypersons and dentists preferred smile esthetics in maxillary first premolar extraction treatment, whereas orthodontists gave higher scores to non-extraction fixed mechanotherapy.

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SKELETAL AND DENTAL CHANGES AFTER BONE-BORNE VERSUS TOOTH-BORNE SURGICALLY ASSISTED RAPID PALATAL EXPANSION IN SUBJECTS WITH TRANSVERSE MAXILLARY DEFICIENCY – A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: The objective of this study was to determine the difference in skeletal and dental effects of bone-borne (BB) versus tooth-borne (TB) surgically assisted rapid palatal expansion in subjects with maxillary transverse deficiency (SARPE).

Methods: This review included only randomized (RCTs), non-randomized clinical trials (n-RCTs) and cohort studies. We excluded case reports/series, reviews, case-control, single-arm longitudinal and animal studies. Online databases (PubMed, Dental and Oral Science, CINAHL, and Cochrane Central Register of Controlled Trials) were systematically searched electronically for articles until June 2022. Google scholar and clinicaltrials.gov databases were utilized for hand searching. SARPE with BB and TB appliances were considered as intervention and control, respectively. The outcomes assessed were skeletal and dental expansion at maxillary canine, first premolar and first molar regions. Risk of bias in clinical trials and cohort studies was assessed with Risk of Bias (RoB) 2.0 and Newcastle-Ottawa tools, respectively. The meta-analysis was conducted using the RevMan software V.5.3.5.22. The outcome was estimated using weighted average difference and 95% confidence intervals (CIs). The studies' heterogeneity was assessed using Cochrane's heterogeneity test (I² Test).

Results: Seven articles fulfilling the inclusion criteria were included in the qualitative and quantitative synthesis. Five studies were included in the meta-analysis to measure the skeletal expansion at first premolar and first molar regions. No significant differences were observed between the groups (Mean difference: -0.16; 95% CI [-0.34, 0.67]). All seven studies were included in the meta-analysis to measure the dental expansion and no significant differences were observed (Mean difference: -0.29; 95% CI [-0.77, 0.19]).

Conclusion: This systematic review and meta-analysis concluded that there was no difference in skeletal and dental expansion in patients who underwent SARPE with BB and TB appliances. The difference in follow-up duration could have influenced the findings, however, a meta-analysis was performed to eliminate these confounding factors.

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ASSESSING THE QUALITY OF LIFE OF PATIENTS AFTER PERMANENT PACEMAKER IMPLANTATION AT A TERTIARY CARE HOSPITAL IN KARACHI, PAKISTAN

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Background: The burden of cardiovascular diseases (CVDs) and people requiring permanent pacemakers (PM) continue to rise in Pakistan. Globally, approximately 1.25 million PM insertion procedures are performed in a year, which is expected to rise in the future. Permanent PM implantation is a recommended method for treating cardiac conduction disorders and arrhythmias. Living with PM may cause physical and mental health issues, influencing patients' quality of life (QoL).

Purpose: To assess the QoL among patients with permanent PM and determine the factors associated with QoL.

Methodology: The study used a cross-sectional analytical study design. The consecutive non-probability sampling method was applied to recruit a total number of 135 patients with permanent PMs. The data was collected by using the validated tools: the Short Form 36 Health Survey (SF-36) and Assessment of Quality of Life and RELated events (AQUAREL).

Results: The present study showed that the patients with permanent PM scored above average in all domains of QoL which represent a good QoL. Regarding SF-36, the highest score was observed in the emotional well-being domain (78.25 ± 16.12), while the lowest score (57.41 ± 40.29) in the physical health domain. The AQUAREL tool demonstrated that patients had fewer symptoms of chest discomfort (94.95 ± 11.15) as compared to arrhythmia (90.62 ± 10.90) and dyspnea (75.60 ± 15.03). The results also indicated that the patient's sociodemographic factors including age, gender, and household income were statistically significantly associated with the domains of QoL.

Conclusion: The study has measured the QoL and determined the factors affecting the QoL among patients with permanent PM. The findings can also serve as a guide for designing and planning interventions intending to focus on the most affected domains and promoting the QoL in PM patients. A pre-post study needs to be conducted to compare the QoL of patients before and after PM implantation.

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SODIUM IMBALANCE AND IN-HOSPITAL MORTALITY IN PATIENTS PRESENTING WITH SEPSIS AT TERTIARY CARE HOSPITAL

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Background: Sepsis is a common condition with high morbidity and mortality. Recently updated definition of sepsis and septic shock have been proposed which better identify patients who are likely to have a poor outcome, and therefore give an opportunity to escalate care. Hyponatremia is the most common electrolyte abnormality observed in hospitalized patients. The prevalence of dysnatremia is around 10- 20% of patients with critical illness and the prevalence of hypernatremia around 25-45% varies around 25-45% according to the time of onset, threshold for diagnosis, and population. The rationale of the study was to find the frequency of pattern of sodium imbalance and in-hospital in patients presenting with sepsis in order to establish the local perspective as there is paucity of local data has not been well studied. Moreover, genetics, lifestyle, and the dietary habits of the Pakistani population are different from the rest of the world.

Material and Methods: This study was conducted at Aga Khan University Hospital Karachi , in the department of medicine for the duration of 6 months after ERC approval. Sample size of the study was 142 by taking prevalence of severe hyponatremia 15.8%, with margin of error =6% and CI=95%. Patient who admitted with diagnosis of sepsis with age above 20 were included in study. Data was collected and recorded in computers, results were generated by using SPSS recent version and analysis was done by analyst.

Results: During the selected time frame for the study 153 patients were included in study. Table-1 described the patients demographics, clinical characteristic and outcome of the patients included in study, and comparison has been done among two group with and without hyponatremia. Overall mortality in our study was found to be 39%, out of which 43.8% had hyponatremia, and 29.3% were with normal sodium levels. Female comprised of 51.2% of hyponatremic patients and 45.5% of normal serum sodium group. The SOFA score between these two groups did not show any significant difference. Patients with hyponatremia group had prolonged complicated hospital stay and required invasive ventilation (%) and had an increased mortality rate (43.8%) in comparison to patients who had normal sodium levels (29.3%).

Conclusion: Hyponatremia is associated with significantly higher mortality than normonatremic patients admitting with sepsis and predicts worse prognosis in patients on medical admission.

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EVALUATION OF HIGH DOSE RIFAMPICIN DAILY IN THE REDUCTION OF TREATMENT DURATION FOR PULMONARY TUBERCULOSIS FROM 6 MONTHS TO 4 MONTHS

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Background: The annual incidence of tuberculosis is currently estimated at 10 million with 1.4 million deaths globally. The fact that cure is not always achieved in routine treatment may, in part, be due to patients failing to adhere to the current WHO-recommended 6-month regimen. Thus, the objective of this trial was to evaluate efficacy and safety of a higher daily dose of rifampicin of 1200mg or 1800mg, with the aim of achieving more rapid and secure sterilization of the lungs and a reduction of treatment duration to 4 months.

Study Design and Method: This open label, phase III, randomized controlled, non-inferiority trial. 30 adult TB patients were recruited from Aga Khan Hospital and were randomly assigned to one of three regimens: a standard 6-month control regimen (CR); 4-month regimen in which rifampicin was dosed at 1200 mg/d (SR1); or a 4-month regimen in which rifampicin was dosed at 1800 mg/d (SR2).

Results: 10, 09, and 11 participants were assigned to CR, SR1 and SR2, respectively. Comparing SR2 with the control group, non-inferiority was not demonstrated. In the primary mITT population, an unfavourable outcome (death, withdrawal, change in treatment) occurred in 11.1% of participants in SR1 and 18.1% in SR2 group. There was 01 culture-confirmed relapse in SR2 and none in SR1 and Control arm.

Conclusion: The trial did not identify a study regimen that was non-inferior to control according to our predefined criteria. However, primary outcome favorable responses rates, at 80%, 66% and 63% in Control, SR1, and SR2 arms, respectively. In conclusion, 4-month regimens including high dose rifampicin were associated with very few adverse events, yielded an adjusted risk difference that satisfied the criteria for non-inferiority in terms of safety but did not meet non-inferiority criteria for efficacy. It is concluded that Rifampicin remains an attractive rifamycin choice for higher dose therapy, given cost and availability.

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ASSOCIATION OF HIGH BLOOD PRESSURE LEVEL WITH ADVERSE PREGNANCY OUTCOMES

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Hypertensive disorders during pregnancy are a leading cause of maternal and fetal morbidity and mortality worldwide. Hypertension carries the risk for adverse pregnancy outcomes (APO) such as stillbirth, preterm birth, emergency c-section, and, early neonatal death. Presently research has been done on the association of raised blood pressure with subsequent cardiac, renal, and neurological disorders. However, there is a relative paucity of data pertaining to determining the blood pressure cut-off with regards to APO amongst pregnant women. We aimed to assess the association of high blood pressure with APOs and identify the optimal blood pressure cut-off value indicative of APOs in pregnant women.

A prospective cohort study was conducted in Karachi, Pakistan. Pregnant women of reproductive age who gave consent were enrolled and followed. Three antenatal and two postnatal checkups were conducted to collect maternal morbidity information. Trained field workers were deployed to measure blood pressure and proteinuria at every visit.

Outcome data were available for 3686 women. The mean blood pressure values increased from the early antenatal till the early postnatal period and then declined, returning to baseline levels 42-60 days after delivery. From 3461 live births, 61 (1.7%) early neonatal deaths, 953 (26.9%) preterm births, 107 (2.9%) stillbirths, and 412 (11.4%) c-sections occurred. Taking continuous blood pressure readings, we observed the association of hypertension with APO. The adjusted odds of stillbirth, preterm birth, and c-section were slightly higher for women with hypertension (140/90) compared to hypertension (130/80) (aOR=2.51 vs 1.69 respectively), (aOR=1.27 vs 1.16 respectively) and (aOR=1.63 vs 1.24 respectively).

The study emphasizes the significance of closely monitoring and addressing hypertension during pregnancy to lower the incidence of APO and enhance maternal-fetal well-being. Additionally, it is crucial to conduct further research to establish the most appropriate blood pressure thresholds for pregnant women, as modifying these thresholds can alter the likelihood of APOs.

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COMPARISON OF FIVE DIFFERENT DISSEMINATED INTRAVASCULAR COAGULATION CRITERIA IN PREDICTING MORTALITY IN PATIENTS WITH SEPSIS

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Objective: Disseminated Intravascular Coagulation (DIC) screening is not a part of sepsis management yet. This could be attributed to the scarcity in literature about the frequency of occurrence of DIC in patients with sepsis. The mortality rate in patients with sepsis is higher in those with associated DIC as compared to non DIC patients. This study compares the five different criteria used to diagnose DIC and its relationship in predicting outcome in patients with sepsis in our population.

Methodology: A retrospective observational study was conducted in the Medicine department of Aga Khan University Hospital. All adult Patients with ICD-9 coding of sepsis with clinical suspicion of DIC from January 2018 to December 2020 were enrolled in this study. Five different DIC criteria were used to diagnose DIC namely, ISTH (International Society of Thrombosis and Hemostasis), KSTH (Korean Society on Thrombosis and Hemostasis), JAAM (Japanese Association for Acute Medicine), RJAAM (revised-JAAM) and JMHW (Japanese Ministry of Health and Welfare).

Results: Of 222 septic patients included in this study with clinical suspicion of DIC, 94.6% of patient had DIC according to KSTH criteria, followed by JAAM (69.4%), ISTH (64.0%), JMHW (53.2%) and lastly R-JAAM (48.6%). KSTH had sensitivity of 95.4% in diagnosing DIC and predicting mortality with a positive predictive value of 70%, JAAM had sensitivity of 75.9%, and positive predictive value of 75.9% and ISTH had sensitivity of 69.4% and positive predictive value of 75.3%. R-JAAM had the highest specificity (66.1%) followed by ISTH (48.5%) in diagnosing DIC and predicting mortality.

Conclusion: This study can serve as the foundation for prospective studies in future. Previous research have shown different criteria to be performing differently in different populations. To the best of our knowledge no study is done here in this region comparing these criteria in our population.

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**CONGENITAL HIGH AIRWAY OBSTRUCTION SYNDROME – NOT ALWAYS LETHAL-
A CASE REPORT**

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Objective: Congenital high airway obstruction syndrome (CHAOS) is a rare and highly lethal condition, with multifactorial causes. Accurate antenatal diagnosis and counselling for postnatal management in patients willing to continue pregnancy plays a vital role in good perinatal outcomes.

Case Report: A 32-year-old lady in her 4th pregnancy was referred from a secondary care unit to Feto-maternal unit of a tertiary care hospital for diagnosis due to presence of echogenic bright lungs on Anomaly scan. Her second level scan showed that both lung tissue was massively enlarged and hyper-echogenic resulting in compression of the heart, with flattened diaphragm, collapsed stomach bubble. Two vessel cord was seen, with polyhydramnios but there was no hydrops.

Diagnosis of Congenital high airway obstruction syndrome was made. Detailed counselling was done by a neonatologist regarding guarded prognosis and high risk of intrauterine fetal demise due to hydrops and still birth.

Couple opted to continue with the pregnancy knowing that EXIT procedure for the survival of neonate, is not being available in the current setup. They opted for full code of the baby, so fetomaternal surveillance was carried through out pregnancy for developing any complications.

She was induced at 37 weeks due to polyhydramnios and SGA fetus, since EXIT procedure not available Cesarean section was not offered. An alive baby girl with Apgar of 7/1 and 8/5 was delivered vaginally in the presence of neonatology team with ENT team on backup.

The neonate underwent emergency tracheostomy (by ENT team) within first hour and intra-operative findings showed Cotton-Myer Grade III subglottic stenosis. Baby is planned for corrective surgery at 1 year of age.

Discussion: CHOAS is a rare neonatal condition with high mortality rates. Correct and timely antenatal diagnosis, evidence base counselling by a multidisciplinary team with extensive experience in managing fetal abnormalities before, during and after birth can lower the mortality rates and ensure survival of the neonate despite diagnosis of a nearly lethal condition.

Conclusions: In conclusion, this information regarding this nearly lethal condition should be used to counsel prospective parents appropriately about the future outlook of the condition to help them make informed decision regarding fate of the pregnancy

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FACILITATORS AND BARRIERS IN THE UPTAKE OF COVID 19 VACCINE IN PREGNANT AND POSTPARTUM WOMEN

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Objective: There has been remarkable progress in vaccine research and development in recent years. Yet there is still considerable hesitancy in its uptake in the pregnant population. The purpose of this study is to understand the factors which facilitate and those which act as barriers to Covid vaccination in pregnant patients.

Design: All pregnant and postpartum patients were asked to participate in this cross-sectional study.

Method: Data were recorded on a pre-designed research questionnaire. Sample size was calculated using Open Epi version 3.01. Non-probability consecutive sampling was done. Statistical analysis was performed using SPSS version 20.

Results: A total of 300 participants were enrolled. Sixty-six (21.6%) participants responded that Covid vaccine is either not safe or they are not sure regarding its safety during pregnancy. One fifty-nine (51.9%) participants responded that Covid vaccination is either not safe or they are unsure regarding its safety during breast feeding. Two hundred fifteen (70.3%) subjects responded that Covid vaccine protects against severe Covid disease while eighty-two (26.8%) responded that it protects against Covid infection. Thirty-five (15.4%) participants mentioned that they face difficulty in getting Covid vaccine. One hundred ninety-four (84.6%) were satisfied with the vaccination center services.

Conclusion: Despite mass awareness regarding Covid, about one third of the patients were of the opinion that Covid vaccination is either not safe or were unaware about its safety during pregnancy and lactation, due to lack of trials and researches of Covid vaccination during pregnancy. Further efforts are needed to increase awareness regarding Covid vaccination safety especially during pregnancy and lactation

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CHRONIC MYELOID LEUKEMIA IN PREGNANCY: 20 YEARS' EXPERIENCE IN TERTIARY CARE CENTER

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Objective: CML is a chronic myeloproliferative disorder that usually occurs during or after middle age. CML accounts for up to 10% of pregnancy-associated leukemia, with an annual incidence of 1 per 100,000 pregnancies. Since pregnancy is rare in CML, there are no dedicated studies to address the optimal management of this condition. This study aims at addressing the cases of pregnancy with CML over the last 20 years in our hospital and discuss the presentation, course, management, and complications as well as the pregnancy outcomes.

Design: Retrospective cross-sectional study to include all the cases that presented at our tertiary care hospital.

Method: All patients with CML who got pregnant were included in this study. Data was retrieved through the hospital information management system and was recorded on a pre-structured questionnaire.

Results: A total of 16 patients, age between 20-40 years, with CML in pregnancy were included in the study. All were diagnosed cases of CML, by bone marrow biopsy showing ABL-BCR translocation. Majority patients, before conceiving were under treatment in the remission phase of disease, only one patient being diagnosed in the 8th month of pregnancy. Of the remaining patients, 2 had terminations on medical grounds, one due to being in the acute phase of disease and other being on teratogenic drug (nilotinib). Two pregnancies landed up in spontaneous miscarriages, one at 12 weeks gestation and other with premature rupture of membranes leading to inevitable miscarriage at 21 weeks. Rest of the 11 patients had good clinical outcome with delivery at term. Most of the patients were on tyrosine kinase inhibitor (Imatinib), started in the second trimester to avoid fetal teratogenicity in the first trimester. However, two of these patients developed intrauterine growth retardation (IUGR) while being on imatinib. Regular antenatal follow up with maternal medicine consultant and consultant hematologist were planned during the pregnancy. Adjustment of dosage of medication was made by having regular complete blood counts.

Conclusion: Most of the patients had good pregnancy outcome despite having CML. Therefore, CML is not a contraindication to pregnancy. But pre-conception optimization of medication and multidisciplinary team approach with maternal medicine consultant and hematologist are necessary for better pregnancy

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JOURNEY OF MEDICATION RECONCILIATION COMPLIANCE IN DIFFERENT SERVICE LINES OF A TERTIARY CARE HOSPITAL IN A LOWER MIDDLE- INCOME COUNTRY FROM 2018-2021: A DESCRIPTIVE ANALYSIS

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Objective: Medication related adverse events have been identified as a major health care problem. Different strategies have been adopted to reinforce compliance to medication reconciliation by the physicians so that these adverse events can be minimized. In this study we aimed to compare the overall compliance to medication reconciliation in different departments of Aga Khan University Hospital (AKUH).

Study design: This was a retrospective study reviewing the medication history of all the patients admitted in different service lines of AKUH from 2018- 2021. The discrepancies between pharmacist collected medication history (the Gold Standard) and that in the pharmacy system (CPOE) and initial assessment forms at admission from 2020-2021 were compared. The study outcome was the overall compliance to medication reconciliation over 4 years. The data was analyzed on STATA version 16.

Results: Overall compliance to medication reconciliation was seen to improve to from 32.7% in 2018 to 69.4% in 2021 in pharmacy system (CPOE). Women health care showed improvement in compliance in initial assessment forms from 3.8% in 2018 to 43.4% in 2021. According to the pharmacist led medication reconciliation, the overall discrepancy in the data of 1105 patients admitted from 2020 – 2021, between the medication history taken by the physician and that by the pharmacist was 25.4%, majorly contributed by the incomplete medications listed in the initial assessment forms and incomplete list transcribed into the pharmacy system (CPOE). Lowest discrepancy was found in musculoskeletal and sports medicine (5.4%).

Conclusion: It is necessary to understand the importance of medication reconciliation i.e. obtaining and recording accurate medication histories and transcribing it completely into the pharmacy systems (CPOE), and implementing the evidence based practice of integrating clinical pharmacist to lead the medication reconciliation process to minimize the medication related errors and improve quality of care.

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PLEURO- PULMONARY COMPLICATIONS OF DENGUE FEVER*Iffat Khanum, Nausheen Iqbal, Rohama Daas , Sajjan Raja, Hiba Syed, Sadia Sattar**Department of Medicine, Aga Khan University*

Background: Dengue is the most rapidly spreading mosquito born viral disease with marked increased in incidence all over the world. Dengue pulmonary complications are uncommon and has been identified in majority of severe and fatal cases . There is no specific treatment of dengue but early identification of potentially manageable complication can lead to favorable outcomes. The purpose of current study is to identify clinical characteristics, risks factors and outcomes associated with dengue fever complicated by lung involvement so that early identification and prompt action could avert adverse outcomes.

Methods: We had conducted a retrospect study of adult patients admitted with dengue and pulmonary complication over the period of 6 months in a tertiary care hospital , Karachi, Pakistan .

Results: Out of 175 patients , 27 (15.4%) were found to had pulmonary complication . Mean age was 36.85(±15.2) in patients with pulmonary complication and 36.81(±10.8) in those who did not develop any pulmonary complication and there was male predominance in both groups. The common co morbid illness were diabetes and hypertension in both groups . Dengue hemorrhagic fever and dengue shock syndrome were more common in patients with lung involvement as compared to those with no pulmonary complication (p value < 0.001) . Fever , SOB and bleeding from any site of body(p value 0.003) were also significantly more prevalent in patients with dengue ad pulmonary complication . Pleural effusion was present in majority(n 21, 77.8%) followed by lung collapse 3(11.1%), pneumonia 3(11.1%), pneumothorax 1(3.7%), ARDS 1 (3.7%)and pulmonary hemorrhage 1 (3.7%). Length of stay was longer (p value <0.001) and higher mortality(p value < 0.001) was observed in patients with pulmonary complication as compared to patients with no pulmonary involvement. There was more bleeding episode observed in patients admitted with dengue with concomitant lung involvement (p value 0.003) in comparison to group with no pulmonary manifestation .

Conclusion: The pulmonary complications were more prevalent in patients with complicated cases of dengue fever and associated with high mortality . Timely recognition and management of such cases can improve disease related outcomes .

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KNOWLEDGE, ATTITUDES AND PRACTICES OF HEALTHCARE PROVIDERS TOWARDS COVID-19 DIAGNOSIS AND MANAGEMENT AND LONG COVID IN PAKISTAN: A CROSS-SECTIONAL SURVEY

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Background: Globally, the COVID-19 pandemic has significantly increased morbidity and mortality. More than 40% of COVID-19 survivors may experience long-term repercussions even after recovering, and more than 80% report continuing symptoms a month after infection, according to reports. Therefore, it is crucial to stay current on the COVID-19 info-demic in order to give patients who are COVID-19 impacted, either immediately or over time, the best therapy possible. The purpose of our study is to ascertain the present knowledge, attitudes, and practices of physicians involved in the care of COVID-19 patients in Pakistan about COVID-19 and Long COVID.

Methods: A cross-sectional survey was conducted among physicians involved in providing care to COVID-19 patients in Pakistan via google form platform. A pre-tested questionnaire was administered comprising of questions on knowledge, attitude and practices towards COVID-19 and Long COVID. The frequency of adequate knowledge, attitude and practices was determined based on available global guidelines for physicians.

Results: A total of 55 physicians completed the survey with median age 33 years (IQR 30-41) and 60% female participants. n=20 (36%) were internal medicine physicians and had more than 10 years of experience since graduation. 80% of the respondents were able to correctly answer knowledge questions related to COVID-19 diagnosis and prevention. However, there were variable responses with regards to treatment practices with 27%(n=15) participants advising Dexamethasone, 25%(n=14) advising Azithromycin and 2 physicians recommending ivermectin to non-severe COVID-19 patient. Regarding knowledge of Long COVID; only 35%(n=19) correctly identified the definition of Long COVID and 40% did not think that long COVID could occur in asymptomatic COVID-19 patients. Majority responded as neutral to experiencing “anxiety and fear while working with suspected or confirmed COVID-19 patients” whereas 14.5% strongly agreed to experiencing it.

Conclusion: Given the knowledge and practice gaps particularly with regards to long COVID, we advise additional training to enhance physicians’ abilities to use evidence-based medicine.

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COMPARISON OF RISK FACTORS AND OUTCOME OF PATIENTS WITH AND WITHOUT COVID-19 ASSOCIATED PULMONARY ASPERGILLOSIS FROM PAKISTAN: A CASE-CONTROL STUDY

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Background: Early identification of COVID-19-associated pulmonary aspergillosis (CAPA) is particularly challenging in low- middle-income countries where diagnostic capabilities are limited, and risk factors for CAPA have not been identified. It is also essential to recognise CAPA patients who are likely to have a poorer outcome to decide on aggressive management approaches. Therefore, this study aimed to identify risk factors and outcomes for CAPA among admitted moderate to critical COVID-19 patients at our centre in Pakistan.

Methods: An unmatched case-control study with ratio of 1:2 was conducted on hospitalised adult patients with COVID-19 from March 2020-July 2021. Cases were defined according to European Confederation of Medical Mycology and the International Society for Human and Animal Mycology consensus criteria. Controls were defined as patients hospitalised with moderate, severe or critical COVID-19 without CAPA.

Results: A total of 100 CAPA cases (27 probable CAPA; 73 possible CAPA) were compared with 237 controls. Critical disease at presentation (aOR 5.04; 95% CI 2.18-11.63), age \geq 60 years (aOR 2.00; 95% CI 1.20-3.35) and underlying co-morbid of chronic kidney disease (CKD) (aOR 3.78; 95% CI 1.57-9.08) were identified as risk factors for CAPA. Patients with CAPA had a significantly greater proportion of complications and longer length of hospital stay (p -value $<$.001). Mortality was higher in patients with CAPA (48%) as compared to those without CAPA (13.5%) [OR = 6.36(95% CI 3.6-11)].

Conclusions: CAPA was significantly associated with advanced age, CKD and critical illness at presentation, along with a greater frequency of complications and higher mortality.

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OUTCOMES OF DENGUE FEVER IN HOSPITALIZED PATIENTS OVER A PERIOD BETWEEN 2010 -2021 AT A TERTIARY CARE CENTER IN KARACHI, PAKISTAN

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Background: Dengue is one of the most prevalent vector-borne diseases with 100 -400 million infections reported annually worldwide. The incidence has sharply increased in recent decades, posing a serious threat to global health. In Pakistan, where dengue is endemic, a significant outbreak occurred in 2022 which was attributed to unprecedented flooding during monsoon. The aim of this study is to determine the trend of hospitalizations and clinical outcomes in patients with Dengue fever between 2010 – 2021 at a tertiary care center in Karachi, Pakistan.

Methods: A cross-sectional study was conducted on hospitalized Dengue fever patients. The dataset included co-morbidity and outcome data that was collected using electronic hospital management information systems. Patients greater than 18 years of age with Dengue fever as primary diagnosis were included using ICD-9 and ICD-10 codes. In-hospital mortality and length of hospitalization were determined.

Results: A total of 6508 hospitalizations due to Dengue fever were recorded over 12 years with the highest number of cases (n=1565, 24%) reported in 2019 and cases peaking between September to November annually (Figure 1). The median age (IQR) was 36 (27-49) years with a 2:1 male-to-female ratio. Most frequent co-morbid was hypertension (n=799, 12.2%) followed by Diabetes Mellitus (n=667, 10.2%) and ischemic heart disease (n=448, 6.8%). Among major complications, n=418 (6.4%) patients had acute kidney injury and n= 685 (10%) had liver injury. 52 patients had co-infection with Malaria and 41 patients had concomitant typhoid fever. In-hospital mortality was 2% (n=128) and median (IQR) length of hospitalization was 2 (2-4) days.

Conclusion: In-hospital mortality due to Dengue remained low though there has been an increase in trend of hospitalizations due to Dengue over the years.

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QUANTIFICATION AND IMPACT OF INCOMPLETE REVASCULARIZATION USING RESIDUAL SYNTAX SCORE IN NSTEMI PATIENTS AFTER PERCUTANEOUS CORONARY INTERVENTION*Syed Waqar Ahmed, Nasir Rahman**Department of Medicine, Aga Khan University Hospital*

Background: Residual SYNTAX Score (rSS) is a quantification method of incomplete revascularization (ICR), which has shown correlation with PCI outcomes. A rSS score of >8 has shown to be predictive of worse PCI outcomes. Achieving CR with PCI may not always be possible, due to increased coronary artery complexity and co-existing medical conditions for which a concept of reasonable incomplete revascularization (RICR) has been proposed. Studies have shown that a RICR defined as rSS >0 and ≤ 8 have similar outcomes to patients that achieve CR. Since South Asian patients are known to have angiographically extensive and complex coronary artery disease, it is pertinent to assess the clinical utility of rSS to achieve CR or RICR in our population.

Objective: The aim of this study was to assess the prognostic significance of rSS after PCI for NSTEMI in terms of All cause mortality and MACE (Major adverse cardiac event) at 3 years of follow up

Method and result: A retrospective analysis of 115 consecutive NSTEMI patients who underwent PCI at the Aga Khan University Hospital Karachi between January 2016 to December 2016 was performed. 7 patients were excluded from the final analysis due to missing data (n=108). The SYNTAX scores before (baseline syntax=bSS) and after PCI (rSS) were calculated. Patients were stratified as CR if rSS =0, RICR if rSS >0 and ≤8 and ICR if rSS >8. Patients that achieved CR were 44 (40.7%), RICR were 40 (37.7%) and ICR were 24 (22.2%). After 3 year follow-up, ICR patients had the highest incidence of both all cause mortality [(CR) 4.5% vs. (RICR) 5% vs. (ICR) 37.5% respectively; p<0.001] and major adverse cardiovascular (MACE) defined as composite of follow up cardiac death, MI and revascularization [(CR) 5% vs. (RICR) 10% vs. (ICR) 50% respectively; p<0.001]. There was no difference in the incidence of all-cause death (4.5% vs. 5%; p=0.92) or MACE (4.5% vs 10%, p=0.332) in patients with CR and RICR respectively (Table 1).

Conclusion: The residual SYNTAX score (rSS) is a useful tool in quantifying incomplete revascularization in patients undergoing PCI for NSTEMI. ICR appears to confer a higher three-year mortality and MACE, however outcomes for RICR and CR were comparable. Hence the calculation of rSS in daily practice may also be used to determine a reasonable level of revascularization in patients where complete revascularization may not be possible

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INFLUENCE OF FACIAL STRUCTURES ON THE PERCEPTION OF SMILE ATTRACTIVENESS BETWEEN LAYPERSONS AND ORTHODONTISTS – A CROSS – SECTIONAL ANALYTICAL STUDY

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Introduction: During social interactions, a person concentrates on facial components such as the eyes mostly, therefore, it can be considered that factors other than smile parameters can influence an attractive smile. The objective of this study is to determine the role of facial structures in perception of an attractive smile between laypersons and orthodontists.

Materials and Methods: Seventy-four raters evenly distributed across two panels of raters (orthodontic residents and orthodontists (OD), and laypersons (LP) participated in this cross-sectional study. Smiling frontal photographs of adult male and female subjects and zoom in smile photographs of the same subjects were shown to the above – mentioned groups who were then asked to make subjective assessments of smile attractiveness using a visual analog scale (VAS). Mann – Whitney U test was employed to compare smile attractiveness between the raters. Linear regression was applied to determine the factors influencing smile attractiveness with & without facial structures.

Results: LPs found all four photographs equally attractive, and their rating was reported with a median of 6. ODs found the female subject photographs equally attractive and those were reported with a median of 6. ODs were most critical while rating zoom in smile male photographs and it was reported with a median of 4. There was a significant association ($p < 0.05$) of age of raters with the rating of the photographs.

Conclusions: ODs found the frontal smile female photograph as the most attractive. Female photographs received higher rating scores from both LPs and ODs. ODs were most critical while rating the male photographs. Age of the raters had a significant association with the rating of photographs.

Keywords: Smile attractiveness, Facial components, Frontal smile photographs.

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COMPARISON OF CANINE RETRACTION RATE BETWEEN MINISCREW ASSISTED MICRO-OSTEOPERFORATION AND CONVENTIONAL TECHNIQUE – A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: One of the major challenges of orthodontics is to reduce the treatment time by achieving maximum results in a specific timeline. The current review aimed to systematically gather data for the synthesis of results to increase the strength of the evidence in the literature. These findings will help orthodontists to achieve desired outcomes with maximum results in a shorter period.

Objective: To determine the difference in canine retraction rate between micro-osteoperforation (MOP) and conventional technique (CT) in patients

Methods: Online databases (PubMed, Dental and Oral Science, CINAHL, and Cochrane Central Register of Controlled Trials) were deliberately looked electronically for articles up until July 2022. MOP was considered as an intervention whereas the CT was taken as a control. The outcome assessed was the rate of tooth movement.

Eligibility Criteria: Six randomized control trials (RCT) were included in this study which reported the canine retraction rate with MOP and CT over the period of 3 months.

Data Collection and Analysis: Online databases were used to extract the data. The risk of bias in clinical trials was assessed with (RoB) 2.0. The meta-analysis was conducted using the RevMan software V.5.3.5.22. The outcome was estimated using weighted average difference and 95% confidence intervals (CIs). The studies' heterogeneity was assessed using Cochrane's heterogeneity test (I² Test).

Results: Six articles were included in the qualitative and quantitative synthesis. The rate of tooth movement was assessed at pre- and post-canine retraction in 125 patients who underwent canine retraction under miniscrew assisted MOP versus conventional technique. There was a statistically significant difference in canine retraction rate between miniscrew assisted micro-osteoperforation and conventional technique (95% CI: 0.05, 0.19).

Conclusion: Micro-osteoperforation can be used clinically to accelerate orthodontic tooth movement by reducing the treatment time. There is a significant increase in the canine retraction rate with miniscrew assisted micro-osteoperforation as compared to the conventional canine retraction.

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EFFECTS OF THREE DIFFERENT TREATMENT MODALITIES ON DENTAL ARCH DIMENSIONS IN SKELETAL CLASS II MALOCCLUSION – A CROSS-SECTIONAL STUDY

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Introduction: Patients with class II skeletal malocclusion usually present with transverse issues. This study aimed to compare the effects of Clark's twin block appliance therapy (CTB), upper first premolars extraction (U4) and non-extraction (NE) treatment modalities on dentoalveolar width and buccolingual inclinations in the transverse dimension.

Materials and Methods: A cross-sectional study was conducted on a sample of 45 skeletal class II subjects, aged 10-35 years, ideally treated with CTB, U4 and NE. Transverse arch dimensions were manually measured on the pre- and post-treatment dental casts using a digital vernier caliper and a universal bevel protractor. A paired t-test was used to compare the pre- and post-treatment values of dental arch width changes. The one-way ANOVA was applied to compare dental arch width changes among the treatment groups which were further evaluated by post-hoc Tukey for comparing the pre- and post-treatment dental arch changes between groups.

Results: Statistically significant differences for upper arch width dimensions were found between CTB and U4 groups ($p < 0.001$). Highly statistically significant differences were found for lower arch width dimensions between NE and U4 groups ($p < 0.001$) with the U4 group showing the greatest increase. There was a statistically significant difference in the buccolingual inclinations among all three groups.

Conclusions: Upper arch transverse dimensions were observed to be increased in patients treated with CTB, while in the upper first premolars extraction group lower arch width showed a significant increase. The non-extraction group showed the least changes in the pre- and post-treatment transverse dimensions.

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MOLECULAR EPIDEMIOLOGY OF BETA THALASSEMIA AND SCREENING VARIANTS OF B-GLOBIN GENE IN PAKISTAN.*Kanwal Tariq**Department of Pathology and Laboratory Medicine, Aga Khan University***Background:**

β -Thalassaemia, an autosomal recessive hemoglobinopathy, is one of the commonest genetically transmitted disorders throughout the world which in severe condition may cause haemolysis of RBCs, splenomegaly, and anaemia. The normal human Adult (HB A) haemoglobin molecule is composed of 2 Alpha and 2 beta globin polypeptides each with a heme subunit attached to it.

Aim: To determine the prevalence of various mutations in beta (b) thalassaemia

Study design and method: DNA from the Beta globin gene samples was amplified in 2 fragments per sample using 2 different PCR reactions PCR I had 1 forward primer and 2 reverse primers, out of which, one reverse primer was situated in the region deleted in 619bp deletion mutation. PCR II only had one forward and one reverse primer.

In individuals not affected by 619bp deletion in HBB gene, PCR I would yield a 1457 bp fragment and PCR II would yield a 1212 bp fragment.

Results: Figure 1: Gel Electrophoresis of PCR products: The product showed two different bands for both fragments, for fragment 1, bands were 1457 bp and 1671 bp in length and for fragment 2, bands were 1212 bp and 593 bp in length. This is indicative of a heterozygous 619bp deletion mutation (HBB: g.71609_72227del619).

Figure 2: Sequencing Results: The sequencing results on the mutation surveyor application showed a heterozygous G to C mutation on the 5th nucleotide in the first intronic region (HBB: c.92+5G>C).

Conclusion: According to the Hbvar Database of Beta haemoglobin variants, both mutations lead to severe Beta Thalassaemia with the patient being unable to produce functioning proteins, hence molecular diagnosis shows the patient is suffering with Beta Thalassaemia Major.

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EFFECTS OF XMN1 POLYMORPHISM ON BLOOD TRANSFUSION AND ITS RELATION TO B-THALASSEMIA PHENOTYPE AND GENOTYPE*Kanwal Tariq**Department of Pathology and Laboratory Medicine, Aga Khan University*

Effects of XMN1 polymorphism on blood transfusion and its relation to B-Thalassemia phenotype and genotype.

Background: Xmn-1 polymorphism is a prominent mediator ameliorating β -thalassemia phenotype through inducing fetal hemoglobin expression. β -Thalassemia syndromes are the most common form of chronic hemolytic anemia due to impaired globin chain synthesis. Xmn1 Polymorphism, accountable for increased Fetal Hemoglobin, an important ameliorating factor in minimizing disease severity.

Xmn1 polymorphism, characterized by C>T transition at 158 bp upstream of the gamma-globin gene and responsible for increased HbF concentration and reduced thalassemic burden.

Aim: In the present study, we attempted to screen a cohort of β -Thalassemia patients for the presence of Xmn1 trait and to evaluate its overall impact on the severity of disease.

Study design and method: HBB gene mutations and Xmn-1 polymorphism were determined by amplification-refractory mutation system (ARMS) PCR method.

The PCR products were digested with the XMN 1 restriction enzyme. Digestion products were electrophoresed on a 3% agarose gel. Amplification with the primers produced a 650 bp fragment in the wild genotype, the heterozygous genotype gives 2 bands at 400 bp and 250 bp

Results: The study participants consisted of seventy-one patients included Males and Females. Overall, Xmn-1 polymorphism was observed. Homozygous (TT) and heterozygous (CT) genotypes of the polymorphism represented with frequencies of 5 (26%) and 12 (7%), respectively. Hb F level was significantly higher in patients with at least one Xmn-1 allele ($67.9 \pm 17.9\%$) than those without the polymorphism ($19.5 \pm 20.3\%$, $P < 0.0001$). Also, patients with homozygous genotype demonstrated significantly higher Hb F compared to heterozygous (CT) cases (respective percentages of 85 ± 6.8 and 54.7 ± 10.5 , $p < 0.0001$). Also, patients with homozygous genotype demonstrated significantly higher Hb F compared to heterozygous (CT) cases

Conclusion: Our results highlighted the role of Xmn-1 polymorphism as the main phenotypic modifier. Hence genetic screening at this level can make the diagnosis precise for thalassemia patients.

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EPIDEMIOLOGY AND CLINICAL OUTCOME OF NON-COVID VIRAL RESPIRATORY INFECTIONS IN CHILDREN OF A LOW MIDDLE-INCOME COUNTRY*Syeda Asma Sherazi, Ali Faisal Saleem**Department of Pediatrics, Aga Khan University*

Introduction: Pakistan's under-five mortality is alarming, with pneumonia and diarrhea as the leading cause. The burden of non-COVID viral infections is unknown, and the study aims to identify their burden and outcomes.

Objective: We aim for this study to describe the epidemiology of viral lower respiratory infection.

Methods: This was cross-sectional data. For the patients admitted with respiratory symptoms, the nasal swab test was performed and 15 different non-COVID viral respiratory pathogens were identified. Data was entered and analyzed in SPSS version 23. Descriptive analysis was used to determine the characteristics of individuals and demographic features. A cross tab was performed to analyze the outcome and association between exposure and outcome. The statistical association was assessed between different factors i.e., viral respiratory pathogens with invasive and non-invasive mechanical ventilation, inotropic support, and mortality. A p-value of <0.05 was taken as significant.

Results: Among 234 patients, n=187 (80%) had positive viral PCR. Males were predominant (n=137, 58%). The median age was 9 months. The most common respiratory pathogen was the respiratory syncytial virus (RSV) (n=62, 26%) followed by entero/rhinovirus (n=24, 10%). March-September were the most common months with positive viral PCR (n=155, 66%). Half of the patients (n=92, 50%) patients had pediatric intensive care (PICU) stay, and all required non-invasive mechanical ventilation (hi-flow). One-fifth of patients, (n=34,19%) required invasive mechanical ventilation and also inotropic support.

Twelve (6%) patients with positive viral PCR died during the hospital stay. Among those who died, 4 patients had RSV while 4 had rhino/enter and 2 had influenza.

Conclusion: The respiratory syncytial virus is the most common pathogen identified and is also associated with PICU stay and mortality. It is important to have an effective vaccine for RSV to prevent morbidity and mortality in children.

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OPTIMIZING PLACE OF TREATMENT AND ANTIBIOTIC REGIMENS FOR YOUNG INFANTS PRESENTING WITH SIGNS OF POSSIBLE SERIOUS BACTERIAL INFECTION

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Introduction: WHO recommends in-hospital treatment for young infants with possible serious bacterial infections; if hospitalization is not feasible, a combination of injectable and oral antibiotics as outpatients are recommended.

Objective: RCT 1: Optimising place of treatment for young infants presenting with any low mortality risk sign of possible serious bacterial infection.

RCT 2: Optimising duration of hospitalization for young infants presenting with any moderate mortality risk sign of possible serious bacterial infection

Methods: This is a multicenter, open-label, two-arm, randomized controlled design being conducted at AKUH secondary hospital and NICH, Karachi. All young infants fulfilling eligibility based on any of one low mortality risk sign (temperature $\geq 38^{\circ}\text{C}$, respiration $\geq 60/\text{min}$, chest indrawing) for RCT 1 and any one of moderate mortality risk sign (not feeding well, temperature < 35.5 , movement on stimulation) or any two of study 1 signs in RCT 2. The sample size is 1750. The intervention arm is 7 days of outpatient antibiotic treatment whereas the control arm is the in-hospital treatment of 7 days. All Young infants will be followed at days 2, 4, 8, and 15 for poor clinical outcomes.

Results: Results are based on interim analyses of a 24% sample size. Total of 4561 (6.34%) young infants screened, 414 (9.08%) presented with mild CSI, 360 (7.89%) with moderate CSI, and 39 (0.86%) with any critical illness. Among 801 (17.56%) eligible infants, 359 (44.8%) had PSBI signs with any exclusion, while 29 (6.46%) refused consent. To date, 266 (27%) enrolled in RCT 1 and 154 (21%) in RCT 2. Of 266 (27%) in RCT 1, 133 (50%) were randomized in the control arm and 133 (50%) in the intervention arm. The poor clinical outcome in RCT 1 includes: death is 15 (1.1%), critical illness 3 (1.12%), new CSI at day 4 or 8 5 (1.87%), and persistence of mild CSI at day 8 30 (11.27%). Of 154 (21%) enrolled in RCT 2, 78 (50.65%) were randomized in-hospital, while 76 (49.35%) were outpatient arm. In RCT 2, death is 1 (0.64%), and new CSI at day 8 20 (12.98%).

Conclusion: The research would reduce the need for hospitalization, decrease treatment costs of the health system and the families, decrease nosocomial infection rates, and further, it will improve the availability of hospital beds for infants who need hospitalization.

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RISK FACTORS ASSOCIATED WITH FALLS AND SUBSEQUENT HIP FRACTURES AMONG ELDERLY IN A DEVELOPING COUNTRY: A CASE CONTROL STUDY

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Background: Falls among the elderly are a tragically common occurrence that can result in serious health consequences ranging from minor bruising to fatal injuries such as fractures and brain damage. The study aims to identify the risk factors associated with hip fractures in the geriatric patients and to determine the association of hip fractures with different fall prevention strategies in patients seeking treatment at a tertiary care hospital, Karachi, Pakistan.

Methods: This was a single-center case-control study conducted in a tertiary care hospital. Data was retrieved from hospital medical records and recorded on a pre-structured proforma. Measures of association for predictive variables were analyzed using logistic regression analysis and crude and adjusted odd's ratios (OR) with 95 percent confidence intervals (CI).

Result: A total of 270 patients were included in the study, 135 in each arm i.e cases and controls out of which 139 (51%) were males and 131 (49%) were females. The mean age of the patients was 69.8 ± 10 years (range 55-103). After adjusting for other variables in the model, the odds of having osteoporosis among patients with hip fractures was 17 times higher than the odds of having osteoporosis among the controls (OR=17.42, 95% CI=5.44-55.7). The odds of having indoor falls among patients with hip fractures was 7.3 times higher than the odds of having indoor falls among controls (OR=7.29, 95% CI (3.69-14.39)). Patients with higher functional class are more prone to falls and hip fractures. Indoor falls are more common than outdoor falls. Most common place of indoor fall was bedroom followed by washroom.

Conclusion: From our study we can conclude that osteoporosis was the leading cause of hip fracture, followed by age greater than 70 years. Indoor falls were more common than outdoor falls.

Keywords: Functional class, minor bruising, hip fractures, geriatric patients, fatal injuries.

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PROGNOSTIC IMPLICATION OF SURGICAL APGAR SCORE IN HIP FRACTURE SURGERIES, A RETROSPECTIVE COHORT STUDY.

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Introduction: The Surgical Apgar Score (SAS) is a simple scoring system to predict post-operative morbidity and mortality within a 30-day post-operative period. It integrates intra-operative variables including the estimated blood loss, lowest heart rate and lowest Mean Arterial Pressure (MAP) to predict the likelihood of developing morbidity or mortality, and allows the clinician to plan the degree of monitoring that will be required post-operatively

Methodology: It is a retrospective cohort study conducted at section of orthopedics, Aga Khan University hospital. A total of 215 patient were included in the study. Survival analysis was done using Cox proportional hazard model and Weibull distribution , the event being mortality among patients with hip fracture who underwent surgery.

Results: The mortality among patients with SAS>5 was 7.8% as compared to 18.8% among patients with SAS<7. Patients who had SAS<5 had more complications and more deaths. Males suffered more deaths in our cohort as compared to females.

Conclusion: The utility of SAS in the operating room may provide immediate, reliable and a real-time feedback information about patient postoperative risk. We conclude that the SAS is a good and reliable predictor of mortality in the hip fracture patients.

Keywords: Hip Fractures; Apgar score; Morbidity; Mortality; Retrospective Studies.

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MUTATIONAL ANALYSIS OF NSCLC SPECIMENS TO DEMONSTRATE THE PREVALENCE OF EGFR AND ALK MUTATIONS - A RETROSPECTIVE HOSPITAL BASED STUDY

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Background: A large percentage of non-small cell lung carcinoma (NSCLC) show somatic gene alterations called driver mutations. The present study of formalin-fixed paraffin-embedded tissues from patients diagnosed of NSCLC were done to evaluate the prevalence of EGFR and ALK driver mutations in Pakistani patients.

Method: Lung biopsy specimens obtained from known NSCLC patients from January to October 2021 were included in this study. Relevant clinical and laboratory data were collected from ILMS. Mutational analysis of EGFR and ALK genes was carried out by multiplex real-time PCR and Fluorescence in situ Hybridization techniques. Biomarkers required for diagnosing NSCLC, including Cytokeratin AE1/AE3, BER-EP4, P-40, TTF-1, KI-67, and NAPSIM A, were also taken into consideration.

Results: Out of 156 patients tested, 57 (36.5%) were females, and 99 (63.4%) were males with a median age of 58 years. All samples were tested for the presence of EGFR mutations. The outcome demonstrated no pathogenic mutation in 103 (66%) patients, whereas EGFR mutations (exon 19 del, L858R, exon 20 insertion, L861Q, G719X, S768I, G719X) were detected in 53 (33.9%) samples. FISH-based ALK gene rearrangement assay was performed using a break-apart probe on 59 samples, and 51(86.4%) of them were found negative for ALK gene rearrangement, with only 8(13.5%) of them testing positive. One sample strongly suggestive of pulmonary adenocarcinoma based on the presence of BER-EP4 antibody and NAPSIN A protease was positive for both ALK, gene rearrangement, and EGFR exon 19 deletion and exon 20 insertion mutations.

Conclusion: The most frequent EGFR mutation among out study patients was exon 19 deletion. The detected mutation rate demonstrated a higher prevalence of EGFR mutations (33%), as compared to ALK gene rearrangement (15.2%) in Pakistani lung adenocarcinoma patients.

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FREQUENCY OF POSTOPERATIVE HYPERGLYCEMIA AND OUTCOMES OF HYPERGLYCEMIC CHILDREN WHO UNDERWENT REPAIR OF CONGENITAL CARDIAC DEFECTS IN A TERTIARY CARE SETUP OF PAKISTAN.

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Introduction: Hyperglycemia is ubiquitous in critically ill children after surgical repair of congenital cardiac defects. Despite heavy burden of congenital cardiac defects in our region, there is a dearth of data determining poor outcomes in post-surgery patients. The results of this study will thereby explore outcomes of hyperglycemia and facilitate early recognition and prompt management of postoperative hyperglycemia that will aid in reducing morbidity and mortality.

Objective: To determine the frequency of postoperative hyperglycemia and outcomes in hyperglycemic children who underwent repair of congenital cardiac defects.

Materials and Method: This is a descriptive study conducted at CICU of Aga Khan University Hospital during 2020-2021. Glucose levels were monitored within 1st post-operative hour, then at 4th and 8th postoperative hours, followed by once daily monitoring on day 2 and 3. The severity of hyperglycemia was classified as moderate (126-199 mg/dl) and severe (>200 mg/dl) and post-operative outcomes in hyperglycemic children were assessed.

Results: Mean \pm SD of age was 40.40 \pm 48.63 months. Out of 185 patients, 62.2% were male while 37.8% were female. Hyperglycemia was found to be in 98.4% patients among them 28.6% and 69.7% had moderate and severe hyperglycemia respectively. Hyperglycemia was not found to be significantly associated with duration of mechanical ventilation ($p=0.221$), length of hospital stay ($p=0.285$) or length of CICU stay ($p=0.235$). Severity of hyperglycemia is not significantly associated with duration of mechanical ventilation ($p=0.204$), length of hospital stay ($p=0.117$) or length of CICU stay (0.055).

Conclusion: Hyperglycemia is a frequent finding in children who underwent repair of congenital cardiac defects, and it is not significantly associated with duration of mechanical ventilation, length of hospital or CICU stay. More work needs to be done on association of outcomes of hyperglycemic children because timely diagnosis and correction of hyperglycemia can lead to decrease morbidity.

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MANUSCRIPT CHARACTERISTICS INFLUENCING CITATIONS: COMPARISON OF FOUR NEUROLOGY JOURNALS

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Introduction: Bibliometric analysis is a statistical tool that analyses published literature of a specialty quantitatively and its international scientific influence qualitatively (1), using parameters such as citation count and impact factor (2). For better career advancements, current researchers aim to publish articles which attract more citations and qualifies as a high impact article (3).

Objective: To inspect 28 data characteristics among the top neurology journals with the highest impact factor and their influence on citation rate.

Methods: Consecutive articles from January 2004 to June 2004 were collected from four major neurology journals with the highest impact factor: The Lancet Neurology (impact factor, 11.964), Acta Neuropathologica (7.589), Brain (5.858) and Annals of Neurology (5.706). Web of Science was used to extract the citation count for these articles, and 28 article characteristics were tabulated manually. Univariate analysis and a multiple regression model were performed to predict citation number from the collected variables.

Results: A total of 288 manuscripts i.e. 24 in The Lancet Neurology, 70 in Acta Neuropathologica, 117 in Brain and 77 in Annals of Neurology. Univariate analysis revealed the following variables to have a significant positive correlation with increased citations: journal (1; $p < 0.0001$), country of origin (15; $p < 0.0001$), number of tables (28; $p = 0.0007$), words per title (7; $p = 0.0006$), design of study (17; $p = 0.001$), open access (22; $p < 0.0001$), total words (24; $p < 0.0001$), total references (25; $p < 0.0001$) and total number of pages (26; $p < 0.0001$). In a multivariate regression model the following variables predicted increased citation count ($p < 0.0001$, $R^2 = 0.4377$): number of pages, open access status, multicenter studies and journal origin.

Conclusion: The results of our bibliometric study may be used by authors while compiling their manuscript to increase recognition and improve the impact of their articles over what they would normally experience.

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BILATERAL PNEUMOTHORAX IN A PATIENT WITH ANGIOSARCOMA OF THE SCALP

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Background: Angiosarcoma is a rare, vascular malignancy that arises from endothelial cells of blood vessels. This case report aims to create the awareness of its existence in the region and its mode of presentation.

Case Presentation: A 63-year-old Pakistani man presented to the emergency department with sudden bilateral chest pain and shortness of breath for 2 days. On examination, a scalp lesion was seen which had been increasing in size over the last 6 weeks. The lesion was 8 x 10 cm in size with an irregular border, non-tender, violet and dome-shaped in elevation on the right occipito-parietal lobe of the skull. Chest computed tomography (CT) showed multiple cystic lesions on both lungs, patchy areas of ground-glass opacities, nodules of variable sizes and bilateral pneumothorax. Bilateral tube thoracostomy was performed which provided symptomatic relief for shortness of breath. His bronchoalveolar lavage (BAL) was negative for infection. He underwent biopsy of scalp lesion which was positive for aggressive angiosarcoma.

Conclusion: Bilateral spontaneous pneumothorax can be the initial manifestation of aggressive cutaneous angiosarcoma and frequently leads to respiratory failure. Early recognition is essential to prevent delay in diagnosis and management.

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ALTERNATE DIAGNOSIS IN CLINICALLY DIAGNOSED PULMONARY TUBERCULOSIS PATIENTS TREATED AT TERTIARY CARE HOSPITAL IN A HIGH TB BURDEN COUNTRY

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Background: In Pakistan more than 52% of Pulmonary tuberculosis (PTB) cases diagnosed are smear negative/ clinically diagnosed TB. This rate is very high in the era of more reliable and rapid tests available for the confirmation of TB. The reasons for the high proportion of clinically diagnosed TB are not clear. While the diagnosis of PTB is usually straightforward, several disorders can be mistaken for it. Common misdiagnoses of smear negative PTB include post TB bronchiectasis, malignancy, allergic bronchopulmonary aspergillosis (ABPA) and chronic pulmonary aspergillosis (CPA)

Methods: A retrospective cross-sectional study was conducted at a tertiary care hospital in Karachi, Pakistan. Clinically diagnosed PTB patients were selected and their response to treatment was reviewed in subsequent clinical visits through review of charts. Any alternate diagnosis that would emerge in this time was recorded

Results: Out of the 61 patients 33 (55%) showed clinical and radiological improvement with ATT but 28 (45%) failed to improve and were later on found to have alternate diagnosis. Among these 10 had metastatic disease, 8 had lung malignancy, chronic heart failure in 3, post TB bronchiectasis in 2, ABPA in 1 and CPA in 1 patient

Conclusion: Although the sample size is small but around half of the patients has failed to respond to therapy and were found to have an alternate diagnosis. Use of ATT in such patients not only delays treatment for their primary disease but also expose patients to potentially toxic medications. There is a need of review the cases of clinically diagnosed TB for an alternate diagnosis before starting ATT

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ACCEPTABILITY OF TELEPHONE-CARDIOPULMONARY RESUSCITATION (T-CPR) PRACTICE IN A RESOURCE-LIMITED COUNTRY- A CROSS-SECTIONAL STUDY

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Background: T-CPR has been shown to dramatically increase bystander CPR rates and is associated with improved patient survival.

Methodology: We collaborated with a private EMS working in Karachi, and analyzed audio taped for those patients in which dispatcher recognized the need for CPR. Total of 481 calls were included from January – December 2018 to gather the required information such as age, gender, status of patient, time for CPR instruction given and barriers in performing CPR.

Results: Majority of the patients were males (n=278; 57.8%) and most had witnessed cardiac arrest (n=470; 97.7%) at home (n=430; 89.3%). The mean time to recognize need for CPR by a telecommunicator was 4:59 ± 1:59(minutes), while mean time to start CPR instruction by bystander was 5:28 ± 2:24(min). Mean time to start chest compression was 6:04 ± 1:52(min.)

In comparison with the AHA recommendations of timeline which they have divide into high performance system and minimal acceptable. In only 3 (0.6%) of cases time to recognize need for was less than a minute and in 28(5.8%) of cases it was less than 2min while 440(93.5%) cases was out of this time line. In only 1(0.2%) of case CPR instruction was started within a minute and in 14(3%) of cases it was within 2min but in 453(96.8%) of cases it was beyond that time line. For time to first compression none met high performance system and in 40(8.7%) of cases it was started within 3min meeting minimal acceptable limit while rest was out of range.

Conclusion: Our results shows high acceptability of T-CPR by bystanders. We also found considerable delays in recognition of cardiac arrest and initiation of CPR by dispatchers. Further training of dispatchers could reduce these delays.

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EPIDEMIOLOGICAL CHARACTERISTICS, PRESENTATION, AND OUTCOME OF CHILDREN WITH CRANIOPHARYNGIOMA OVER 20 YEARS

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Introduction: Craniopharyngioma constitutes approximately 10% of primary brain tumors in children which can cause considerable morbidity and mortality due to local aggressiveness of the tumor itself or its treatment affecting the hypothalamus-pituitary axis and visual deficits.

Objective: The aim of this study is to report the epidemiological characteristic features of pediatric patients with craniopharyngioma, the treatment modality used in management and to highlight the short-term and long-term health impacts in patients with craniopharyngiomas from our part of the world.

Methods: We studied a single-center cross-sectional retrospective review of 20 years record of 49 patients with craniopharyngioma treated from 2001-2020 treated at a tertiary care center in Aga Khan University Karachi.

Results: The record of 49 children with craniopharyngioma was reviewed. Out of a total 26(53%) were male and 23 (46.9%) were female. mean age was 9.5years SD \pm 4.5 years. Most common symptoms at initial presentation were headache 41(83.6%), visual deficit 40(81.6%), nausea vomiting 26(53%), and endocrine abnormalities 16(32%). Craniopharyngioma treatment approaches included gross total resection 23(46.9%), subtotal resection without radiotherapy 14(28.5), and subtotal resection with radiation 12(24%). Histopathologic findings of the majority 40 (81%) revealed adamantinomatous type

Only 23(46.9%) children followed in clinic post-op with median follow-up since craniopharyngioma presentation was 5 years (interquartile range: 2-10 years) Pituitary hormone deficiencies (98%), and visual disturbances (75%), were the most common long-term health conditions observed.

Conclusions: The most common symptoms in our cohort were headache, visual deficit, nausea vomiting. The most common surgical modality used in our patient was subtotal resection, almost all have adamantinomatous type of tumor in histopathology, and Pituitary hormone deficiencies and visual disturbance were the most common long-term health conditions observed in our study.

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COMPARISON OF DIAGNOSTIC ACCURACY OF XPRT MTB/RIF AND GENO TYPE MTBDRPLUS LINE PROBE ASSAY FOR DIAGNOSIS OF TUBERCULOUS PLEURAL EFFUSION

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Background: Tuberculous pleural effusion (TPE) occurs in up to 25% of TB patients. Owing to the pauci-bacillary nature of the pleural fluid, the diagnosis of TPE is a challenge. Newer diagnostic tools are required for the rapid diagnosis of TPE.

Objectives: To compare the sensitivity and specificity of Xpert MTB/RIF and Geno type MTBDRplus line probe assay (MTBDRplus) for diagnosing TPE.

Methods: A prospective cross-sectional study was performed at Aga Khan University Hospital, Karachi, Pakistan from August 2014 to January 2016. Patients with suspected TPE were recruited on the basis of history, exudative lymphocytic nature of effusion and raised adenosine deaminase level. Pleural fluid samples were tested for AFB smear, culture, Xpert MTB/RIF and MTBDR plus.

Results: We enrolled 99 patients with mean age of 50.4 ± 20.3 years. AFB culture was positive in 14 (14.14%) cases. Considering AFB culture as Gold standard, the sensitivity of Xpert MTB/RIF was found to be 57.14% (95% CI: 28.86 – 82.34%) and specificity was 97.65% (95% CI: 91.76 - 99.71%) and the sensitivity of MTBDR plus was 35.71% (95% CI: 12.76 – 64.86%) and specificity was 98.82% (95% CI: 93.62 - 99.90%). The sensitivity of Xpert MTB/RIF in TPE was higher than MTBDRplus (p 0.013), while specificity was similar.

Conclusion: Xpert MTB/RIF is more sensitive for detecting TPE than MTBDRplus and AFB smear microscopy. A multicenter, large-sample study is needed to evaluate this method for early TPE diagnosis.

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EVALUATION OF PHARMACEUTICALLY COMPOUNDED ORAL CAFFEINE ON THE IMPACT OF MEDICATION ADHERENCE AND RISK OF READMISSION AMONG PRETERM NEONATES: A SINGLE-CENTER QUASI-EXPERIMENTAL STUDY.*Dr. Gul Ambreen**Department of Pharmacy, Aga Khan University*

Background: Caffeine is available in an ampoule, used via parenteral and enteral routes in preterm neonates to treat apnea of prematurity (AOP) in neonates of gestational age ≥ 35 –40 weeks. A longer duration of therapy has a higher risk of medication non-adherence due to higher costs and inappropriate dosage forms. Pharmaceutically compounded oral caffeine (PCC) could be an appropriate alternate dosage form. The researchers aimed to determine the impact of PCC on medication-related factors influencing medication adherence (MA) and the frequency of hospital readmission with apnea (HRA) in preterm neonates.

Methods: A single-center quasi-experimental study for this quality improvement project using PCC among the preterm neonates admitted in a tertiary care level-III NICU at the Aga Khan University Hospital Karachi, Pakistan, received caffeine therapy, and survived at discharge. The researchers compared pre-PCC data (April-December 2017) with post-PCC data (April-Dec 2018) each for nine months, with three months intervals (January-March 2018) of PCC formulation and implementation phase. The study was conducted according to the SQUIRE2.0 guidelines. The Data were collated on factors influencing MA, including the cost of therapy, medication refill rates, and parental complaints as primary outcome measures. The Risk factors of HRA as secondary outcomes.

Results: After PCC implementation cost of therapy was reduced significantly from Rs. 97000.0 (729.0 USD) to Rs. 24500.0 (185.0 USD) ($p < 0.001$), significantly higher ($p < 0.001$) number of patients completed remaining refills (77.6% pre-phase vs 97.5% post-phase). The number of parental complaints about cost, ampoule usage, medication drawing issue, wastage, inappropriate dosage form, and longer duration of therapy reduced significantly in post-phase. HRA reduced from 25% to 6.6% ($p < 0.001$). Post-implementation of PCC (RR 0.14; 95% CI: 0.07–0.27) was a significant independent risk factor for reducing HRA using a multivariate analysis model. Longer duration of caffeine therapy after discharge, multiple births (RR 1.15; 95% CI: 1.15–1.15), and those who had higher number of siblings were other significant independent risk factors for HRA.

Conclusions: PCC dispensation in the appropriate dosage form at discharge effectively reduced cost, non-adherence to therapy, and risk of hospital readmissions. This neonatal clinical and compounding pharmacist-led model can be replicated in other resource-limiting setting.

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EFFICACY OF COLISTIN IN MULTIDRUG RESISTANT NEONATAL SEPSIS: EXPERIENCE IN A TERTIARY CARE CENTER IN KARACHI, PAKISTAN*Gul Ambreen¹, Muhammad Sohail Salat², Kashif Hussain¹, Syed Raza¹, Umer Ali¹**¹ Department of Pharmacy, Aga Khan University**² Department of Pediatrics, Aga Khan University*

Background: Emergence of multi-drug-resistant-organisms (MDRO), especially Gram-negative-bacteria (GNB), associated infectious diseases are highly associated with increased morbidity and mortality, with limited options for treatment. Colistin has been reintroduced after previously being abandoned due to adverse effects. Little is known about its efficacy in the neonatal population.

Material and methods: This study included all the term and premature infants born in and/or outside Aga Khan University Hospital (AKUH) and admitted to NICU between June 2015 and June 2018 with MDRO infections. We assessed colistin use through medical records. Predictors of response to colistin were assessed by univariate and multivariate logistic regression.

Results: Our study included 153 neonates, who received colistin during study period. Total of 93 patients had culture proven sepsis with Pan-Resistant/MDR-GNB (84 colistin sensitive and 9 resistant). Acinetobacter, Klebsiella, Enterobacter species and Pseudomonas were the most commonly isolated pathogens. Mean microbial clearance was achieved in 2.6±2.1 days. 42(27.4%) neonates died during therapy. Predictors of response to colistin included, gestational age ≥28 weeks (p=0.003; adjusted Odds Ratio (AOR) 3.8), weight (g) 2390(±78.6) (p<0.001;AOR 5.4), absence of deteriorating factors, like thrombocytopenia (p<0.001; AOR 7.6), metabolic-acidosis (p=0.011;AOR 4.3), poor-perfusion (p<0.001;AOR 11.2). Colistin sensitivity (p=0.004; AOR 1.1), initiation of therapy (p=0.011;AOR 4.3), and length of stay in hospital (p<0.043;AOR 1.8). Nephrotoxicity occurred in 8(5.2%) patients, seizures in 21(13.7%) and electrolytes imbalance was observed in 28(18.3%) neonates.

Conclusions: The use of colistin in preterm and extremely preterm neonates was found effective with reversible side effects through intravenous, inhalation and Intrathecal routes to treat Pan-Resistant/MDR-GNB.

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TASK SHARING MODEL FOR INTRAVENOUS IRON THERAPY FOR THE MANAGEMENT OF IRON DEFICIENCY ANEMIA DURING PREGNANCY: AN OBSERVATIONAL STUDY FROM PAKISTAN*Sahir Noorani, Sabahat Naz, Ishrat Fatima**Department of Pediatrics and Child Health, Aga Khan University*

Background: Primary healthcare facilities (PHCs) in low-resource settings are often understaffed. Thus, treating iron deficiency anemia is challenging, and task sharing with midwives could be effectively utilized to ensure access to treatment. This study assessed the use of Intravenous (IV) iron therapy by midwives among pregnant women in a community-based PHC facility in Karachi, Pakistan.

Material and Methods: This study was conducted at two PHCs where midwives administered IV iron therapy under telephonic supervision of an obstetrician. We retrospectively extracted data for all eligible women (Total 228) between February 2021 to March 2022. Pregnant women with Hemoglobin < 11g/dL, had a singleton birth, and Hemoglobin values available before and after treatment were included. Women who received at least one IV iron dose were classified as IV iron, whereas oral iron therapy was the standard of care group (114/group). McNemar test for matched pairs (parity and gestational age (+/- 1 week) at baseline Hb) was used to assess change in anemia status within groups.

Results: In IV iron group, 43% (n=49) women with moderate anemia at baseline shifted into normal-to-mild category, while 10.5% (n=12) women with severe anemia moved into moderate (4.4%, n=5) and normal-to-mild (5.3%, n=6) category after receiving treatment (McNemar p-value <0.001). In contrast, 52% (n=59) women with mild anemia in standard of care group remained same (39%, n=44) or worsened to moderate anemia (13.2%, n=15) (McNemar p-value < 0.16). No serious adverse events were reported in IV iron group.

Conclusion: Supportive supervision models such as task sharing using midwives within PHCs are an efficient way of improving access to care in low-resource settings.

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RELATIONSHIP OF CAFFEINE REGIMEN WITH OSTEOPENIA OF PREMATURETY IN PRETERM NEONATES: A COHORT RETROSPECTIVE STUDY*Gul Ambreen¹, Muhammad Sohail Salat², Kashif Hussain¹**¹ Department of Pharmacy, Aga Khan University**² Department of Pediatrics, Aga Khan University*

Background: Caffeine is a routinely prescribed pharmacological active compound in neonatal intensive care units (NICU) for treating apnea of prematurity (AOP), which also decreases the risk of bronchopulmonary dysplasia and cerebral palsy in neonates. Caffeine-induced excessive calcium loss can promote the development of metabolic bone disease (MBD) in preterm neonates. This study aimed to evaluate the effect of the caffeine regimen on the development of osteopenia of prematurity (OOP), using serum alkaline phosphatase (serum-ALP) concentrations as a surrogate marker at the 4th week of life.

Methods: This retrospective cohort study was conducted including neonates of < 32 weeks gestational age (GA) and birth weight < 1500 g, admitted to NICU from April-2017 to December-2018 and received caffeine therapy till 28 days of life for AOP. Based on serum-ALP levels, formed the high and low-ALP groups. Neonatal characteristics, caffeine regimen, risk factors for OOP, including duration of parenteral nutrition (PN), exposure to medicines associated with MBD, and intake of essential vitamins and minerals, were compared in both groups. Predictors of OOP were analyzed through logistic regression.

Results: From the total of 268 participants, 52 (19%) developed OOP, mostly female (61.5%). In the high ALP group, the serum-ALP levels were significantly higher than in the low-ALP group (725.0 ± 143.8 vs 273.6 ± 55.0 units/L, $p < 0.001$). The high-ALP group received significantly ($p < 0.001$) higher daily and cumulative caffeine doses and were associated with a higher likelihood of developing OOP in this study cohort [cumulative dose (mg) (AOR = 1.082 95% CI 1.011 to 1.157) and daily dose (mg/kg/day) (AOR = 2.892 95% CI 1.392 to 6.007)]. Smaller GA was found directly related to OOP. Among the other medical risk factors, phosphorus intake was significantly low in the high-ALP group. No, significant relationship between duration of PN and use of steroids and diuretics, and intake of vitamins and minerals were identified.

Conclusion: The daily and cumulative doses of caffeine and smaller GA are associated with the development of OOP in this study cohort. Clinical randomized control studies are needed to validate the outcomes and determine the range of safest and most effective caffeine doses for treating AOP in preterm neonates.

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PHARMACIST-DIRECTED VANCOMYCIN THERAPEUTIC DRUG MONITORING IN PEDIATRIC PATIENTS – A COLLABORATIVE-PRACTICE MODEL*Kashif Hussain 1, Muhammad Sohail Salat 2, Gul Ambreen 1**1 Department of Pharmacy, Aga Khan University**2 Department of Pediatrics, Aga Khan University*

Background: Therapeutic drug monitoring (TDM) of Vancomycin (VCM) is required to prevent inappropriate dosage-associated bacterial resistance, therapeutic failure, and toxicities in pediatrics. Anecdotal experience and studies show that many healthcare institutions confront barriers while implementing TDM services.

Aims & Objectives: This study aimed to assess a pharmacist-directed VCM-TDM service for optimizing patient care in our institution.

Standards/ Evidence/ Consensus Statement: Clinical Pharmacist can play a significant role of pharmacist directed TDM services to optimize the correct prescribing of initial VCM doses and dose adjustments.

Materials and Methods: Patients aged 1 month-18 years who received intravenous VCM were included in this quasi-experimental study. The pre-implementation phase (March-June 2018) consisted of retrospective assessment of pediatric patients, the interventional phase (July 2018 to February 2020) included educational programs and the post-implementation phase (March-June 2020) evaluated the participants based on pharmacist-directed VCM-TDM services as a collaborative-practice model including clinical and inpatient pharmacists to provide 24/7 TDM services. Outcomes of the study included the mean difference in the number of optimal (i) prescribed initial VCM doses (primary) (ii) dosage adjustments and (iii) VCM-sampling time (secondary). After ethical approval, data were collected retrospectively.

Results: A hundred patients were there in each phase. The number of cases who were correctly prescribed initial VCM doses was significantly higher in the post-implementation phase, mean difference of 0.22, [95% CI (0.142–0.358), $p < 0.0001$]. Patients who had correct dosage adjustments in the post-implementation phase also had higher statistical significance, mean difference of 0.29, [95% CI (0.152–0.423), $p < 0.05$]. More correct practices of VCM-levels timing were observed in the post-implementation phase, mean difference of 0.15, [95% CI (-0.053–0.264), $p = 0.079$].

Conclusion: This study showed the significant role of pharmacist-directed TDM services to optimize the correct prescribing of initial VCM doses and dose adjustments.

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PRACTICAL APPROACHES TO IMPROVE VANCOMYCIN-RELATED PATIENT OUTCOMES IN PEDIATRICS- AN ALTERNATIVE STRATEGY WHEN AUC/MIC IS NOT FEASIBLE.*Kashif Hussain 1, Muhammad Sohail Salat 2, Gul Ambreen1**1 Department of Pharmacy, Aga Khan University**2 Department of Pediatrics, Aga Khan University*

Background: Anecdotal experience and studies have shown that most pediatric patients fail to reach target therapeutic vancomycin trough levels (VTLs) and required higher total daily doses (TDD). This retrospective study aims to evaluate the frequency of hospitalized children who achieved target VTLs with a vancomycin (VNCO) dosing regimen of 40-60 mg/kg/d q6h and to assess the VNCO-TDD required to attain the target and their effects on clinical outcomes in pediatric patients.

Methods: After ethical approval, patients of 3 month-12 years were evaluated in this chart review study who received ≥ 3 intravenous-VNCO doses and appropriately drawn blood samples of VTLs between October 2019 to June 2020. Data were retrieved for demographic and clinical characteristics, culture reports, VNCO-regimen, subsequent steady-state VTLs, concomitant nephrotoxic medications, and serum creatinine. Clinical pharmacists made interventions in VNCO therapy and higher VNCO-TDD were used. Safety of higher vs standard daily doses and their clinical impact on duration of therapy, hospital stay, and survival were evaluated.

Results: A total of 89 (39.1%) patients achieved target VTLs (SD-group). The smallest proportion (18.2%) of 2–6 years patients achieved target VTLs and reported the lowest mean value of 10.1 ± 0.2 mg/L which was a significant difference ($p < 0.05$) from all subgroups. Subtherapeutic VTLs were observed in 139 (60.9%) cases (HD-group), who received higher VNCO-TDD of 72 ± 8.9 mg/kg/d q6h to achieve the targets. Duration of therapy in culture-proven septic patients was significantly ($p = 0.025$) longer in SD-group [18.4 ± 12.2 days] than HD-group [15.1 ± 8.9 days]. Nephrotoxicity and electrolyte imbalance were comparable in groups. Length of hospital stay was significantly ($p = 0.011$) longer [median 22 (range 8–55) days] in SD-group compared to HD-group [median 16 (range 8–37) days]. Number of patients survived in HD-group were significantly ($p = 0.008$) higher than SD-group [129 (92.8%) vs 75 (84.3%)].

Conclusion: Initial Vancomycin doses of 72 ± 8.9 mg/kg/day q6h are required to achieve therapeutic target in 3 months to 12 years patients. High doses are not associated with higher nephrotoxicity than reported with low doses. In addition, efficient pharmacist intervention for the use of higher VNCO-TDD may improve clinical outcomes in terms of duration of therapy, hospital stay, and survival.

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DETERMINING THE RELATION OF CHILDHOOD SEXUAL ASSAULT WITH THE DEVELOPMENT OF IRRITABLE BOWEL SYNDROME LATER IN LIFE - A SYSTEMATIC REVIEW

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Introduction: Childhood sexual abuse (CSA) is a prevalent issue worldwide. While its long-lasting impact on mental health is well-known, there is a paucity of information regarding other consequences that may extend beyond childhood, including irritable bowel syndrome (IBS). This study aimed to elucidate the association between CSA and IBS development later in life.

Methods: A comprehensive database search of MEDLINE (via PubMed), Scopus, Embase, Web of Science, and Google Scholar was performed to find relevant studies between 2001 and 2021. Data on the prevalence of IBS was meta-analyzed using a Mantel-Haenszel random effects model on RevMan (v5.4.1).

Results: A total of 7 observational studies (5 case-control and 2 cross-sectional) with 3,187 participants were included in this review from a pool of 7748 unique records. Using the Newcastle-Ottawa scale, 3 studies were determined to be of high quality, 2 studies of fair quality, and 2 studies of poor quality. The pooled odds ratio denoting the association between CSA and IBS was 1.87 [95% CI: 1.56, 2.26]. The prevalence of IBS in the CSA group was 51.86% while it was 36.74% in the non-CSA group.

Conclusion: Data from the current literature suggests CSA is significantly associated with the development of IBS, further strengthening the argument that CSA can lead to long-term detriments extending into adulthood. However, there is no existing literature that stratifies other aspects of IBS, including symptom severity, on the basis of childhood sexual abuse exclusively, so high-powered prospective studies are needed to further shed light on this topic.

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LONG-TERM HEALTH IMPAIRMENTS IN SURVIVORS OF SEVERE AND CRITICAL COVID-19 INFECTION, DISCHARGED FROM A TERTIARY CARE HOSPITAL.

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Objective: We aimed to prospectively investigate long-term health impairments in survivors of severe and critical COVID-19 infection, discharged from a tertiary care hospital. This will help us in planning safer discharges and pre-emptive rehabilitation of affected patients.

Methods: This prospective cohort study of longitudinal follow-up was conducted at the Aga Khan University Hospital and included patients above 18 years of age admitted between 1st January and 30th June 2021. A total of 503 confirmed cases admitted to AKUH wards were interviewed (after a year of their discharge) and analysis was done on 481 patients after excluding expiries. The disease was categorized into three groups according to the severity of the disease that is non-severe, severe, and critical.

Results: The mean age of the study population was 56.9±14.3, majority (61.7%) were males with diabetes as the most common comorbid condition. Out of 481 patients, 35.2 %, 40.5 % and 24.5% had non-severe, severe, and critical disease respectively. Majority (65%) of the patients were asymptomatic at the time of the interview, with the highest number of patients in the non-severe group. There were new/worsened/persistent symptoms related to illness in 23% of the interviewees and this was more common among the patient with severe/critical disease. The most prevalent symptoms that persisted even after a year following infection was fatigue (35%) and breathlessness walking upstairs (23%). Fatigue was more common among patients with critical disease (52%) as compared to patient with severe (38%) and non-severe disease (20%). Around 3.1% and 4.3% of the severe and critical patients respectively became NYHA 4 as compared to 0-0.5% previously. By 60 days following discharge, 187 patients were able to resume their jobs. The highest impact of emotional and financial challenges was observed in patient with critical disease with 43.6% and 40.2% survivors reporting emotional and financial difficulty respectively.

Conclusions: Our study observed that even after one-year COVID-19 survivors continued to have debilitating symptoms and functional status with significant financial and emotional impact on their lives. Patients with severe and critical disease had more symptoms and higher readmission as compared to the non-severe cohort.

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TRENDS IN RHEUMATOID ARTHRITIS: AN OBSERVATIONAL STUDY FROM A LOW MIDDLE INCOME COUNTRY

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Introduction: Rheumatoid Arthritis (RA) is one of the most common forms of inflammatory arthritis. It is associated with pain, functional decline, poor quality of life, frequent hospitalizations, and mortality. This study aimed to determine temporal trends in RA hospitalization from 2010 to 2019.

Methods: Retrospective observational study using inpatient hospital database was conducted from 2010 to 2019 using ICD-9 codes. All adult (> 18 years) admitted with either primary or secondary diagnosis of Rheumatoid Arthritis were included.

Results: A total of 3236 patients were admitted with a primary or secondary diagnosis of RA. The mean age was 57.36 ± 14.85 with a female preponderance of 78.7%. The majority (55%) of the patient population had an age between 41-65 years. Most of the patients (60.48%) were admitted through the emergency room and amongst admitted majority (87.74%) had a secondary diagnosis of RA. More than half of the patients (58.6%) had a length of stay of 0-3 days. Admission through the outpatient department were highest (77.14%) in patients who had a primary diagnosis of RA. A total of 173 patients died in our cohort and all of them had RA as a secondary diagnosis. Infections (17.92%) and complications of RA (11.7%) were the most common cause of death in our study population. Age, pancytopenia, autoimmune hemolytic anemia, thrombocytopenia and interstitial parenchymal lung with mortality on Univariate Analysis while admission from ER(OR 6.7; 95% CI[4.0-11.3]), re-admission (OR 1.5; 95%CI:[1.1-2.1]), length of stay > 7 days (OR 5.7; 95% CI[3.9-8.3]), RA vasculitis (OR 5.9; 95% CI [2.8-12.8]), pleural effusion(OR 6.1; 95%CI [3.7-10.0]) were found to be significant on multivariate analysis.

Conclusion: The trends show an increase in the number of hospitalizations in RA patients from 2010 to 2019 and an increase in the mortality of patients with a secondary diagnosis of RA. The substantial rise in hospitalization from RA is of concern indicating the raised prevalence of RA in LMICs.

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ACUTE UPPER GASTRO-INTESTINAL BLEED IN DIFFERENT AGE GROUPS: FREQUENCY, FACTORS, AND OUTCOMES

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Objective: Data comparing the causes and contributing factors of acute upper gastro-intestinal (GI) bleed between the various age groups is scarce. This article focuses on the frequency, contributing factors, and outcomes of acute upper GI bleed in elderly versus middle-aged versus younger individuals.

Methods: A total of 509 patients, aged eighteen years and above presenting with acute upper GI bleed were included in this study. Patient's co-morbid conditions, presenting complaints, laboratory workup, endoscopic findings, treatment given, including any intervention done: medical/ endoscopic/ surgical/ radiological were noted from patient's medical records.

Results: The majority (62%) admissions were in elderly cohort (mean age 73.9 ± 8.8 years) with male predominance. Around 57% of the patients suffering from acute upper GI bleed secondary to variceal pathology belonged to middle aged cohort. The gastric/duodenal ulcer bleeding was the common cause of bleeding in the elderly individuals. Thrombocytopenia (27.9%) and coagulopathy (14%) were the frequently observed underlying risk factor in the younger population. The mortality rate was around 13.8%, however according to the age groups there was no statistically significant difference in the mortality.

Conclusion: Acute upper GI bleed is more frequently seen in elderly male population with non-variceal source of bleeding as the most common underlying cause. The frequency of peptic ulcer disease and duodenal ulcer disease as the cause of upper GI bleed was seen to rise with increasing age. However, the present study reported no difference in the mortality when age groups were compared.

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NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN AS A PREDICTOR OF ACUTE KIDNEY INJURY IN CHILDREN WITH SHOCK: A PROSPECTIVE STUDY

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Background: The current definition of acute kidney injury (AKI) is based on serum creatinine (SrCr) and urine output, limited by delayed identification of such patients. Plasma neutrophil gelatinase-associated lipocalin (NGAL) is considered an early diagnostic and highly predictive biomarker of AKI.

Objective: To determine the diagnostic accuracy of NGAL compared with creatinine clearance for early detection of AKI in critically ill children.

Study Design and Methods: Prospective, single-center observational study was conducted at pediatric intensive care unit (PICU) between May 2016 to April 2018. All critically ill children aged 1-month to 16 years, requiring inotropic support were enrolled. SrCr and NGAL values were obtained at three time points; 6, 12, and 48 hours after vasopressor initiation. Patients with AKI were defined as having loss of >25 % renal function based on creatinine clearance within 48 hours. NGAL level of more than 150 ng/dl was suggestive of the diagnosis of AKI. Data was analyzed on SPSS V22. Receiver operator characteristic curves (ROC) were generated for NGAL and SrCr to compare the predictive ability of both at 6, 12, and 48 hours of starting vasopressor support.

Results: A total of 94 patients were enrolled. The mean age was 43.41 ± 50.95 months with 60% (n=56) males. Most common primary admitting diagnosis was related to cardiovascular system 46% (N=43) and Septic Shock 21% (N=20). 36% (n=34) developed AKI within 48 hours following shock and 31% (n=29) died during hospital stay. The median length of hospital stay was 12 days (7-21). The AUC for NGAL at a cutoff of 150ng/ml was 0.70, 0.74, and 0.73 at 6-hour, 12-hours, and 48-hour, respectively. NGAL had a sensitivity of 85.3% and specificity of 50% at 0 hours of follow-up for diagnosis of AKI. While comparing pRIFLE and NGAL for AKI, NGAL diagnosed 29 and 20 more patients than pRIFLE at 12 and 48 hours.

Conclusion: Serum NGAL has better sensitivity and AUC compared to SrCr for early diagnosis of AKI in children admitted with shock.

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COMPARISON OF CHEMILUMINESCENCE IMMUNOASSAY (CLIA) WITH THE MICROBIOLOGICAL ASSAY (MBA) TO PREDICT FOLIC ACID DEFICIENCY IN WOMEN OF REPRODUCTIVE AGE (WRA)

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Background: Anemia caused by folic acid deficiency is widely prevalent in the developed world and affects mostly women of reproductive age (29.9%) and children < 5 years of age (42.2%) living in low- and middle-income countries. Rapid advancements in diagnostic technologies in the last few decades have made CLIA, the most adapted technique in clinical laboratories due to its higher throughput and ease of analysis. CDC-USA recommends microbiological assay (MBA) or LCMS-MS to accurately measure folate concentrations in human body fluids.

Objective: To assess the reliability between the automated CLIA and the recommended MBA in predicting folic acid deficiency in WRA.

Method: We conducted a comparative study on 11825 serum samples of WRA collected in the National Nutrition Survey of Pakistan (NNS-2018). We have compared CLIA with MBA for the estimation of serum Folic Acid.

Results: The inter-assay reliability (kappa-coefficient) between CLIA and MBA assay was found to be 0.016 which shows poor to no correlation between the two assays. The ability of the CLIA assay to diagnose folic acid deficiency reported by the MBA assay (<3 ng/mL) was found to be 3.4% only. 43.19% of the samples that were reported to have elevated serum folate concentration (>17 ng/mL) by MBA were all reported to have elevated folate levels by CLIA assay as well.

Conclusion: Our results showed that CLIA failed to detect serum folate deficiency in our population and may not be used in high folic acid deficiency endemic regions, such as Pakistan, and should be replaced with a better assay like MBA.

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TREATMENT OF PEDIATRIC BURN SCARS WITH LASER THERAPY*C. Sedaros¹ , J. Kovacevic¹ , L. Indelicato² , S. Larson² , S. Islam³**¹University of Florida, College of Medicine, Gainesville, FL, USA**²University of Florida, Division of Pediatric Surgery, Gainesville, FL, USA**³ Department of Surgery, Aga Khan University*

Introduction: Among pediatric patients who have experienced burn injuries, scarring is a significant issue both functionally and psychologically. Scars may become hypertrophic, and contracture formation causes limitations to functionality. The purpose of this study was to understand the impact of laser therapy in children.

Methods: A retrospective cohort study of patients aged 20 and younger who underwent laser therapy for the treatment of burn scars at our institution was performed. Data regarding demographics and details of the burn, and laser settings were collected. Scars were assessed before and after the initiation of laser therapy.

Results: Out of a total 63 patients, 55.7% were male, and 60.3% White, while 26.98% were Black. The most common burn etiology was flame / contact type (58.7%), with 87.3% requiring grafting. 41 (65%) had >10% TBSA burns, with a mean of 14.5%. Scar development was noted at around 18 weeks after injury (6-81 week range). The average age at first laser treatment was 9.8, and this was 2 years after injury. 42 (66.7%) had contractures and the location involved large joints in almost a third of cases, while 33 (52.3%) reported limitation of ROM. Of the subgroup of patients with early outcomes reported, 98.4% (n=18) had improved ROM, 100% (n=19) had softening of their contracture, 80.7% (n=26) had reduced scar thickness, and 82.6% (n=23) had improvement in color of scar. 27% of patients failed to complete the therapy, while 57% were still undergoing laser.

Conclusion: Scar formation in children with burns occurs up to 2 years after injury, with ones that require grafting at highest risk. Laser therapy was successful with improved elements of the scar as well as function and should be considered as an important adjunct to improve long term outcomes for children. Following long term results will be critical in the future.

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ASSOCIATION OF MICRONUTRIENT DEFICIENCY WITH THE NON-EFFICACY OF PNEUMOCOCCAL IMMUNIZATION IN PAKISTANI CHILDREN UNDER FIVE YEARS OF AGE.

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Background: Immunization is one of the most effective and affordable public health interventions to prevent vaccine-preventable diseases. It is evident that immunomodulation needs multiple essential micronutrients like vitamins and trace metals which are crucial at every phase of immunity building.

Worldwide, around 14% of all fatalities in children < 5 are caused by pneumonia which could be avoided through vaccinations

Objective: To evaluate whether serum zinc and vitamin D deficiency play any role in pneumococcal vaccine failure.

Methods: We retrieved data from 43,279 children <5 years of age (fully immunized) from the archives of the National Nutritional Survey of Pakistan (NNS, 2018). The onset of pneumonia was considered evidence of pneumococcal vaccine failure. The association between the non-efficacy of the pneumococcal vaccine and blood levels of zinc and vitamin D were assessed in these children.

Results: Overall, the incidence of pneumococcal infection was found to be 2.6%, whereas diarrhea and fever which are not candidly linked to pneumococcal vaccinations occurred in 7.7% and 13.0% of the children respectively. However, the difference between the incidence of pneumonia and other diseases (i.e., fever and diarrhea) was found to be statistically significant ($p < 0.00001$). Zinc and vitamin D deficiency were significantly associated with pneumococcal vaccine failure at a 95% confidence level.

Conclusions: The significant association found between micronutrient deficiencies and pneumococcal vaccination reflects that micronutrient deficiency may reduce vaccine efficacy. Thus, optimal nutritional status is important for successful immunization programs.

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ASSESSING THE SEVERITY OF PANCREATITIS IN CHILDREN

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Introduction: Acute pancreatitis is a well-studied disease process in the adult population and majority of cases are mild, however, complications of severe pancreatitis including pancreatic necrosis, abscess formation, pseudocyst formation, and hemorrhage can occur. Although pancreatitis most often presents in adult patients, children are also affected and it is poorly understood - this study looks at our experience.

Methods: We performed a retrospective review of all patients ages 2 years through 20 years with acute pancreatitis. Data regarding demographics and clinical care were collected. Severe pancreatitis was defined as requiring intensive care unit (ICU) admission, while mild pancreatitis was defined as tolerating admission to the medical/surgical floor.

Results: Of the 132 patients included in this study, the mean age was 14.2 years. The study population was predominantly female (57.6%), white (62.9%), and publicly insured (62.9%). Thirty-two (24.2%) patients required ICU admission and were categorized as “severe”. Compared to the mild cases, severe pancreatitis patients were more likely to be Black or African American, had fewer previous episodes of pancreatitis, had more comorbidities, and were more likely to have diabetic ketoacidosis as the etiology. Severe pancreatitis patients were less likely to be started on an oral diet initially (46.9% vs. 93.0%) and were more likely to experience complications during their hospital stay (43.8% vs. 3.0%). There were 4 deaths in the severe pancreatitis group compared to 0 deaths among mild cases.

Conclusion: Severe pancreatitis is rare in children but carries significant morbidity and potential mortality. Children that require ICU admission due to initial physiologic derangement face a much higher risk of complications during their hospital stay. Further understanding of severe pancreatitis in children will be important going forward to assist in disease prevention and risk stratification.

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PUBLICATIONS IN PEDIATRIC CRITICAL CARE MEDICINE: TRENDS FROM PAKISTAN

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Background: Pediatric Critical Care Medicine (PCCM) is a relatively nascent yet rapidly evolving field in low-middle-income countries (LMIC) with an associated increase in scientific publications.

Objective: To analyze the characteristics of literature on PCCM research and education published from Pakistan

Study Design and Methods: We conducted bibliometric analysis of literature pertaining to PCCM published between January 2010 and December 2021 from Pakistan. A comprehensive search was conducted through Medline, Google Scholar, and PakMediNet (a Pakistani medical repository). The search strategy included the following free text and MeSH terms: “pediatric critical care medicine Pakistan” OR “Pediatric Intensive Care Unit Pakistan” OR “critically ill children Pakistan” OR “critically injured children Pakistan” OR “children Pakistan.” Data was extracted on a structured spreadsheet, and bibliometric analysis was performed. A p-value of <0.05 was considered statistically significant. Common keywords extracted from bibliographic database files from PubMed and a frequency network was mapped using VOSviewer (version 1.6.18).

Results: The search strategy yielded a total of 7514 papers, out of which 146 articles were identified to meet the inclusion criteria. These were published in 51 journals (13.3 per year). Most of the studies were descriptive and related to clinical profiles and outcomes. Around 73.3% (n=107) articles were published as original articles, 65.8% (n=96) of the articles were published in PubMed-indexed journals and one-quarter of the articles 24% (n=35) were published in locally indexed journals. 69.4% (n=100) were published from five pediatric intensive care units in Karachi (the largest city) and 56% (n=81) of the total publications were contributed by a single private sector hospital. The total citation count was 1072, with two articles receiving more than 50 citations. There was a linear trend with some skewing and an annual growth rate of >15%.

Conclusion: PCCM-related publications from Pakistan showed positive linear growth. Most publications were descriptive clinical studies with a paucity of multicenter studies, RCTs, and high-impact publications highlighting a need for quality and impactful research work and rigorous research training for fellows.

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ANIMAL RELATED INJURIES IN CHILDREN – BARKING DOGS DO BITE*M.T. Wnuk² , J. Thielhelm² , R. Petrozel¹ , S. Islam³**1UF Health Shands Hospital, Department Of Pediatric Surgery, Gainesville, FL, USA;**2University Of Florida, College Of Medicine, Gainesville, FL, USA**3 Department of Surgery, Aga Khan University*

Introduction: Animal bites are one of the leading causes of emergency room visits in children. These injuries can result in substantial morbidity manifesting in both physical and traumatic stress disorder. Patterns of injuries as well as the inflicting animal vary, and we hypothesize that age plays a role in the distribution and severity of injury. The purpose of this study was to better understand the injuries sustained, animals involved, and potentially recognize modifiable events.

Methods: Following IRB approval, a retrospective cohort analysis of all children presenting with animal bite injuries over 10 years was performed. Data regarding the clinical presentation, demographics, and outcomes were collected and analyzed. The cohort was divided into 0-5 years of age and greater than 6 years, and comparative statistics performed.

Results: Out of 173, 167 (96.5%) bites were canine. A majority of cases were male (60.7%), less than 5 years old (52.6%), white (79.2%), and had public insurance (74.6%). The bites tended to occur at home (59.0%) and with dogs that were known (81.5%), and 62% presented directly to our facility. Of the known breeds, Pit bull comprised 57.6% (72/125). The patients less than 5 years age had a significantly higher proportion of white children, home attacks, and head and neck wounds compared to the older cohort. Older children had significantly higher number of learning disabilities and extremity wounds. A majority (57%) required operative repair under general anesthesia. 64.2% of patient's wounds required follow-up.

Conclusion: This is one of the largest series of canine injuries in children. We noted that the most common victim is a young, white boy attacked at home by dogs known to them. Younger patients had a higher proportion of head and neck bites. Education of parents and pit bull owners may ameliorate these events. Multi center studies would help understanding better.

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RESTORATION OF PARTIAL DENTULISM WITH OVERLAY PARTIAL DENTURE IN BRUXIST PATIENT WITH ORAL SUB MUCOUS FIBROSIS (OSF) – A CLINICAL REPORT

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Background: Patients with Oral Submucous Fibrosis (OSF), a pre-malignant condition presenting with limited mouth opening, pose a challenge to increase occluding vertical height in advanced stages as a consequence of fibrosis of buccal mucosa and related hypo-vascularity of soft tissues. This case report describes prosthetic rehabilitation in such case with an overlay-removable partial denture.

Objective: Restoration of a partially dentate patient with severely resorbed distal free-end residual alveolar ridges presenting with a history of oral sub-mucous fibrosis with severe dental attrition due to bruxism.

Method: A 44 years old diabetic male patient, requesting replacement of missing teeth as he faces difficulty in chewing was found to have OSF consistent with past history of betel nut chewing and smoking, leading to limited mouth opening of 30 mm. The challenge in restoring the occlusion was further increased as no loss of freeway space was encountered owing to dento-alveolar compensation. After stabilizing the patient's periodontal health, and removal of non-restorable teeth, the mandibular arch was restored with Kennedy's class II mod 1 acrylic removable partial denture (RPD) opposing an acrylic overlay-RPD with acrylic overlay on the incisal edges of remaining anterior teeth of the Kennedy's class I maxillary arch.

Result: The patient reports comfortable use of the overlay acrylic RPD, and continues to follow-up in clinic for review with occasional chipped off acrylic of the overlay, which is repaired at chairside. A transition of maxillary acrylic overlay-RPD with cast RPD having porcelain overlay over the incisal edges of anterior teeth is planned and being executed for the patient as a definitive prosthesis for rehabilitation.

Conclusion: Overlay removable partial denture (O-RPD) can serve as a viable option for restoring function in a partially dentate patient whose remaining dentition has suffered from extensive attritional wear. It can be effectively executed to rehabilitate patients with low socio-economic status.

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DIAGNOSING RESPIRATORY PATHOLOGIES WITH POINT OF CARE LUNG'S ULTRASOUND IN PEDIATRIC INTENSIVE CARE UNIT AT AGHA KHAN HOSPITAL, KARACHI, PAKISTAN

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Background: Respiratory pathology is one of the major causes of admissions in the pediatric intensive care unit (PICU). These patients frequently require thoracic imaging, however, portable chest x-ray (CXR) has its limitations and high-risk of radiation exposure.

Objective: To determine sensitivity and specificity of point of care lung ultrasound (LUS) in detecting lung pathology compared to CXR and clinical diagnosis in children admitted in PICU requiring respiratory support.

Study Design and Methods: A cross sectional analytical study was conducted at the PICU of a tertiary care hospital. Children aged 1-month to 18 years admitted in PICU requiring respiratory support from June 2018 to February 2019 were enrolled. LUS was performed by a single sonologist (within 24-hour window period of CXR) using previously described protocol scanning six zones of lungs. Images of LUS and CXR were reviewed by two providers independently. Receiver operating curve was generated to determine predictive ability of LUS taking CXR as gold-standard.

Results: A total of 220 LUS were performed on 117 patients, 195 (88.6%) examinations were completed. Admitting diagnosis was respiratory disease 149 (67.7%) and cardiovascular diseases 50 (22.7%). LUS and CXR were reported normal in 24 (10.9%) and 21(9.5%) studies respectively. Sensitivity and specificity of LUS compared to CXR was 89.95% and 19.05% respectively; Sensitivity was highest in age groups 2-12 months (92%) and for the diagnosis of pneumonia (62%). LUS sensitivity and specificity compared to clinical diagnosis was 72.7% and 95.7% for acute respiratory distress syndrome (ARDS) and 59.8% and 54.3% for pneumonia. CXR and LUS findings showed an agreement of 0.95 and 0.86 respectively. Agreement between CXR and LUS was highest for diagnosis of ARDS (0.48) and lowest for pulmonary edema (-0.036). Agreement between LUS and clinical diagnosis 0.63 for ARDS and 0.11 for pneumonia.

Conclusions: LUS can be safely performed in a PICU of a low resource setting, it is modestly sensitive for diagnosis of different respiratory pathologies compared to clinical and CXR diagnosis.

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ASSESSING ACCURACY OF ARTIFICIAL INTELLIGENCE MODELS FOR GESTATIONAL AGE ESTIMATION: A SYSTEMATIC REVIEW AND META-ANALYSIS*Sabahat Naz, Sahir Noorani, Ali Jaffar**Department of Pediatrics and Child Health, Aga Khan University*

Estimating reliable gestational age (GA) is essential to provide appropriate care during pregnancy and to the newborn. Several publications on the use of artificial intelligence (AI) models to provide accurate GA using ultrasound images have been made. This review aims to synthesize the evidence on the use of AI models to estimate GA using ultrasound as the gold standard.

A literature search was performed using PubMed, CINAHL, Wiley Cochrane Library, Scopus, and Web of Science databases. Studies that reported the accuracy of AI models for GA estimation on ultrasound images were included. Risk of bias assessment was performed using Quality Assessment for Diagnostic Accuracy Studies-2 (QUADAS-2) tool. We performed meta-analysis on four studies based on the trimesters, external validation, and input measures to present pooled means with CIs in the form of forest plots using STATA version 17.

Out of the 935 studies screened, ten were included. Three studies (30%) were from high-income, two (20%) from upper-middle-income, and one (10%) from low-middle-income countries. The remaining four studies (40%) used data across different income regions. The pooled mean error in GA estimation throughout the trimesters was 4.22 days (CI: 0.71, 7.73), whereas 7 days (CI: 6.08, 7.92), during the first trimester, 1.56 days (CI: 1.01, 2.11) during the second, 4.40 days (CI: -2.70, 11.50) during the third, and 5.93 days (CI: -2.88, 14.74) during the second and third trimesters. The risk of bias assessment for patient selection and flow and timing assessments was low in 50% (n=5) and 80% (n=8), respectively. Index and reference test interpretation bias was unclear in nine studies (90%). None of the studies had a high risk of bias in any domain.

Preliminary experience with AI models shows promising performance to accurately assess GA and holds tremendous potential in resource-poor settings where trained sonologists may be limited or difficult to access.

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CLINICAL FEATURES, OUTCOMES, AND PREDICTORS OF MORTALITY IN HEPATIC HYDROTHORAX- A STUDY FROM LOWER MIDDLE-INCOME COUNTRY

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Background: Literature on hepatic hydrothorax(HHT) in Pakistan is scarce. This study was conducted to determine clinical features, management, outcomes of HHT and association with Child-Pugh scoring system and Model for End-Stage Liver Disease(MELD)score.

Methodology: A 10-year retrospective cross-sectional analysis of patients admitted in a tertiary care hospital in Karachi, Pakistan from 2011-2021. Outcomes were measured by length of stay, in-hospital and 30-day, 90-day and 1-year mortality, recurrence and/or readmission.

Results: Total 70 patients were included; mean age was 58.9 ± 10.2 years and 51.4% (31) were male. Hepatitis C was most common cause of CLD in 62.9% (44), hepatitis B in 7.1% (5); 21.4% (15) had Non-B Non-C CLD and alcoholic liver disease in 5.7% (4). Ascites was present in 92.9% (65), 82.9% (58) had right-sided effusion, 11.4% (8) left-sided and bilateral in 5.7% (4). Median MELD score was 22 (16-27). Median pleural fluid LDH levels was 118 IU/L (IQR (78.75-211) and median pleural fluid protein levels was 1.2g/dl (IQR 0.80-1.75). Medical management was done in 97.1% (68), thoracentesis 84.3% (59), 31.4% (22) had pigtail-catheter insertion and 5.7% (4) patient required chest tube. Post-procedure complications were observed in six patients and four patients developed hydropneumothorax (5.7%). Median length of hospital stay was 5 (IQR 3-7) days. The 30-day mortality rate was 25.7% (13); among whom 18.6% (13) died during hospital stay. Recurrence of hydrothorax during hospital stay or after discharge was observed in 58.6% (41) and readmissions were required in 54.3% (38). Although there was no significant difference in median MELD scores of patients who developed recurrence [22.0 (IQR 14-27) vs 22 (IQR 14.25-27.25) p=0.937] and with 30-day mortality [25.0 (IQR 22-28.5) vs 22.0 (IQR (14-27) p-value 0.076)], patients with MELD score >20 had a higher mortality rate (35.7% vs 10.7% p-value 0.019). Patients with Child-Pugh Class C disease also had a statistically significant higher mortality rate (94.4% vs 5.6% p-value 0.026).

Conclusion: There was a high recurrence and mortality rate of HHT in our patient population which highlights poor outcomes of HHT. Child-Pugh and MELD scoring system can be utilized as predictors of mortality in Pakistani patients with HHT, although larger scale prospective studies are required to assess their role as prognostic scores in HHT.

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COVID-19 INFECTION AMONG VACCINATED AND UNVACCINATED: DOES IT MAKE ANY DIFFERENCE?

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Objective: There is a probability that vaccination may lead to reduction in the severity and complications associated with COVID-19 infection among hospitalized patients. This study aimed to determine the characteristics, clinical profiles, and outcomes of COVID-19 infection in vaccinated and non-vaccinated patients.

Design and data sources: This prospective observational cohort study was conducted at the Aga Khan University Hospital (AKUH) and recruited COVID-19 patients admitted between June 1st and September 30th, 2021. Patients' demographics, date of admission and discharge, comorbid conditions, immunization status for COVID-19 infection, presenting complaints, lab workup and computed tomography (CT) scan findings were obtained from the medical records. The primary outcome of the study was patients' condition at discharge and the secondary outcomes included level of care, length of stay (LOS), requirement of non-invasive ventilation (NIV) and inotropic support.

Results: Among a cohort of 434 patients, 37.7% (n = 164), 6.6% (n = 29) and 55.5% (n = 241) were fully vaccinated, partially vaccinated, and unvaccinated, respectively. Around 3% and 42.9% of the patient required inotropic and NIV support respectively; however, there was no discernible difference between them in terms of vaccination status. In case of unvaccinated patients there were significantly increased number of critical care admissions (p-value 0.043). Unvaccinated patients had significantly higher median serum procalcitonin, ferritin, LDH and D-dimer levels. Around 5.3% (n = 23) of the patient required invasive ventilation and it was more common in unvaccinated patients (p-value 0.04). Overall, mortality rate was 12.2% (n = 53) and this was higher (16.2%, n = 39) in unvaccinated patients as compared to fully vaccinated patients (6.1%, n = 10, p-value 0.006).

Conclusions: Through this preliminary data, we can conclude that patient can develop severe and critical COVID-19 infection despite being vaccinated but this proportion is low as compared to unvaccinated population. So, uninterrupted endeavors need to be done to vaccinate as many individuals as possible. Furthermore, more effective vaccinations need to be developed to lessen the high death toll of COVID-19 infection.

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CAN WE QUANTIFY THE VALUE CREATED BY POSTERIOR CERVICAL DECOMPRESSION AND FUSION?*Daniyal Mansoor Ali¹, Sheza Hassan²**1 Department of Neurosurgery, Thomas Jefferson University Hospital, Philadelphia, PA**2 Center of Excellence for Trauma and Emergencies, Aga Khan University*

Introduction: To determine value in healthcare delivery, spine surgeons need to understand their outcomes in the context of true intraoperative costs.

Objectives: To evaluate intraoperative costs using time-driven activity-based costing (TDABC) and combine these costs with patient-reported outcome measures (PROMs) for posterior cervical decompression and fusions (PCDFs).

Methods: Components of total intraoperative costs and its major drivers were assessed using TDABC. To assess outcomes, Neck Disability Index (NDI) and Visual Analogue Scale (VAS) were used. Paired t-test was used to compare NDI and VAS pre- and postoperatively. The percentage change in NDI and VAS were correlated with total intraoperative costs. A novel metric (Value Index) – the dollars spent for a one percent improvement in NDI and VAS - was calculated.

Results: The average total intraoperative cost per case was \$11,725 ± \$2,027 and \$15,446 ± \$3,669 for CT junction sparing versus crossing PCDFs, respectively. Average preoperative VAS scores (5.29 ± 2.54) decreased at 6 weeks (3.40 ± 2.17, 41.75%, p<0.001), 3 months (4.00 ± 2.47, 31.16%, p=0.06), and 6 months (3.67 ± 2.57, 26.25%, p=0.02), postoperatively. Similarly, preoperative NDI scores (19.65 ± 8.70) decreased at 6 weeks (18.56 ± 8.74, 1.35%, p=0.44), 3 months (13.39 ± 9.14, 17.26%, p=0.01), and 6 months (17.00 ± 10.27, 5.02%, p=0.25), postoperatively. Both VAS (R² = 0.0264 at 6 months post-op) and ODI scores (R² = 0.2013 at 6 months post-op) weakly correlated with total intraoperative costs. To reduce VAS and NDI by one percent postoperatively, the average dollar amount spent was \$425.70 and \$4,558, respectively (Value Index).

Conclusion: A significant reduction was observed in VAS and NDI scores in patients undergoing PCDFs. PROM scores weakly correlated with total intraoperative costs. We also introduce a Value Index for PCDF - a higher dollar amount was required to reduce NDI scores by one percent after surgery, as compared to VAS scores.

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ECHOCARDIOGRAPHIC FINDINGS, CORRELATION WITH CARDIAC BIOMARKERS AND THEIR PROGNOSTIC SIGNIFICANCE IN PATIENTS WITH COVID-19 INFECTION

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Background: There is scarce data on echocardiographic findings in COVID-19 from Pakistan. This study was done to evaluate the spectrum of echocardiographic findings in COVID-19 patients and their correlation with cardiac biomarkers. Indications and subsequent changes in management were also assessed.

Methodology: Patients with at least one SARS-Cov2 RT-PCR positive result having undergone TTE were included. Echocardiography was performed by Echo technologists using portable machines. Findings were reported in electronic health care records and were reviewed from March to July 2020. Patients with poor echocardiographic windows or incomplete records were excluded.

Results: Total 125 patients were included in the study. Majority 63.2% (79) were male and 19.4% (24), 33.6% (42), and 47.2% (59) had mild, moderate and severe COVID-19 respectively. Critical COVID-19 and patients on invasive mechanical ventilation were 21.6% (27). Mean peak Troponin levels were 4.48 ± 20.07 ng/ml, median peak C-Reactive Protein levels were 135mg/l (IQR 63.65-191), median Pro-BNP levels 842 (IQR 205-2971) and peak D-Dimer levels were 3.75 ng/ml (IQR 1.00-9.125). Evidence of new myocardial infarction was reported in 12% (15) and evidence of myocarditis in 24.8% (31). Segmental left ventricular wall motion abnormalities were observed in 10.4% (13) and global changes in 6.4% (8). 16% (20) patients had change in management after TTE. Only 5 patients had prior echocardiogram available for review and among these, new findings were present in 3 patients. Using spearman correlation, weak inverse relation was found between ejection fraction and troponin ($r=0.367$, $p\text{-value}<0.001$), peak CRP ($r=0.238$, $p=0.009$), peak D-Dimer ($r=0.27$, $p=0.003$) and pro-BNP levels ($r=0.281$, $p=0.003$). Approximately 17.6% patients died and there was no statistically significant difference in mortality rate among patients with normal and impaired LV systolic function (15.4% vs 28.6%).

Conclusion: LV function assessment was most the common indication for TTE and was normal in majority of the population. There was a weak co-relation of LV function with cardiac biomarkers. Echocardiographic evaluation resulted in a change in management in less than one-third of patients. Further studies are required as data on echocardiographic abnormalities in COVID-19 patients in Pakistan is scarce.

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CLINICAL EFFICACY OF SIMULATION BASED TRAINING IN A LOW MIDDLE INCOME COUNTRY: FROM BEDSIDE TO WEB-SIDE

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Telemedicine (TM) and virtual care have evolved from a low volume, niche service to a significant part of medical care. This study aims at developing an innovative curriculum to prepare medical providers for the practice of TM, through real-time audiovisual interaction with standardized patients (SPs).

10 medical residents were selected randomly from the department of Emergency medicine (EM), Anesthesia and Surgery (GS) in a tertiary care teaching hospital in Karachi. All participants were asked to send in a videoclip of themselves talking in camera. After taking consent, a pre-session survey was filled by all participants and videos were played to analyze the logistics of audiovisual presentation. TM curriculum developed based on PEARLS healthcare debriefing tool was executed during the session. 4 modules of course included 1) On-camera etiquette, 2) Communication skills, 3) Physical exam skills, and 4) Patient safety. Each participant had 2 clinical cases i.e., Upper respiratory tract infection and Urinary tract infection on zoom with SPs in the institutional simulation center. Each case was followed by a debriefing in terms of PEARLS tool i.e., Setting the scene, Reaction, Description, Analysis, and Summary. At the end of session, post-test survey was conducted to assess usefulness and efficacy of training.

Out of 10 participants, 60% were male, and their areas of specialty were EM(70%), Anesthesia (10%), GS (10%), and Artificial intelligence (10%). 60% of them were residents in training, while rest were attendings or senior instructors. 70% of them had no previous exposure to TM and remaining had a one-time exposure during clinics. By the end of session, the percentage of participants wanting to practice TM increased from 20% to 90%. They all agreed at the end that communication skills required in TM are different from that of in-person (50% to 100%). All the participants felt more confident to present themselves professionally on camera and believed that they can communicate effectively (50% to 100%). Most significant improvement was observed in their confidence to conduct physical exam and evaluation (10% to 100%) using TM and its effectiveness to treat patients (60% to 100%).

TM training can alter the course of care as an efficacious and useful tool especially for far flung areas with limited resources and enhance the confidence of physicians to provide care online.

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ACCEPTABILITY AND FEASIBILITY OF AMBULANCE BASED MHEALTH FOR PEDIATRIC EMERGENCIES IN A LOW RESOURCE SETTING

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Globally, half of all 6.2 million deaths in children are caused by acute illnesses occurring primarily in low-middle income countries (LMICs) and are mostly treatable if diagnosed timely. We hypothesize that linking ambulances that transport acutely ill children to a remote pediatric emergency physician using a simple audiovisual device is feasible and acceptable.

We conducted a qualitative study in Pakistan, to determine acceptability of Ambulance Based Teleconsultation (ABT) for the emergency care of acutely ill children. We used Theoretical Framework of Acceptability (TFA) which includes 7 domains: Affective Attitude, Burden, Ethicality, Intervention Coherence, Opportunity Cost, Perceived Effectiveness, and Self-efficacy. We conducted 5 in-depth interviews (IDIs) with Telemedicine physicians, 9 IDIs with parents of children who recently needed ambulance, and 4 Focused group discussions (FGDs) with emergency medical technicians (EMTs).

We deduced multiple themes and sub-themes from these discussions. In terms of supportive perspectives, all groups thought that ABT would offer prompt intervention, especially in crowded cities and remote regions with scarce resources. Video-based physician support was the highlight of positive perspectives especially for critical cases. Parents believed that ABT will enhance their trust in EMTs and reduce their stress level during transport of their child. Overall, it was considered an ethically sound and socially acceptable intervention. Major concerns and challenges raised mutually by all groups included parental reluctance to camera use for privacy concerns, parental doubts about reliability of doctor and appropriateness of treatment, risk of miscommunication, and inadequate counseling. Factors identified to address these challenges were: formal training for EMTs and telemedicine physicians to work in collaboration for parental consent and counselling, a robust telecommunication infrastructure, public awareness, and parental support.

Overall, Parents, EMTs and telemedicine physicians thought that ABT can be successfully implemented in LMICs through proper training and community awareness and could improve the survival in critically ill children.

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BEST MANAGEMENT OF PATIENTS WITH MALIGNANT PERICARDIAL EFFUSION: A COMPARATIVE STUDY BETWEEN IMAGING-GUIDED PERICARDIOCENTESIS AND SURGICAL PERICARDIAL WINDOW*Pirbhat Shams, Intisar Ahmed, Abdul Baqi**Section of Cardiology, Department of Medicine, Aga Khan University*

Background: The clinical course of malignancies is frequently complicated by third-spacing in body cavities, including pericardial effusion. What remains the optimal management for malignant pericardial effusion, is a dilemma.

Objectives: We aimed to compare 30-day outcomes of imaging-guided pericardiocentesis and surgical pericardial window in patients with malignant pericardial effusion.

Methods: A retrospective observational study was done at a tertiary care hospital. We reviewed hospital record files of 91 consecutive patients admitted with malignant pericardial effusion from January 2010 to December 2019 and requiring imaging-guided pericardiocentesis or pericardial window.

Results: A total of 71 patients were included in the final analysis. Most patients were male (68%). The mean age was 45 years. Hypertension was the most common comorbid condition. Lymphoma or leukemia (39%) was the most common cause of malignant pericardial effusion followed by lung cancer (28%). 57.7% of patients underwent pericardiocentesis, and the remainder underwent surgical pericardial window (42.3%). The overall procedural success was 97.2%, and the overall mortality was 5.6%. The length of hospital stay was higher in patients undergoing pericardial window ($p = 0.007$), whereas the re-accumulation rate was higher in the pericardiocentesis group (0% versus 34%, $p < 0.001$). Patients undergoing pericardial window had higher odds of major bleeding requiring transfusions.

Conclusion: Pericardial window is a promising and effective management option for patients having recurrent malignant pericardial effusion but comes at a cost of complications such as bleeding and infection. There is a higher rate of recurrence following isolated pericardiocentesis but a comparable mortality difference between the two procedures. Complication rates can be reduced by improving surgical technique and peri-operative management. Meticulous surgical care, infection precautions, and good glycemic control in this immunocompromised sub-set can preserve the pericardial window as a better management option.

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CLINICAL AND EPIDEMIOLOGICAL FEATURES OF PEDIATRIC POPULATION HOSPITALIZED WITH COVID-19: A MULTICENTER LONGITUDINAL STUDY (MARCH 2020-DECEMBER 2021) FROM PAKISTAN

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Background: Evidence on differential susceptibility of children versus adults who are infected once exposed and who require hospitalization varies. Despite the global spread, the epidemiological and clinical patterns of COVID-19 remain largely obscure, particularly among children.

Objective: We aimed to explore the epidemiological, clinical, and phenotypic parameters of pediatric patients hospitalized with COVID-19 in Pakistan.

Study Design and Methods: A longitudinal, multi-center, cohort study was conducted in five tertiary care hospitals in Pakistan from March 2020-December 2021. Data on various epidemiological and clinical variables were collected using Case Report Forms (CRFs) adapted from the WHO COVID-19 clinical data platform at baseline and at monthly follow-ups for 3 months.

Results: A total of 1,090 children were included. The median age was 5 years (Interquartile range 1-10), and the majority presented due to new signs/symptoms associated with COVID-19 (57.8%; n=631), the most common being general and respiratory symptoms. Comorbidities were present in 417 (38.3%) children. Acute COVID-19 alone was found in 932 (85.5%) children, 81 (7.4%) had multisystem inflammatory syndrome (MIS-C), 77 (7.0%) had overlapping features of acute COVID-19 and MIS-C, and severe disease was found in 775/1,086 (71.4%). Steroids were given to 351 (32.2%) patients while 77 (7.1%) children received intravenous immunoglobulins. Intensive care unit (ICU) care was required in 334 (31.6%) patients, and 203 (18.3%) deaths were reported during the study period. The largest spike in cases and mortality was from July-September 2021 when the Delta variant first emerged. During the first and second follow-ups, 37 and 10 children expired respectively, and medical care after discharge was required in 204 (25.4%), 94 (16.6%), and 70 (13.7%) children respectively during each monthly follow-up.

Conclusion: Our study highlights that acute COVID-19 was the major phenotype associated with high severity and mortality in children in Pakistan in contrast to what has been observed globally.

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SEROLOGICAL RESPONSE USING ELISA ANTI-VI-IGG AFTER SINGLE DOSE OF TYPHOID CONJUGATE VACCINE AGAINST SALMONELLA TYPHI AMONG CHILDREN IN HYDERABAD, PAKISTAN.

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Typhoid which is a potentially life-threatening infection caused by the bacterium *Salmonella Typhi*, affects 11-21 million people annually and can be prevented through immunization with Typhoid Conjugate Vaccine (TCV). To measure the serologic response following immunization with Typbar-TCV against *Salmonella typhi* using ELISA anti-Vi-antibodies at several time points over a period of 3 years among children from Hyderabad, Pakistan. Children aged 6 months-10 years who were vaccinated during the outbreak response for XDR typhoid in Hyderabad were followed for 3 years post TCV vaccination in a prospective cohort study conducted in Hyderabad, Pakistan from March 2018 to February 2022. Blood samples were taken at baseline and after administration of TCV at 4-6 weeks, 6 months, 1 year, 2 years and 3 years post vaccination to measure ELISA anti-Vi-IgG levels and estimate seroconversion rates. Seroconversion was defined as a 4-fold rise in anti-Vi-IgG titer from baseline to 4-6 weeks. Febrile cases were identified through biweekly phone followups and blood cultures were offered to any child with fever for ≥ 3 days within the last 7 days of at the nearest AKU satellite laboratory. At enrolment, the mean age of the study participants was 47.6 (SD \pm 29.9) months. Most participants (501/958; 52.3%) were male. A majority of participants seroconverted (777/837; 92.8 %) at 4-6 weeks following a single dose of TCV. The drop in GMT below 4-fold from the baseline was observed in only 79/287 (27.5%) participants 3 years post TCV vaccination. During the 3 years of follow-up, 7 children had culture confirmed typhoid (6 = *S. Typhi*, 1 = *S. Paratyphi*). All 7 enteric fever cases seroconverted at 4-6 weeks post TCV vaccination. Our study shows successful seroconversion (92.8%) immediately following a single dose of TCV. Elevated anti-Vi-IgG antibody titers were maintained above the baseline at 3 years in 208/287 (72.5%) of the cohort.

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FREQUENCY OF TYPHOID CARRIER IN PATIENTS UNDERGOING CHOLECYSTECTOMY FOR GALL BLADDER DISEASES USING REAL TIME PCR.

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Background: Annually, millions of new typhoid cases are reported globally despite advancement in treatment and preventive measures. One of the major cause of typhoid endemicity is gallbladder carriage of typhoid etiological agent, Salmonella enterica subsp. enterica, serovar Typhi (S. Typhi) and Salmonella Paratyphi (S. Paratyphi). This study is aimed to determine the frequency of typhoid carriers in patients who underwent cholecystectomy for gall bladder diseases.

Methods: A cross sectional study was conducted at Aga Khan University Hospital and Jinnah Postgraduate Medical Center, Karachi from December 2018 to February 2020. All individuals of age ≥ 10 years were included. Multiplex real time polymerase chain reaction (PCR) was performed on gall bladder specimens including gallstones, bile and gallbladder tissue and sera of same patients were screened against YncE IgG via ELISA.

Results: Out of 989 enrolled participants, 34 (3.4%) were carriers of either S. Typhi (2.3%) or S. Paratyphi (1.1%). It was found that most of the carriers harboring organism in their gallstones 24/34 (70.6%) while 20/34 (58.8%) in tissues and 11 (32.4%) in bile. ELISA was performed on sera of 34 PCR positive and 34 age and gender matched PCR negative samples (controls) to measure anti-S. typhi Vi IgG. Our results showed no association of Vi and YncE with PCR positive carriers. The mean age of participants was 40 (± 14.3 SD) years. The reason of cholecystectomy in 949/989 (96%) of them was gallstones. Among typhoid carriers, majority 25/34(73.5%) of them were females. History of typhoid fever was not significantly associated with typhoid carrier.

Conclusions: We found higher rates of salmonella carriage in gallstones compared to tissue and bile. To control the typhoid fever cases in the region, we should try to interrupt the transmission cycle through typhoid carriers by developing cost effective, specific, and non-invasive diagnostic tools to improve typhoid carrier identification.

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GASTROINTESTINAL MANIFESTATION OF COVID-19 AND LFTS ASSOCIATION WITH COVID-19, ITS PATTERN AND SEVERITY - A STUDY FROM TERTIARY HOSPITAL, PAKISTAN

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Introduction: Covid-19 infection as pandemic caused huge number of morbidity and mortality worldwide. It mainly involves respiratory system but it has significant effect on gastrointestinal and hepatobiliary system.

Aim/ Objective: Aim of this study to assess gastrointestinal manifestations of Covid-19 and to evaluate frequency, pattern, association of LFTs with Covid-19, its severity.

Method and Material: It is a cross-sectional study was conducted at The Aga Khan University Hospital, Karachi. All the patients above 18 years of age, who were admitted in the hospital with the diagnosis of COVID-19, from 26 Feb 2020 till June 2020, were enrolled. Patient demography, clinical presentation, laboratory tests, duration stay and clinical outcomes (discharged stable and expired) were assessed. Statistical analysis of given variables performed with SSPS.

Result: Total 533 hospitalized patients median age of the cohort was 42 years (IQR 41 – 65 years). 328 (61.5%) were predominantly male. Common comorbid were HTN 224 (42%) and DM 192 (36%). Gastrointestinal symptoms mainly noticed nausea in 130 (24%), vomiting and diarrhea in 80 (15%) and 84 (15.4%) respectively. LFTs found abnormal in (92%) of total patients, mainly SGOT 336(81%), GGT 312(69.4%), SGPT 309(66.8%) and whereas there was no significant change in rest of liver enzymes. Significant association seen between abnormal LFTs and raised CRP, TLC, and LDH and disease severity.

Conclusion: Nausea, vomiting and diarrhea are the common gastrointestinal feature of Covid-19. Abnormal LFTs found almost 90% of patient mainly with raised GGT, SGPT, SGOT whereas PT and Albumin are least affected. Abnormal LFTs have significant association with inflammation markers (raised TLC, LDH, CRP) and disease severity.

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SURVIVAL OF ADULT IN-HOSPITAL CARDIAC ARREST PATIENTS IN TERTIARY CARE HOSPITAL: A RETROSPECTIVE COHORT STUDY*Muhammad Subhan Khan**Department of Emergency Medicine, Aga Khan University Hospital*

Introduction: In-hospital cardiac arrest Survival data not only describe the population characteristics, factors associated with cardiac arrest but also describe the system proficiency of dealing with this rapidly fatal condition. Fast, efficient interventions as well as local implementation and compliance of up-to-date resuscitation guidelines are key to improved survival. Other factors include a focus on the prevention, and early recognition of the event, availability of the trained multidisciplinary rapid response team 24 hours per day and 7 days a week. Determination of the survival will not only help highlighting modifiable factors associated with improved survival but also unhide the need for further improvement, optimization of hospital-based protocols and assessment of adherence with up-to-date guidelines

Objective: To determine the survival of in-hospital cardiac arrest patient at discharge and factors associated with survival at discharge.

Parametric survival analysis was used to assess the association between CPR duration and covariates with survival at discharge.

Results: Among 72 patients admitted, 39 (54%) patients achieved return of spontaneous circulation (ROSC). Survival to hospital discharge was 18% (13/72). Majority of the cardiac arrest patients were males (HR=1.23 [0.70-2.16]) and better survival was noted in females. Mortality was high in patients admitted to ICU (93%) and special care units (95%). While better survival noted in patient in general wards (25% HR= 0.24 [0.07-0.78]) and emergency department (42% HR= 0.67 [0.33-1.36]). Majority of the patients (87.5%) presented with non-shockable rhythm. While increase survival was noted in patients presented with shockable (33%). Sepsis (54% HR=0.61 [0.36-1.02]) and hypotension (57% HR=2.04 [1.21-3.44]) were found to be the most common pre-existing condition leading to cardiac arrest. Majority of cardiac arrest occurred during the day times (66.7%) while survival was worse when cardiac arrest at night times (HR=2.09 [1.24-3.55]). CPR time >10 minutes (HR=4.24 [2.24-8.02]), time of cardiac arrest (HR=2.18 [1.29-3.71]) and Respiratory insufficiency (HR=0.56) was found to be significant in determining survival at discharge.

Conclusions: Lower survival is noted as compared to global data. Survival at discharge was higher in patients who received ≤ 10 minutes of CPR. Better monitoring and staffing at night times and early recognition at night may help in improving the survival of IHCA.

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CURRENT ETIOLOGICAL PATTERN OF NON-VARICEAL UPPER GI BLEED AND ITS OUTCOMES

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Introduction: Peptic ulcer disease was the cause of almost more than fifty percent of Non-variceal upper GI bleeding (NVUGIB), nowadays due to easy accessibility and frequent usage of PPI, there is a significant change in the etiology of NVUGIB.

Objectives: The aim of the study to know the disease pattern, severity, complications outcome such as re-bleeding and mortality accordance with specific findings observed in Esophagogastroduodenoscopy.

Methodology: The Descriptive cross-sectional study was done at AKUH to look for clinical features including etiology and endoscopic findings of NVUGIB from 2016-2018 total of 729 patients were included with a diagnosis of upper GI bleeding out of which 189 were diagnosed as NVUGIB. Different variables were collected from chart review and analyzed by SPSS version 21.

Results: A total of 189 patients with male 132 (69.8%), median of age 65 (18-100), were analyzed, The most common comorbidities were HTN (51.3%), DM (36.0%), and IHD (29.6%). Among them who are taking anti-platelets were (22.2%). On arrival 138 (73.0%) presented with a history of melena, 101 (53.4%) had NG blood aspirate and 95 (50.3%) had DRE positive. Majority patient underwent endoscopy within 24 hours with following endoscopic findings: Pan-Esophagitis (3.7%), Distal esophagitis (21.2%), GEJ ulcer (14.8%), gastritis (46.6%), Gastric ulcer (28.6%), Dieulafoy lesion 4 (2.1%), gastric AVM 2 (1.1%), Duodenitis (19%), duodenal ulcer (37%), Duodenal AVM 2 (1.1%). Endoscopic Interventions were done in 61 (32.2%) patients, out of which Sclerotherapy in 10 (5.3%), APC in 8 (4.2%), Sclerotherapy + APC in 32 (16.9%), Sclera+ APC+ Hemoclip in 7(3.7%), Sclerotherapy + Hemoclip in 4 (2.1%) were performed. Radiological angio-embolization were done in 6 (3.2%) and Surgical intervention in 1 (.5%) patient. Re-bleeding during admission was noticed in 9 (4.8%), there was 13 (6.9%) readmission with re-bleeding, clinic follow up in stable condition 152 (80.4%) while mortality in the hospital or within 30 days as an outpatient was observed in 3 (1.6%) patient and rest were lost to follow up 21 (11.1%).

Conclusions: It is concluded NVUGIB is common among male gender, endoscopic findings indicate gastro-duodenal site still a major cause for NVUGIB in this region contrary to the western population where recent studies support esophagitis and esophageal ulcer as major findings.

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CORRELATION OF PREOPERATIVE LOCALIZATION OF PARATHYROID ADENOMA WITH IMAGING FINDINGS AND SURGICAL OUTCOME

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Background: The objective of this study was to evaluate the outcomes of parathyroidectomy with or without positive preoperative imaging and their correlation.

Methods: A cross-sectional study was undertaken at the department of endocrinology, Aga Khan University Hospital between August 2022 and January 2023. All patients aged more than 18 years with primary hyperparathyroidism and cases where preoperative parathyroid Imaging ultrasound or sestamibi result available. Patients who underwent reoperative parathyroid surgery, or had secondary or tertiary hyperparathyroidism were excluded from the study. The patient demographics, preoperative imaging results, intraoperative strategy and findings, complications, and outcomes were collected. The primary outcome is a cure, which is defined as normalization of calcium levels and PTH on day one and at the first post-operative follow-up appointment which was at 2 weeks post-surgery.

Results: A mean of 48.23 15.1 years was observed with a preponderance towards female gender. The mean preoperative PTH was 614.50 ± 658.8 with the lowest levels being 29.0 and highest being 2500. There were 9 (6.4%) cases of double adenoma, one case of four gland hyperplasia, and 129 (92.1%) cases of single adenoma, and one case of ectopic gland. The mean age and gender were not significantly different in cases with MIBI+/US+, MIBI-/US-, MIBI+/US-, or MIBI-/US+ (Table 2). The highest cure rate was found in cases with both MIBI and US positive findings i.e. 51 (43.2%) (Table 3).

Conclusion: Patients with positive preoperative imaging who undergo parathyroidectomy are cured in almost 43.1% of cases, compared to 7.6% when the disease was not localized. This difference however does not reach statistical significance. Therefore, regardless of preoperative imaging results, these data confirm the existing guidelines that all pHPT patients who are likely to benefit from operational intervention should be considered for parathyroidectomy.

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HYBRID ENDOSCOPIC ULTRASOUND IN THE COVID-19 ERA FOR THE TISSUE DIAGNOSIS OF SOLID LESIONS: AN INITIAL EXPERIENCE FROM A TERTIARY CARE CENTRE IN PAKISTAN.

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Introduction: Endoscopic Ultrasound (EUS) is well-established mode of intervention for tissue acquisition in solid organs. EUS guided Biopsy using FNB needles in last recent years significantly increases the diagnostic yield with rapid on-site evaluation (ROSE). In the Covid-19 era implementation of endoscopic SOPs has led to evolve a hybrid technique to get high diagnostic yield for tissue sampling to get high diagnostic Yield. We share our initial experience of EUS cases performed with this approach without ROSE.

Methods: All 84 cases from June 2020 till December 2021 were included, COVID screen test by PCR was performed before the procedure. The Procedure was done in a negative pressure room with all SOPs as per institutional guidelines for patient and staff safety with a minimum number of persons during procedure. 22G/25G FNB needle with Franseen design and capillary suction method was used.

Results: Among these cases, 55 were male, mean age 56 years, Mean duration of procedure 25 minutes mean. 63 for organ targeted for malignant pathology e.g. pancreas 35, liver 02, lymph nodes 17, subepithelial lesions 06, mediastinal lesions 08, common-bile duct/gall bladder 04. 17 cases had a multi-targeted biopsy for the additional staging of disease. The number of 'passes' with the needle was average 02 with single pass 17, two pass 39, three passes 11, multitarget single pass in 17. Needle size was 22G in 78 cases and 25G in 6. Common tissue diagnoses include pancreatic adenocarcinoma 26, neuroendocrine tumours 04, tuberculosis 05, gastrointestinal stromal tumours 02, leiomyoma 03, lymphoma 03, metastatic renal cell carcinoma 04, squamous cell carcinoma 04, cholangiocarcinoma/gall bladder adenocarcinoma 07, Sarcoma 02 and solid pseudopapillary epithelial neoplasm of pancreas (SPEN) 01. There were no immediate or early complications in all cases.

Conclusion: Hybrid EUS in Covid 19 Era has emerged as a useful/cost-effective and safe approach to get tissue yield without the need for ROSE.

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ETIOLOGIES, SEVERITY AND OUTCOME OF ACUTE PANCREATITIS, IN A TERTIARY CARE HOSPITAL

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Introduction: Acute pancreatitis (AP) is an inflammatory process of the pancreas with varying degree of involvement of regional tissue. Disease-related factors and treatment related factors are useful in predicting outcome.

Objective: To determine the etiologies, severity and outcome of acute pancreatitis in a Tertiary Care Hospital.

Study Design: Descriptive study.

Study Setting: Study was conducted at Department of Medicine, Aga Khan University Hospital, Karachi.

Duration Of Study: Six months after approval of synopsis from 07-01-21 till 07-06-21.

Subjects and Methods:

Quantitative and qualitative data was collected, presented and analyzed. Effect modifiers were controlled through stratification to see the effect of these on the outcome variable. Post stratification chi square test was applied taking p-value of ≤ 0.05 as significant.

Results: A total of 120 patients who met the inclusion and exclusion criteria were included in this study. Mean age, duration of illness, serum amylase and serum lipase in our study was 57.63 ± 3.54 years, 6.89 ± 3.54 hours, 200.51 ± 90.56 U/L and 400.89 ± 100.28 U/L respectively. 56 (46.7%) and 64 (53.3%) were male and female. 116 (96.7%) and 04 (3.3%) were discharged and expired. Out of 120 patients, 533 (44.2%), 24 (20%), 07 (5.8%), 03 (2.5%), 01 (0.8%), 09 (7.5%), 09 (7.5%) and 14 (11.7%) had gall stone, alcohol use, hyperlipidemia, hypercalcemia, trauma, neoplasm, autoimmune and idiopathic etiology respectively. Finally, 80 (66.7%), 33 (27.5%) and 07 (5.8%) had mild, moderate and severe illness.

Conclusion: The clinician should be aware that acute pancreatitis can occur in any age group and gender due to different etiology. The severity of AP does not depend on etiology, and should be diagnosed on clinicoradiological basis so that appropriate management can be done in those patients.

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HOSPITALIZATION TRENDS FOR SYSTEMIC LUPUS ERYTHEMATOSUS IN A LMIC

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Background and aims: Systemic lupus erythematosus (SLE) is a debilitating disease with major contribution to the

worldwide morbidity and mortality. Long-term outcomes in SLE have improved over

the past decades, however, increased morbidity and mortality, especially among young individuals, still exists. The objective of this study was to evaluate the trends in hospitalization and in-hospital mortality in SLE at the largest academic medical center in Pakistan.

Methods: Retrospective observational study using inpatient hospital database was conducted from 2010 to 2019 using ICD-9 codes. All adult (> 18 years) admitted with diagnosis of SLE (primary and secondary) were included. Hospital admission rates, emergency admissions, common diagnosis, and outcome were recorded in addition to the demographics. Inferential statistics were applied to determine the common diagnosis in patients with secondary diagnosis of SLE.

Results: A total of 1529 patients were admitted during the study period; out of which 19.6% had SLE as primary condition and 80.4% had it as secondary diagnosis. 86.6% were female. The mean age was 41.7 years; 52.8% were younger (between the age of 18 to 40 years). Higher admission rate (13.3%) was observed in

2017 (1000 patient of 5.2). 102 (6.7%) patients died during the study period; among those 86 (7%) had SLE as secondary diagnosis at the time of hospitalization. Respiratory infections (13.9%) and reproductive system related (11.3%) causes were the common reasons of admission to the hospital in these patients. Diabetes (HR:1.89), pneumonia (HR:4.99), pancytopenia (HR: 3.88), and liver dysfunction (HR:7.51) were identified as an increased risk of mortality in patients in survival analysis. Kaplan-Meier survival curve showed that survival of patients was higher in those who had SLE as an associate as compared to those who had SLE as primary diagnosis at admission. However, this difference is not statistically significant. Furthermore, the length of stay was longer (>7 days) in patients with secondary diagnosis of SLE as compared to those with primary diagnosis of SLE.

Conclusion: Results from a big Asian patients data revealed that infections are the main cause of higher

hospitalization rate as well as increased length of stay in all patients with SLE. Mortality rate is low in patients who have had SLE as an associate and not primary diagnosis at admission.

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RECURRENCE OF PORTOSYSTEMIC ENCEPHALOPATHY IN CIRRHOTIC PATIENTS AND ITS RISK FACTORS

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Introduction: Portal systemic Encephalopathy (PSE) is a common complication of cirrhosis that places a high societal burden of illness and hospitalization. Identifying the patient's risk for PSE may allow closer monitoring to preserve the quality of life and reduce and manage risk factors accordingly. It is important to assess the risk factors for recurrent PSE so that appropriate prevention and prognostication can be done. Therefore, this study is done to assess the recurrence of PSE in cirrhotic patients after the first episode of PSE and its risk factors.

Method: It is a retrospective study done in the section of Gastroenterology, The Aga Khan University Hospital, Karachi, Pakistan from Jan 1, 2021, till December 31, 2021. Patients who were admitted first time with PSE and admitted within 3 months of index PSE were enrolled in the study. Grading of PSE (I-VI), laboratory tests (Bilirubin, Albumin, Creatinine, and electrolytes), ascites with spontaneous bacterial peritonitis (SBP), gastrointestinal bleeding (GIB), acute kidney injury (AKI), Child-Turcotte-Pugh (CTP) score, and Model of End-Stage Liver Disease (MELD) Score were collected by chart review and analyzed by SPSS version 20.

Result: Total 61 patients were included in the study and 10 were lost to follow-up. The main comorbidities were hypertension 33 (64%) and diabetes 28 (54%). As per etiology HCV (59%), HBV (27%), Alcohol (6%), others (7%). Out of 51 patients, 33 were readmitted with PSE while 22 patients remained stable on follow-up. On comparative analysis of both groups; infection, MELD score, low albumin, and raised total bilirubin showed significant P-value (<0.05). The rest of the parameters were more or less the same in both groups.

Conclusion:

We found that high MELD score, raised total bilirubin level, low Albumin level, and infections were the risk factors for recurrence of PSE. Identification of risk factors during assessment can reduce the recurrence of PSE. We would recommend validating the results of our study on large scale prospectively.

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CLINICAL CHARACTERISTICS, OUTCOMES, AND FACTORS ASSOCIATED WITH MORTALITY IN NOCARDIA PNEUMONIA: 18 YEARS' REAL-WORLD DATA FROM A TERTIARY CARE HOSPITAL IN KARACHI, PAKISTAN*Yasmin Rahim, Jaffar Khan, Shayan Shahid, Safia Awan, Muhammad Irfan**Division of Pulmonary and Critical Care, Department of Medicine, Aga Khan University Hospital*

Background: Pulmonary nocardiosis is a rare pulmonary infection with high morbidity and mortality. Limited real-world data on pulmonary nocardiosis patients are available from developing countries like Pakistan.

Objective: This study aimed to evaluate the risk factors, clinical, radiographic, and microbiologic characteristics, and outcomes and factors associated with in-hospital mortality in pulmonary nocardiosis patients.

Methods: This retrospective observational study was conducted at the Aga Khan University Hospital, Karachi, Pakistan, from August 2003 to June 2020. Demographics, immune status, underlying diseases, laboratory data, treatment, and outcomes of all nocardiosis patients were recorded in predesigned proforma.

Results: Sixty-six patients with smear/culture-proven pulmonary nocardiosis were identified. Most patients (83.3%) were treated with trimethoprim-sulfamethoxazole alone or in combination with other medicines. The overall mortality rate in our study was 33.3% (n=22/66). Factors significantly associated with mortality were respiratory failure (p<0.001), raised procalcitonin levels (p=0.01), concomitant fungal infections (p=0.01), concomitant TB (p=0.03), and patients on combination therapy (p<0.001).

Respiratory failure (odds ratio [OR] 46.94 [95% confidence intervals [CI]: 5.01–439.03] p<0.001), concomitant fungal infection (OR 17.09 [95% CI: 1.47–197.88] p=0.02) and patients on combination therapy (OR 6.90 [95% CI: 1.23–38.61] p=0.02) were also identified as independent risk factors for mortality on multivariate analysis.

Conclusion: This study provides essential information on the clinical characteristics and risk factors, outcomes, and factors associated with mortality for pulmonary nocardial infections.

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**DOES COVID-19 CAUSE DELAY IN THE TREATMENT OF ROAD TRAFFIC INJURIES?
A RETROSPECTIVE COHORT STUDY***Salman Muhammad Soomar¹, Dr. Maria Khan², Zeyanna Dhalla^{1,3}, Dr. Uzma Rahim Khan¹**1 Department of Emergency Medicine, Aga Khan University, Karachi Pakistan**2 Medical College, Aga Khan University, Karachi Pakistan**3 University of Michigan, United States of America*

Background: Road Traffic Injuries resulted in mortality due to various factors, including delay in arrival to the hospital, delay in first aid and medical attention, and availability of beds & trauma and operating rooms. During the COVID-19 pandemic, the PCR test was mandatory, which caused the delay in treatment of all patients, including RTI patients. This study aims to determine the delay in treating road traffic injuries during the COVID-19 pandemic.

Methods: We conducted a retrospective cohort study using patients' data with RTIs presented to the Emergency Department of Aga Khan University Hospital Karachi, Pakistan, from April 1, 2020- to February 28, 2022, and tested for COVID-19 was included. The exposure was COVID-19 (positive/negative), and the outcome was a delay in treatment. The delay in treatment was considered when the time from ED arrival and treatment started was ≥ 6 hours. A total of 373 patients enrolled using the non-probability purposive sampling method. Multivariable binary logistic regression was used to check the association between covariates and delay in treatment.

Results: Out of 373 RTI patients, the majority were males (312, 83.6%), and the mean \pm SD age was 32.2 \pm 17.4. Most injuries were fractures in the upper & lower limbs (236, 63.3%), and 302 (81.0%) underwent surgery. Of 373, 74 (19.8%) RTI patients were positive for COVID-19. The mean \pm SD number of hours from ED arrival to treatment start in COVID-19 positive patients was 10.9 \pm 6.7, while 6.4 \pm 1.6 in negative patients. About 70% of the patients had a delay in treatment (259, 69.4%). Most of the patients were admitted to the ward (327, 87.7%), while 13 (3.5%) were admitted to ICU. The adjusted odds of delay in treatment of RTI patients were 1.80 times (95% CI 1.27-2.45) in males compared to females. The adjusted odds of treatment delays in COVID-19 positive were 1.47 times (95% CI 1.13-1.92) compared to negative patients.

Conclusion: Patients with road traffic injuries who were COVID-19 positive were associated with higher odds of delay in treatment in the Emergency Department.

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ETIOLOGY OF OSTEOARTICULAR INFECTIONS IN CHILDREN AT A TERTIARY CARE HOSPITAL, KARACHI*Wajiha Khan, Noor ul Ain, Fatima Mir**Department of Pediatrics and Child Health, Aga Khan University*

Introduction: Osteoarticular infections remain a significant cause of morbidity worldwide in children. They can have a devastating impact with a high rate of serious and long-lasting sequelae, especially on remaining growth.

Objective: To determine the causative microorganism and their sensitivity responsible for osteoarticular infections in children at a tertiary care hospital in Karachi, Pakistan.

Subjects and methods: Data was prospectively collected from patients after taking a verbal consent. 92 patients who met the diagnostic criteria were included. Quantitative and qualitative data was collected, presented and analyzed. Post stratification chi square test was applied taking p-value of ≤ 0.05 as significant.

Results: A total of 92 patients were included in this study. Mean age in our study was 11.78 ± 4.49 years. 57 (62%) and 35 (38%) were male and female. Out of 92 patients, 55%, 28%, 9%, 4%, 2% and 2% had MRSA, MSSA, streptococcus, pseudomonas aeruginosa, E coli and klebsiella pneumoniae. Frequency distribution of diagnosis showed that out of 92 patients, 24 (26%) and 68 (74%) had osteomyelitis and septic arthritis respectively. Frequency distribution of site involved showed that out of 92 patients, 8 (8.6%), 82 (89.1%) and 02 (2.1%) had upper limb, lower limb and other involvement respectively.

Conclusion: Treatment of OAI is usually instituted empirically before the causative agent and its resistance pattern is known. Therefore close monitoring of patients must be done in all patients with regular follow-up.

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MANAGEMENT AND TREATMENT OUTCOMES OF MALIGNANT RETROPERITONEAL TUMORS FOLLOWING RESECTION: EXPERIENCE OF A TERTIARY CARE CENTER IN PAKISTAN

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Background: Retroperitoneal soft tissue tumors are rare, comprising of 0.1-0.2% of all malignancies. They are heterogeneous in histology usually occurring in the 6th decade of life with slight male dominance. Complete surgical resection with negative microscopic margin (R0) is the preferred treatment modality associated with best survival odds. However, the tumor's proximity to vital organs and vessels makes achieving R0 resection a challenge, increasing the likelihood of local recurrence. Variations exist in treatment protocols to decrease local and distant recurrence, and to downstage the tumor, in order to improve patient survival and subsequent quality of life.

Methods: A retrospective review was conducted including patients (n=34) who underwent resection for retroperitoneal tumors at Aga Khan University Hospital, Karachi from January 2008 to December 2021. Patients with incomplete medical records were excluded from the study. All patient factors, surgical details and outcomes, disease free survival and recurrence were identified using a structured questionnaire.

Results: The mean age of the patients was 48.9 ± 14.0 years (55.9% males), with 82.4% being symptomatic at presentation. Abdominal pain was the predominant complaint. Liposarcoma was the most common (52.9%) histologic type and majority of the tumors ranged from 10-20cm in size. Twenty-seven of the patients had organ involvement. The mainstay of treatment for resectable tumors was en bloc resection and R0 resection margins were achieved in 70.6% of patients. Despite this, 20 out of the 24 patients with R0 resection had disease recurrence (median 12 months), local recurrence being more common than distant metastasis. Fifty percent, of the patients with recurrence underwent re-excision of the tumor. Only 5 patients received neoadjuvant chemo/radiotherapy while 20 patients received adjuvant treatment. In our study, 32.3% of the patients had post-operative surgical complications. Median duration of survival was 31.4 months (Disease free survival 16 months).

Conclusion: The excision of malignant retroperitoneal tumors presents a surgical challenge when it comes to achieving an R0 resection. Complete resection with a multi-modality treatment approach is the current practice of care to prolong survival, though recurrence rates unfortunately remain high.

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RANDOMIZED CONTROLLED TRIAL TO ASSESS THE EFFECTIVENESS OF APNOEIC OXYGENATION IN ADULTS USING LOW-FLOW OR HIGH-FLOW NASAL CANNULA VERSUS USUAL CARE TO PREVENT DESATURATION DURING ENDOTRACHEAL INTUBATION IN THE EMERGENCY (APOXED)

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Background: Nasal cannulas are used as an adjunct to prevent desaturation during apneic phase of rapid sequence intubation. The objective of this study was to assess the superiority of low flow versus high flow combined with head side elevation against the usual practice of endotracheal intubation in the emergency room.

Method: The apneic oxygenation in the emergency department (ApOxED) is an open label, parallel-group, randomized controlled trial conducted in the emergency department of Aga Khan University Hospital. The primary outcomes of the study were lowest non-invasive oxygen saturation measurement during direct laryngoscopy and 3 minutes after placement of the endotracheal tube and first pass success rate. The intervention constitutes head side elevation up to 30 degrees for improving glottic visualization together with high flow or low flow oxygen delivery through nasal cannula to increase the safe apnea time during laryngoscopy. Primary analysis was intention to treat. The sample collection was stopped after 1 years of data collection. The trial is registered at ClinicalTrials.gov Registry (NCT04242537).

Results: Thirty adults were enrolled in high flow and standard arm while 28 adults were enrolled in low flow arm with all having comparable patient characteristics and a mean age of 51.74 (\pm 15.96). Lowest noninvasive oxygen saturation after placement of endotracheal tube was 95 [99 - 90] in high flow, 96.5 [100 - 92.5] in low flow and 95 [99 - 91] in standard arm. Similarly non-invasive oxygen saturation 3 minutes after placement of endotracheal tube was 98 [100 - 96] in high flow, 99 [100 - 93] in low flow and 99 [100 - 95] in standard arm. Post intubation non-invasive oxygen saturation < 92% was seen in 4 [12.9%] in high flow, 16 [57.1%] in low flow and 7 [20%] in standard arm with a p-value of <0.001.

Conclusion: The combination of high-flow or low flow nasal cannula with head side elevation prevent desaturation and increase safe apnea time, suggesting a role for it as an recommended airway management strategy for adults in the emergency department

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ASSOCIATION OF DOWRY PRACTICES WITH PERCEIVED MARITAL LIFE AND INTIMATE PARTNER VIOLENCE

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Objective: To understand the perceptions of women about the influence of dowry customs on their marital life and on

intimate partner violence.

Method: The cross-sectional study was conducted in Karachi between 2008 to 2010, and comprised married women of reproductive age. Data was collected through a valid World Health Organization questionnaire which was validated for the local context after translation into Urdu. Data was analyzed using SPSS 10.

Results: Of the 810 women approached, 759(93.7%) formed the final sample. Of them, 447(59%) women and 307(40.4%) of the husbands were aged 25-35 years. Women in arranged marriages involving dowry transaction reported more positive marital outcomes(adjusted odds ratio: 11.5). Consenting to a marriage was positively associated with positive marital life (adjusted odds ratio: 36.8), and the same was the case when the marriage was contingent on dowry transaction (adjusted odds ratio: 10.4). Provision of dowry, however, was not protective from physical(adjusted odds ratio: 3.7),sexual(adjusted

odds ratio: 3.7) or psychological violence (adjusted odds ratio: 8.9).

Conclusion: Dowry practices existing Pakistani culture despite the fact that dowry wives were found to have no protection against intimate partner violence. However, women perceived that the provision of dowry to groom's family had a positive impact on marital life.

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GENDER BASED VIOLENCE TRAINING

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Background: Gender-based violence (GBV) are the detrimental acts anchored in gender inequalities that are disproportionately directed towards individuals based on their gender. Pakistan is ranked among top four most dangerous countries for women, which alarm the existing vulnerabilities based on gender disparities.

Purpose: The study aimed to build the capabilities of the healthcare providers and community stakeholders through transformative capacity building interventions and assess effectiveness of these interventions for healthcare transformation against GBV, using the ecological model by WHO and sustainable development goals.

Method: A bi-level study using mix method approach, was conducted in four main districts of Peshawar and Sindh, including Chitral, Gilgit, Kamber, and Matiar respectively.

In level I, healthcare providers (n=147) were recruited through purposive sampling technique and trained to increase the supply of GBV prevention service. In level II, community stakeholders (n=87) were recruited, and master trained to raise the demands of these services by mobilizing community resources.

The qualitative inquiry through exploratory descriptive approach was conducted to identify the participants' perceptions about the intervention and its potential effects on their attitudes and behaviors. While statistical data was collected through self-administered questionnaires with high face validity, assessing the knowledge difference before and after the intervention, and (b) satisfaction level among participants.

The qualitative data was analyzed through content analysis; whereas quantitative analysis used descriptive statistics to calculate proportional difference between the knowledge scores and satisfaction level.

Results: Six themes emerged from the content analysis. The statistical analysis highlighted 25% and 33% difference in knowledge proportions of HCPs and community stakeholders respectively, with higher levels of satisfaction. Further, several transformative strategies were highlighted at the individual, family, community, and societal level to reduce social and gender disparities.

Conclusion: GBV is a crucial human right concern, which could be addressed through inter-sectoral collaborative initiatives for awareness and access towards services.

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PERPETUATION OF GENDER DISCRIMINATION IN PAKISTANI SOCIETY: RESULTS FROM A SCOPING REVIEW AND QUALITATIVE STUDY CONDUCTED IN THREE PROVINCES OF PAKISTAN

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Background: Gender discrimination is any unequal treatment of a person based on their sex. Women and girls are most likely to experience the negative impact of gender discrimination. This study aims to assess the factors that impact gender discrimination in Pakistan and its impact on women's life.

Methods: A mixed method approach was used in the study in which a systematic review was done in phase one to explore the themes of gender discrimination, and qualitative interviews were conducted in phase two to explore the perception of people regarding gender discrimination. The qualitative interviews (in-depth interviews and focus group discussions) were conducted with married men and women, adolescent boys and girls, Healthcare Professionals (HCPs), Lady Health Visitors (LHVs), and Community Midwives (CMWs). The qualitative interviews were analyzed both manually and electronically through QSR NVivo 10. The triangulation of data from the systematic review and qualitative interviews was done to explore gender discrimination-related issues in Pakistan.

Results: The six major themes have emerged from the systematic review and qualitative interviews. It includes (1) the Status of a woman in society (2) Gender inequality in health (3) Gender inequality in education (4) Gender inequality in employment (5) Gender biased social norms and cultural practices and (6) Micro and macro level recommendations. In addition, a woman is often viewed as a sexual object and dependent being who lacks self-identity unless being married. Furthermore, women are restricted to household and child-rearing responsibilities and are often neglected and forced to suppress self-expression. Likewise, men are viewed as dominant figures in the lives of women who usually make all family decisions. They are considered financial providers and sources of defense. Moreover, women face gender discrimination in many phases of life including education and access to health care.

Conclusion: Gender discrimination is mostly found in Pakistani society. To prevent gender discrimination, the entire society, especially women should be educated and gendered sensitized to improve the status of women in Pakistan.

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SHARING PEDIATRIC TRAINEE EXPERIENCES - ---USING MIXED-METHOD EXPLANATORY DESIGN

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Objective: Healthcare workers are at a higher risk of overall burnout as compared to the general population. Similarly, healthcare workers have a higher rate of emotional exhaustion when compared to the general population. The aim of the study is to explore the professional quality of life (Compassion Satisfaction (CS), Burnout (BO) and Secondary Traumatic Stress (STS)) amongst Pediatric specialty trainee at a private tertiary care hospital in Karachi, Pakistan.

Methods: By using a Mixed-Methods-Explanatory Design, Pediatric trainees (level I-IV) were assessed at two time points, February-March 2019 and February-March 2020 through a predefined scale, Professional Quality of Life (ProQOL), followed by focused group discussions. Mean sums of CS, BO and STS were the primary measures assessed. Secondary measures included correlation of the measures and exploring experiences of Pediatric trainees towards the residency program.

Results: We surveyed a total of 118 pediatric responses for two years. Trainees from both years showed similar moderate level for mean sum of scores for all three components: CS, BO and STS. No significant correlation was observed with gender, place of living or year of residency. Opinions and perceptions of the trainees in qualitative analysis revealed both positive and negative impacts on the trainees.

Conclusion: This study elucidates on the professional quality of life and provides insight into the type of events experienced by the trainees. Implications exist for residency program management and trainees to support an improved and sustainable healthcare workforce.

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IMPACT OF A HYBRID EDUCATIONAL COURSE FOR NURSING STAFF ON PAIN ASSESSMENT AND INITIAL TREATMENT IN A TERTIARY CARE HOSPITAL

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Introduction: Nurses work closely with patients so they should have proper knowledge and awareness regarding post-operative pain.

Objectives: Primary objective was to assess the impact of the educational course on the knowledge, skills, and perceived practice change regarding pain assessment and initial treatment among nursing staff working in adult surgical and medical wards of AKUH. The secondary objectives were to assess the impact of the educational course on the retention of knowledge and perceived change in clinical practices among nurses at AKUH, three months later.

Methods: An education course was developed and then implemented for the nursing staff of AKUH. The evaluation method comprising pre and post-MCQ tests and assessment of the clinical skill of all participants was done at the start of the interactive session and at the end of the session using PCIA and Epidural Likert scale. All participants were contacted three months after the course via email and were requested to take an online MCQ test to test their knowledge retention and complete an online questionnaire to know about the perceived change in their clinical practice.

Results: Both pre-test and post-test MCQs were completed by 86 participants, of which 52 (60.5%) were female and 34(39.5%) were male. The overall gain in knowledge after the educational session was statistically significant ($p < 0.001$). Participants showed an overall 90.79% improvement in the skills of assessing patients using PCIA after attending the course. The participants showed an overall 79.47% improvement in the skills of assessing patients receiving epidural analgesia after attending the course.

Conclusion: The educational course showed significant improvement and impact on the knowledge and clinical skills of the participants after attending the course. There was a 6.59% decline in participants' overall knowledge, three months after the educational course.

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EXPLORING THE EXPERIENCES OF HEALTHCARE PROFESSIONALS REGARDING THE SIMULATION-BASED TRAINING APPROACH DURING THE COVID 19 PANDEMIC, AT A TERTIARY CARE HOSPITAL, KARACHI, PAKISTAN: AN EXPLORATORY QUALITATIVE STUDY

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Background: The significance of continuing education has always been emphasized, since the beginning of the medical profession, and during the COVID 19 pandemic, the need for simulation-based training in managing the global crisis increased considerably. However,

experiences regarding simulation-based training have not yet been explored in low-middle countries, like Pakistan.

Purpose: The Study aimed to explore the experiences of simulation-based training during the COVID 19 pandemic, among practicing healthcare professionals, and identified the challenges and barriers associated with this learning approach, at a tertiary care hospital in Karachi, Pakistan.

Methodology: Using a descriptive, qualitative design, semi-structured, interviews were conducted of healthcare professionals who had worked in the COVID areas of the Aga Khan University Hospital, and attended two or more simulation-based training sessions during the pandemic. There were 17 healthcare professionals enrolled, which included six doctors, eight nurses, and three physiotherapists. Interviews were stopped upon data saturation. The COREQ guidelines were used and a thematic analysis was conducted.

Findings: Three main themes were identified: (1) simulation-based learning experience, (2) factors affecting simulation-based training during COVID 19, and (3) recommendations for improvement. In the simulation-based learning experience, learning opportunities through technology, self-efficacy, and improved patient outcomes were the major findings. The factors that affect participants learning during COVID 19, were organizational factors; facilitator training and competencies, and logistics and human resources were of great concern, which hindered their learning. The findings have led to some recommendations for improvement, in which resource allocation and capacity building were the major findings.

Conclusion: Simulation-based training has proven to be vitally important during the COVID 19 Pandemic. However, strategies need to be developed for facilitator competencies, and human and logistic factors for a better learning experience. Thus, organizations should become aware of and identify the particular challenges faced by healthcare professionals during the pandemic, to improve the effectiveness of simulation-based training.

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EVALUATION OF USER EXPERIENCE AND SATISFACTION WITH WORKPLACE BASED ASSESSMENTS (WPBAS) IN DENTAL RESIDENCY PROGRAM

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Introduction: The traditional methods of clinical examinations are challenged nowadays for their subjectivity, content validity, and reliability. Oral examinations assess the trainees on the ‘know how’ of Miller’s pyramid of clinical competency rather than on the ‘show how’. To mitigate the shortcomings of these methods a movement from traditional methods to Workplace Based Assessments (WPBAs). Therefore, the objective of our study was to explore the experience and satisfaction of the dental residents with WPBAs tools

Materials and Methods: A cross-sectional study design was utilized to conduct this study and the total study duration was 8 months (March - October 2022). A purposive sampling technique was used and all the residents from Operative Dentistry, Prosthodontics, and Orthodontics were included in the study. A questionnaire with both open-ended and close-ended questions was utilized to record the experiences and satisfaction of the dental residents who had previously undergone the process of WPBAs. Qualitative variables were reported as frequencies and percentages. Thematic analysis was done for open-ended questions.

Results: The total number of participants in the study was twenty. 80% of the residents reported that they were satisfied with WPBAs tools in dental residency programs, and these are effective teaching-learning tools. Fifteen residents agreed that WPBAs improved their clinical skills and helped them identify their weak areas and all the participants reported that the feedback given to them was constructive. 90% of the participants reported that they were given the opportunity to put in their views, WPBAs motivate them, and they create an opportunity for learning. However, 35% of the participants in our study reported that being observed adversely affects their performance.

Conclusions: Dental residents generally have positive feedback for WPBAs in clinical settings and these methods should be employed regularly to enhance clinical learning.

Keywords: WPBAs, Dental Residency, Mini-CEX, DOPS

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RESIDENTS AND FACULTY'S EXPERIENCE AND SATISFACTION WITH TASK ORIENTED ASSESSMENT OF CLINICAL SKILLS (TOACS) IN DENTAL RESIDENCY PROGRAM*Faiza Ali, Aqeel Ahmed, Rashna Hoshang Sukhia, Mubassar Fida**Section of Dentistry (Orthodontics), Department of Surgery, Aga Khan University*

Dental residents are often required to demonstrate competency in knowledge, patient care, interpersonal and communication skills. Task-Oriented Assessment of Clinical Skills (TOACS) is a modified version of Objective Structure Clinical Examination (OSCE) and it is valid, reliable, and known to have better educational impact. Our objective therefore was to record the experience and satisfaction of dental residents and faculty members with TOACS and to evaluate the main obstacles preventing effective utilization of it in dental residency programs.

Materials and Methods: This study was conducted using a Cross-sectional study design with purposive sampling technique. A self-structured questionnaire was designed based on literature to record the experiences and satisfaction of the dental faculty and the residents. Fisher's exact test was applied to see the association among the participants' responses as per the residency level and thematic analysis was done for open-ended questions.

Results: Twenty-three residents and seven faculty members participated in our study. 78.3% of the residents agreed that TOACS improved their clinical skills and helped them identify their weak areas. On applying Fisher's Exact test, we did not find any significant difference in the opinions of residents as per the residency level, residents who were assessed using TOACS in their under-graduate studies (p-value= 0.47) and who received any training regarding TOACS (p-value= 0.10). All the faculty members agreed that TOACS identifies developmental needs of students, and they are satisfied with these exercises.

Conclusions: Most residents who participated in this study stated that TOACS improved their clinical skills and assisted them in identifying areas of weakness. In addition, most of the faculty in our study agreed that it was simple for them to implement TOACS and that it enhanced their attitude toward the training of residents.

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PERCEPTION OF MEDICAL STUDENTS ABOUT FAMILY MEDICINE DISCIPLINE IN KARACHI, PAKISTAN.*Dr Unab Khan, Dr Munazza Asad**Department of Family Medicine, Aga Khan University*

Background: Despite the dire need, Family Medicine (FM) remains an under-recognized discipline in Pakistan. As FM is not part of the undergraduate curriculum in most medical colleges in Pakistan, medical students and doctors usually have little to no knowledge about the discipline and hence do not consider it as a career choice.

Objective:

1. To assess the perceptions of medical students about Family Medicine as a career choice.
2. To compare the perceptions about FM among medical students who had FM in their undergraduate medical curriculum to those who did not.

Methods: Data was prospectively collected from medical students at four different medical universities including public and private, after taking a written informed consent. Study design was a cross sectional study. Quantitative and qualitative data was collected, presented, and analyzed over a period of 6-months. Post stratification chi square test was applied taking p-value of <0.05 as significant.

Results: A total of 300 students who met the inclusion and exclusion criteria were included in this study. The mean age in our study was 22.76 and standard deviation of 1.676. 116 (38.67%) were male and 184 (61.33%) were female. Most of the participants had positive perception about FM 82.48% while exposure to FM in undergraduate curriculum played a significant role in improving perception. However, exposure to FM in UG had no impact on their career choice.

Conclusion: Perception about Family Medicine is significantly influenced by exposure in undergraduate curriculum. Family Medicine is an important field that especially needs emergence in developing countries like Pakistan to improve healthcare provision on a large scale. Early exposure to FM in the UG curriculum would impact on perception if not the choice of specialty. While improved perception will eventually impact the choice of specialty preference but may require some more time.

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EEXPLORATION OF FACULTY MENTORSHIP PROGRAMS: A QUALITATIVE STUDY @ AKU*Rehana Rehman 1, Dr Tazeen Saeed Ali 2, Dr Rahila Ali 3, Saira Afzal**1 Department of Biological & Biomedical Sciences, 2 School of Nursing and Midwifery and 3 Educational Development, Aga Khan University*

Background: Mentorship is crucial for career development as it improves job satisfaction, promotes institutional belonging, improves academic productivity and increases faculty retention. The aim of our study was to explore Faculty Mentorship Programs at Aga Khan University Medical College (AKU- MC) and Aga Khan University School of Nursing and Midwifery (AKU-SONAM).

Methods: We conducted an explorative qualitative study from February till December 2021 after approval from ERC at Aga Khan University using purposive criterion sampling. Mentors and mentees of faculty mentorship programs who participated in at least 2 mentor mentee sessions, chairs, co-chairs, and coordinators of the mentoring program, dean and founder members of both entities were included in the study. A semi-structured interview guide with open ended, introductory, probing & concluding questions was developed and validated and reviewed by experts. After piloting, 6 Focused group discussion (FGD) and 11 In-depth interviews (IDI) were conducted in both entities. Results were triangulated with literature, methods of data collection, types of participants and documents, across both the entities.

Results: The findings described the transition from informal to formal mentorship identifying roles and responsibilities of leadership, administration, mentors and mentees. A strong need of incentives and rewards was put forward by the participants. We identified one independent and two similar themes after rigorous data analysis from both entities. The independent themes were, “all the flowers of tomorrow are seeds of today” (AKU-MC), “watering plants to enrich ecosystem” (AKU-SONAM). Similar themes that emerged from consistent findings in both entities, were “deeper the roots -luscious the fruits”, and “spring always follows winter”.

Conclusion: The study elucidated that mentorship programs in both the entities were in line with the goals and vision of the institution. Dyad mentoring model with structured feedback system, was adopted in AKU-MC, whereas work driven model was practiced in AKU-SONAM. Both the entities acknowledged the need of additional resources, administrative support, rewards, incentives and recognition of mentors for sustainability of the program.

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EVALUATION OF ORGANIZATIONAL READINESS FOR SIMULATION IN SECONDARY AND TERTIARY CARE HOSPITALS IN KARACHI

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Introduction: Readiness for change drives the successful implementation of new programs and policies in any organization. Simulation-based education (SBE) has been proven to develop the skills of healthcare professionals across all learning domains and thus improve patient outcomes by ensuring improved competency of healthcare professionals. To help leaders plan for advancing a simulation program, The Simulation Culture Organizational Readiness Survey (SCORS) is a valid and reliable tool that calculates an organization's readiness for simulation integration.

Objectives:

- To determine the level of readiness for integration of simulation-based education (SBE) amongst employees and students at The Aga Khan University, Karachi's secondary and tertiary hospitals.
- To determine the organizational readiness factors that influence the preparedness of the employees and students for simulation-based education.

Study design and method: The study was a cross sectional analysis in which the SCORS questionnaire was administered to employees and students at Aga Khan University (AKU) and Hospital Main Campus and Secondary hospitals in Karachi, using SurveyMonkey. The data was analyzed using SPSS version 19.0.

Results: There were 199 responses combined from all the targeted centers. 79 were males (43.89%) and 101 were females (56.11%), while 19 chose not to answer. 60% of the respondents had participated in SBE activities as either a student (41.43%), faculty (10.71%), or both (7.86%). Around 34.83% of respondents said that the institute had "very much" defined the need for SBE integration. 25.84% of the participants stated that SBE was being used as a teaching modality in their institute. 58.43% of the participants believed now is the time to implement changes to support SBE.

Conclusion: Organizational readiness is an essential component in the process of adapting SBE, which in turn will help improve patient outcomes and reduce errors in the field. The stakeholders, faculty, students, and administrators must have a clear vision and commitment for successful SBE integration.

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SELF-ASSESSMENT OF COMMUNICATION AND INTERPERSONAL SKILLS OF RESIDENTS: A FACTOR ANALYSIS

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Background: Residents must have the ability to assess their own skills and knowledge to take responsibility for their own professional growth throughout their careers.

Objective: To examine how a population of internal medicine residents assessed their own performance in 8 facets of competence during residency.

Methods: A self-assessment questionnaire was distributed to 145 residents at the Aga Khan University from three successive cohorts from 2010 to 2012. 103 residents (71%) completed the survey. Questions included items pertaining to various competency domains including punctuality, reliability, and overall professional competence.

Results: The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was used, and there was sufficient inter item correlation (KMO = 0.905), indicating that the patterns of correlation were relatively compact. Principal component analysis indicated that the performance dimensions in the self-assessment questionnaire are related to a single construct that encompasses various elements of professional behavior. Cronbach's α for the 8 performance dimensions was 0.91. No statistically significant gender or residency group differences were found for the 8 performance variables on the chi square or Kruskal-Wallis K Independent Samples tests.

Conclusions: Our results from exploratory factor analysis indicate that residents have a one-dimensional view of performance. Two unique aspects of professionalism, namely interpersonal relations and conveying medical information, emerged in another study that evaluated patients' impressions of residents. There is a need to further examine the sub-themes that fall under the umbrella of professionalism. The findings of our study highlight the importance of future research into additional performance dimensions and sub-themes of professionalism.

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MORNING REPORT IMPROVES RESIDENTS' DIAGNOSTIC COMPETENCE & CLINICAL PROBLEM-SOLVING ABILITY

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Introduction: Morning report (MR) is an educational activity that uses inpatient case-based teaching. Given the rapid changes taking place in medical practice, it is important to assess the residents' perspective regarding this teaching method.

Objective: To establish the perspective of residents in internal medicine on various aspects of MR and propose a format based on our observations.

Study Design: Observational cross-sectional study.

Place & Duration of Study: Data was collected from groups of residents in the Department of Medicine at the Aga Khan University Hospital, from July 2002 to August 2007.

Methodology: An observational cross-sectional survey on MR was conducted among the residents of the Department of Medicine at Aga Khan University. A 22-item questionnaire was distributed among the residents based on the purpose, format, and contents of the morning report, as well as the most appropriate person to present and conduct it, and how frequently they should be carried out.

Analyses were carried out using the statistical software 'Statistical Package for Social Sciences' (SPSS)

Results: 92% of residents believed MR to be an effective teaching activity with 65% of them choosing 'Improvement in clinical problem-solving ability' as the primary purpose of MR followed by 'improving presentation skills' (62%) and 'conveying medical knowledge to the residents' (58%). 79 residents (87%) believed that the junior resident should present the case history. 75 residents (83%) thought that faculty on call at time of patient's admission should conduct MR. Residents wanted to discuss diagnostic work-up (90%) and management (89%) of specific interesting cases (79%) in MR.

Conclusion: MR is an effective educational activity and should be an essential component of any post-graduate residency program within the country and outside.

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WHAT MOTIVATES CLINICAL FACULTY TO TEACH MEDICAL STUDENTS?

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Introduction: With clinical faculty finding it increasingly difficult to balance the competing triad of teaching, clinical service, and research, medical schools must be cognizant of the factors that motivate clinical faculty to teach in order to effectively recruit and retain clinician educators.

Methods: A 52-item questionnaire was distributed via to all clinicians from five departments (Internal Medicine, Family Medicine, Emergency Medicine, Surgery, and Pediatrics) at the Aga Khan University in Karachi, Pakistan. Respondents' identities were kept confidential to ensure candidness and promote greater disclosure to maximize accuracy.

Results: Out of 215 clinicians, 135 completed the survey (62.8%). 53.3% were male and 46.7% were female. Medicine (28.9%) and Surgery faculty (25.9%) constituted the largest group of respondents, followed by Pediatrics (18.5%), Emergency Medicine (11.9%), Family Medicine (8.1%). More than half (52.6%) were Assistant Professors, while 15.6% were Senior Instructors/Instructors, 19.3% were Associate Professors and 12.6% were Professors. 93.3% of faculty had completed their postgraduate training in Pakistan and 35.6% of faculty were involved in teaching for more 4 hours per week.

Personal fulfillment, a passion for teaching, satisfaction as a teacher and giving back to the profession were identified as significant motivators. Significant obstacles to effective teaching were identified as a lack of recognition for their teacher identity, both contractually and financially. Clinical faculty did not feel appropriately compensated for the time they spent teaching, and found it difficult to spend time preparing lessons and balancing teaching responsibilities along with clinical service and research.

Conclusion: Understanding the factors that motivate physicians to teach is critical to the future of medical education because it can help with clinical teacher recruitment and retention, policy development to recognize and reward educational excellence, and the design and delivery of faculty development programs that meet physicians' needs.

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BUILDING CAPACITIES IN CRISIS: INJURY AND TRAUMA RESEARCH TRAINING PROGRAM IN AFGHANISTAN

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Background: Injuries and violence, including road traffic crashes, wars, terrorism, and political conflicts, are the major cause of mortality and morbidity worldwide in Afghanistan.

Aims: This project aimed to share approaches and experience of sustainable capacity building of injury research in Afghanistan

Methods: It is a five-year capacity-building program with short and long-term training opportunities delivered through an innovative model of sustainable institutional collaboration for capacity development. The long-term training includes a two-year post-graduate with a concentration on trauma and injury prevention and control. The short-term training comprises virtual trauma care courses, workshops, research tutorials, journal clubs, and seminars/webinars.

Results: Overall, four researchers from Afghanistan have received long-term post-graduate training at the Aga Khan University, Pakistan, since 2016. Three of these graduates are still working in injury and trauma research. The program alumni have also been supported after post-graduation for practical experience in Pakistan. They were engaged in research, program management, educational activities, and mentoring new fellows. Four short-term virtual training have been supported, where nearly 78 Afghan health practitioners and other stakeholders were trained. A total of six papers have been published, five manuscripts submitted to journals, and these alumni have written 16 research proposals along with 05 grant proposals related to injury research. These alumni have been working diligently in conducting capacity-building sessions for post-graduate medical trainees and clinical faculties. They have coordinated and facilitated over 114 short-term training programs to date, and the program created a wider impact at the regional level. These activities also led to a policy forum with the ministry of health to bring evidence into practice.

Conclusion: Capacity building in crisis areas is challenging and requires dedicated local people, multiple-level collaboration, technology, and never-ending patience. A stronger systematic and organizational focus is required to retain the developed capacities in trauma and injury.

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FACTORS ASSOCIATED WITH HOME DELIVERY IN RURAL SINDH, PAKISTAN: RESULTS FROM THE GLOBAL NETWORK BIRTH REGISTRY

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Background: According to global estimates for 2017, nearly 295,000 maternal deaths occurred worldwide. This burden of maternal deaths in LMICs is primarily due to poor healthcare service utilization, as indicated by relatively low rates of institutional deliveries and skilled-birth attendance (SBA).

Objectives: To assess the factors associated with home delivery and its subsequent effect on the pregnancy outcome in rural Sindh, Pakistan.

Methods: Data for this study were taken from The Global Network's Maternal Newborn Health Registry (MNHR), which is a prospective, population-based observational cohort study. Registry data for 2018–2019 for District Thatta, Pakistan was retrieved for analysis. Multivariable logistic regression models were used to determine each independent variable's effect on the delivery place by including all predictors and covariates.

Results: A total of 4649 women were included in the study, of these, 1286 (27.7%) women had delivered at home. Of those who delivered at home, a larger proportion was illiterate (90%), had a BMI of less than 18.5 kg/m² (26.0%), had parity of 3 or more (48.1%), and had a history of pregnancy loss as compared to women who had institutional delivery. In addition, two-thirds of women (63.4%) delivered at home had less than 4 ANC visits, whereas 15.6% did not receive ANC. On multivariable logistic regression we found that home delivery was significant associated with being illiterate (aOR=1.60; [95% CI: 1.34, 2.04]), having high parity (aOR=1.91; [95% CI: 1.58, 2.32]), and no ANC visit (aOR=14.8; [95% CI: 10.2, 21.5]).

Conclusions: More than a quarter of our study sample women delivered at home. These women were illiterate and did not receive antenatal care during pregnancy. The provision of comprehensive and quality antenatal care should be ensured as it improves the mothers' health-seeking behavior and helps them make informed decisions about their health and well-being.

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MIDWIVES' EXPERIENCES, FACILITATORS AND BARRIERS RELATED TO OBSTETRIC ULTRASOUND IN GILGIT BALTISTAN AND CHITRAL, PAKISTAN*Rani Nisa, Dr. Rafat Jan, Miss Shahnaz Shahid, Dr. Waseem Mirza**School of Nursing and Midwifery and Department of Radiology, Aga Khan University*

Background: Obstetric ultrasound is considered an essential tool of safe antenatal care globally. The recent guidelines by World Health Organization recommends ultrasound as routine care of antenatal service. Ultrasound helps in early detection of high-risk pregnancies and their management through timely referrals. Midwives are the significant healthcare care providers for antenatal care services including ultrasound services.

Purpose: The study aimed to explore the midwives' experiences, facilitators, and barriers related to obstetric ultrasound use in Gilgit Baltistan and Chitral, Pakistan.

Methodology: A phenomenological study design was used in this study. Total of 14 participants were recruited through universal sampling technique. The participants were selected from the basic health centers different districts of Gilgit Baltistan and Chitral, Pakistan. In-depth individual interviews based on lived experiences were carried out using a semi structured interview guide to collect the data. Data was analyzed using Creswell's steps (2013) analysis for themes.

Findings: The findings revealed four major themes: (i) Transformation of practice, (ii) Filling of fulfillment and satisfaction, (iii) Discomfort with training duration and multidisciplinary team, and (iv) Dissatisfaction with the resources.

Conclusion: It is concluded from the study that midwives can play a major role in antenatal care specially in providing ultrasound services to the community. This study highlighted that if midwives are given proper trainings, they could perform ultrasound scanning in their basic health centers and make delivery of service easy for community. Furthermore, it also satisfied women and their families economically to save cost. According to the study midwives have tried their best to overcome the hurdles and to continue their practice so if they are facilitated well, then they can be more empowered, more confident and more responsible in their skills.

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SAFEGUARDING PATIENT SAFETY VIA BARCODED MEDICATION DISPENSING SYSTEM – PAKISTAN’S FIRST BARCODED MEDICATION ADMINISTRATION SYSTEM

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Background: Preventable medication related errors continue to occur in different health care setups compromising the patient safety. Medication errors pose significant patient Safety risks related transcribing, dispensing and administration of Medication orders. These include wrong drug, wrong route of administration, wrong dose, and wrong patient etc.

Objective: Implementation of barcode medication administration System (BCMA) to reduce multifactorial human errors linked with adverse drug events and medication errors

Method: The aim of the implementation of BCMA is to aid Physicians , Pharmacist and nurses in the process of medication management and use to prevent medication errors / adverse events to enhance patient safety and quality of care.

Medication management process is comprised of 8 steps starting with i) medication receiving, ii) medication labeling and storage , iii)transfer of medication from warehouse to pharmacy satellites , iv)ordering through CPOE , v) dispensing of medication , vi)medication review , vii)verification patient verification at bedside, and viii) mark administration in EMR.

Barcode equipment were installed in satellites along with scanners and medication trolleys. In house Data Matrix and QR Barcode labels were initiated / generated for stored medication before transferring to any of the satellite in hospitals. BCMA was installed and implemented from prescribing of medication orders till administration of medications

Results: After implementation of BCMA analysis / examination showed a significant decreased in 50% decrease in annually reported medication related to Medication Administration and 74% decrease in Annually reported medication errors.

More than 1900 medications errors were prevented in 4 Years since 2019.

Conclusion: BCMA technology played a vital role in safeguarding patients safety in the hospital by preventing the medication errors from dispensing till administration

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PHARMACISTS INTERVENTIONS FOR SAFE MEDICATION PRACTICES IN A PRIVATE TERTIARY CARE ACADEMIC MEDICAL CENTER

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Background: CPOE is important for safe and effective use of medication management. It involves order entry by physician and appropriateness review by Pharmacist.

CPOE demarcates all medication order processes involving the prevention of medication errors by Pharmacist via intervention Pharmacists intervene while processing orders.

Objective: The main objective of this study was to showcase the clinical footprints of pharmacist for safe medication practice while appropriate medication review

Method: Data was collected of drug therapy problems (DTPs) by pharmacist. DTPs were analyzed for Dose, Frequency, Route of administration, Incorrect Drug IDs for the time period of one year I.e. Jan 2022 to Dec 2022

Result: 206,9583 number of medications orders were entered by physician and reviewed by Pharmacist. During appropriateness medication review 917,263 DTPs identified and corrected which is the 44% Of total entered medication orders

Conclusion: Data advocates appointment of pharmacist in both public and private Sector hospitals as per intentional best practices and benchmarks to improve medication safety.

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DEVELOPING AND IMPLEMENTING AN EVIDENCE BASED DRUG SELECTION MODEL FOR A TERTIARY CARE HOSPITAL OPERATING IN A MIDDLE AND LOW INCOME COUNTRY WITH REGULATORY CHALLENGES.

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Background:

Formulary system provides a systematic method to review scientific evidence on clinical and cost effectiveness in drug selection decision, thus potentially improving health outcomes.

Drug Formulary Management and drug selection is a challenge in developing countries with regulatory challenges.

Pakistan's pharmaceutical industry is regulated by Drug Regulatory Authority of Pakistan (DRAP). The industry heavily relies on imports to meet the demand of basic raw material – Active Pharmaceutical Ingredients (APIs) that produce the required effect on the body to treat a medical condition. There only a few API Manufacturers operating in Pakistan. The estimated reliance of manufacturers on imported APIs is more than 95%. Pakistan economic condition and Local Currency devaluation against US dollar further puts API sourcing at risk.

Objective: aims to show an evidence-based approach toward medicine selection criteria

Method: Checklist for drug selection Model was developed based on principles laid down by WHO, ASHP, USP, BP and international best practices exercised by major global regulatory agencies containing 12 points checklists. Implementation of the model Strengthen and safeguard formulary system against the volatile Pharmaceutical Industry scenario. Request for RFQ was floated to 100+ pharmaceutical Manufacturers and Pharmacy technical review committee received more than 4000 drug application dossiers against 1685 formulary entries. Based on the selection models' dossiers were rated and brands and branded generics were selected and shortlisted as suitable alternative formulary options.

Further the exercise established an online bank for all drug dossiers to be use for prospective and retrospective formulary management evaluations. Active Pharmaceutical Ingredient (API) their sourcing and quality certifications along with IMS data (National Consumption Data in various ethnic entities.

Consideration of prior institution experience to safeguard formulary against Paucity of national pharmacovigilance data

Results: 4000+ Drug Applications / Dossiers were reviewed and ranked.

Total of 108 brand switching were done to enhance quality and efficacy.

Conclusion: For selection of safe, effective, and quality drug for AKUH in current pharmaceutical industry scenario, Drug selection guide plays a vital role for formulary management based on Safety, Efficacy and Cost effectiveness.

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EXPERIENCES OF PARENTS HAVING PRETERM OR LOW BIRTH WEIGHT INFANTS DELIVERED IN BUNER KHYBER PUKHTOONKHWA*Shafiq Zada 2, Dr.Tazeen Saeed Ali 1, Nimra Asif 1**1 School of Nursing and Midwifery and 2 Department of Community Health Sciences, Aga Khan University*

Background: Every year, 1.1 million neonates die because of complications developed by preterm and LBW infants. Pakistan holds the third position among the highest death rate of newborns, globally. Almost 30 million LBW infants are born annually around the globe, and this is 23.4% of all live births. Annually, 15 million babies are delivered preterm, and this makes it one in 10 babies. Having LBW and preterm infants with complications negatively affects the lives of parents and family. Nurses play a very important role while counseling parents, involving parents in infant care, and in delivering discharge teaching.

Objectives: To explore the experiences of parents having preterm or LBW infants. It aimed at highlighting the challenges encountered by parents while caring for LBW and preterm babies.

Methodology: An Explorative Descriptive Qualitative (EDQ) study design was applied to explore the experiences of parents having preterm or low birth weight babies in District Buner, Khyber Pakhtunkhwa.

Findings: Parents of preterm newborns in the Neonatal Intensive Care Unit have particular psychological requirements (NICU). The NICU faces a huge challenge in addressing these issues. Clarifying the roles of social workers, psychologists, and nurses in helping parents, and developing interprofessional collaboration, may reduce nursing staff stress. Paying close attention to the parents' requirements, having a dialogue with them about those needs, and telling them about the many sorts of assistance offered may considerably reduce the stress of their infant's protracted hospitalization.

Conclusion: Neonatal Intensive Care Unit (NICU) parents have complex psychosocial care needs. The NICU staff faces significant obstacles in attempting to fulfil these objectives. It would be helpful for nurses and families, if the nurses working condition are improved. This could include raising the number of nurses skilled in addressing the psychological aspects of neonatal care.

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COVID-19 VACCINE BREAKTHROUGH INFECTION*Zulfeqar Ali**School of Nursing and Midwifery, Aga Khan University*

Background: Although the COVID-19 vaccine has played an important role in controlling COVID-19 infection, but even after the vaccination, cases of COVID-19 vaccine breakthrough infections have been reported. This study investigated the prevalence and severity of the COVID-19 vaccine breakthrough infection.

Purpose: The purpose of this study was to determine the prevalence and severity of breakthrough infections. This research also determined the mortality and recovery rates of patients who had the COVID-19 breakthrough infection.

Method: A quantitative chart review study design, with a consecutive sampling technique, was used for this study. The study was conducted in three tertiary care hospitals, where the data was collected from the medical records of the patients with infections. The data were analysed through the Statistical Package for Social Sciences (SPSS) 25.

Findings: A total of 5,815 files were reviewed; out of that, 242 patients presented with COVID-19 vaccine breakthrough infections. The prevalence of COVID-19 vaccine breakthrough infections was 4.16%. Most of the infected patients were in the age categories 58-67 and 68-77 years. In all, 51.2 % of them were females, and almost 52% of the patients were admitted to public hospitals.

Most of the patients presented were severe followed by non-severe patients. The critical patients were males (11.2%), age category 58-67 years (39.6 %), uneducated (15.3%), and with comorbidities (39%).

Conclusion: Patients reported a high prevalence rate of COVID-19 vaccine breakthrough infections. Even after vaccination, the possibility of individuals getting COVID-19 remains. The time between the number of doses, and even the composition of vaccines, need to be adjusted so that they offer good efficacy against the variants as well.

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LEVEL OF SATISFACTION AMONG PATIENTS TREATED UNDER THE SEHAT SAHOLAT PROGRAM IN THE PUBLIC AND PRIVATE SECTOR HOSPITALS IN DISTRICT BUNER, KPK.

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Background: The World Health Organization (WHO) estimates that half of the world's population is still unable to afford basic health services (WHO, 2017), and about 100 million people are led into poverty yearly due to out-of-pocket (OOP) expenses for health services (Nemati et al., 2020). Therefore, the WHO suggests that all the member countries of the United Nations (UN) should achieve the Universal Health Coverage (UHC) status by the year 2030 (WHO, 2017). Due to widespread poverty and high OOP health expenditure (Ayub et al., 2018), the government of the province of Khyber Pukhtoon Khwa (KPK), started the Sehat Saholat Program (SSP).

Purpose: The purpose of the study was to know the level of satisfaction of patients availing SSP in the public and private sector hospitals, in district Buner, KPK.

Methodology: A cross-sectional descriptive study design was used to find out the level of satisfaction of patients treated under SSP in the public and private sector hospitals of district Buner, KPK. The data was collected from 422 participants through a random sampling method and was analyzed through SPSS version 22.

Findings: The study found that 91.94% of the participants were satisfied with the services that they received through SSP. However, the participants suggested that SSP services should not be limited to a few healthcare settings but should be expanded to other healthcare settings and services. They also suggested that pilferage in the present system be controlled.

Conclusion: The study concluded that most of the participants were satisfied with the overall services they received under SSP in the current study setting, but still, there is a need to improve some services. So, it is recommended that the quality of services be improved through proper supervision and monitoring of SSP.

Keywords: Universal Health Coverage, Sehat Saholat Program, Sehat Insaf Card

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PEOPLE'S PREFERENCES FOR TRADITIONAL, SPIRITUAL, RELIGIOUS, AND FOLK HEALERS FOR ONCOLOGICAL DISORDERS*Nabila Anwar**School of Nursing and Midwifery, Aga Khan University*

Aim: To investigate why cancer patients and their families prefer traditional, spiritual, folk, and religious healer practices over medical treatment, and to explore the various traditional, spiritual, folk, and religious healing practices used to treat oncological disorders.

Methodology: A descriptive qualitative study design was used to study the perceptions, knowledge, and practices of patients with cancer diagnoses, their family members, and traditional, spiritual, religious, and folk healers. Patients' and their family members' preferences for using the services of traditional, spiritual, religious, and folk healers for the treatment of oncological disorders were also studied. A semi-structured, open-ended interview guide was used to collect the data.

The participants were patients diagnosed with cancer (n= 4), their family members (n= 4), and the healers (n= 4) providing care to these patients. In total, there were twelve participants, four from each group.

Results: Data analysis of this study showed that factors influencing decision making for the healing practices were resources, such as unavailability of healthcare facilities within the vicinity, distances and limited finances, fear related to a new diagnosis, and cultural influence, including spiritual and religious factors. Furthermore, the types of practices performed by the patients and used by healers were to treat oncological disorders were found to be religious, spiritual, traditional, and folk healing practices.

Conclusion: The conclusion of this study is that people prefer religious, spiritual, traditional, and folk healing practices for oncological disorders for multiple reasons, like cultural belief, lack of resources, inaccessibility of healthcare facilities, and lack of awareness. People use various healing practices that they believe can aid in healing, but this is due to their ignorance. These and many other factors lead to a delay in cancer diagnosis, until it is too late to save their lives. However, religious, and spiritual practices can help in enhancing the quality of life when an individual is in a challenging health condition.

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EXPLORING THE EXPERIENCES OF THE STAKEHOLDERS IN THE CAREGIVING ASSISTANT PROGRAM (CGA) FOR ELDERLY CARE IN KARACHI, PAKISTAN

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Background: Pakistan's health care system is ill-prepared to meet the preventive and interventive care needs of the elderly. Elder health care is largely undefined yielding too few trained healthcare providers to meet this population's unique care needs. The imperative is to shift from the generic approach to elder care in both communities, (Khan et al., 2018) home-based and acute settings to a geriatric speciality approach. To meet the growing demand for elderly care, six weeks of vocational training (caregiving assistant course) was partnered between Non-Governmental Organizations and Nursing Homes. This study holds a significant place for all the stakeholders which includes service users, service providers, and key informants of NGOs.

Purpose: The purpose of this study is to explore the experiences of stakeholders, service users, service providers (CGA) and Key Informants of NGOs, on Caregiving Assistant Program (CGA) for elderly care in Karachi, Pakistan.

Method: The study was carried out using qualitative methodology, with a descriptive exploratory design. 3 different semi-structured interview guides were used to collect the data from 10 service users (Elderly people), 3 key informants and 2 Focus Group Discussions (FGDs) were carried out consisting of seven and four participants each (n=11) who attended vocational training and provided consent to participate.

Finding(s): A total of six broad themes emerged: two from the responses of key informants, two from Service users and two from service providers (CGAs). The themes were: theory-practice gap, communication and development skills, post-training employment, mentorship and supervision, provision of capable support and lastly, responsiveness and engagement.

Conclusion: This study has been a trendsetter in enhancing a trained human resource/nursing workforce for the domain of elderly people, who were trained through a specially designed curriculum. The researcher aims to have its benefits, not only limited to an old age home but to also extend to other elderly care institutions across the country including private and public setups.

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KNOWLEDGE AND PRACTICES RELATED TO HIGH-ALERT MEDICATIONS AMONG NURSES

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Nurses are the backbone of hospitals, and their most important job is to administer medications to patients, which include routine as well as high alert medications (HAMs). HAMs are defined as a subclass of medications that, when prescribed or administered inappropriately, are more likely to harm patients than other medications, as they have a narrow therapeutic index. Insufficient knowledge and practices of nurses regarding HAMs are one of the contributing factors in medication errors (MEs). Hence, nurses need to have sound knowledge and practices regarding HAMs. No published study could be found on the knowledge and practices regarding HAMs in Pakistan.

Objectives: The objective of this study was to measure the knowledge and practices of nurses regarding HAMs, including narcotics, concentrated electrolytes (CE), anticoagulants, thrombolytic, look-alike and sound-alike medications (LASA), insulin, and neuromuscular blocking agents (NMBA), in the emergency department (ED) of a private tertiary care hospital in Karachi, Pakistan.

Methodology: A cross-sectional descriptive design was utilized to assess the knowledge and practices of nurses regarding HAMs. A total of 92 participants were recruited for the assessment of knowledge and practice, through total population sampling and consecutive sampling techniques, respectively. A survey and an observational checklist were used to investigate the knowledge and practices of nurses regarding HAMs, respectively.

Findings: Out of the total participants, 87% had a satisfactory knowledge level of all seven categories of HAMs, while only 27% had a satisfactory level of practice regarding HAMs.

Conclusion: This cross-sectional study signifies the need for effective theoretical knowledge implementation into clinical practice. Further research on challenges and barriers regarding effective implementation of theory into practice is recommended to overcome the theory-practice gap.

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QUALITY OF DISCHARGE TEACHING AND READINESS FOR HOSPITAL DISCHARGE AMONG FAMILY CAREGIVERS OF MEDICINE PATIENTS HOSPITALIZED AT A TERTIARY CARE HOSPITAL IN KARACHI, PAKISTAN

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Introduction: The successful transition from hospital to home requires extensive discharge education and preparation. Family caregivers play a crucial role in the continuity of care and recovery process of medicine patients post-discharge. Hence, it is essential that they consider themselves, adequately prepared and ready for this transition.

Objective: The study aimed to assess the quality of discharge teaching, readiness for hospital discharge (RHD) and its associated factors among family caregivers of medicine patients at a tertiary care hospital, Karachi, Pakistan.

Methods: The study was conducted using a cross-sectional analytical design and consecutive sampling technique was used to recruit 160 family caregivers of medicine patients. The data was collected through quality of discharge teaching scale (QTDS), and readiness for hospital discharge scale (RHDS). Moreover, the relationship of demographics, hospitalization, and clinical characteristics with family caregivers' RHD was assessed by using one-way ANOVA, independent t-test, and Pearson correlation.

Results: The findings of the study revealed that 89.4% of the family caregivers reported RHD (≥ 7) and the average mean score of RHDS was found to be 8.23 ± 1.07 . Moreover, the average mean score of QTDS was reported to be 6.81 ± 1.24 . The univariate analysis of independent variables showed that there was a statistically significant relationship of patients' age ($r = -0.200$, $p < 0.05$), length of hospital stay ($r = -0.190$, $p < 0.05$), functional status ($F = 8.101$, $p < 0.05$), number of take-home medications ($r = -0.160$, $p < 0.05$), and quality of discharge teaching ($r = 0.538$, $p < 0.001$) with family caregivers' RHD.

Conclusions: The results of the study concluded that it is crucial to assess the quality of discharge teaching and RHD before discharge. Moreover, the low quality of discharge teaching reported by family caregivers suggests that there is a need to focus on effective discharge planning and individualized discharge guidance in the institution to promote safe transition.

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EVOLUTION OF A NURSE INTERNS TRANSITION-TO-PRACTICE PROGRAM*Amina Lakhani, Sana Menji, Sehrish Salim, Khairunnissa Hooda**Nursing Services, Aga Khan University*

Background: A focus on successfully transitioning newly graduated nurses to practice has emerged over the last 2 decades. Multiple factors have contributed to this emphasis, including the projected nursing shortage, a workplace millennial generational shift, an increasing complexity of healthcare, rapidly changing healthcare economics with care shifting to the ambulatory setting, and evidence of successful outcomes of transition-to-practice programs.

Objectives:

1. To smoothen the transition of interns at AKUH.
2. To familiarize the nurse interns with standardized practices and protocols.

Method: Case Report

Results: Through structured orientation programme and clinical rotations the primary outcome achieved were promoting independent practice, rationalization, decision making and development for job competency among nurse interns. From its inception, the transition-to-practice program at Nursing Services, The Aga Khan University Hospital was guided by theories applicable to nursing role transition and skill acquisition. Shifting of paradigm from traditional teaching model to simulation-based practice endowed an individual to provide holistic care to the patient with rationalization and critical thinking. Also, it allowed participants to follow standard practices with confidence- ensuring the patient's safety. Clinical rotations in different specialties support the nurse interns in development of a holistic approach to nursing care.

Conclusion: Transition to practice programs provide a foundation for professional nursing practice to meet the needs of the newest generation of nurses as they grow their careers and care for vulnerable, complex patients and families in a rapidly changing healthcare environment. Ongoing examination of the structure and content of programs will continue to provide direction for research on the most effective evidence-based curricula and learning environments that will allow professional nurses to thrive and contribute to current and future challenges in healthcare delivery.

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WRONG TIME MEDICATION ADMINISTRATION ERRORS: OCCURRENCES AND CAUSES*Sana Menji**Nursing Education Services, Aga Khan University*

Background: Medication errors are one of the leading preventable adverse events caused by medical errors during patients' stay in the hospital. It can occur at any point during the medication management cycle from prescribing to administering; however, nurses can prevent these errors by ensuring all five rights of medication administration. Wrong time medication administration errors are the most common administration errors encountered during patient care. Right time of medication administration has same significance as that of right dose of Medication yet it is the most neglected type of medication error.

Objective: The objective of the study was to estimate the occurrence of wrong time medication administration and the causes of early or late administration of doses.

Method: A descriptive method of study was used in seven departments of a tertiary care hospital in Karachi. A 48 hour point prevalence data of timely administration of medication was collected through the electronic Medication Administration record system for a period of 6 months and the causes of late medication administration were listed and shared with nursing leadership of those departments.

Results: It was identified that out of 709 total doses, 672 doses were administered to the patients on time, that is from one hour before the dose time to one hour after the dose time. These doses also include early or late doses with reasons that were unavoidable during patient care. Few of the causes for late medication administration identified during the study were "Medications late received from pharmacy", "Unable to mark medication on time" & "Given".

Conclusion: The study highlighted the significance of electronic administration record in capturing the timely administration of medications, wrong time medication errors and the reasons behind these errors. The results of the study were used to sensitize nurses for the timely administration of medications via teaching and discussion sessions.

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EFFECTIVENESS OF SIMULATION STRATEGY IN IMPROVING CONFIDENCE, SATISFACTION LEVEL AND COMMUNICATION SKILLS OF UNDERGRADUATE NURSING STUDENTS AT COMMUNITY HEALTH NURSING CLINICAL SETTING IN PAKISTAN

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Introduction: The use of simulation is an innovative teaching strategy which creates student centered learning and bridge the theory practice gap. The aim of this study was to determine the effectiveness of simulation strategy in improving confidence, satisfaction level and communication of undergraduate students.

Methods: A quasi-experimental design with no control group was employed to achieve the study objectives. The study was conducted at a simulated village set-up, constructed at the Centre for Innovation in Medical Education (CIME) to give participants the feel of a real community and village set-up. All the 22 students enrolled in Post RN BScN under-graduate nursing program who took the Advanced Community Health Nursing Course were invited to participate. The simulation was aimed to provide students with the experience of the planning cycle in the community, mainly the assessment and the priority setting activity with the stakeholders. The simulation scenario was developed by expert faculty members who teach community health nursing courses. The students attended simulation in 4 to 5 students per session. The students' performances during simulation were video-recorded using B-line software used for debriefing activity of around 30 to 40 minutes following the simulation session. Paired t-test was applied to detect the differences in the pre and post scores of confidences and self-efficacy.

Results: Students' self-efficacy and confidence regarding communication with community showed a significant mean difference of 38.2(±17.7). Self-efficacy score of students in explaining the prioritization activity in local context, focused discussion with stake holders, avoidance of jargons is also seen to have significant mean difference pre and post intervention phases with scores of 30.4(±17.2), 36.3 (15.2), 28.2(22.2) having p-value <0.001 respectively. Students' confidence and self-efficacy mean score difference for negotiation skills 30.4 (±20.7), empowering community (26.6 (±24.7) , rapport building 22.8(±29.9) was also significantly different before and after intervention with p value of <0.001. Moreover, the mean difference for critical analysis were recorded to be 35.6(±23.85) and summarizing the agreed conclusion was 34.1(24.4); p value <0.001 for both.

Conclusion: The first simulated rural community environment was created in CIME to teach the undergraduate nursing students about the community settings before their actual experience.

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MANAGEMENT OF CHILDREN WITH MODERATE TO SEVERE ACUTE MALNUTRITION IN PERI-URBAN COMMUNITIES OF KARACHI, PAKISTAN: RESULTS FORM A SERVICE DELIVERY INITIATIVE

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Background: Malnutrition contributes to high morbidity and mortality among children under five years of age. Many cases of moderate acute malnutrition become severe and complicated due to delays in case detection and presentation at health facilities. In Pakistan approximately 3.15 million (or 15%) children under five are estimated to be wasted, and 9.03 million (or 43%) children stunted in 2021.

Decreasing child mortality and improving maternal health depends heavily on reducing malnutrition, which is responsible, directly, or indirectly, for 35% of deaths among children under five.

Methods: In 4 poor communities of Karachi, we screened children between 6 to 59 months of age. All children visiting primary health centers in Rehri Goth, Ibrahim Hyderi, Ali Akbar Shah and Bhains Colony were assessed for Acute Malnutrition by community health workers and physicians. Eligibility was based on age (6-59 months) and Mid Upper Arm Circumference (MUAC). Children having MUAC < 11.5 cm were labelled as severely acute malnourished (SAM) and children with MUAC > 11.5 to < 12.5cm as moderately acute malnourished (MAM) as per definition of the World Health Organization. Each child enrolled as MAM received a total of 24 packets of Ready to Use Supplementary Food (RUSF), ROSHAN+, for 6 weeks (1 sachet on alternate days); and 42 packets of RUSF for 6 weeks, i.e., 1 sachet per day. The children were followed bi-weekly for repeat MUAC to assess improvement or recovery. During this time, all children who were identified to have danger signs were referred.

Results: From July 2022 to January 2023 (24 weeks), we screened 20,778 children of 6 to 59 months of age. Among those screened, 1647 (8%) children had Moderate Acute Malnutrition (MUAC \geq 11.5 to < 12.5 cm) and 706 (3.3%) had Severe Acute Malnutrition (MUAC < 11.5 cm). Out of them 58 children were excluded, 18 had danger sign and 40 had a concomitant surgical or medical condition that required hospitalization. All the children were offered RUSF (Ready to Use Supplementary Food). Families of 11 children refused for therapy. A total of 2284 children were enrolled. Of them 1603 are enrolled with MAM and 681 with SAM, (as shown in Table 1) and are being given RUSF for 6 weeks with bi-weekly follow up and physical assessment.

Table 1: Number Of Children Screened

Normal 20778

Moderate Acute Malnutrition 1603

Severe Acute Malnutrition 681

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WORK-RELATED MUSCULOSKELETAL DISORDER AMONG SURGERY TRAINEES WORKING IN AGA KHAN UNIVERSITY HOSPITAL KARACHI-PAKISTAN CROSS-SECTIONAL STUDY.

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Introduction: Work-Related Musculoskeletal Disorders (WRMSDs) are a group of disorders that affect muscles, tendons, the skeleton, cartilage, ligaments, and nerves. Surgery trainees are at high risk for developing WRMSDs as many procedures require ergonomically challenging positions for extended hours.

Objective: To determine the factors (demographic including gender, BMI, physical activity, sub-specialties, and working hours) associated with WRMSD among surgical trainees in a tertiary care hospital, in Karachi, Pakistan.

To determine the frequency of WRMSD among surgery trainees

Methods: This analytical cross-sectional study was conducted on 139 trainee surgeons working in tertiary care hospital in Karachi. We used non-probability purposive sampling to recruit participants who spent at least one year in the same hospital as trainees. We used a structured questionnaire adapted from the Nordic Musculoskeletal Questionnaire and Global Physical Activity Questionnaire. Using STATA version 16, we applied Penalized Logistic Regression to assess the association of factors with WRMSD among trainee surgeons.

Results: In those who developed WRMSD, the mean number of hours worked per week was 24.8 ± 18.0 , and 87% of trainees were affected. The frequency of neck pain was reported higher (n=103) at 88% compared to other anatomical positions such as shoulder and upper limb. Only 11% have attended a training session on ergonomics in past. The odds of developing WRMSD among trainees working in Orthopedics, Neurosurgery, and Cardio-thorax were high at 15.7 (95% CI = [1.86-285.26]) compared with Dentistry.

Conclusion: The study not only identified the prevalence of WRMSDs in Pakistan but also found important associations, which may help to develop preventive strategies and improve the working conditions for surgery trainees. Training in Ergonomics is crucial, so the trainee can effectively work in the intense environment of the operation theatre.

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UNDERSTANDING THE HUMAN FACTORS INVOLVED IN TRAUMA RESUSCITATION DYNAMICS AMONG TRAUMA TEAM MEMBERS OF A LEVEL-1 TRAUMA CENTER IN A DEVELOPING COUNTRY – A MIXED-METHODS STUDY

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Background: Trauma is one of the leading causes of death worldwide, and its management needs a coordinated and collaborative effort. Trauma teams are one of the core ingredients of the trauma process. It possesses a few characteristics to accomplish goals in the trauma cycle. This study aims to explore and understand various human factors involved in trauma resuscitation dynamics among trauma team members of a level-I trauma center.

Methods: In our study, we employed a sequential exploratory mixed-method design, conducted at the Aga Khan University Hospital, Karachi, Pakistan. The study consisted of a qualitative phase including 14 in-depth interviews and 6 focus groups from trauma care specialists across the hospital. After analyzing the data, qualitative themes and sub-themes were developed. The other quantitative phase was a web-based self-directed survey questionnaire sent to 63 trauma team members to collect data on the team members' level of understanding of human factors. The Chi-square test was used to determine the relationship between categorical variables. The findings from both phases were mixed at the interpretation stage of the study.

Results: The understanding level of trauma team members was significantly correlated with the human factors involved in trauma care, including the availability of technology and tools, an adequate physical environment, tasks assigned during trauma situations, and care delivery processes required for trauma mechanics (p-value <0.005). The thematic analysis from the qualitative phase endorsed the findings that the understanding of human factors involved in the trauma cycle among trauma team members is extremely crucial to improving the quality of trauma care and patient outcome.

Conclusion: The human factors and system reengineering have shown positive outcomes in developed countries. Understanding our working environment and redesigning our work system model and its processes will eventually lead to success in the management of trauma care.

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FACTORS ASSOCIATED WITH CONTINUATION OF HORMONAL CONTRACEPTIVES AMONG MARRIED WOMEN OF REPRODUCTIVE AGE IN GILGIT- PAKISTAN: A COMMUNITY-BASED CASE CONTROL STUDY*Fazila Bibi, Sarah Saleem, Shafquat Rozi, Shiyam Sunder**Center of Excellence for Trauma and Emergencies and Community Health Sciences
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Background: Worldwide contraceptive continuation is affected by service delivery, biological and sociodemographic factors. This study aimed to determine the association between the distance from home to the nearest Family Planning center and continuation of hormonal contraceptives among married women of Gilgit, Pakistan for at least six months after initiating it.

Methods: An unmatched case control study, was conducted in the community settings of district Gilgit, Pakistan from April 1, 2021 to July 30, 2021. The cases were married women of reproductive age who were using a hormonal method of contraception for at least last six months continuously, and controls were married women of reproductive age who had used hormonal method in the past and currently were using a non-hormonal method for at least last six months. Simple and multiple logistic regression method was used to identify factors associated with continuation of hormonal method of contraception.

Results: The mean age of cases was 34.8 years (SD 5.9 years) whereas mean age of controls was 31.5 years (SD 5.3years). Final multivariable logistic model suggested distance from home to family planning center (AOR 6.33, 95% CI, 3.74-10.71), age of women (years) (AOR 1.07, 95% CI, 1.02-1.12), women with some level of formal education (AOR 0.27 95% CI, 0.12-0.6), satisfaction with current method (AOR 3.64 95% CI, 2.06-6.44) and visits to the family planning center to avail services (AOR 1.86 95% CI, 1.07-3.45) as supportive factors to continue using a modern method of contraceptive.

Conclusion: Continuation of a hormonal method was associated with easy access to family planning centers, satisfaction with the current method use and visits to the family planning centers. Continuation was also seen in women with low education status. Findings emphasized that presence of family planning centers in close proximity to residential areas make access and continuation in use easier.

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TREATMENT OF IRREVERSIBLE PULPITIS IN MATURE PERMANENT TEETH: A COST-EFFECTIVENESS ANALYSIS OF PULPOTOMY VERSUS ROOT CANAL TREATMENT*Nighat Naved 1, Fahad Umer 1, Asif R. Khowaja 2**1 Department of Surgery, Aga Khan University Hospital**2 Brock University, Ontario*

Introduction: Evidence-based dentistry suggests pulpotomy as a potential alternative to root canal treatment in mature permanent teeth with irreversible pulpitis. However, the evidence surrounding the cost-valuation and cost-efficacy of this treatment modality is not yet established. In this context, we adopted an economic modeling approach to assess the cost-effectiveness of pulpotomy versus root canal treatment, as this would aid in effective clinical decision-making.

Methods: A Markov model was constructed following a mature permanent tooth with irreversible pulpitis in an 18-year-old patient over a lifetime using TreeAge Pro Healthcare 2022. Transition probabilities were estimated based on existing literature. Costs were estimated based on the United States healthcare following a private-payer perspective and parameter uncertainties were addressed using Monte-Carlo simulations. The model was validated internally by sensitivity analyses, and external validation was done by an experienced health economist.

Results: In the base-case scenario, root canal therapy was found to be the dominant treatment modality (ICER= USD 23.91 per tooth Life Years gained). The mean time until teeth were retained in the oral cavity after pulpotomy, and root canal treatment were 38 years and 51.6 years respectively. In the probabilistic sensitivity analysis, root canal treatment was found to be highly cost-effective compared to pulpotomy against different WTP values.

Conclusion: Root canal treatment was found to be more cost-effective compared to pulpotomy in mature permanent teeth with irreversible pulpitis over a lifetime of an individual.

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MEN'S INVOLVEMENT IN CURRENT FAMILY PLANNING PROGRAMS: AN EXPLORATORY STUDY FROM KARACHI

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Introduction: There has been no improvement in contraceptive utilization in Pakistan since the last decade, especially in involving men in family planning programs and services, as the programs focus on women for contraception despite men being the primary decision-makers of the household. Research Objectives: 1. To identify current gaps in family planning services for men. 2. To explore the male perception of accessibility and acceptability of family planning services.

Methodology: we conducted a qualitative exploratory study using a deductive approach. Data were collected through semi-structured interviews using purposive sampling. Twenty-five interviews were conducted with 8 key informants and stakeholders working in family planning programs in Sindh, 8 in-depth interviews with service providers, and 9 in-depth interviews with married men. Data were transcribed and analyzed under prior selected themes. Subthemes and codes were identified.

Findings: Male involvement in the family planning program is minimal. FP centers provide services to women only by women health care providers. Female service providers are not trained to counsel males. Male service providers are available in RHS" A centers only. The community men are reluctant to discuss family planning methods with female providers. One International NGO runs a small-scale vasectomy project with Population Welfare Department in Karachi. Men know about social marketing NGOs due to their advertisements. However, the policy review revealed that since 2002 policies have included men's involvement in family planning programs.

Conclusion: Service delivery options are very limited for men. Only limited vasectomy services are available at RHS-A centers, which does not impact the contraceptive prevalence rate nationally and at the provincial level. Female service providers are not trained to counsel men. Involving men can increase the use of contraceptives in Pakistan. Keywords: Family Planning, Male involvement, Reproductive health, Contraceptives/ Contraception.

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MENSTRUAL HYGIENE MANAGEMENT FACILITIES AT SCHOOLS AND ASSOCIATED SCHOOL ABSENTEEISM AMONG ADOLESCENT SCHOOLGIRLS IN RURAL AREAS OF DISTRICT SUJAWAL, PAKISTAN: A CROSS SECTIONAL STUDY

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Background: Menstrual hygiene management refers to the hygiene and health necessities of girls and women during menstruation. Worldwide, millions of young girls do not go to school during menstruation. In rural Pakistan, 22% of school absenteeism has been reported during menstruation. The aim of the study was to determine menstrual hygiene management facilities at schools and associated school absenteeism.

Methods: We conducted a cross sectional survey among 300 adolescent schoolgirls of rural areas of district Sujawal who have already experienced menstruation. Multistage cluster sampling technique was used to identify the schools and data was collected from three schools. We approached all eligible adolescent girls in each school with the assistance of teachers utilizing class attendance registers. We collected the data on sociodemographic, menarche experiences, facilities at school for menstrual hygiene and associated school absenteeism through a survey questionnaire adapted from Bangladesh National hygiene survey 2018. Using Cox proportional hazard model analysis, we estimated a prevalence ratio for the factors associated with menstrual hygiene management and school absenteeism.

Results: All the three schools lacked provision of menstrual hygiene management facilities for their students. The adolescent schoolgirls were 3.02 times (95% C. I=1.54 – 5.93) likely to report absenteeism from school during menstruation adjusting for current class grade of the adolescent schoolgirls. The prevalence odds ratio of school absenteeism was 30 percent lesser (POR=0.70 95% C. I=0.52-0.96) in older school students.

Conclusion: All the study schools were not able to provide sufficient support for young students to manage menstrual hygiene in school timings resulting in high school absenteeism. Therefore, advocacy and awareness of school administration and parents regarding clean, latrines need to be raised for preventing high rate of school absenteeism.

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MENTAL WELL-BEING OF COVID-19 SURVIVORS IN KARACHI, PAKISTAN: AN EXPLORATORY CASE STUDY*Salima Nazim Meghani, Rozina Karmaliani, Muhammad Asim**School of Nursing and Midwifery and Department Community health sciences, Aga Khan University*

Introduction: COVID-19 pandemic has affected an individual's mental well-being and increased mental health burden globally. There is a dearth of literature on the mental well-being of COVID-19 survivors in the Pakistani population. Hence, this study explores the experiences of survivors, family caregivers, and healthcare providers regarding the mental well-being and healthcare needs of the COVID-19 survivors in Pakistan.

Method: The exploratory case study design was used in the context of the population of Ayesha Manzil and Karimabad, areas in central Karachi. Through the snowball sampling technique, those adult survivors who quarantined themselves at home were included. In addition, family caregivers of survivors and healthcare providers were also interviewed to triangulate the study. IDI and KII were used to collect data. The thematic analysis method was applied to analyze the data.

Results: The key effects on COVID-19 survivors' mental well-being, coping strategies, and the response of healthcare providers were identified through six themes which include self-acceptance of life changes, personal growth, purpose in life, relationship with others, autonomy, and environmental mastery. The study's findings also indicate a non-availability of public-funded mental health services in the area.

Conclusion: Study findings explicitly conclude that COVID survivors of central Karachi have suffered from negative mental well-being. The study suggests initiating community-based mental health services and programs to cope with negative mental well-being. In addition, training LHW and CHW for barefoot counseling for COVID patients are recommended. Furthermore, the study suggests training all general practitioners in mental health, which results in early diagnosis of survivors' mental well-being issues and reduces the country's mental health burden.

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CLINICAL AND PSYCHOSOCIAL FACTORS ASSOCIATED WITH QUALITY OF LIFE IN PATIENTS WITH HEAD AND NECK CANCER: AN ANALYTICAL CROSS-SECTIONAL STUDY FROM A LOWER-MIDDLE-INCOME COUNTRY

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Introduction: The disease course of head and neck (H&N) cancers can severely impair patients' quality of life (QoL). In Pakistan, a South Asian lower-middle-income country (LMIC), psychosocial factors may be associated with QoL. Thus, we aimed to assess QoL and associated factors amongst patients with H&N cancers in Pakistan.

Methods: An analytical cross-sectional study was conducted amongst adult (≥ 18 years) patients with H&N cancer who were ≥ 4 weeks post-initiation of treatment. The survey assessed QoL (European Organization for Research and Treatment of Cancer Quality of Life Questionnaires), mental health outcomes (Hospital Anxiety and Depression Scale), and social support (Enriched Social Support Instrument). Multivariable linear regression was used for analysis.

Results: A total of 250 patients (mean age: 51.6 years) were included. The majority of patients were married (87%) and living with multigenerational/extended family households (53%). On multivariable linear regression, ongoing cancer treatment (beta coefficient: -13.93), having a tracheostomy (-10.02), and receiving adjuvant chemoradiotherapy (-8.17) were significantly associated with poorer global QoL. Additionally, poorer QoL was associated with depression (-24.37) and anxiety (-13.34). However, having more household family member was associated with better global QoL (0.34).

Conclusion: The QoL of patients with H&N cancer in Pakistan is affected by both the nature of cancer treatment as well as sociocultural factors such as household size. Given that poorer QoL is associated with poorer mental health outcomes, there is a need to develop and implement psychosocial interventions to improve QoL of patients with H&N cancer in Pakistan, particularly during active treatment.

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KNOWLEDGE ABOUT HIV AND DISCRIMINATORY ATTITUDES IN PAKISTANI WOMEN OF REPRODUCTIVE AGE: FINDINGS FROM THE 2017-18 DEMOGRAPHIC HEALTH SURVEY

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Introduction: A prominent issue associated with HIV is the stigma surrounding it due to a lack of awareness. People living with HIV (PLHIV) fear being stigmatized and anticipate discriminatory behavior from healthcare providers and the general community. Limited evidence is available regarding the issue of stigma surrounding HIV in Pakistan, especially among women.

Objective: This study aimed to find the association between HIV and AIDS-related knowledge and discriminatory attitudes among Pakistani women of reproductive age using the 2017–18 PDHS data.

Methods: A study sample of 3381 Pakistani women of reproductive age was analyzed using ordinal logistic regression for complex survey data. A composite variable was created using several DHS variables from the HIV module to denote the respondents' HIV-related knowledge and their attitude toward PLHIV. The knowledge and attitude scores were calculated using a scoring method, and data-driven categorization was done for this PDHS 2017–2018 secondary analysis.

Results: More than half (58.8%) of the respondents presented with a negative attitude toward PLHIV, and 64.3% of the respondents had insufficient knowledge regarding the illness. In the multivariable analysis, only knowledge about HIV and level of education were found to have significant associations with discriminatory attitudes. This study concluded that the odds of individuals living in a rural setting and hailing from a low socioeconomic background being more likely to present with a negative attitude towards people with HIV were 2.52 times (95% CI:1.07–5.89) higher than those living in an urban setting and hailing from a high socioeconomic background.

Conclusion: Negative attitudes toward HIV were a prominent finding among Pakistani women of reproductive age. Most respondents came from a good educational background but had insufficient knowledge about HIV/AIDS. Further research is needed to understand the stigma and discrimination toward PLHIV.

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NEUROCOGNITIVE OUTCOMES IN NEWLY DIAGNOSED BRAIN TUMOR CHILDREN IN KARACHI, PAKISTAN

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Introduction: Neurocognitive dysfunction can have a significant impact on functional outcomes and the daily life of children with brain tumors.

Objective: To assess the neurocognitive outcomes in newly diagnosed brain tumor children.

Methods: The study was conducted at tertiary care hospitals of Karachi, Pakistan. A total of 48 newly diagnosed children with brain tumor age 5-21 years were recruited. Validated tools were used for neurocognitive testing of the children. The Wechsler intelligence scale was used for verbal intelligence assessment. While the Ravens and Wechsler intelligence scales were used for nonverbal (perceptual reasoning and processing speed) assessment respectively.

Result: About 29 patients were from private tertiary care hospital while 19 from public sector hospital. In about 57.1% of the patients, the tumour was defined as low grade, based on histological assessment.

On pretreatment neurocognition assessment, patients scored 1.28 standard deviations below the normative mean on verbal intelligence (81.4 ± 19.5) and 2.33 standard deviations below the normative mean on processing speed (63.34 ± 14.37). About, 62% of patients were below 50th percentile on perceptual reasoning. A low monthly household income, a low parental educational status and younger age of the child were found to be correlated to the child's neurocognition deficit in different domains.

Conclusion: Newly-diagnosed brain tumor children display neurocognitive impairments in various domains. Socio-demographic factors like younger age of the child, low household monthly income, and low parental educational level are all important potential predictors of neurocognitive deficits. Monitoring for neurocognitive deficits and integration of neuropsychological evaluations at the time of diagnosis is critical in the care of children with brain tumors.

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EXPERIENCES OF FAMILY CAREGIVERS OF CHILDREN LIVING WITH THALASSEMIA-MAJOR IN KARACHI: A PHENOMENOLOGICAL STUDY*Dr Maliha Baqar**Community Health Sciences, Aga Khan University*

Introduction: Thalassemia(major) is an inherited blood disorder with a prevalence of 5% worldwide. It is an emerging public health issue in Pakistan requiring lifelong blood transfusion and chelation therapy with multidisciplinary care. Pakistan's weak health system has led to poor compliance with the treatment guidelines resulting in poor quality and low life expectancy for these children.

Objectives: The study's objective was to explore the experiences of family caregivers of children living with Beta-Thalassemia(major) residing in Karachi and to identify their enablers and barriers to health service utilisation for their children living with thalassemia(major).

Methodology: The interpretative phenomenological research design was employed to gain insight into the caregivers experiencing the phenomenon. The in-depth interviews with 18 caregivers were conducted at selected thalassemia centres in Karachi using a non-probability purposive sampling technique. Thematic analysis using both inductive and deductive approaches was employed. Results: The study's findings were interpreted at individual, interpersonal and organisational levels, highlighting unawareness about the carrier state, limited knowledge of the disease, financial constraints and worries about the child's future as main challenges of caregivers. The absence of emotional and social support has made them feel helpless and hopeless. The obstacles in registration at thalassemia-care centres, expensive chelating agents and non-availability of blood were significant challenges for seeking care and child-rearing for caregivers. The absence of guidelines for thalassemia-carrier detection among mothers in antenatal care was also highlighted in the study.

Conclusion: The lack of knowledge about disease and carrier state was a critical finding that stresses the need to implement premarital screening programs. Thalassemia-carrier detection of mothers should be included in antenatal guidelines and counselling at the primary level for disease prevention. The caregivers faced problems seeking treatment, leading to the setting up of a satellite thalassemia centre connected to a state-of-the-art tertiary care thalassemia hospital in the public sector.

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MATERNAL INFECTION AND STILLBIRTH: A REVIEW

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Introduction: Maternal infections likely are an important cause of stillbirths, especially in sub-Saharan Africa and south Asia, where the burden is highest. Due to the lack of routine testing for infection, which can be complex and often expensive, the prevalence of infection during pregnancy and the association of many infections with stillbirth are not well-documented, especially in low-resource countries.

Methods: Following an extensive literature review of infection and stillbirth initially published in 2010, we conducted a review of literature in the last 10 years to identify infections associated with stillbirth, focused on those in low-resource settings. Results: During the last 10 years, over 40 bacterial, viral and other pathogens have been associated with stillbirth. Newly emerging viral infections such as Denge as well as several well-established, but not yet eliminated infections such as rubella have been associated with stillbirth. Two of the maternal infections most strongly associated with stillbirth, each with about a 2-fold risk, are malaria and syphilis but others have been associated with risk in a range of studies. With a lack of routine antenatal screening, many pathogens are identified as associated with stillbirth only through case reports. Infection remains an important, yet understudied, cause of stillbirth.

Conclusion: Research studies to determine definitive associations between various infections and stillbirth are important to better understand the role of infections and strategies to reduce infection-related stillbirth. Summary This review explores the association between infections and stillbirths focusing on low-income country studies published in the last 10 years. Much information about these relationships comes from case reports. Research resulting in a better understanding of the causes and strategies to reduce infection-related stillbirth is necessary.

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THE CAUSES OF PRETERM NEONATAL DEATHS IN INDIA AND PAKISTAN (PURPOSE): A PROSPECTIVE COHORT STUDY

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Background: Preterm birth remains the major cause of neonatal death worldwide. South Asia contributes disproportionately to deaths among preterm births worldwide. Novel evaluations, including histological and bacteriological assessments of placental and fetal tissues, facilitate more precise determination of the underlying causes of preterm deaths. We sought to assess underlying and contributing causes of preterm neonatal deaths in India and Pakistan.

Methods: PURPOSE was a prospective cohort study done in three hospitals in Davangere, India, and two hospitals in Karachi, Pakistan. All pregnant females older than 14 years were screened at the time of presentation for delivery, and those with an expected or known preterm birth, defined as less than 37 weeks of gestation, were enrolled. Liveborn neonates with a weight of 1000 g or more who died by 28 days after birth were included in analyses. Placentas were collected and histologically evaluated. In addition, among all neonatal deaths, with consent, minimally invasive tissue sampling was performed for histological analyses. PCR testing was performed to assess microbial pathogens in the placental, blood, and fetal tissues collected. An independent panel reviewed available data, including clinical description of the case and all clinical maternal, fetal, and placental findings, and results of PCR bacteriological investigation and minimally invasive tissue sampling histology, from all eligible preterm neonates to determine the primary and contributing maternal, placental, and neonatal causes of death.

Findings: Between July 1, 2018, and March 26, 2020, of the 3470 preterm neonates enrolled, 804 (23%) died by 28 days after birth, and, of those, 615 were eligible and had their cases reviewed by the panel. Primary maternal causes of neonatal death were hypertensive disease (204 [33%] of 615 cases), followed by maternal complication of pregnancy (76 [12%]) and preterm labour (76 [11%]), whereas the primary placental causes were maternal and fetal vascular malperfusion (172 [28%] of 615) and chorioamnionitis, funisitis, or both (149 [26%]). The primary neonatal cause of death was intrauterine hypoxia (212 [34%] of 615) followed by congenital infections (126 [20%]), neonatal infections (122 [20%]), and respiratory distress syndrome (126 [20%]).

Interpretation: In south Asia, intrauterine hypoxia and congenital infections were the major causes of neonatal death among preterm babies.

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THE CAUSES OF STILLBIRTHS IN SOUTH ASIA: RESULTS FROM A PROSPECTIVE STUDY IN INDIA AND PAKISTAN (PURPOSE)

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Background: South Asia contributes more than a third of all global stillbirths, yet the causes remain largely unstudied in this region. New investigations, including novel assessments of placental and fetal tissues, facilitate more precise determination of the underlying causes of stillbirth. We sought to assess underlying and contributing causes of stillbirth from settings in India and Pakistan.

Methods: In this prospective cohort study (PURPOSE), we report the cause of death in stillbirths in hospitals in central India and south Pakistan (Davangere, India [three public and private hospitals] and Karachi, Pakistan [one public maternity and one children's hospital]). Women aged 15 years or older and with a known stillbirth (defined as a pregnancy at 20 or more weeks of gestation with the in-utero death of a fetus) weighing 1000 g or more were included in the study. Maternal clinical factors, placental evaluation, fetal tissue evaluation (from minimally invasive tissue sampling), and PCR for microbial pathogens were used to identify the causes of death. An expert panel reviewed available data for all stillbirths to identify the primary and contributing maternal, placental, and fetal causes of stillbirth.

Findings: Between Sept 1, 2018, and Feb 12, 2020, 981 stillborns were included and, of those, 611 were reviewed by the expert panel. The primary maternal causes of stillbirth were hypertensive disease in 221 (36%) of 611 stillbirths, followed by severe anaemia in 66 (11%) stillbirths. The primary placental causes were maternal and fetal vascular malperfusion, in 289 (47%) stillbirths. The primary fetal cause of stillbirth was intrauterine hypoxia, in 437 (72%) stillbirths. We assessed the overlap of main causes and 116 (19%) stillbirths had intrauterine hypoxia, placental malperfusion, and eclampsia or pre-eclampsia indicated as primary causes of death. Infection (including of the placenta, its membranes, and in the fetus) and congenital anomalies also were causative of stillbirth.

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CORRIGENDUM TO: FACTORS ASSOCIATED WITH PARENTAL ACCEPTANCE OF MINIMALLY INVASIVE TISSUE SAMPLING TO IDENTIFY THE CAUSES OF STILLBIRTH AND NEONATAL DEATH

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Background: Minimally invasive tissue sampling (MITS) is a noninvasive technique used to determine the cause of deaths. Very little is known about the factors that affect MITS acceptance or refusal. We present findings from a prospective study conducted in Southeast Asia on the reasons for accepting or refusing MITS.

Methods: This substudy was conducted in India and Pakistan to determine the acceptability of MITS in women who had a stillbirth or preterm live birth who later died. A formal questionnaire was used to gather observations during the consent for MITS, such as reasons for acceptance or refusal of MITS, as well as which family members were involved in the decision process.

Results: In Pakistan, the MITS acceptability forms were completed for 470 of 477 women (98.5%) with an eligible stillbirth for this substudy, and 334 of 337 (99.1%) with an eligible preterm neonatal death. In India, MITS acceptability forms were completed in 219 of 305 women (71.8%) with an eligible stillbirth and 260 of 264 (98.4%) with an eligible preterm neonatal death. In India, the most common reasons for MITS refusal for both stillbirths and preterm neonatal deaths were cultural concerns, while in Pakistan, the most common reason for MITS refusal was a potential delay in the funeral. The primary reason for accepting MITS was that the parents wanted to understand the cause of death. At both sites, fathers, mothers, and relatives, often in consultation, choose whether or not to accept MITS to determine the cause of death in stillbirths and preterm neonatal deaths.

Conclusions: MITS was more commonly accepted in India than in Pakistan. Cultural concerns in India and funeral delays in Pakistan were common reasons for refusal. Parents from both sites were curious to know the cause of stillbirths and preterm neonatal deaths. The father, mother, and relatives were key decision makers for consenting to or declining MITS.

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BIRTH ASPHYXIA IS UNDER-RATED AS A CAUSE OF PRETERM NEONATAL MORTALITY IN LOW- AND MIDDLE-INCOME COUNTRIES: A PROSPECTIVE, OBSERVATIONAL STUDY FROM PURPOSE

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Objective: To assess respiratory distress syndrome (RDS) compared with birth asphyxia as the cause of death in preterm newborns, assigned by the neonatal intensive care unit (NICU) physician at the time of death and assigned by a panel with complete obstetric history, placental evaluation, tissue histology and microbiology.

Design: Prospective, observational study.

Settings: Study NICUs in India and Pakistan.

Population: Preterm infants delivered in study facility.

Methods: A total of 410 preterm infants who died in the NICU with cause of death ascertained by the NICU physicians and independently by expert panels. We compared the percentage of cases assigned RDS versus birth asphyxia as cause of death by the physician and the panel.

Main outcome measures: RDS and birth asphyxia.

Results: Of 410 preterm neonatal deaths, the discharging NICU physicians found RDS as a cause of death among 83.2% of the cases, compared with the panel finding RDS in only 51.0%. In the same neonatal deaths, the NICU physicians found birth asphyxia as a cause of death in 14.9% of the deaths, whereas the panels found birth asphyxia in 57.6% of the deaths. The difference was greater in Pakistan where the physicians attributed 89.7% of the deaths to RDS and less than 1% to birth asphyxia whereas the panel attributed 35.6% of the deaths to RDS and 62.7% to birth asphyxia.

Conclusions: NICU physicians who reported cause of death in deceased preterm infants less often attributed the death to birth asphyxia, and instead more often chose RDS, whereas expert panels with more extensive data attributed a greater proportion of deaths to birth asphyxia than did the physicians.

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PREVENTABLE STILLBIRTHS IN INDIA AND PAKISTAN: A PROSPECTIVE, OBSERVATIONAL STUDY

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Objective: Stillbirths occur 10–20 times more frequently in low-income settings compared with high-income settings. We created a methodology to define the proportion of stillbirths that are potentially preventable in low-income settings and applied it to stillbirths in sites in India and Pakistan.

Design: Prospective observational study.

Setting: Three maternity hospitals in Davangere, India and a large public hospital in Karachi, Pakistan.

Population: All cases of stillbirth at ≥ 20 weeks of gestation occurring from July 2018 to February 2020 were screened for participation; 872 stillbirths were included in this analysis.

Methods: We prospectively defined the conditions and gestational ages that defined the stillbirth cases considered potentially preventable. Informed consent was sought from the parent(s) once the stillbirth was identified, either before or soon after delivery. All information available, including obstetric and medical history, clinical course, fetal heart sounds on admission, the presence of maceration as well as examination of the stillbirth after delivery, histology, and polymerase chain reaction for infectious pathogens of the placenta and various fetal tissues, was used to assess whether a stillbirth was potentially preventable.

Main outcome measures

Whether a stillbirth was determined to be potentially preventable and the criteria for assignment to those categories.

Results: Of 984 enrolled, 872 stillbirths at ≥ 20 weeks of gestation met the inclusion criteria and were included; of these, 55.5% were deemed to be potentially preventable. Of the 649 stillbirths at ≥ 28 weeks of gestation and ≥ 1000 g birthweight, 73.5% were considered potentially preventable. The most common conditions associated with a potentially preventable stillbirth at ≥ 28 weeks of gestation and ≥ 1000 g birthweight were small for gestational age (SGA) (52.8%), maternal hypertension (50.2%), antepartum haemorrhage (31.4%) and death that occurred after hospital admission (15.7%).

Conclusions: Most stillbirths in these sites were deemed preventable and were often associated with maternal hypertension, antepartum haemorrhage, SGA and intrapartum demise.

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ANXIETY LEVELS IN PREGNANT WOMEN RELATED TO COVID-19 VACCINATION AND ITS EFFECTS ON MATERNAL AND FETAL HEALTH, VISITING TERTIARY CARE HOSPITALS OF KARACHI – A COMPARATIVE CROSS-SECTIONAL STUDY

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Introduction: Uncertainty and suspicion of the vaccine's efficacy, miscalculation of the vaccine's usefulness, and inaccessibility to the vaccine are all factors that contribute to vaccine reluctance and predispose to maternal anxiety, which can be deleterious to the health of both the fetus and the mother. The insufficiency and inadequacy of literature regarding the efficacy of vaccination in pregnant women has resulted in fear and anxiety amongst mothers-to-be when opting for COVID-19 vaccination during pregnancy. Thus, this study aimed to compare the levels of anxiety in vaccinated and unvaccinated pregnant women owing to the vaccine's perceived effects on fetal and maternal health.

Methods: An analytical comparative cross-sectional study design was employed to compare the levels of anxiety in two groups: COVID-19 vaccinated pregnant women and COVID-19 unvaccinated pregnant women visiting tertiary care government and private hospitals in Karachi. A purposeful sampling technique was adopted to identify eligible candidates visiting the obstetrics and gynecology departments of the study site hospitals for their antenatal care.

Results: 210 participants were recruited in the vaccinated group and 197 in the unvaccinated group. The prevalence of vaccine-related anxiety observed in the vaccinated group was 19.1%, and in the unvaccinated group, it was 23.4%. Using a multiple cox-proportional algorithm, significant associated factors were identified that potentiated the vaccine-related anxiety, which included vaccination status and the educational status of the husband. Unvaccinated pregnant women showed a higher prevalence of vaccine-related anxiety (PR = 2.04; 95% CI: 1.27–3.29) when adjusted for other covariates. It was also observed that women with both COVID-19 infection-related anxiety and pregnancy-related anxiety had a higher probability of having vaccine-related anxiety: PR = 1.37 (95% CI: 1.24–1.51).

Conclusion: The current study highlights that anxiety among unvaccinated pregnant women is higher and that COVID-19 infection and pregnancy-related anxiety play a significant role in potentiating vaccine-related anxiety. The study emphasizes the need for additional research to support the safety of vaccinations during pregnancy as well as their possible risks and advantages to decrease pregnant women's worry and enhance vaccination acceptability.

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VALIDATION OF A SCREENING TOOL TO RULE OUT ACTIVE PULMONARY TB IN ADULTS COMING TO A PRIVATE TERTIARY CARE HOSPITAL*Dr Sumaiya Siddiqui 1, Dr Sarah Saleem 2, Dr Shiyam Sunder 2**1 Department of Emergency Medicine and 2 Department of Community Health Sciences, Aga Khan University*

Background: Pulmonary tuberculosis is a major public health concern worldwide, with Pakistan ranking fifth among high-burden countries. Diagnosis of tuberculosis is difficult and expensive. Most patients cannot afford diagnostic delays and fees, thus we chose to validate a screening tool based on three questions against GeneXpert as the gold standard. Using this screening tool, we also investigated healthcare professionals' (HCPs') perspectives and experiences with early TB diagnosis.

Methodology: It was a mixed-method study was conducted at ER and clinics in Aga Khan University Hospital between January 1, 2019, and December 31, 2019. A retrospective cross-sectional study was conducted using chart reviews and included patients on which screening tool was administered and GeneXpert was available. The validation of the screening tool for early detection was presented as sensitivity, specificity, and positive and negative predictive values were reported whereas the qualitative part was evaluated through descriptive thematic analysis., fulfilling the inclusion criteria was reviewed, and.

Results: In the quantitative results, for a sample size of 98 patients, 76 screened positive with 45 being GeneXpert positive and 31 testing negative. Out of 22 who screened negative, 8 tested positive and 14 tested negative.

Qualitative results yielded 3 themes and sub-themes, related to early and easy diagnosis of TB, identifying gaps and barriers. The pros and cons of using the current algorithm highlighted shortcomings in terms of its relevance, deficiencies, and sufficiency, directing us to the need for a separate respiratory triage and algorithm modification incorporating the feedback of the physicians and staff.

Conclusion: The sensitivity of our screening tool was 84.91%, specificity was 31.11%, positive predictive value was 59.21%, and negative predictive value was 63.64%.

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ASSOCIATION BETWEEN DENTAL STATUS AND ORAL HEALTH-RELATED QUALITY OF LIFE IN SCHOOLCHILDREN OF KARACHI*Dr Sonia Sameen, Dr Narjis Fatima Hussain, Dr Sohail Lakhani**Department of Community Health Sciences and Center of Excellence in Women and Child Health, Aga Khan University*

Introduction: Dental caries is the most prevalent oral disease among children in most developing countries. Caries may hinder everyday activities like eating, speaking, and socializing and may cause distress to the affected individual, thereby contributing to psychosocial issues. Oral health-related quality of life (OHQoL) determines the degree to which oral conditions can directly affect an individual's functional and psychosocial health.

Objective: The study aimed to measure the association between dental status and OHQoL in schoolchildren of Karachi.

Methods: A cross-sectional study was conducted on 420 private school children aged between 11 and 15 years in Karachi. The data was collected using an interview-based questionnaire. We used the OHIP-14 scale to measure OHQoL and the International Caries Detection and Assessment System (ICDAS) to assess the participants' dental health and caries status. Statistical analysis was performed using multiple linear regression.

Results: Nearly two-thirds of the sample consisted of females with a mean age of 13.32 ± 1.18 years. The mean ICDAS score was 15.46 ± 17.36 and the mean OHIP score was noted to be 8.99 ± 7.65 , respectively. In the multivariable analysis, ICDAS score, frequency of sugary/fizzy drink consumption, frequency of toothbrushing, gender, and age reported significant associations with OHIP scores. The study concluded that for a child consuming more than 10 candies per week and more than 5 sugary/fizzy drinks per week, the difference in the estimated OHIP score as compared to a child consuming 0-5 candies per week and 0-2 drinks per week is 7.51 units.

Conclusion: The findings of our study confirm poorer OHQoL in children with more caries. Our study emphasizes the need to introduce more versatile systems of dental caries assessment. Efforts should be made to develop an effective oral health promotion program for schoolchildren to promote better dental health and thus better OHQoL.

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ENVIRONMENTAL SURVEILLANCE FOR SARS-COV-2 IN KARACHI: CORRELATING SEWAGE SARS-COV-2 RNA CONCENTRATION AND REPORTED INCIDENCE OF COVID-19 FROM A LARGE URBAN DISTRICT

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Background: The SARS-CoV-2 virus is excreted in feces up to 33 days post-infection, even by cases who do not have clinical evidence of the infection. In areas with poor or no active surveillance, such asymptomatic cases are not counted among clinical estimates. Detection and analysis of SARS-CoV-2 RNA in wastewater is useful way to monitor the occurrence and temporal trend of SARS-CoV-2 transmission in the community.

Further, sequencing of the viral genome provides comprehensive information about the circulating variants.

Objective:

1. To perform PCR-based testing and isolation of SARS-CoV-2 RNA and co-relate RNA concentration in sewage with the confirmed district cases.
2. To quantify the amount of SARS-CoV-2 RNA and the virus's variant abundance by using genomic sequencing.

Methodology: Between June 10, 2021 and January 17, 2022, we collected early morning samples twice a week from 4 locations in District East Karachi that drain into the Lyari River by using a Bag Mediated Filtration System,

In a BSL-2 facility, skim milk flocculation and ultracentrifugation were used to obtain a secondary concentration of filtrate. Polymerase chain reaction (PCR) tests were performed for the N1 and N2 genes. Illumina's iSeq100 was used for genomic sequencing.

Analysis of the association between wastewater SARS-CoV-2 RNA concentration and reported COVID-19 cases from the catchment areas was done through a distributed lag negative binomial regression model within a hierarchical Bayesian framework.

Results: A total of 151 raw sewage samples were collected using BMFS, from which 123 (81.5%) tested positive for the N1, N2, or E gene using reverse transcription polymerase chain reaction (RT-PCR).

The negative lag distributed model showed that the average sewage RNA concentrations at each lag (1-14 days prior) were associated with the cases on a corresponding day, with a peak association observed on lag day 10 (RR: 1.15; 95% CrI: 1.10 – 1.21).

Next-generation genomic sequencing showed that the Delta variant dominated from June-September 2022, while, the Omicron variant was identified in November, one month before detection in clinical samples.

Conclusion: Wastewater-based surveillance offers useful data for tracking the temporal trend of SARS-CoV-2 in the community, and it can be utilized in conjunction with next-generation genomic sequencing to enhance clinical-based surveillance.

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BURNOUT & IT'S ASSOCIATION WITH SOCIO-DEMOGRAPHIC & JOB-RELATED FACTORS AMONG DENTISTS IN KARACHI, PAKISTAN.*Misbah Baig**Community Health Sciences, Aga Khan University*

Background: Burnout is a state of emotional, physical, and mental exhaustion caused by excessive and prolonged stress. It is a syndrome characterized by chronic emotional fatigue and feelings of negativism that affects many people who deal with people. Clinical dentistry is a highly stressful occupation, and several studies show that dentists have a high level of burnout which is in turn a risk to the dental profession. The aim of the study was to determine level of burnout among dentists and its association with sociodemographic and job-related factors.

Methodology: A cross-sectional study design was employed to examine the association of socio-demographic and job-related factors with burnout among dentist in Karachi, Pakistan. The duration of our study was from September 2022 to November 2022. The study was conducted in dental departments of four hospitals in Karachi, Pakistan, out of which two were government and two were private. Personal, work-related and patient-related burnout scores were calculated using a validated scale.

Results: 209 participants were enrolled in the study. The mean score for personal burnout was 60.65 (SD=18.65), work related burnout was 55.99 (SD=18.55) and for patient related was 49 (SD=20.63). Multiple linear regression (MLR) was used to identify variables that contribute to burnout. Three models were made for the three subscales of burnout. The factors which were common among the three models contributing to burnout were lack of job satisfaction, work life imbalance and being depressed about work.

Conclusion: Our study found higher levels of burnout among dentists working in hospitals of Karachi, Pakistan. The findings demonstrate the importance of producing and disseminating information regarding dental burnout. It may be advantageous to establish interdisciplinary self-management training programs that incorporate time management, stress management, and relaxation techniques in order to protect dentists against burnout and depressive symptoms.

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MISCARRIAGES AMONG COVID-19 EXPOSED WOMEN PRESENTING IN PUBLIC AND PRIVATE HOSPITALS OF PAKISTAN: A MULTICENTER COHORT STUDY

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Introduction: Covid-19 is a newly identified viral infection globally and has affected the human population severely. Pregnancy is a vulnerable period and pregnant women with viral infections during pregnancy are at higher risks of adverse pregnancy outcomes including miscarriages. Pregnancy loss before 24 weeks of gestation is called miscarriage. Literature regarding the association of SARS-CoV-2 (severe acute respiratory syndrome-Coronavirus-2) and miscarriage is in its infancy. We hypothesized that the rates of miscarriages are twice or more among women exposed to Covid-19 during pregnancy as compared to those who are not.

Methods: This hospital-based, multicenter, retrospective study is a supplementary study in a larger international prospective cohort study investigating maternal, pregnancy and neonatal outcomes for women and neonates infected with SARS-CoV-2. Data from six sites across Pakistan was extracted for this study. All women who reported a pregnancy, had a verified outcome and exposure status were included.

Results: Out of 278 Covid exposed women, total 177 (61.6%) participants were recruited from public hospitals and 110 (38.3%) from private hospitals while out of 33 unexposed, 12 (36.3%) were recruited from public hospitals and 21 (63.6%) from private hospitals. Patients who suffered a miscarriage in the exposed group were 4.5% (13/287) and 6.1% (2/33) in the unexposed group. Exposure to Covid-19 was not associated with miscarriages and the difference was not statistically significant (OR 1.41 95% CI 0.30,6.66). However, age of the patient [OR 1.14 95% CI 1.02, 1.29] and gestational age at enrollment [OR 0.76, 95% CI 0.67, 0.85] showed statistically significant association with miscarriages.

Conclusion: We conclude from this study that the exposure to SARS-Cov-2 as assessed by antibody status and rapid antigen/RT-PCR tests does not affect the miscarriage rate, thus we failed to reject our null hypothesis. Inclusion of larger sample from ongoing parent study might help to elaborate these findings.

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SCREENING ADOLESCENTS FOR HEALTH PROBLEMS AT A PRIVATE SCHOOL IN KARACHI

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Background: Adolescence encompasses the transition from childhood to adulthood. Since, adolescents will be the stakeholders of the future, proactively intervening for improved health, including physical, emotional, mental, and social well-being, is vital to reduce the future disease burden. There has been a lack of decision-making power for this age group, so they highly rely on parents and school. It is vital to assess their problems and understanding by using a tool which gives a child-centered lens to these problems.

Objective: To screen adolescents for health problems at a private school in Karachi.

Methods: Items from the AYA tool were kept for screening alongside of the basic demographics according to the age group and context. A convenience sample was attained and a total of 126 adolescents aged 8-13 years were part of the screening. The screening was conducted individually in a private space by trained nursing students. Descriptive analysis was run on the responses and percentages of the responses were listed.

Results: Among 126 participants 52.3% were females and 47.6% were males. 60.3% lived in a nuclear family, 38.9% in extended families and 0.8% with a single parent. 55.5% have access to digital devices with an average reported screen time of 2 hours per day. 71.4% reported no, limited or inappropriate knowledge about puberty. Among these boys were less aware about puberty as compared to girls. 41.2% of students reported bullying at school.

11.9% reported to have any self-harm experiences and 8.6% expressed that they have run away from home. 34.1% mentioned negative body image. 39.4% skip meals, use laxative and throw up to lose or control weight. 42% reported grades as getting poor than previous grades. 7.1% don't feel safe at home, school and in community. 38.9% do not wear seat belts in cars or trucks and 57.1% do not wear helmets while skateboarding & bike riding. 2.4% reported no adult to talk. 10.3% reported they don't get 60 minutes of physical activities during the week.

Conclusion: Puberty education, self-harm experiences, negative body image, lack of physical activity, and unsafety have been reported as common adolescent health issues by children aged 8-13 years old in a private school in Karachi. Further research is needed to study adolescents' attitudes towards high-risk behaviors and solutions. Health interventions for promoting help-seeking behaviors and peaceful adolescent development should be ensured.

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PREVALENCE OF TOBACCO IN PAKISTAN, EVIDENCE FROM A RURAL DISTRICT IN SINDH PROVINCE*Muhammad Ashar Malik**Department of Community Health Sciences, Aga Khan University*

Introduction: Tobacco use in Low-and Low-middle income countries is alarmingly high where it has a poverty gradient. Moreover, the production of tobacco in the informal sector of the economy makes tobacco control policies ineffective, resulting in the widespread use of tobacco products, especially smokeless tobacco such as Paan/Gutka. In this research, we explore the prevalence of all forms of tobacco in the poorest districts of Sindh province.

Methods: A district-level survey was conducted in Thatta in 2019. A population-representative sample (n=7776) was drawn in urban and rural union councils in four Talukas in Thatta. Survey questions include responses on using smoking or smokeless tobacco such as cigarettes/Beri and Paan/gutka respectively. Prevalence was estimated for smokers, Paan/gutka, and tobacco use of all forms. These estimates were stratified by the demographic and socio-economic characteristics of the respondents.

Results: The prevalence of tobacco users (all forms) was 30.9%, Smoking 1.4%, and Pan-gutka was 29.8%, highest in Keti Bandar (30.9%, 30.2%, and 1.3% respectively) and lowest in Thatta Taluka (26.5%, 24.9%, and 2.1% respectively). Tobacco users were mainly male (37% of all males), married (58% of married), and middle-aged (58% in the age group 24-40 years), Tobacco prevalence in <5 years was 1.6%. Multivariate Probit parsimonious regression model indicates that Literate (-.22, CIs -0.32- -0.12) and females (-.47, CIs -0.56- -0.39) are less likely to use any form of tobacco. Smoking was determined by urban population, while Paan/Gotka was significantly prevalent in predominantly rural Talukas.

Discussion and Conclusion: In predominantly rural and ranked among the poorest district, the High prevalence of smokeless tobacco is a phenomenon of the rural poor. Produced at a small scale and as an informal economic activity, Stringent public health intervention, as well as effective implementation of tobacco control regulation, is key to controlling the tobacco menace in the province of Sindh.

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THE EXTENT OF OUT-OF-POCKET PAYMENTS IN A PUBLIC HOSPITAL, KARACHI. A CROSS-SECTIONAL STUDY

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Background: Access to affordable, high-quality care is vital to human well-being and economic and social development. Rendering to the World Bank, Out-Of-Pocket payments are the payments made by individuals to healthcare providers to get healthcare services, and they are of two types: Formal and informal. Health financing in Pakistan, an LMIC in South Asia, is financed through general taxation and OOP payments. Sindh spent 89.437 billion rupees on health, and From the overall health expenditure, the government contributes only 30 9.8 %. Government hospitals in Karachi are the victims of inadequate medical care because they are congested, understaffed, and have insufficient funding to deliver medicines, health supplies, laboratory services, and radiology services.

Objective: This study aims to generate evidence on the extent of OOP payments, formal and informal, for patients seeking treatment in a public hospital in Karachi.

Method: The research design used in this study was a cross-sectional study, and it was conducted at the Dr Ruth K. M. Pfau Civil Hospital, Karachi, a tertiary public hospital. This study included the participants admitted to CHK's three wards; gynae, medicine, and surgery. Convenience sampling technique to collect data from the 315 participants who stayed two or more days in the hospital using the questionnaire developed by reviewing the literature. The analysis was carried out using the STATA software.

Results: Of the 298 study participants, most were female (176, 59%), young (149, 50%), unemployed (195, 65%), non-educated (123, 41%), married (240, 81%), and belonging to urban areas (244, 82%). Only seven participants received free healthcare services; the remaining were paid from their pockets. The high mean expenditure was made on food (3102), followed by laboratory tests (2880), blood bags (1769), surgical items (1293), medicines (1227), radiology tests (1104), and informal payments (142). In univariate analysis, we found a statistically significant relation between the stay and total OOP payments (P-value 0.00), and the same goes for residence (P-value 0.026). Moreover, we did not find any statistically significant association between our dependent and independent variables in multivariate analysis.

Conclusion: To recapitulate those mentioned above, we found that OOP payments in a tertiary care hospital are present. Unfortunately, the hospital failed to provide complete free healthcare to individuals at a tertiary care level.

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READINESS OF EMERGENCY CENTERS OF TERTIARY CARE HOSPITALS IN ADDRESSING RESPIRATORY INFECTIONS REQUIRING ISOLATION IN KARACHI, PAKISTAN

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Background: Optimum service delivery is the key to curbing transmission of acute respiratory infections presented to emergency departments like influenza, SARS-CoV-2, and others. Tertiary care hospitals need to be well prepared in dealing with surge capacity, protection of HCWs and decreasing morbidity in other patients. This study conducted an in-depth analysis of the readiness of emergency departments in dealing with transmissible respiratory infections.

Methods: Concurrent mixed methods study design is used. Quantitative methods are covered by direct observation of four tertiary care hospitals in Karachi, Pakistan using an adapted version of Service Availability and Readiness assessment (SARA) checklist and a cross sectional survey of Health Care Workers (HCWs) of the same facilities. The results obtained were graded using the readiness scores classified as low (<75%), intermediate (75-99%), ready (>99%). Three eighty-seven responses were recorded. Qualitative method is covered by six in-depth interviews of key informants from same hospitals. All findings were triangulated to find the facility readiness under 6 domains: governance and coordination, facility infrastructure, human resources, supplies, communication, and infection prevention and control (IPC).

Findings: Facility observation showed low scores in IPC, infrastructure, and communication strategies. HCW survey results were congruent with overall mean readiness score for governance and coordination (85.04%), facility infrastructure (81.99%), human resources (83.03%), supplies (90.4%), communication (85.4%) and IPC (75.1%) in the four hospitals (p value= <0.05). The highest and lowest mean readiness score attained were in the domains of supplies and IPC respectively. Qualitative findings suggest limited resources for isolation of patients, IPC trained staff, and poor coordination among staff members as key to barriers in emergency department's readiness to deal with transmissible respiratory infections.

Conclusion: Overall readiness was intermediate in all hospitals. Limited resources and lack of implementation and trainings in IPC being the crucial element identified in this mixed methods study design.

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ACCEPTABILITY OF COMMUNITY MIDWIVES IN RURAL COMMUNITIES OF PAKISTAN: A QUALITATIVE EXPLORATORY STUDY

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Background: The Government of Pakistan initiated the Community Midwifery program in 2006 to provide skilled birth attendance to women living in rural areas. However, the acceptability of midwives and what impact these community midwives have made on overall maternal morbidity and mortality remains an unanswered question. We explored the perceptions of health officials, community midwives, midwifery students, and community women about the factors that influence the acceptability of community midwives' services in the rural district Thatta, Pakistan.

Objective: The aim of the study was to explore the acceptability of community midwives in rural areas of Pakistan

Methods: A qualitative exploratory study was conducted in the rural district Thatta of Pakistan. In-depth interviews were conducted with health officials, midwifery students who were currently enrolled in the midwifery program of the district; community midwives providing services in district Thatta, and trained community midwives who are not practicing. Interviews were also conducted with community women to explore their views about the acceptability of community midwives for services provision. Data were collected and analyzed using the qualitative thematic analysis approach, and the deductive method was used for reporting study findings.

Results: Two overarching themes were identified: (I) community acceptance and support; and (II) dynamics between CMWs and other health care providers. The major hindering factors to CMWs acceptance included their young age challenging social acceptability, patronizing behavior of doctors, high acceptance of traditional birth attendants working in rural areas, and the community's reluctance towards referral services. The facilitating factors included clients' privacy maintained at birthing stations and the affordability of community midwives' services.

Conclusion: There are deep-rooted challenges related to the acceptability of midwifery services at the community level and with other competing healthcare providers which need advocacy to support and accept their services at the community level and by other professionals.

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ORAL HEALTH-RELATED OUTCOME OF ORAL HYGIENE PROMOTION INITIATIVE AMONG THE HOUSEKEEPING STAFF IN TERTIARY CARE HOSPITAL IN KARACHI, PAKISTAN: QUASI-EXPERIMENTAL DESIGN

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Introduction: Oral health is a crucial indicator of overall health, well-being, and quality of life. Oral hygiene is the best way to prevent oral diseases, including dental caries, and periodontal diseases. Improving oral hygiene practices in the low-middle-income population is significant.

Objective: The purpose of the study is to investigate current oral hygiene practices, assess the prevalence of oral disease, and the impact of oral health education sessions on oral hygiene practices among housekeeping staff at tertiary care hospital.

Methods: This is a Quasi-experimental study design. An oral examination and a questionnaire were used to obtain baseline data. After one week, a combined instructional session was held, with different teaching tools such as PowerPoint presentations, Videos/multimedia, charts, dental typodonts, and oral hygiene aids being used. A post-assessment after 8 weeks was performed to see the improvement in their oral health practices after the intervention. The Mc Nemar test was used to assess any significant difference between the pre-educational session and post-educational session habits.

Results: A total of 43 participants above 18 years were enrolled in this study. The outcome of the sessions was reported as their dental hygiene knowledge grew to 100%, for example, 34% previously used a soft bristle brush, which increased to 100%, and their tobacco habits decreased as previously 51% were using tobacco in different forms and after the intervention, it decreased to 22%. There was a statistically significant difference in pre and post-tobacco usage, flossing habits, and plaque level as indicated by the Mc Nemar test.

Conclusion: The study shows that oral health education of housekeeping employees has a positive impact on their oral hygiene knowledge, attitude, and practices that result in improved optimal oral health. The repetition and reinforcement of oral health education programs have a significant impact on oral health behavior.

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EFFECT OF MASS-MEDIA ON NUMBER OF ANTENATAL CARE SERVICE VISITS AMONG PREGNANT WOMEN IN PAKISTAN: A SECONDARY ANALYSIS USING PAKISTAN'S DHS 2017-18*Dr Muhammad Anas Khan 1, Dr Ainan Arshad 2**1 Department of Community Health Sciences and 2 Department of Medicine, Aga Khan University*

Introduction: Maternal mortality and morbidity along with childhood survival can be improved with efficient antenatal care visits. Raising awareness regarding maternal health is thus a critical determinant in reducing maternal health-related outcomes.

Objectives: This study aimed to determine the effect of mass-media exposure and other factors on the number of ANC visits by pregnant women in their last pregnancy using 2017-18 PDHS data.

Methods: A sample of 8130 women of reproductive age was analyzed using negative binomial regression. Data was extracted from birth and individual recode modules Number of ANC visits utilized and effect of mother's education along with additional variables from DHS data was assessed including age, education level, wealth index, use of mass-media and access to health facility.

Results: The results of our analysis showed that mean age and number of ANC visits was 29 years (± 6) and 4 (± 3) respectively. Majority of the study population did not read newspaper or magazine (86.39%), similarly a higher number (92.04%) did not listen to the radio, however approximately half reported watching TV at least once a week (48.07%). Moreover, the rate of number of ANC visits among women aged 26-29 years was 3% less as compared to women aged 15-25 years. The rate of number of ANC visits among women having higher education was 1.7 times as compared to women having no education. The study concluded that the rate of number of ANC visits among women with higher education and exposure to TV at least once a week was 1.7 times as compared to women with no education and no TV exposure.

Conclusions: Higher education coupled with mass-media exposure was found to be significantly associated with greater coverage of ANC visits among Pakistani pregnant women. Owing to low literacy rate, devising policies for utilizing mass-media to raise awareness for ANC coverage is critical.

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MENTAL, REPRODUCTIVE, AND PHYSICAL HEALTH ISSUES AMONG TRANSGENDER COMMUNITY AND THEIR OBSTACLES TO HEALTHCARE SETTING PESHAWAR, PAKISTAN. A CROSS-SECTIONAL STUDY*Ihsan Ullah 1, Amir Iqbal 2**1 School of Nursing and Midwifery, Aga Khan University Karachi Pakistan**2 Institute of nursing sciences, Khyber medical university Peshawar Pakistan*

Objectives: To search out the major health problems and barriers to getting health care by the transgender community in Peshawar, Pakistan.

Methods: An analytical cross-sectional study was conducted in the transgender community of Peshawar from June to September 2022. The study included 138 participants from different areas of Peshawar by targeting their “gurus”. Non-probability, the snowball-sampling technique was used to collect the required sample size. Data was collected by using a structured questionnaire. Data were analyzed using SPSS version 22. Results were generated in form of tables and graphs.

Results: Among 138 participants 31 (22.5%) were Trans-female and 107 (77.5%) were Trans-male. The main health problems of transgender are hypertension, hepatitis B, typhoid, depression, anxiety, and verbal abuse. The majority of the participants are isolated, physically abused, and discriminated against. Many Trans genders are sexually active, only 20% used condoms, 5.1% were aware of STDs, 90% of the participants did sex for pay, and 31% have genital tract ulcers. 74% of the participants were physically abused only 25% were screened for HIV. 76% of participants did not have a routine checkup in the last two years. 86.6% of participants had felt that they are discriminated against during treatment while 87.3% feel that they were neglected during treatment and the majority of participants revealed that their healthcare provider’s lack of training for treatment has been reported as a major barrier in getting desired healthcare.

Conclusion: Transgender community faces physical, mental, social, and reproductive health issues. Non-acceptance, feeling ashamed, lack of CNIC availability, and non-affordability have been reported as major barriers to getting desired health care.

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DENTAL HEALTHCARE SYSTEM'S READINESS IN IDENTIFYING, REPORTING AND REFERRING THE PATIENTS OF DOMESTIC VIOLENCE COMING TO THE HEALTHCARE SETTINGS IN KARACHI, PAKISTAN- A QUALITATIVE STUDY

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Background: Domestic Violence (DV) is an important public health issue and dentists may be the first point of care to encounter the victims of DV, experiencing trauma to the head and neck region. However, they lack the necessary knowledge and awareness, and several gaps exist in the dental healthcare system.

Objective: The objective of the study focused on exploring the dental healthcare system's readiness in identifying, reporting and referring the patients of domestic violence coming to the healthcare settings in Karachi, Pakistan.

Method: The study followed a qualitative exploratory design with purposive sampling and was conducted in one public, one private dental institution and in the selected stakeholder's official premises in Karachi. 13 participants were interviewed in total. In-depth interviews were conducted with the dentists in the public and private dental institutions and Key Informant Interviews were conducted with key stakeholders including law-enforcement, policy maker, educationists and regulatory authorities. Data was collected from August to September 2022. Interviews were conducted within 30 minutes and then analyzed following Miles and Huberman's data analysis method.

Results: The findings of the study depicted the gaps in reporting and referral mechanisms, insufficient knowledge of dentists for helping DV patients, missing coordination between health, education and law-enforcement departments and agencies to assist the victims of DV and overall lack of education and awareness to cater DV in Karachi, Pakistan.

Conclusion: DV is a grossly prevalent issue in our society and dental healthcare system lacks response and knowledge on how to timely and properly deal with the intricacies of this matter. Thorough awareness and education regarding DV amongst the population is necessary. Dental healthcare system needs collaboration, support and integrated working and only by achieving a unified goal and multi-sectoral approach, can readiness be achieved.

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PATTERNS OF SUICIDE AND SELF-HARM IN PAKISTAN: A RETROSPECTIVE DESCRIPTIVE STUDY

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Introduction: Suicide is a major global public health problem. Low and middle-income countries contribute 78% of all suicidal deaths. Pakistan, a South Asian country, lacks official statistics on suicides at national level. Medico-legal reports on suicides and self-harm are extremely rich and important source of information but greatly under-utilized in Pakistan.

Objective: The study aimed to examine the patterns of suicides and self-harm retrospectively in patients who were registered with medico-legal centers (MLCs) in Karachi, during the period January 2017 to December 2021.

Methods: Using retrospective descriptive design, the data was collected from the medical records maintained at three major MLCs of Karachi including Jinnah Postgraduate Medical Centre, Abbasi Shaheed Hospital, and Civil hospital Karachi. Information on suicide and self-harm cases was extracted from records of all MLCs and data was analyzed using descriptive statistics.

Results: During the study period, a total of 21707 cases reported. Among them, 588 suicide and 21119 self-harm cases observed. Majority of the cases were reported from JPMC (69%). Among all suicide cases, 67% were male and 32% were females while in self-harm, 44% were males and 56% were females. Majority of the suicide (61%) and self-harm (79%) cases were reported under the age group of 10-30 years. Poisoning was found to be the most common method of suicide (66%) and self-harm (99%). Poisoning by organophosphates, rat killers, insecticides and medicine were common among them.

Conclusion: Self-harm and suicide account for a significant burden of mortality and morbidity in Karachi. Health care professionals should work in developing primary and secondary suicide prevention strategies as well as informed policy for suicide prevention in Pakistan.

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MEASURING CHILDREN'S SOCIAL, EMOTIONAL AND BEHAVIORAL LEARNING OUTCOMES AMONG PRIMARY SCHOOL CHILDREN IN SINDH, PAKISTAN

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Background: Social-emotional learning is an integral part of children's growth as it encourages brain development as well as social connection, and collaboration. There are no equitable opportunities for children in LMIC to engage them in life skills and character-building activities resulting in limited opportunities for personal as well as professional growth. The study aims to evaluate the baseline status of social-emotional learning, peer violence, exposure to violence at home, and corporal punishment among girls and boys primary school children.

Methodology: The study used a pre-post Quasi-experimental design. The data was collected from 923 grade three students from 25 primary schools of District Thatta and Sujawal in Sindh, Pakistan. The measures used to assess the baseline status were International Social & Emotional Learning Assessment (ISELA), Illinois Bullying Scale (IBS), the Corporal Punishment in School (CPS), and the Strength and Difficulty Questionnaire (SDQ).

Results: The findings showed that 70% of students belong to middle-income households and they have encountered adverse childhood experiences in their life. Moreover, results showed there was no significant difference in the mean score of life skills using the ISELA scale, between girls and boys. The findings showed a high prevalence of bullying and corporal punishment at school in boys (11.50, +12.35), (5.05, +4.96) as compared to girls (9.50, +8.59), (3.30, +2.95). It was also investigated that girls are more susceptible to emotional and hyperactivity problems (4.00, +2.61), (3.08, +1.80) as compared to boys (3.48 +2.71), (2.83, +1.61). There was an insignificant difference shown among the conduct (p-value= 0.6686) and peer problem (p-value= 0.2235) subscales of the Strength and Difficulty Questionnaire.

Conclusion: The most common issues at baseline that students encountered were behavioral, and emotional issues, lack of effective communication, and conflict-resolution skills. Furthermore, most students are subjected to corporal punishment at school and are vulnerable to bullying. Therefore, there is a need for play-based intervention to improve students' social, emotional, and mental well-being.

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EFFECTIVENESS OF INACTIVATED COVID-19 VACCINES AGAINST SARS-COV-2 INFECTIONS AMONG HEALTHCARE PERSONNEL IN PAKISTAN: A TEST-NEGATIVE, CASE-CONTROL STUDY.

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Background: During the COVID-19 pandemic, several vaccines that were efficacious in randomized controlled trials (RCTs) were authorized for mass vaccination. In developing countries, inactivated vaccines were widely administered. While inactivated vaccines have been deemed effective in reducing disease severity, for healthcare personnel (HCPs), effectiveness against COVID-19 infections is also essential to reduce the risk to vulnerable patients and ensure a stable healthcare workforce. In addition, there are limited studies examining inactivated vaccines' effectiveness against emerging SARS-CoV-2 variants in real-world settings. We aimed to estimate the effectiveness of inactivated vaccines (BBIBP-CorV and CoronaVac) against RT-PCR-confirmed COVID-19 infections among HCPs in the setting of emerging SARS-CoV-2 variants in Pakistan.

Methods: We conducted a retrospective matched test-negative case-control analysis of existing data of HCPs at a private healthcare system in Pakistan. HCPs tested between April 1 and September 30, 2021, were included. Each case was matched to two to six controls by the date of the RT-PCR test (≤ 7 days) to reduce bias. We compared demographics, reasons for testing, and vaccination status between cases and controls using chi-square for categorical variables and t-test for continuous-level data. The odds of getting a PCR-confirmed SARS-COV-2 infection were calculated using conditional logistic regression, after adjusting for age, gender, and work area. Vaccine effectiveness (VE) was calculated as percent VE using $(1-OR)*100$.

Results: Inactivated vaccines were ineffective against COVID-19 infections ≥ 14 days after receiving the first dose [VE: 20% (95% CI: -10, 41; $p=0.162$)]. The vaccines showed modest effectiveness ≥ 14 days after the second dose against COVID-19 infections [VE: 33% (95% CI: 11, 50; $p=0.006$)], and symptomatic COVID-19 infections [VE: 36% (95% CI: 10, 54; $p=0.009$)].

Conclusions: Inactivated vaccines show modest effectiveness against COVID-19 infections in the setting of emerging variants of concern. This builds a strong case for boosters or additional vaccination.

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SELF-POISONING: AN ANALYSIS OF CASES AT THE NATIONAL POISONING CONTROL CENTER KARACHI, PAKISTAN

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Introduction: Poisoning is a significant global public health problem and the major cause of morbidity and mortality worldwide. There are an estimated 200,000-400,000 acts of self-harm annually in Pakistan (pop. 220 m). Epidemiological data on poisoning in general and on self-poisoning in particular, is limited in Pakistan.

Objective: Considering the limited evidence, we aimed to study the pattern of self-poisoning cases retrospectively in patients admitted to National Poisoning Control Centre, JPMC, Karachi, during the period from January 2019 to December 2021.

Methods: We conducted a retrospective study utilizing the information of patients' records available in NPCC, Karachi. All patients who presented with an act of self-poisoning between January 2019 and December 2021 were included in the study, and data was analyzed using descriptive statistics.

Results: During the study period, 10,827 self-poisoning cases were admitted to NPCC. In the year 2019, there were 4945 (46%) cases, followed by 2830 (26%) and 3052 (28%) cases in 2020 and 2021 respectively. About 50% were females and 49% were males. More than half of the patients (66%) were in the age group of 10-29 years. Most commonly used poisons were compounds containing organophosphates (52%), followed by ingesting unknown substances (19%) and tablets (12%). Majority of them discharged (n= 9693, 90%), 2% (n=226) expired, 4% (n=440) Left Against Medical Advice (LAMA), while 1% (n=97) shifted to ICU. Out of 226 deaths, 54% were due to Organophosphate poisoning (case fatality approx. 2%) and 8% was Paraphenylenediamine (blackstone) ingestion (case fatality 17%). No psychiatric evaluation or follow up was done for self-poisoning patients.

Conclusion: Self-poisoning appears to be a significant public health concern in Karachi. There is a need for central, standardized data collection throughout the country. Information obtained can be used to raise awareness, identify vulnerable groups, and inform policy for suicide prevention and poison control.

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TESTING AN EDUCATIONAL INTERVENTION TO ENHANCE RESILIENCE AND SELF-EFFICACY AMONG SCHOOLTEACHERS: A PILOT STUDY IN PAKISTAN

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Introduction: To maintain quality and stop burnout or attrition in teachers it is important to look at their resilience: the ability to bounce back from difficulty. Teacher resilience does not appear to be an innate or stable skill, it is a skill that can be learned and acquired over time and can fluctuate depending on the situation. Self-efficacy, which shows belief in one's skills to achieve goals, is another trait that can help build resilience in teachers.

Objective: The present research aims to share experiences from implementing a resilience-building workshop for teachers, focusing on their self-efficacy, knowledge, and skills regarding children's mental health.

Methods: Four modules related to teachers' resilience and well-being was conducted at school located in an urban squatter settlement in Pakistan. The effectiveness of these interventions was evaluated by assessing self-efficacy and resilience, in pre- and post-teaching modules. The Resilience Scale 14 and General Self-Efficacy scale were used.

Results: The Wilcoxon Signed Rank Test determined a significant difference between the pre- to post-module scores of GSE ($p= 0.016$) and resilience ($p= 0.006$). The pre-median scores with IQR of Self-Efficacy were 28(10), and Resilience scores 76(12); and post-scores for Self-Efficacy and Resilience scores increased to 35 (5.5) and 88 (14) respectively. This indicated significant improvement in general self-efficacy and resilience skills after four weeks of training.

Conclusion: This pilot study showed that building knowledge regarding mental health struggles in students and oneself, learning ways to cope with stress and manage student behavior, and forming a peer support system are crucial in building self-efficacy and resilience in teachers.

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DOMESTIC VIOLENCE AMID COVID PANDEMIC IN PAKISTAN

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Introduction: Domestic Violence (DV) has huge public health implications for women mental health, leading to serious mental and physical health sequel. During COVID-19, incidents of DV increased globally. There is very limited reliable data from Pakistan on DV during COVID. Health care professionals (HCP) are well positioned to care for violence victims as they can identify DV while providing care. However, this crucial role of HCP to address violence is not usually implemented.

Objectives: We conducted this study in 2 parallel arms:

Arm 1: To assess women's mental health during COVID and effect of lockdowns on DV.

Arm 2: To study the HCP's attitudes and practices towards DV victims during pandemic.

Methods: This was a cross-sectional study. In arm 1, the online survey was forwarded to all married women residing in Pakistan whereas in arm 2, the survey was forwarded to all HCP of AKU Pakistan. The period of data collection was December 2021 - March 2022.

Results: In arm 1 study, a total of 103 women participated in a survey. Majority of them (86%) belong to Karachi. About 40% women were in the age group of 31-40 year, 56% educated at the postgraduate level and 68% were employed during COVID. About 11% women exposed to spousal violence during pandemic. About 17% women found to be positive for domestic violence on HITS while 27% women found positive for mental illness on SRQ-20.

In arm 2 study, majority of the HCP agreed that DV has increased globally (59%) including Pakistan (69%). They also agreed that this is because of financial crisis (79%), lack of support (69%) and lockdowns (83%) during pandemic. About 52% HCP reported that they do not have sufficient training to counsel DV victims and 66% reported that they refer DV victims to mental health specialist. Only 7% were aware about the social resources for women protection.

Conclusion: Pandemic adversely effected women mental health. HCPs require capacity building in knowledge and skills to identify and respond effectively to survivors of violence and other trauma.

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STRENGTHENING THE HEALTH SYSTEM OF GENDER-BASED VIOLENCE THROUGH INSTITUTIONAL CAPACITY BUILDING- A QUASI-EXPERIMENTAL STUDY DESIGN

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Introduction: Gender-Based Violence (GBV) continues to be a significant global issue. Health workers and stakeholders can play a pivotal role in addressing it if they are trained adequately as these professionals are building blocks of our healthcare system that connects the government with the community to achieve better health outcomes.

Background: Despite the increasing prevalence of GBV worldwide, it is under-reported in Pakistan due to several factors. One of the most critical factors is the lack of GBV health services, appropriate protocol and referrals, and competent healthcare professionals. HCPs are the front-line workers and usually, they are the ones whom victims can trust during this sensitive time, especially when disclosing violence. Therefore, a need emerged to conduct implementational research to explore the effectiveness of capacity building in improving GBV.

Methodology: A Quasi-experimental study was conducted whereby 3 days based on extensive capacity-building training on GBV was provided to HCPs and stakeholders in each of the 3 regions of Pakistan (Sindh, Chitral, and Gilgit Baltistan). A total of 300 participants were selected through a purposive sampling technique. For data analysis, mix method approach has been used. Quantitative analysis was done through the descriptive method. Qualitative is achieved through categorical analysis.

Results: To measure the understanding and confidence of participants about GBV, the result showed a significant increase in post-test scores. Moreover, excellent outcomes were revealed in the overall awareness of participants. From training participants' verbal and written feedback, the following thematic categories emerged: "Effectiveness of capacity building from participant's lens"; "Health system response from government officials"; "Self-reflection of GBV". To evaluate the impact of training, follow-up was done to ensure the sustainability of the interventions.

Conclusion: GBV is a crucial and sensitive issue in our societies. Usually, people are unaware of the need and significance due to which they ignore initiatives at their individual and family levels. Through this training, we tried to make trained healthcare professionals available.

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AVAILABILITY OF ESSENTIAL DIAGNOSTIC TESTS FOR COMMUNICABLE DISEASES AT PUBLIC HOSPITAL LABORATORIES OF KARACHI AND THE CHALLENGES IN ITS IMPLEMENTATION.*Mohammad Zeeshan 1, Amna Rehana Siddiqui 2**1 Department of Community Health Sciences, Aga Khan University and**2 APPNA institute of Public Health*

Background: Essential diagnostic list by WHO is a catalogue of tests for communicable (CD) and non-communicable disease (NCD) which suggests evidence-based recommendations to support countries in choosing the diagnostic tests according to their disease burden.

Objective:

1. To determine the proportion of in vitro diagnostics (IVDs) for communicable diseases in WHO-EDL available at public sector hospital laboratories in Karachi.
2. To assess the barriers encountered in ensuring the availability of IVDs in terms of facility infrastructure, finance, human resources, and laboratory equipment.

Methods: Explanatory sequential mixed method study design, cross-sectional survey for quantitative and in-depth interview for qualitative component. Through purposive sampling 14 public hospital laboratories of Karachi were initially identified for data collection. Nine laboratories consented to participate, and data collected during September to October 2022. Quantitative data were collected for availability of 9 assays of general diagnostic tests and 39 disease specific assays for 13 communicable diseases. In-depth interviews (IDIs) with relevant stakeholders were conducted to evaluate the challenges for availability of tests.

Results: Among the tests, 9 general assays, urine microscopy, blood sugar and CBC were only available in all 9 laboratories, whereas Culture and sensitivity testing were performed in only four tertiary care hospital laboratories.

For communicable disease (CD) specific assays, 21/39 (54 %) were not available in any facility. Dengue antigen/antibody, screening tests for Hepatitis B and C and HIV were available in all laboratories.

Of 13 CDs, assays for 5 diseases were not available.

Nine assays were discontinued in different laboratories due to non-availability of reagents and kits

Challenges for non-availability of diagnostic tests identified through IDIs were secondary to administrative issues, inadequate and untrained human resource, inefficient bio-medical support, negligible clinician-laboratory liaison.

Conclusion: Public hospital laboratories in Karachi indicated lack of human and other resources, and linkages for the availability of essential diagnostic services for communicable diseases

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EXPERIENCES OF HEALTHCARE PROVIDERS REGARDING WORKPLACE HARASSMENT IN GILGIT DISTRICT, PAKISTAN

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Background: Healthcare facilities are globally facing the dilemma of workplace harassment, as it has long-term negative effects on healthcare providers. Workplace harassment is considered a major reason for work-related distress and subsequently, psychological well-being issues for healthcare providers. The present study identified the experiences of healthcare providers regarding workplace harassment in the Gilgit District, Pakistan.

Objectives: The study focused on the assessment of the experiences of healthcare providers regarding workplace harassment in Gilgit District, Pakistan.

Methodology: The study adopted a Qualitative-Exploratory Descriptive design using a semi-structured interview guide for the In-depth interviews (IDIs) with the healthcare providers and Key Informant Interviews (KIIs) with the incharges of the selected healthcare facilities, in one public (secondary care) and one contracted-out (primary care) health facility. A total of 15 interviews were conducted with doctors, dentists, nurses, and LHVs from August 2022 to September 2022 and were analyzed using Braun and Clarke's six-phase approach.

Findings: The findings indicated the regularity of workplace harassment incidents due to the lack of awareness regarding employee rights, detrimental effects of harassment incidents on their mental and physical health, unavailability of actions by the authorities, and absence of a formal reporting system and institutional policies for workplace harassment. There were several gaps that were identified such as the insignificance of workplace harassment in Gilgit Baltistan, fear of the influential people affecting the reporting of such incidents, lack of training and awareness sessions focusing primarily on workplace harassment, and poor safety and security of the healthcare providers.

Conclusion: According to our study findings, recognizing the causes of harassment is crucial due to its detrimental effects on employees' mental health and well-being as well as their productivity. In this context, the study intends to contribute to the formulation and implementation of measures to avoid workplace harassment in the health sector.

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ROLE OF MOBILE HEALTH TECHNOLOGY IN PROMOTING INFANT AND YOUNG CHILD FEEDING PRACTICES IN LOWER MIDDLE-INCOME COUNTRIES: A LITERATURE REVIEW*Rehama Iqbal 1, Rozina Nuruddin 2, Nuruddin Mohammed 3**1 Medical College, 2 Department of Community Health Sciences and 3 Department of Obstetrics and Gynaecology, Aga Khan University*

Introduction: Globally, high rates of stunting and wasting are attributed to suboptimal infant and young child feeding practices (IYCF). Innovative intervention like mobile health (mHealth) technology is gaining momentum in lower-middle-income countries (LMICs) as a low-cost behavior change communication tool for the improvement of IYCF practices among expecting and nursing mothers.

Objective: To summarize findings about effectiveness of mHealth interventions in improving IYCF practices

Method: Studies were identified by searching peer-reviewed journals published from 2018 to 2022 using the PubMed, Google Scholar, and Cochrane database. We reviewed original articles published in English on use of mHealth intervention for promotion of IYCF practices in LMICs. Qualitative studies, systematic reviews and protocols were excluded. The titles and abstracts were screened for eligibility. The full text of relevant papers was then individually examined to confirm the relevance of included papers. The authors, date of publication, objectives, study design, participants, sample size, settings, and primary outcome were extracted from each paper.

Results: Out of 75 studies identified, 9 met the selection criteria. The study design was predominantly randomized controlled trials (n=6), targeting mainly lactating mothers (n=4) as the participants. The studies were aimed at improving early initiation of breastfeeding (n=7), exclusive breastfeeding (n=5), improving attitude, and practices (n=2) and anthropometric measurements (n=1). The interventions were delivered through text messages (n=1), voice messages (n=4), both text and voice messages (n=1), or through mobile application (n=3). Significant improvements in the intervention arm were reported in the breastfeeding practices (n=6), initiation of supplementary food at six months (n=1) and attitude and practices (n=2).

Conclusion: The mHealth intervention has shown promising results in improving breastfeeding but there is limited evidence of its role in enhancing IYCF practices. More rigorous studies are needed to evaluate the role of contextualized mHealth based coaching intervention in LMIC.

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NUTRITIONAL STATUS OF WOMEN AND CHILDREN IN PERI-URBAN AREAS OF KARACHI, PAKISTAN

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Background: Maternal undernutrition has a critical role in the etiology of maternal and child morbidity and mortality. Malnutrition persists at high levels on a global scale, especially in lower-middle-income countries. This study aimed to assess the baseline nutritional status of married women of reproductive age (MWRAs) and their children of less than 2 years.

Methods: The survey was conducted in seven peri-urban areas of Karachi. A total of 1470 mother and child dyads were enrolled. Two-stage systematic random sampling technique was used to select households with eligible mother-child dyads using a geographic information system. Data collectors received intensive training to ensure accurate anthropometric measurements in accordance with the FANTA anthropometric guide 2018. The data were compared to provincial indicators from the National Nutrition Survey (NNS) 2019. Assessment of nutritional status was made through measurement of mid-upper arm circumference (MUAC) and body mass index (BMI) using weight and height (or length for infants < 18 months).

Results: Most women (45%) had normal BMI like the provincial indicator (46%). Overall, the proportion of women who were 'underweight' and 'obese', was similar to Sindh figures. However, the average of 'underweight' (16%) was less than the provincial (20%). For children, while the average 'wasting' (24%) and 'underweight' (39%) were the same as the provincial numbers, the average 'stunting' (39%) was less than the number in Sindh (46%).

Conclusion: The study findings suggest that the nutritional status of women and children is extremely poor in peri-urban sites and can be critical for maternal and child health outcomes. Contextually designed interventions can be created based on anthropometric data to improve the nutritional and health outcomes of MWRAs as well as the growth trajectory of children.

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THIRTY-YEAR TRENDS OF TRIPLE BURDEN OF DISEASE IN THE ADULT POPULATION OF PAKISTAN

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Background: Pakistan has been facing a significant number of communicable diseases, non-communicable diseases, and injuries during the last three decades. The triple disease burden has significantly affected Pakistan's healthcare system. Therefore, this study aims to determine and analyze the thirty-year trends from 1990 to 2019 of communicable and non-communicable diseases and injuries in terms of estimated prevalence, death rates, and encounter percentages for Pakistan to create sustainable solutions to these growing issues.

Methods: The data of the last 30 years, i.e., 1990 to 2019, was extracted from the Global Burden of Diseases for Pakistan, available at the Institute of Health Metrics and Evaluation. Variables included in the analysis were the prevalence of disease, the total number of deaths per year due to communicable and non-communicable diseases, road injuries, age (20-89 years), and sex. Percentage change in prevalence and deaths over 30 years was calculated for 2019 against 1990 as a benchmark. Poisson regression analysis was also performed to evaluate the trends in prevalence, deaths due to the triple burden of disease, and the incidence rate ratio.

Results: A relative decrease of -23.4% was noted in the prevalence rate of communicable diseases per 100 thousand population between 1990 to 2019. A relative increase of 1.4% was noted in the prevalence rate due to non-communicable diseases. A surprising relative increase of 56.1% was noted in the prevalence rate of road injuries per 100 thousand population. A major change was noticed in the age group of 20-24 years, where we observed a 26.9% decrease in communicable diseases, and in the age group of 25-49 years, where there was an 18.8% increase in injuries observed. The female gender has shown a 2% increase in the burden of non-communicable diseases. The prevalence rate per 100,000 of incidence rate ratio of communicable diseases significantly decreased to 0.9796 [95% CI: 0.9887- 0.9905], but the prevalence rate of injury significantly increased to 1.0094 [95% CI: 1.0073- 1.01145], respectively.

Conclusion: Stakeholders in Pakistan must take the next steps and develop strategies to decrease this burden on EDs and mortality rates in the population to create better outcomes for the patients and help the healthcare system overall.

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DETERMINANTS OF SUBOPTIMAL INFANT AND YOUNG CHILD FEEDING PRACTICES AND UNDERNUTRITION IN LOWER-MIDDLE-INCOME COUNTRIES: A REVIEW OF CONCEPTUAL FRAMEWORKS*Rehama Iqbal 1, Rozina Nuruddin 2, Nuruddin Mohammed 3**1 Medical College, 2 Department of Community Health and 3 Department of Obstetrics and Gynaecology, Medical College, Aga Khan University*

Background: Improving the nutritional status of children in lower middle-income countries (LMICs) remains a high public health and development priority. Optimal infant and young child feeding (IYCF) practices can reduce undernutrition. Despite being a low-cost and simple intervention, many LMICs have poor coverage. The common factors associated with poor IYCF practices among these countries have not yet been explored.

Objective: To identify similar factors associated with suboptimal IYCF practices and undernutrition in LMICs

Method: Studies were identified by searching peer-reviewed journals published from 2012 to 2022 using PubMed, and Google Scholar. We reviewed original or review articles, reports, program, or guidelines, written in English language, with a conceptual framework discussing suboptimal IYCF practices, undernutrition, barriers, enablers, interventions, and conducted in LMICs. The titles and abstracts were screened for eligibility. The full text was individually examined to confirm the relevance of included article. The authors, date of publication, study design, aim, settings, key findings and conceptual frameworks were extracted from each paper.

Results: Out of 25 studies reviewed, 14 met the selection criteria and included reports (n=3), original articles (n=3), review (n=3), secondary analysis (n=2), program (n=1), and qualitative studies (n=2). The represented countries were India, Indonesia, Pakistan, Sudan, Malawi, South Africa, Ethiopia, and Uganda. The majority of studies (n=8) reported individual, contextual, and structural determinants associated with IYCF practice. The conceptual frameworks included socioecological, causes-context and consequences, multilevel factors, enablers-underlying and immediate determinants, barrier-intervention-outcome, and proximal-intermediate-distal factor models. Common determinants of IYCF practices were maternal and infant health and nutrition, women empowerment, , societal norms and culture, health service, public policy, governance, economy, and environmental conditions.

Conclusion: Efforts to improve IYCF practices must address multi-level underlying factors, emphasizing the need to adopt a multiprong approach while designing effective interventions for implementing IYCF guidelines

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DIETARY DIVERSITY AND FOOD INSECURITY AMONG WOMEN AND CHILDREN OF MARGINALIZED COMMUNITIES OF KARACHI-PAKISTAN.*Ayesha Khalid, Mashal Amin, Nadia Ansari**Department of Paediatric and Child Health, AgaKhan University*

Background: Malnutrition is a serious public health problem in Pakistan, where 17.5% of children under the age of five are wasted, 40% of children under the age of five are stunted, and 15% of women are underweight. Diverse diets are becoming more prevalent to support growth at all stages of life, although in low- and middle-income countries, there are gaps between consumption and needs. This study aimed to assess the minimum dietary diversity and food insecurity of married women of reproductive age (MWRAs) and their children of less than 2 years.

Methodology: The study was carried out in seven peri-urban districts of Karachi. A two-stage systematic random technique was employed to choose households using a geographic information system. A total of 1470 mother and child dyads (210 dyads at each site) were sampled for the study. Data was electronically collected and maintained on a cloud server. The 10-item minimum dietary diversity scale for women and the 8-item minimum dietary diversity scale for children were both applied to the 24-hour dietary recall for each participant. The household coping strategy and hunger tool were used to measure food insecurity.

Results: The overall diets of the sampled MWRA's and children were insufficient to meet dietary diversity. Only 22.5% (n=332) of MWRA and 8% (n=188) of children met the standards for consuming all 5 food groups. It was observed that there was a significant association ($P = < 0.001$) between those who consumed unhealthy food groups and those who did not meet the consumption criteria for the five food groups. Additional food insecurity is present in all household, coping mechanisms used include borrowing food 20% (n=290), limiting portion sizes 30% (n=438), reducing the number of meals consumed 31% (n=452), and restricting adult food consumption 24% (n=340) over the previous week. Findings also showed a lack of purchasing power and food access 37% (n=549) of respondents reported not having any food at home, 33% (n= 503) sleeping hungry, and 31% (n=463) going a day without eating in the previous month on a scale of 1 to 10.

Conclusion: The survey provided the evidence needed to design interventions according to the needs of the community and to determine the most effective strategy to improve nutritional and health outcomes and care delivery during subsequent pregnancies as well as growth trajectory of the children.

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COVID-19 VACCINES: HOW EFFICIENT AND EQUITABLE WAS THE INITIAL VACCINATION PROCESS?

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With nearly 11 billion doses of the COVID-19 vaccine being administered, stark differences in the vaccination rates persist. Vaccine distribution initiatives such as COVAX and African Vaccine Acquisition Trust (AVAT) were formed to ensure equitable vaccine delivery. This review evaluates the initial COVID-19 vaccination efforts and the impact of different vaccine distribution initiatives on equitable vaccination coverage in the early phase. We conducted a descriptive and trend analysis with sub-groups by various context parameters of data on COVID-19 vaccination from December 2020 till February 2022, from four public databases including UNICEF, WHO, COVID-19 Task Force and Our World in Data to examine COVID-19 vaccine distribution progress and the contributions of vaccine procurement initiatives. We found that High Income Countries (HICs) had much higher vaccination rate (78.4%) than Lower-Middle-Income Countries (LMICs) (55.5%) and Low-Income Countries (LICs) (10.9%). Large differentials (>80% to <10%) in the vaccination rates of eligible population of adults in LMICs and LICs existed. Differentials in the total vaccine doses delivered to each country ranged from 355.6% to 4.8% of the total population. In LICs, 53.3% of the total doses were obtained via COVAX, 30.9% by bilateral/multilateral agreements, 6.5% by donations and 3.8% by AVAT. In LMICs, 56.4% of total vaccines procured were via bilateral/multilateral agreements, 21.4% by COVAX, 4.2% by donations and 0.5% by AVAT. COVAX delivered 1 billion doses by January 2022 which constituted 53.2% and 21.4% of procured doses in LICs and LMICs. In LICs and LMICs, 6.5% and 4.2% of total doses were acquired through donations while 30.9% and 56.4% of doses were purchased. Despite global efforts, significant disparities were present in COVID-19 vaccination efforts amongst countries of different income groups. Future efforts should focus on addressing vaccine inequities explicitly and in improving global vaccine distribution.

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PREVALENCE OF IRON DEFICIENCY ANEMIA AND ITS PREDICTIVE FACTORS AMONGST PREGNANT WOMEN IN PAKISTAN

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The prevalence of anemia is an important indicator of public health owing to its strong association with morbidity and mortality, especially in vulnerable groups such as expectant mothers. Although Anemia has a multifactorial pathogenesis, iron deficiency anemia is a common complication during pregnancy. Consequences of anemia during pregnancy involve miscarriage, small for gestational age fetuses, peripartum bleeding, stillbirths, low birth weight, and increased maternal morbidity.

Our research aimed to assess the prevalence of anemia in pregnant women and to identify the predictive factors associated with anemia in pregnant women. This was an analytical cross-sectional study conducted in Karachi Pakistan. Women of reproductive age (15-49 years) who consented were included.

A total of 4334 women were initially recruited for the study. The overall prevalence of anemia in the participants was 23.9%, 43.3% had mild, 19% had moderate and 4.9% had severe anemia. The prevalence of anemia was significantly associated with maternal age 30 and above [OR 2, 95% CI (1.4,2.8), $P < 0.001$]. A MUAC of < 21 (malnourished) as well as multigravidity was associated with a higher prevalence of anemia [aOR 3.7, 95% CI (2.1,6.3), $P < 0.001$] and [aOR 1.7, 95% CI (1.4,2.1), $P < 0.001$] respectively. Women's tobacco usage as an addiction was a strong predictive factor [aOR 2.1, 95% CI (1.8,2.5), $P < 0.001$]. Tea consumption had a protective effect [OR 0.7, 95% CI (0.6,0.9), $P < 0.001$].

Anemia is one of the most common complications during pregnancy. Early identification and timely intervention through adequate adherence to antenatal checkups and the provision of Iron Folic acid supplementation during and before this time as part of proper family planning programs can help decrease the burden of disease. Women who are above 30, have a history of stillbirth, and multigravida are found more likely to be anemic. Attention is mostly given to primigravida, which renders this demographic vulnerable to being overlooked.

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GENDER DIFFERENCES IN EARLY DEVELOPMENTAL HEALTH: FINDINGS FROM A POPULATION-LEVEL STUDY IN PAKISTAN*Salima Kerai 1, Seema Lasi 2, Ghazala Rafique 2, Salman Kirmani 3, Eva Oberle 1**1 University of British Columbia**2 Human Development Programme - Aga Khan University**3 Division of Women & Child Health, Aga Khan University*

Background: Substantial research evidence from Pakistan demonstrate that children under five often experience conditions like poverty, undernutrition, inadequate stimulation, and lack of responsive caregiving that prevent them from reaching optimal development. However, reliable and representative data on early childhood developmental health is currently missing in the context of Pakistan.

Method: This study assessed the developmental health among public kindergarten children in Karachi. Teachers completed the Early Years Development Instrument (EDI) in Urdu. The EDI (104 items) is a population-level measure for assessing children's developmental health and vulnerabilities on five domains: Physical Health and Well-being, Language and Cognitive Development, Social Competence, Emotional Health/Maturity and General Knowledge and Communication Skills. Vulnerability in any developmental health domain is operationalized as falling below the 10th percentile of the normative distribution.

Results: Data were collected from 10,725 children (age range 4 to 8 years; mean age = 6.3, SD = 1 year; 53% female) attending Kindergarten (42%) and grade 1 (58%) in 400 schools within five school districts in Karachi. Analyses showed that boys compared to girls and children living in low-income families, had lower average scores on all EDI domains. The score gap between boys and girls in low-income families was larger compared to families that were above poverty line, with boys more vulnerable than girls in each income group. children with mothers having more than secondary education showed reduced vulnerability in all domains compared to mothers having only secondary or less than secondary education. Further results indicated that the gender differences were smaller in some neighborhoods than others and that these differences disappeared among children whose mothers had post-secondary education after controlling for income.

Conclusions: First population-based assessments of early developmental health in children. Results indicated health and social disparities in early child developmental outcomes, including sex and socioeconomic differences, and differences based on mother's education background.

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PREVALENCE OF FOOD INSECURITY, COPING STRATEGIES AND THEIR EFFECT ON HEALTHCARE-SEEKING BEHAVIOR DURING PREGNANCY: A MIXED METHODS STUDY.*Kaniz Amna Haider, Ayesha Khalid, Zoya Surani**Department of Paediatrics and Child Health, Aga Khan University*

Background: In Sindh, 47% of women live in food insecure households and are more likely to undergo poor maternal, neonatal, and child health (MNCH) due to the socio-economic barriers that exist in low, middle-income countries (LMICs).

Objective: The objectives of this study are to 1) assess the frequency of food insecurity (FI) and household coping strategies, and 2) understand how FI affects the healthcare-seeking behavior of pregnant women in peri-urban communities in Karachi, Pakistan.

Methods: A mixed-methods study was conducted in four of Karachi's peri-urban communities with 400 randomly-selected households. To assess the prevalence of FI, the validated Household Food Insecurity Access Scale (HFIAS) and reduced Coping Strategies Index (rCSI) questionnaire was used to collect data over certain recall periods (4 weeks for HFIAS and 7 days for rCSI). For in-depth interviews (IDIs), 6-8 pregnant women from food secure and food insecure households were randomly recruited from the 400 sampled women. Thematic analysis was performed to explore the healthcare-seeking behavior of pregnant women, with and without FI.

Results: The overall prevalence of food insecurity was found to be n= 241 (60.2 %) out of which n= 134 (33.5%) were severely food insecure. Participants reported relying on less expensive foods n= 187 (46.8%) and borrowing and relying on others for food n= 153 (38.3%) as the most common coping strategies. The IDIs highlighted that insufficient diet caused poor health in pregnant women, while obstacles such as lack of proper counseling, financial and physical barriers, and lack of family support at home negatively impacted their healthcare-seeking behavior.

Conclusion: Interventions are necessary to alleviate the effects of poor diet on pregnant women seeking antenatal care services. By implementing effective interventions at primary health centers, MNCH indicators will be improved and sustainable development goals (SDGs) will be met.

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KNOWLEDGE, ATTITUDE AND PRACTICES (KAP) OF PHYSICIAN ABOUT ADULT IMMUNIZATION – A STUDY FROM DEVELOPING COUNTRY

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Background: Health care workers (HCWs) are at risk of acquiring vaccine preventable diseases , Increasing awareness of physicians about adult immunization will provide success in improving adult vaccination coverage .The aim of current study is to establish knowledge and attitude of physician about adult vaccination .

Methods: A cross-sectional survey was performed among physicians via a self-administered questionnaire. Out of 200, 117 complete forms filled by physicians were included in the study

Results: The majority of the participant were female (62%). The physicians' own vaccination status was not satisfactory as 92% of physicians had received HBV vaccine followed by influenza vaccine 46%, MMR vaccine 35%. The majority are not able to get updated information related to adult vaccine recommendations. Approximately 50% and 37% of physicians had received training about adult immunization at the undergraduate level and postgraduate training period respectively.

Only 82 (70 %) of participants believe that vaccines have an overall protective effect on community health . Physicians believed that the high cost of vaccines, lack of vaccination centres for adult immunization, lack of structured programs for adult vaccination and lack of awareness among the community are important factors for the low adult vaccination rate in our population.

Conclusion: Healthcare worker's knowledge and attitude play a key role in improving vaccine coverage of the community. Education interventions are necessary to improve awareness of HCWs and the public in order to protect the community against vaccine-preventable diseases particularly in countries with the low implementation of immunization

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EXPLORING THE EFFECT OF UNAFFORDABILITY ON MEDICATION NON-ADHERENCE IN A PERI-URBAN AREA OF KARACHI*Dr. Muhammad Ashar Malik, Dr. Narjis Rizvi, Abida Bibi**Department of Community Health Sciences and Medical College, Aga Khan University*

Introduction: Nonadherence is a complex or multidimensional healthcare problem and remains a significant unmet challenge for optimizing patient outcomes. Significant proportions of patients need to receive the full benefit of their prescription due to non-adherence, which raises morbidity and mortality rates and societal expenses. The study aimed to find the medication non-adherence of prescription medicine due to unaffordability in the most vulnerable population of Lyari.

Objective: To explore the effect of unaffordability on Medication Non-adherence in peri-urban areas of Karachi, Pakistan.

Methods: A cross-sectional study was conducted, and 542 patients were recruited, buying prescription medicine from the selected pharmacies in the peri-urban area (Lyari) Karachi. In addition, the snap of the recruited patient's prescription was taken with the receipt of the pharmacy bill. In-person interviews were done, and patients were asked questions about their sociodemographic history, illness status, duration of illness, and attendant relation with the patient. At the end of the interview, the reason for not buying the medicine as recommended by the doctor was asked of the patient.

Results: Our results showed that out of the total sample (n=542), 29% (have adhered to their prescription medicine as recommended by the doctor, and 71% have non-adhered to the prescription medicine. Among non-adhered, 48% of patients were non-adhered due to behavioral factors, and 46% were non-adhered because of financial factors. The Median cost of prescription and dispensed medicines were PKR.444 and PKR.246, respectively (differencePKR.190). The difference in costs (PKR) among adhered and non-adhered was statistically significant.

Conclusion: Financial factors as a significant contributor to medicine non-adherence indicate the unaffordability of medicines by the majority of the population. This hints at the issues in prescription practices and medicine pricing regulation.

We suggest more rigorous treatment of the subject matter for future studies by addressing other contributing factors such as therapy-related factors, physician-patient relations and unregulated prices of the medicines.

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STATUS OF DIETARY ADEQUACY AND INFLUENCE OF FAMILY STRUCTURE AMONG PREGNANT WOMEN DURING FIRST TRIMESTER AT A TERTIARY CARE PRIVATE HOSPITAL IN KARACHI - A CROSS-SECTIONAL STUDY

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Background: An adequate diet is essential for maternal and fetal health. Influence of family structure on maternal diet is not well known.

Objective: We aimed to determine maternal dietary adequacy and role of family structure and associated determinants.

Methods: In this cross-sectional study, we recruited 306 first-trimester pregnant women from the Aga Khan University Hospital, Karachi (January 2020 to September 2021). Participants possessed a smartphone (for m-health intervention trial) and reported no major comorbidities or medication use. Through structured questionnaire, sociodemographic, obstetrics, and dietary data were gathered. Information about physical assessment and hemoglobin levels were extracted from medical records. An aggregate Dietary Risk Score (DRS) for quantity and quality was obtained by summing up DRS for each of six major food groups using adequate (DRS 0), intermediate (DRS 1.5), and inadequate (DRS 3) categories. Data was analyzed using STATA 14.0 for linear regression.

Results: Mean for DRS quantity and quality were 10.6 ± 2.4 and 7.5 ± 2.5 , respectively. Adequate quantity and quality for bread/cereals was reported by 14.4% & 19.3%, for vegetables by 0.3% & 49%, for fruits by 41.2% & 88.6%, for meat/fish/beans by 19% & 0%, for milk/milk products by 1% & 37.6% and for oils/fats groups by 90.5% & 8.8%, respectively. Adjusted analysis revealed higher DRS for quantity associated with nuclear family (β : 1.02 (0.22, 1.82)), vomiting (β : 0.79 (0.29, 1.28)), and one homemade meal consumption (β : 3.80 (2.34, 5.27)). Similarly, higher DRS for quality was reported for nuclear family (β : 0.84 (0.16, 1.53)) and low spouse education (β : 1.14 (0.07, 2.21)).

Conclusion: Significant dietary inadequacy was observed for quantity than for quality, necessitating dietary counseling early in pregnancy. Expectant mothers with nuclear family structure, vomiting, less consumption of homemade meals, and low spouse education deserve special attention for dietary advice.

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SERIAL POPULATION-BASED SEROSURVEYS FOR COVID-19 IN DISTRICT EAST OF KARACHI, PAKISTAN

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Introduction: The COVID-19 pandemic, delineated the importance of community-based serial serosurveys for estimating the true burden of the disease, especially in areas where testing is sub-optimal. Household transmission of infection is a key concern in closed congested urban areas.

Objective: This study aimed to determine the prevalence and trend of SARS-CoV-2 in a densely populated community of Karachi.

Methods: Six serial cross-sectional surveys were conducted in April, June, August, and November 2020, February, and December 2021 in Karachi's District East. Households were selected to provide serum samples for Elecsys® immunoassay for the detection of SARS-CoV-2 antibodies. Bayesian regression was used to adjust for assay performance and estimate seroprevalence. Conditional Risk of Infection (CRI) with a 95% confidence interval was calculated using a non-parametric bootstrap of households.

Results: We enrolled 3038` participants of all age groups and genders. The adjusted seroprevalence was estimated to be 0.4% (95% CI 0 - 1.3), 15.1% (95% CI 9.4 -21.7), 21.5% (95% CI 15.6-28), 24.0% (95% CI 18.0-31.0), 53.9% (95% CI 45.5–63.2), 84.9% (95% CI 78.5 – 92.3) in surveys 1, 2, 3, 4, 5, and 6 respectively. CRI was calculated as 41% (95% CI 27.7-51.5) in survey 2, 38.8 (95% CI 26.7-51.7) in survey 3, 41% (95% CI 29.9-51.6) in survey 4, 56.7% (95% CI 50.4–62.6) in survey 5 and 77.8% (95% CI 73.0-81.7) in survey 6. Only 13% of participants had COVID-19-related symptoms.

Conclusion: An increase in seroprevalence estimates in Karachi's District East was observed over time. Community-based seroprevalence studies help to estimate the true proportion of the population that has been infected and predicts the spread of the disease in similar settings.

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NUTRITIONAL SUPPORT FOR LACTATING WOMEN WITH OR WITHOUT AZITHROMYCIN FOR INFANTS COMPARED TO BREASTFEEDING COUNSELING ALONE IN IMPROVING THE 6-MONTH GROWTH.

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Background: Globally, 45% of under-five deaths are due to malnutrition, primarily in low- and middle-income countries. Infants under 6 months of age are especially vulnerable with an estimated 4.7 million moderately wasted and 3.8 million severely wasted. Children of malnourished women have increased risk of stunting and wasting.

Objective: The study aimed to determine the efficacy of fortified balanced energy protein supplements consumed by lactating women for 6 months with or without oral azithromycin to the infant, compared to standard exclusive breastfeeding and nutritional counseling alone, in improving infant length velocity at 6 months of age.

Methods: The study is a randomized control trial in Karachi, Pakistan to evaluate the impact of BEP supplement for mothers and oral azithromycin for infants on infant length velocity. It uses a clustering algorithm (Calinski-Harabasz index) to divide data into groups, and its performance is being compared to K-means.

Results: Our study found that females had a higher prevalence of LAZ (3%) and WAZ (3.7%) compared to males in thriving cluster. Males had more cases of MUAC, BMI & HC (twice as many for MUAC and BMI, thrice as many for HC). Treatment led to improved growth for LAZ, WAZ, WLZ & BMI, with lowest faltering growth in the treatment arm. BEP supplementation had a positive effect on infant weight gain through WAZ, WLZ & MUAC. Clear gender differences in growth patterns were seen for BMI, MUAC & HC. Maternal MUAC increased and BMI decreased across all groups, with a potential role of BEP supplementation in increasing MUAC.

Conclusion: The study showed that nutritional support for lactating women with or without azithromycin for infants improved growth in 6-month-olds more than breastfeeding counseling alone. The results could inform policies to prevent malnutrition and improve growth in infants under 6 months, especially in areas with high infant mortality rates.

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ASSOCIATION OF TRAUMATIC BRAIN INJURY OF PATIENTS PRESENTING TO EMERGENCY DEPARTMENTS WITH PSYCHOLOGICAL DISTRESS OF CAREGIVERS

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Objective: To assess the psychological distress of family caregivers of patients who present with Traumatic Brain Injury (TBI) in the Emergency Department (ED) of Aga Khan University Hospital (AKUH), Karachi Pakistan and determine the association of psychological distress with the severity of the traumatic brain injury of the patients.

Methods: A cross sectional study was conducted in the Emergency Department of the Aga Khan University Hospital from June – October 2022. Information on traumatic brain injury patients was obtained by the triage. Upon arrival an initial diagnosis of traumatic brain injury into a respective category (mild, moderate, severe) by the doctors and nurses of emergency department was made using the Glasgow Coma Scoring. Our data collectors upon checking the relevant diagnosis from patient files and confirming with the doctors who made the diagnosis regarding the traumatic brain injury, approached the caregivers in the emergency department. They were explained the objective and procedure of our study and upon agreeing they were made to sign consent forms in the language of their choice, either Urdu or English. Caregivers were contacted after a period of three weeks post patient's injury on a telephone call upon which information about their socio-demographics and psychological distress was collected. The psychological distress of the caregivers was measured using the General Health Questionnaire-12(GHQ-12).

Results: GHQ-12 scores of 53 caregivers were obtained. Among the gender of caregivers we observed dominance of males among roles of caregivers (54.7%) and as the patients of TBI (83%). 51% of the caregivers belonged to extended families with 38% of the caregivers being the parents of the patients. 64% of the patients did not have any medical insurance. The mean age of TBI patients was 39(11) years.

Conclusion: It is evident that psychological distress is prevalent in caregivers of TBI patients. Higher the severity of TBI higher the distress. Hence it is imperative for health care workers to pay close attention to the psychological wellness of caregivers along with the patients, as they completely bear the responsibility of the patients. Appropriate interventions such as improvement in communication with health professionals for the caregivers can be tested to minimize psychological distress.

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ASSESSMENT OF PATTERNS, SERVICES AND POLICY FOR WAR-RELATED INJURIES IN KABUL, AFGHANISTAN

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Introduction: The health impacts of war and conflict are a growing public health concern. This paper assessed the patterns of war-related injuries as well as services and policies to address such injuries in Kabul, Afghanistan.

Methodology: This study was carried out in three tertiary care centers from August to October 2020 in Kabul, Afghanistan. We conducted a review of hospital records to capture war-related injury patterns and reached out to health managers and healthcare providers through interviews and assessment forms to assess war-related injury services. We purposively selected participants to represent three centers and the Ministry of Public Health for in-depth interviews. Later, we conducted a desk review of available government-level health policies to oversee war injury care at the policy level.

Results: Males (80.4%) were more prone to war-related injuries than females (19.6%). More than half (55.5%) of injured victims were 20-39 years old, and 22.3% of victims were younger than 19 years old. More than half of the affected people were married (58.1%) and unemployed (79.2%). Active battle gunshots were the main cause of war injuries (37.7%), followed by suicide bombings (34.3%). Lower extremities were the most affected sites by all types of war-related injuries. Qualitative data show the availability of a control and command center for emergency responses, including war emergencies; however, gaps were highlighted in areas such as pre-hospital care, infrastructure, and health management information systems. Unavailability of a well-managed complex trauma system and delivery of injury care by general healthcare services were highlighted as main gaps in available services. Available policies barely focused on war trauma care clearly.

Conclusion: Afghanistan is a country chronically affected by war. General health services deal with war-related injuries with inadequate human and institutional capacity, and policies do not prioritize war-related injuries. Establishing complex trauma centers with better infrastructure and compatible human resources is necessary.

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KNOWLEDGE AND ATTITUDES ABOUT CHILD ABUSE AND NEGLECT (CAN) AMONG MEDICAL STUDENTS, RESIDENTS AND NURSING INTERNS AT A PRIVATE UNIVERSITY IN KARACHI, PAKISTAN

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Background: Child abuse and neglect (CAN) often undergoes underreported in LMICs of South Asia due to various sociocultural factors, along with a lack of training and awareness both in society and health care providers (HCPs).

Objective: To identify gaps in knowledge, perceptions, and attitudes, and challenges faced in reporting and addressing CAN by HCPs.

Methodology: An online survey was conducted at a private tertiary care hospital among medical students, nursing students and pediatric residents. 201 filled forms were received (medical students=76, nursing students=92, residents=33). The questionnaire was self-developed, and consisted of questions on demographics, knowledge, perceptions and attitudes. Mean scores were compared among fields of profession. For quantitative variables, mean and standard deviation were reported while for qualitative data, frequency and percentages were reported.

Results: Among 201 participants, 21 were males and 160 females, and the mean age was 23 years (SD 3.67 years). Overall, medical students and residents showed higher knowledge scores, with means of 10.8 (SD 1.87) and 10.7 (SD 2.79). Most HCPs (94.53%) agreed that the major barrier to report CAN was fear of consequences for the child or their family. Regarding the need to provide an educational program related to CAN, participants agreed with an overall mean of 4.1 (SD 0.08).

Conclusion: While our study showed knowledge gaps and varying awareness towards abuse, there was a positive attitude towards willingness to report abuse. General underreporting of abuse suggests that it is essential to implement a comprehensive awareness and educational program on CAN in HCPs.

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WHY PAKISTAN MISSED MDGS 4: DECOMPOSING ANALYSIS OF CHILDHOOD VACCINATION?

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Introduction: Pakistan missed MDG4 (Infant Mortality Rate was 107 in 1990, dropping to 62 in 2015 which is way below the 2/3rd reduction committed in MDGs). Further, Pakistan missed Childhood vaccination targets (>90% coverage). Except for the national-level estimates, limited scientific literature is available at the subnational level to understand the push and pull factors of achievements.

Objective: This paper aims to track progress on the coverage and equity in the coverage of childhood vaccination in Pakistan at baseline 2001, at the end line 2015.

Methodology: We used data on vaccine coverage from the Pakistan Social and Living Standard Measurement Survey (PSLM) rounds, 2001 and 2015. We estimated coverage of vaccination among children aged 1 year and above in four provinces. We analyzed equity by estimating concentration indices.

Results: As of 2015, there was only a 21% increase in national DPT coverage from 64% to 85.2%. KPK achieved only an 11% increase in coverage in BCG vaccination from 70.6% to 81.6% which is the lowest among all provinces. The lowest measles vaccination coverage was seen in Baluchistan at 43.7%, an 8% increase from 2001. Equity was substantially increased especially in the case of polio vaccination. Inequities increased for Measles and full vaccination in Baluchistan province. Punjab had achieved greater equity for all types of childhood vaccination.

Conclusion: Pakistan has missed the targets for health-related MDGs except in Punjab and coverage of Polio vaccination. Further analyses are needed to understand the low coverage especially in the provinces of Baluchistan and in a few cases of Sindh.

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ISSUES AND CHALLENGES FACED BY HEALTHCARE LEADERS IN THE PROCESS OF CHANGE MANAGEMENT

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Objectives: Effective leadership is a crucial component of health-care systems, with a wide range of duties to improve efficiency and productivity. This study aimed at exploring leadership challenges during the change management process in a private tertiary care hospital in Karachi, Pakistan.

Methods: This qualitative study was conducted on a purposeful sample of 11 members of the hospital clinical management team who were working as clinical leaders using face-to-face semi-structured in-depth interviews. The analysis and reporting of the data was based on themes and sub themes.

Results: Seven major themes related to leadership challenges and change management were identified, namely, need for change, biggest change management challenge faced by leader during change management, resistance to change, setback with respect to change management, communicating change, motivation building and analyzing team performance.

Conclusion: We conclude that lengthy/complex processes, behavioral inflexibility, lack of human resources and changing already made policies are the biggest challenges faced by the leader during the process of change management. Taking time out from their clinical services for administrative responsibilities was another obstacle in successfully implementing change. The setbacks faced by clinical leaders during change management were lack of enthusiasm and unity about transformational administration. This study enables us to understand the obstacles that came across in the transition phase by the leaders that are the barriers which prevent successful implementation of plan of change. These findings will benefit human resource executives, academic/clinical administrators, and leaders at all health system levels to understand the leadership issues in relation with healthcare.

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GENOMICS OF KLEBSIELLA PNEUMONIAE AND ESCHERICHIA. COLI IN PEDIATRIC INFECTIOUS DISEASES IN PAKISTAN

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Background: Globally, 2.4 million children die in the first month of life and one of the biggest contributors to mortality, is neonatal sepsis, accounting for nearly 1/3rd of all neonatal deaths. Pakistan has the highest neonatal mortality rate in the world, at 46/1000 livebirths. Studies have identified K. pneumoniae and E. coli as two of the most common bacterial pathogens recognized in isolates. Mainstay of treatment until now has been antibiotics however, its persistent use has led to the emergence of multidrug-resistant bacteria.

Objective: We propose to perform whole genome sequencing of K. pneumoniae and E. coli isolates from sterile body fluids of pediatric population in Pakistan to guide vaccine development.

Methods: We propose a three-pronged strategy to create a repository of K. pneumoniae and E coli isolates collected from the sterile body fluids of pediatric population.

1. Using archived K. pneumoniae and E. coli isolates: Archived isolates from “Causes and incidence of community-acquired serious infections among young children in South Asia” (ANISA) study and Simplified Antibiotic Therapy Trial (SATT).
2. Leverage ongoing clinical trials on possible serious bacterial infection (PSBI), currently ongoing as part of World Health Organization PSBI trials.
3. Leveraging Aga Khan University’s vast network of clinical lab across Pakistan

Results: AKU, Pakistan was one of the community sites for SATT (2009-2011) and ANISA (2012-2013) study. Ten K. pneumoniae were isolated and twenty-one E. coli with two isolates identifying both K. pneumoniae and E. coli which were archived. Next generation sequencing has been performed on these isolates.

Conclusion: Vaccines are one of the most cost-effective public health interventions to save lives. Genome sequencing can help identify patterns related to the virulence as well as factors that contribute to immunity or successful vaccine response.

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ASSESSING THE EFFECTIVENESS OF COVID-19 VACCINES IN PAKISTAN: A TEST-NEGATIVE CASE-CONTROL STUDY

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Background: Evidence on real-world effectiveness of COVID-19 vaccines have largely been reported from developed countries. In Pakistan, inactivated vaccines were first introduced in February 2021 as part of the national vaccination efforts against SARS-CoV-2. Later, mRNA and viral vector vaccines were added to the program. We used a test-negative case-control design to describe the effectiveness of eight different COVID-19 vaccines in Pakistan.

Methods: We contacted adult residents of Karachi who were tested for COVID-19 using RT-PCR at the Aga Khan University Hospital testing facility between June-September 2021. People who were symptomatic within a week prior to the test and provided verbal consent were enrolled in the study. Data were collected on exposure to COVID-19, clinical history, and vaccination status. Individuals who had a positive PCR result were classified as cases and those who tested negative were classified as controls. The effectiveness of different vaccines was calculated by comparing vaccination rates between cases and controls after adjusting for known confounders.

Findings: In total, 1597 cases and 1590 controls were enrolled. Among cases, 38.1% (n=608) were fully vaccinated, while 53.3% (n=847) among controls were fully vaccinated. Sinopharm was the most used vaccine (61.6%) followed by Sinovac (25.6%). The adjusted vaccine effectiveness (VE) estimate of Sinopharm was 33.8% (95% CI: 18.6% - 46.1%) and that of Sinovac was 49.3% (95% CI: 34.8% - 60.6%), respectively. The mRNA vaccines were found to be the most effective against symptomatic COVID-19 infection (VE: 67.4%; 95% CI: 1.8-89.2%).

Interpretation: Inactivated COVID-19 vaccines were moderately effective against symptomatic infection in adult Pakistani population. The mRNA vaccines had higher effectiveness comparable to the other types of vaccines, similar to that reported from elsewhere.

Funding: This study was funded by the Infectious Diseases Research Laboratory (IDRL) at the Aga Khan University.

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PREVALENCE, CAUSES AND PREDICTORS OF NEONATAL MORTALITY IN KARACHI PAKISTAN FINDINGS FROM A POPULATION-BASED COHORT (ALLIANCE FOR MATERNAL AND NEWBORN HEALTH IMPROVEMENT)

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Introduction: Neonatal mortality has declined globally in the last two decades. However, an estimated 4 million babies still die in the first 4 weeks of life (neonatal period). Three-quarters of these deaths happen in the first week- the highest risk being within the first day after birth. We analyzed the AMANHI study data to produce population-based rates, causes and predictors of neonatal mortality (0-28 days) in Pakistan.

Methodology: A prospective community-based study was conducted in Karachi from July 2012 to February 2016. The study enrolled a cohort of women of reproductive age (15–49 years) to identify pregnancies. Pregnant women were followed up at different time points through delivery up to 42 days postpartum. Information regarding neonatal deaths (0-28 days) was collected using the standard WHO verbal autopsy (VA) technique. The cause of death was assigned by physicians after carefully reviewing the filled VA tool.

Results: In this study, 19,790 pregnancies were identified. The total outcomes reported were 18532, out of which 663(3.6%) were abortions/miscarriages, 676(3.7%) stillbirths and 17193(92.8%) were live births. There were 866/17193 (5.0 %) neonatal deaths. The overall neonatal mortality rate is 50.2 per 1000 live births. The study also identified perinatal asphyxia (39%) and severe neonatal infections (36%) including sepsis, meningitis, and pneumonia to be the major causes of neonatal deaths, followed by one in five deaths due to preterm birth complications (22%). Maternal education, low birth weight, parity, sex of the baby, birth order, labor pain and wealth index are associated with neonatal deaths and found statistically significant.

Conclusion: The study provides accurate estimates of neonatal mortality rates, causes of death and factors associated with mortality. Our findings show the necessity of enhancing the standard of maternal intrapartum care and immediate newborn care to reach survival goals in the Sustainable Development Goal era.

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PREVALENCE AND OUTCOMES OF MISSING CHILDREN IN PAKISTAN - PERSPECTIVES FROM A LOWER-MIDDLE INCOME COUNTRY

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Background: Child trafficking and kidnapping are common reasons for missing children in Pakistan. However, due to a lack of government support and awareness amongst families, the authorities fail to provide protection to children. Moreover, various socio-cultural hindrances prevent parents and guardians from reporting missing children.

Objectives: This study aims to highlight the current situation of missing children and subsequent sequelae in the country.

Participants and setting: Four child protection organizations responded and provided access to available data. In 2021, two national organizations reported 1741 and 1448 cases of missing children respectively.

Methods: Seven leading child protection organizations in Pakistan were approached via email or through provided contact numbers. Permission for access and use of their data for the year 2021 was sought. Data from organizations that responded within a month of contacting them was analyzed in the study.

Results: The highest prevalence of missing children was found to be in Islamabad (3.52/100,000) while the lowest representation was from Khyber Pakhtunkhwa (0.61/100,000). Nationwide, 1275 out of 1448 children were recovered (88.1%). Balochistan had the highest recovery rate in the country (91.25%) while Punjab accounted for the lowest (82.42%).

Conclusion: The increasing trends in child abduction call for measures such as the ZARRA act. These initiatives aim for rapid recovery and response after a missing child is reported via a helpline. Moreover, national health surveys and collaboration between provincial authorities leading to a national registry can help capture a true picture of the current situation nationwide.

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A COMPARISON OF THE PRIMARY, SECONDARY, AND TERTIARY HEALTH CARE SYSTEMS IN PAKISTAN FOR THE ADMINISTRATION OF ZINC SUPPLEMENTATION DURING DIARRHEAL TREATMENT IN CHILDREN.

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Background: An estimated 1.9 million child deaths worldwide are attributed to diarrhea each year. Therapeutic zinc supplementation for diarrhea prevents future episodes of diarrhea. In Pakistan, primary health care is the initial point for the diagnosis and treatment of any ailment. However, tertiary hospitals are preferable because they have the availability of different medical disciplines under one roof.

Objective: To assess the difference in the prevalence of zinc prescription between primary, secondary, and tertiary health care systems during diarrheal treatment in children.

Method: We extracted data from 4043 children (National Nutrition Survey of Pakistan-2018) who suffered from diarrhea within the last two weeks before enrolment. The questionnaire regarding the choice of the healthcare facility was selected and segregated into two groups involving the treatment with or without therapeutic zinc supplementation.

Results: It was found that only 7% of diarrheal children were treated with zinc supplementation. Most of these supplements i.e., 68.2% were prescribed at tertiary care hospitals, whereas 27% and 4.6 % were prescribed by primary and secondary health care hospitals, respectively. The difference in the zinc prescription practice between tertiary and other healthcare facilities was found to be statistically different ($p < 0.001$).

Conclusion: The results showed that primary, as well as secondary healthcare facilities, do not often prescribe zinc to treat diarrhea in children as compared to tertiary healthcare facilities. This emphasizes the need of educating these medical practitioners on the use of zinc supplements during the treatment of diarrhea.

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THE HUMAN DIAMOND DROPS*Sara Sheikh, Tazeen Saeed Ali, Zohra Kurji, Kiran Mubeen, Shelina Bhamani**School of Nursing and Midwifery, Aga Khan University*

Early initiation, exclusivity, continuation of breastfeeding as recommended has numerous health benefits. Lancet series on breastfeeding estimated using breastmilk substitutes results in >800,000 child death worldwide. Research shows that lactation consultants improve breastfeeding outcomes and increase maternal breastfeeding self-efficacy. So far there is only one lactation clinic in Pakistan and very limited research work has been conducted on the effectiveness of the role of lactation consultant. The study aimed to measure breastfeeding self-efficacy and explore the experiences of mothers who availed the lactation clinic services during the year 2021 at the tertiary care hospital of Karachi, Pakistan. A concurrent mixed-method study design was conducted with 105 (quantitative) and 16 (qualitative) participant mothers. content analysis and logistic regression with quartile distribution were carried out to detect and extract major themes and mean breastfeeding self-efficacy scores along with demographic characteristics that are associated with increasing breastfeeding self-efficacy of mothers. Three major themes were extracted including factors affecting breastfeeding practices, the emerging role of lactation consultants, and future recommendations. The mean breastfeeding self-efficacy score of mothers who availed the lactation clinic services was 58.69 (± 13.59). Moreover, the participant mothers reported being moderately confident regarding breastfeeding without using formula as a supplement and comfortable breastfeeding in public places or in the presence of family members. The current study found that lactation services are required by mothers at all phases (prenatal, antenatal, and postnatal) and role of the lactation consultant is significant for mothers to promote, motivate and sustain breastfeeding practices among women in Pakistan.

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COMPARISON OF PSYCHOLOGICAL DISTRESS LEVELS AMONG FRONTLINE MEDICINE RESIDENTS DURING DIFFERENT COVID-19 PANDEMIC WAVES IN PAKISTAN

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Background: While studies have evaluated the impact of coronavirus disease-2019 (COVID-19) on the mental health of healthcare workers (HCW), to our knowledge, there are no studies in Pakistan, which have compared psychological distress levels during the

first and second waves. This study was done to assess anxiety levels of Internal Medicine residents and identify risk factors for psychological distress.

Methodology: Cross-sectional study was conducted in the Aga Khan University Hospital, Karachi. A questionnaire comprising of demographic data and risk assessment tools, seven-item Generalized Anxiety Disorder scale (GAD-7), and nine-item Patient Health

Questionnaire (PHQ) was used for data collection from Internal Medicine residents using nonprobability convenience sampling technique in May–June 2020 and April 2021.

Results: A total of 88 responses were recorded. Response rate was 75.7 percent (56/74) and 43.2 percent (32/74) during the first and second waves, respectively. Mean age was 27.9 ± 3.2 years and mean clinical career in years was 3.2 ± 2.1 . Majority, 51.8 percent (29/56) and 68.8 percent (22/32), were not satisfied with community prevention measures and 75 percent (42/56) and 65.6 percent (21/32) considered interventions necessary in case of psychological distress during pandemic, during the first and second waves, respectively. A higher number of HCW reported their family not supporting their frontline work during the first wave (16.1 percent vs 3.1 percent; p value 0.023). There was a statistically significant difference in psychological distress levels as median GAD-7

scores were 5(IQR 2–8) vs 9.5(IQR 3.25–13) (p value 0.009) and median PHQ-9 scores were 4(IQR 2–11) vs. 7(IQR 4–17) (p value 0.056) during the first and second waves, respectively.

Conclusion: There was a significant difference in anxiety levels during the first and second waves of COVID-19 and family support for frontline work was higher during the second wave. Further studies are required to assess these differences.

Keywords: COVID-19, mental health, healthcare workers, psychological impact

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LONG TERM EPIDEMIOLOGICAL CHARACTERISTICS AND TRENDS OF EMERGENCY MEDICAL DISEASES (EMDS) GLOBALLY

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In 2015, there were 28.3 million deaths globally due to Emergency medical diseases (EMDs) with majority in Low-Middle income Countries (LMICs). This study analyzes the trend of EMDs over a period of 30 years using the metrics of Emergency disease mortality rate (EDMR) and emergency disease burden (EDB) per 1000 population.

We used publicly available data from the Institute of Health Metrics (IHME) data source for 30 years (1990-2019). The list of EMDs was derived from the literature published by Vashi et al. showing 71 Emergency Care Sensitive Conditions (ECSCs) presenting most frequently in Emergency Department (ED). The data consisted of geographical World Bank (WB) regions and Sociodemographic index (SDI) categories for 195 countries. The three primary outcome measures were Mortality, Years of Life Lost (YOLLs), and Disability Adjusted Life Years (DALYs).

Globally, the overall burden was reduced for mortality by 2% (8.75 to 7.2), YOLLs by 15% (380 to 230), and DALYs by 15% (490 to 340) per 1000 population. The most significant change for mortality was observed in Low SDI countries with the greatest decline (14 to 7 per 1000 population) followed by low-middle SDI countries (10 to 7 per 1000 population). High, high-middle, and middle SDI countries observed a slight decline with plateau at the end. Similar trends were observed in plots for YOLLs and DALYs for all countries. In terms of WB regions, Sub-Saharan Africa and South Asia showed the most significant improvement in terms of survival from EMDs i.e., 13.75 to 7 and 10 to 6 per 1000 population respectively. Central Europe, Eastern Europe, and Central Asia, on the other hand, had an upward trend of mortality during the years 1990-2000 which decreased later on. Despite the eventual decline, the mortality burden in these regions stayed higher than that of 1990.

In summary, this is the first study to show a 30-year trend of ECSCs or EMDs across the globe based on SDIs and WB classification using the metrics of EMDR and EDB. Overall, Mortality, YOLLs and DALYs showed a global decline with variations in each region. Further studies can be conducted to understand the pattern and indicators of these variation.

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A CALL OF HOPE: TELEPHONE-ASSISTED CPR (T-CPR) TRAINING IN A LOW-MIDDLE INCOME COUNTRY

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Out-of-hospital cardiac arrest (OHCA) is the leading cause of global mortality, most of which comes from Low-Middle income countries (LMICs). Telephone-assisted CPR (T-CPR) has shown to improve OHCA survival by 25-30% in high income countries and its role is even more critical in regions with rudimentary pre-hospital systems and partially functioning emergency rooms. Our aim is to assess the knowledge, perceptions, and implementation of T-CPR in Emergency Medical Services (EMS) District Officers (DOs).

Following American heart association (AHA) guidelines, 37 DOs in Punjab, Pakistan were trained in T-CPR. This course entailed AHA recommendations, 3 components of T-CPR (Identification of OHCA, Pre-arrival CPR instructions, CPR coaching), "No, No, Go" protocol, Question-Answer (QnA) evaluation, and simulated skills practice. After skills assessment, all participants completed the "Save my heart" course outlined by AHA. One month follow-up was conducted to assess the delivery and implementation of T-CPR. After a verbal consent, responses were recorded through google forms either during phone call or online.

Study sample consisted of 37 DOs of EMS for a population of 120 million. All DOs were male, supervising an average of 25 dispatchers each. After one-month of T-CPR training, they were approached via phone call to fill the follow-up survey. Of 37 participants, 20 (54%) completed the form. Although 95% of the participants had adequate knowledge retention for T-CPR's first component, only 50% remembered all 3 components. Knowledge retention for the "No, No, Go" protocol and "QnA" evaluation was 19 (95%) and 20 (100%), respectively. By the time of evaluation, T-CPR had been added to the dispatcher's software and it was being actively implemented. 19 DOs (95%) taught T-CPR to dispatchers in their control rooms. Each call room responded to approximately 2-3 T-CPR calls per day related to OHCA. All participants agreed that the course improved their T-CPR-related knowledge and confidence. All trainees suggested to conduct trainings with other DOs in the country, and 70% of them recommended public awareness for T-CPR.

In conclusion, T-CPR training can increase the knowledge and confidence of DOs supervising the dispatchers in events of OHCA. With yearly follow-ups, close monitoring, and T-CPR implementation, OHCA related mortality can be reduced in LMICs.

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THE OFF-LABEL USE OF PROMETHAZINE AND ITS ASSOCIATED FACTORS AMONG MOTHERS OF CHILDREN UNDER THE AGE OF TWO YEARS IN A PERI-URBAN COMMUNITY IN KARACHI, PAKISTAN

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Background: Antiallergic syrups are a popular choice of drugs among mothers in developing countries; however, their use in infants and children, although widely known, is not well documented, 'promethazine' is one such drug. Promethazine's off-label use and neglect of its label's black box warning have been associated with health issues in children. It is available over the counter in Pakistan, alone and in combination. Despite being contraindicated in children under two years, it is routinely dispensed to oblivious mothers by equally ignorant chemists and dispensers.

Methods: A cross-sectional survey was conducted with an aim to assess the prevalence, knowledge, attitude, and practices (KAP), as well as the factors associated with promethazine use among mothers of children under two years in a peri-urban community in Karachi, Pakistan.

Results: A total of 422 mothers participated in the survey. From the sample, n=153 (36%) had used promethazine in the previous year, while n=65 (15%) mothers were found to be currently using it. The high prevalence was significantly associated with mothers' limited knowledge of its indications and lack of understanding about its hazardous effects. This resulted in unsafe attitudes and practices such as self-medication. The most cited reason among promethazine-using mothers (n=58, 89%) was for night-time sedation.

Conclusion: This is a first community-based study investigating off-label promethazine use among Pakistani mothers. The high prevalence was significantly associated with mothers' limited knowledge of its indications and lack of understanding about its hazardous effects. This highlights the need for pharmacovigilance and enhanced surveillance of the off-label use of promethazine in the pediatric population.

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EVALUATING PREGNANT WOMEN'S EXPERIENCES WITH MIDWIFERY-LED ANTENATAL CARE SERVICES IN PERI-URBAN COMMUNITIES IN KARACHI, PAKISTAN.

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Objective: To understand pregnant women's satisfaction with the quality of midwifery-led antenatal care (ANC) services at primary health centers (PHC) in Karachi, Pakistan.

Methods: A cross-sectional survey was conducted at two PHCs from peri-urban communities of Karachi. Pregnant women attending these clinics in their third trimester were interviewed regarding access to care, ANC experience, person-centered approach, and general satisfaction with the facility. These themes were mapped onto the universal Respectful Maternity Care (RMC) charter. The data were analysed using descriptive statistics and the chi-square test.

Results: A total of 904 pregnant women participated in the survey. Women reported high satisfaction with operating hours (94%, n=854) and cleanliness at the facility. Most patients (>90%) reported highly on privacy, being respected by midwives, and facing non-discriminatory treatment. Women had the least independent decision-making power when it came to seeking ANC (2.5% n=23). Further, 60% (n=542) of women reported regarding informed consent before a procedure, and only 13% (n=120) reported counseling for birth preparedness. Women with any education were more satisfied with the consent process than uneducated women (61% vs. 49%, p<0.001). Older women (>30 years) were significantly less dependent on their elders for decision-making as compared to those < 30 years of age (47% vs. 70%, respectively, p<0.001).

Conclusion: Most women were satisfied with the facility's ambiance, respect, and care. However, women reported dissatisfaction with certain pregnancy counseling they received. The findings will assist in devising efficient strategies such as regular RMC and technical training that would strengthen midwife-patient interactions, thus increasing their satisfaction and eventually improving maternal and newborn outcomes.

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INJURIES DUE TO CELEBRATORY AERIAL FIRING DURING NEW YEAR AND INDEPENDENCE DAY: A CASE SERIES OF A TERTIARY CARE HOSPITAL IN KARACHI, PAKISTAN

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Introduction: Aerial firing and celebratory shooting are culturally practiced in the middle east, north India, Pakistan, Afghanistan, and parts of Latin America on different occasions. These firings usually lead to unintentional injuries.

Objectives: The study aimed to determine the pattern and outcomes of celebratory aerial firing injuries presented in the emergency room of a tertiary care hospital.

Method: It was a retrospective case series study. Ten years of data (2012-2022) from the emergency room in a tertiary care hospital were used. All cases of gunshot injuries during new year's eve (31 December & 1 January) and Pakistan Independent Day (13th & 14th August) were included. Cases were extracted from the electronic medical records, and required data were collected by reviewing each case file. Variables include patient demographics, events that resulted in injury, time of injury, site of injury, and injury outcome. We used SPSS 21 to analyze the data. Frequencies and percentages were calculated for all qualitative variables, and a Chi-square test was used to check the association between dependent and independent variables.

Result: A total of 27 cases were studied. The majority of the cases, 20 (74%), were presented during Independence Day celebrations and at night. Eighteen cases (66.7%) were males, and the rest 9 cases (33.3%) were females. The affected population was between the ages of 8 and 59, with a mean age of 28(±15). Regarding the injury site, 12 (44.4%) injuries happened in the upper limbs, followed by lower limb 5(18.5%) and chest 5(18.5%). From the total number of patients, n=15 were discharged alive, while only n=03 patients were reported dead. However, more patients, n=12, reported as left Against Medical Advice (LAMA).

Conclusion: Injuries resulting from celebratory aerial firings lead to major unintentional injuries. More studies in multiple centers, especially major public hospitals, are recommended to study the pattern and outcomes along with clinical complications.

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EMERGING DISPARITIES BETWEEN MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN (MIS-C) PATIENTS IN HICS VS. LMICS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Multisystem inflammatory syndrome in children (MIS-C) is a hyperinflammatory condition temporally associated with coronavirus disease 2019 (COVID-19). We performed a systematic review describing epidemiological, clinical, and diagnostic characteristics alongside therapeutic interventions and associated outcomes. Furthermore, we compared these findings in high income countries (HICs) vs. lower-middle income countries (LMICs). Our study assessed 80 reports representing 7742 MIS-C cases, including children with a mean presenting age of 7.99 years (lower in LMICs; 7.39 years), predominantly male (59.35%; more so in LMICs, 61.01%), with a majority belonging to Hispanic (32.95%) or Black (29.74%) communities. A majority of the patients had no reported comorbidities (84.44%), however, the most frequently reported comorbidities were obesity (14.1%), respiratory disease (9.11%), and asthma (6.51%). According to our review, MIS-C was characterized by fever (99.71%), gastrointestinal symptoms (75.82%), the presence of a rash (58.57%), and raised inflammatory and coagulation markers. Echocardiography showed ventricular dysfunction (47.92%) with a mean left ventricular ejection fraction of 46.77%, and some degree of valvular dysfunction (38.73%). Intravenous immunoglobulins (IVIG) (83.68%) and steroids (69.86%) were mainstays of MIS-C treatment, however, antibiotics were administered in 89.47% of cases. The mean length of hospital stay was 8.9 days (higher in LMICs; 10.36 days) and the mean length of ICU stay was 5.3 days (higher in LMICs; 6.34 days), with 55.21% of patients needing ICU admission. Mortality was generally noted to be low in HICs (1.64%), however, LMICs reported a staggering disparity, reporting 12.79% deaths. The review findings suggest that MIS-C has a heterogeneous presentation that can be associated with life-threatening complications, especially in LMICs.

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READINESS OF TERTIARY CARE HOSPITALS FOR DISASTER AND MASS CASUALTY MANAGEMENT IN KARACHI, PAKISTAN.

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Background: Disasters are expected to increase in frequency and intensity in Pakistan due to geographical location. A well-developed healthcare system is inevitable considering the huge impact of these disasters and the inadequate coping capacity of a developing country like Pakistan.

Objectives: The study aimed to determine the tertiary care hospitals readiness for disaster and mass casualty management in Karachi, Pakistan.

Methods: It was a cross sectional study, conducted in five tertiary care hospitals of Karachi. WHO's Hospital Emergency Response Checklist was used in this study. It has 9 components and 92 indicators. Each indicator has three responses to choose from, "Due for review", "in progress", and "completed" which were assigned 0,1,2 marks respectively when chosen as answer making a maximum score of 184. Individual healthcare facility scores were calculated and categorized according to the previous studies as unacceptably prepared (0-64), insufficiently prepared (64-129), and sufficiently prepared (130-184) as outcome variables.

Results: Three hospitals in Karachi were insufficiently prepared to deal with any emergency. Two out of three public and one out of 2 private hospitals were insufficiently prepared. Public hospital 1,2, and 3 secured 98 (64-129), 125 (64-129), and 132 (130–184), respectively. While on the other hand private hospital 1, and 2 obtained 112 (64-129), and 167 (130-184) scores respectively. One hospital had unacceptable preparedness in components of post disaster recovery, logistics and supply management. Four (n=5) tertiary care hospitals were insufficiently prepared while only one (n=5) was sufficiently prepared to deal with disasters.

Conclusion: Majority of tertiary care hospitals in Karachi were insufficiently prepared. Overall preparedness of tertiary care hospitals in Karachi needs more efforts and upgradation in all key components to reduce the impact of disasters.

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Association of Medication adherence, Self-care Behavior and Diabetes Knowledge with Diabetes Empowerment among patients with Type 2 Diabetes, at OPD setting, Karachi, Pakistan: A Cross-Sectional Study.*Mohiba Ali Khowaja, Shafquat Rozi, Sobiya Sawani**Department of Community Health Sciences, Aga Khan University*

Background: Diabetes empowerment is important for diabetic control as it postpones the onset of complications. This study aimed to investigate the association of medication adherence, self-care behaviors, and diabetes knowledge with Diabetes empowerment among patients with type II diabetes.

Methods: A cross-sectional study was conducted on 451 type II diabetes patients attending Endocrinology clinics at OPD setting in Karachi. Data was collected electronically using a structured questionnaire comprising of tools to measure Diabetes empowerment, medication adherence, self-care behaviors, diabetes knowledge, and socioeconomic scale. It also included health-related information from patients' medical record.

As outcome variable was continuous, so multiple linear regression analysis was used to assess the independent effect of diabetes empowerment on medication adherence, self-care behaviors and diabetes knowledge with other co-variates.

Results: The mean Diabetes Empowerment score was 3.62 (SD=0.31). The mean age of the participants was 56.68 (SD=11.76). 53.88% were females, 80.71% were married, 77.56% were obese, and 66.30% were upper-middle class with average diabetes duration of 11.7 years (SD=7.89). HbA1c values were ≥ 7 in 63.41% of study participants.

Diabetes Empowerment was significantly associated with medication adherence (P= 0.001), general diet (P<0.001), special diet (P=0.011), smoking status (P =0.001), and socioeconomic status (upper lower, P=0.085).

Conclusion: A comprehensive strategy for the treatment of type II diabetes is essential to enhance clinical results, improve patient quality of life, and prevent diabetes-related comorbidities. People with type II diabetes should be encouraged to embrace an empowerment-based approach by healthcare providers. It is critical to do research that promotes empowerment.

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Child Emotional Abuse and Association with Depression and Suicidal Ideation: A Literature Review from an LMIC

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Background: Childhood emotional abuse (CEA) encompasses harmful non-violent behaviors that significantly damage a child's neurological development and hinder the formation of secure attachment patterns. This paper aimed to discuss its prevalence, risk factors, and association with depression and suicidal outcomes later in life, from a low-middle income country (LMIC) perspective.

Methodology: This paper is a narrative review. PubMed and Google Scholar were used to search articles and those deemed relevant by the team members were included in the study. A total of 10,853 studies were screened for relevance.

Results: Children with a history of being emotionally abused reported higher rates of decline in mental well-being, anxiety, stress, depression, and substance abuse. This impacted their social and emotional growth, school performance, and overall well-being. Subsequently, it was found that when the child grows up, this significantly worsens adult disease outcomes for Axis II disorders such as depression and suicidal ideation. Through our review, we found a positive association between parental psychological abuse and resulting adverse psychological events in school-going children. Previous literature in the region was consistent with these findings.

Conclusion: Although there has been increasing interest in CEA recently in South Asian LMICs, there is still room for larger, prospective studies to be done and awareness to be raised in this area. Once substantial data is available and lapses in literature are recognized, organizations will be better informed to develop guidelines and take necessary interventions early in children's lives to reduce the burden of manifestations of CEA.

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Association of biological, socioeconomic, and environmental factors with neurodevelopment in children at 2 years of age in Bangladesh, Pakistan and Tanzania: Results from the AMANHI-ACT study

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Background: With high burden of preterm births and malnutrition in Africa and south Asia and growing evidence of its association with child's delayed development, there is also budding evidence generating on preterm children growing out of their delays at later age. Hence, to formulate strategies for better neurodevelopment of child, understanding the role of the adverse childhood experiences (ACEs) related to birth outcomes, with further exploration required on environmental factors mostly modifiable, including SES, parental education, home safety and frequency of childhood illnesses parental education is important.

Methods: The Alliance for Maternal and Newborn Health Improvement - All Children Thrive (AMANHI-ACT) study is a population-based birth cohort in Bangladesh, Pakistan, and Tanzania. Pregnant women enrolled between 8 to 12 weeks of ultrasound dated gestation between 2014 and 2016 were followed until 2 years of child's age. Physical growth and neurodevelopment of children were assessed using anthropometric measures and Bayley-III Scales of Infant and Toddler Development (BSID-III). Data were analyzed keeping BSID III composite scores as outcome variable. Linear regression models were built individually for the three BSID domains reporting β coefficients with 95% confidence intervals (CIs).

Results: A total of 3062 children from the three study sites were assessed for development at 2 years of age. Birth phenotypes including gestational age and weight at birth of children are found to be significant predictors of cognitive, language and motor development. Also faltered physical growth measured at 2 years had significant effect on child's cognitive ($\beta = -1.66$; 95% CI = -2.41, -0.92) and language development ($\beta = -0.9$; 95% CI = -1.7, -0.1). Maternal education was found as an important confounder with effect mediation showed by wealth quintiles and hunger status. Other factors including child's immunization, episodes of illnesses and home environment also were found to have significant association with child's neuro development.

Conclusion: Overall, children who were born preterm, had incomplete or no immunization, staggered physical growth, increased episodes of diarrhea, fever, and hospitalizations at 2 years of age had delayed cognitive, language and motor development.

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GOVERNMENT PURCHASING INITIATIVES INVOLVING PRIVATE PROVIDERS IN THE EASTERN MEDITERRANEAN REGION: A SYSTEMATIC REVIEW OF IMPACT ON HEALTH SERVICE UTILIZATION

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Introduction: Rapidly expanding private health care sector in Eastern Mediterranean Region (EMR) has led to government funded programs to purchase services from private providers either as standalone contracting-out (CO) initiatives or purchasing services as part of government financed insurance schemes.

Objective: This paper attempts to fill this knowledge gap by conducting a systematic review of impact on service utilization of government in purchase of private providers in the EMR.

Methods: Cochrane Central Register of Controlled Trials; PubMed; CINHALL; Google scholar were searched for published literature and World Bank Group, Knowledge Services for Private Sector Development; Global Index Medicus; Google.com; Official websites of ministries of health were searched for grey literature. Inclusion criteria included geography, LMIC setting, type of intervention, study design, study participant, outcome measures. The search was conducted during the month of October -November 2021.

Results: We found 17 studies with purchase of private provider services involving contracting (n=9), CO under insurance (n=3) and a combination of both (n=5) being implemented over seven countries. The impact on out-patient curative care utilization is largely seen in both CO and insurance interventions. There is weaker evidence for promotive preventive services. Childcare preventive services in CO and insurance did not have any impact as compared to government managed services, maternity services had higher utilization, whereas data on reproductive health services is scarce and inconclusive. Data on inpatient utilization increase is scarce and remains an evidence gap for CO as well as CO under insurance

Conclusion: Evidence implies increase in curative and maternity care utilization due to purchasing interventions of CO and insurance with pro-poor effect seen for CO only. Rigorous testing through embedded studies before scale up or changes in designs of large intervention should be done whereas countries initiating purchasing interventions should frame these within a study design to allow valid measures of effects.

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GENDER PERSPECTIVES OF INDEPENDENT MOBILITY AMONG SCHOOL CHILDREN AND ADOLESCENTS IN KARACHI, PAKISTAN: A CROSS-SECTIONAL STUDY.

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Background: Independent Mobility (IM) refers to the freedom of children and adolescents to play, move, and travel around their neighborhood without any supervision. IM has a crucial role in meeting the physical activity guidelines. In low and middle-income settings security concerns and high rates of RTIs mentioned as the biggest barriers for children's IM and there is a gender bias in this, girls are less or not allowed by parents to mobilize alone. This has been reported more among the families with lower socioeconomic status, less educated, conservative, and traditional mindset.

To understand this better this study aims to assess the gender differences in the independent mobility of children and adolescents in Karachi, Pakistan.

Methods: This was a cross-sectional study regarding the independent mobility of children and adolescents in Karachi, Pakistan. The self-reported independent mobility was assessed through the standard questionnaire. A total of 73 schools were selected. The sample size of this study was 674. Frequencies and percentages were calculated for the data. The Chi-square test was applied considering the p-value ≤ 0.05 significant.

Results: Of the 674 children, 425 (63.06%) were girls. Two-thirds of the children commute to school by walking, 293 (69.94%) girls and 191 (76.71%) boys. Parents had the agreement on the same [girls 307 (72.58%) & boys 210 (85.71%)]. One-third of the girls, 156 (36.88%), and half of the boys, 124 (49.80%), were allowed to cross main roads at their own. Parents' results agreed with girls' response of 153 (36.17%) however, parents reported much less freedom for boys to cross main roads 98 (38.15%) than boys' response (p=0.001).

Conclusion: Overall, independent mobility is about equal for both genders in Pakistan, yet the perception of children's independence has inconsistencies.

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HEALTHY FAMILIES FOR PAKISTAN THROUGH ACCELERATING SRHR AND FP SERVICES, A QUALITATIVE BASELINE ASSESSMENT

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Introduction / Background: The study aimed to understand the perceptions of sexual and reproductive health care services, reproductive rights, gender equality, and health care system gaps in the underserved areas of Gilgit Baltistan, Chitral and Sindh, Pakistan.

Methods: This qualitative study was conducted using a descriptive exploratory approach to understand perceptions of behaviors and attitudes related to family planning and sexual and reproductive health. The target population for this study included married adults (aged 18-49), adolescent girls and boys (aged 14-21), members of the health care work force and heads of departments. A total of 57 focus group discussions and 38 in-depth interviews were conducted. A purposive sampling technique was used to identify participants.

Results: From the data obtained five themes were emerged. The first theme underlined the concept of transformation from a girl to a woman, focused on the signs of puberty, motherhood, connection of marriage and breastfeeding, and societal perception of a good woman and bad woman. The second theme underlines the concept of transformation from a boy to a man. The third theme highlighted the understanding of methods of family planning and its consequences. The fourth theme emphasized on the gender inequality and strategies to overcome such notions. The fifth theme highlighted the importance of sexual health of adolescent boys and girls, and barriers to using sexual health services while the sixth theme describes the significance of sexual health of adolescent boys and girls along with barriers associated to using sexual health services.

Conclusion: Both social pressure and gender dynamics strongly influence the uptake of sexual health, reproductive health, and family planning services, leading to a lack of empowerment among women while making decisions regarding sexual reproductive health and family planning. There was lack of involvement among men concerning the uptake of effective family planning initiatives.

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EXPLORING THE INFLUENCE OF STOMA ON THE SEXUAL HEALTH OF ADULT PATIENTS IN KARACHI, PAKISTAN.

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Background: Stoma is one of the emerging procedures in Pakistan and it requires many adjustments with respect to life and the health domains, whereby, sexual health is one of the important concerns that require attention. Globally, many studies have been conducted and have concluded that sexual health issues deteriorate the physical and psychological health of patients with ostomies. However, in Pakistan, there is no evidence of data that has discussed the sexual health of ostomy patients in our context, therefore, there was a need to conduct a study that explicitly explored the influence of stoma on the sexual health of patients in the Pakistani context.

Objective: The aim of this study was to explore the influence of stoma on the sexual health of adult patients in Karachi, Pakistan.

Method: A qualitative descriptive exploratory design was used. Data was collected from a total of 13 stoma (colostomy, ileostomy, and urostomy) patients, using semi-structured interviews. These participants were recruited from the General Surgery and Urology department of the Aga Khan University Hospital (AKUH) in Karachi, Pakistan.

Results: Four broad themes evolved through content analysis: perceptions about sexual health, challenges in daily activities, coping and management, and comfort of HCPs and stoma patients in discussing sexual health. The participants acknowledged the importance of sexual health in their lives after ostomy; however, they lacked broad understanding of the phenomenon. The experiences of participants, in relation to sexual health after ostomy, were varied. Also, perceptions regarding sexual health were stated in relation to aging, socio-cultural background, and physiological nature of stoma treatment. They also shared that intimacy with the partner helped them in coping with this major stressor of life. Some of the participants managed their sexual activities with stoma by using different alternatives. Lastly, the participants felt that discussion regarding sexual health with HCPs was important, as this would help them prepare, and adapt with stoma, for maintaining a healthy sexual life.

Conclusion: The study findings recommend that it is essential to educate and train HCPs in relation to sexual health; also, there is a need of adopting strategies by doctors and nurses to promote sexual health assessment and sexual health education sessions for ostomy patients and their spouses.

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INTIMATE PARTNER VIOLENCE AGAINST WOMEN: A COMPREHENSIVE DEPICTION OF PAKISTANI LITERATURE

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Background: Intimate partner violence against women is a significant problem in Pakistan associated with an alarming set of mental health issues.

Aims: To identify the prevalence of intimate partner violence in Pakistan and the causes, health effects and coping strategies used by women.

Methods: A comprehensive search based on the identified keywords was conducted using Google Scholar and PubMed. Relevant literature was also searched and included. Abstracts were then shortlisted using the Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines, and 25 studies were selected. Quantitative studies on intimate partner violence were included in the review. The review comprises only reports published in English from 2008 to 2018.

Results: The review accounts for the overall prevalence of violence and its various subtypes against women in Pakistan: psychological 31.3-83.6%, physical 10.0-98.5%, sexual 2.5-77.0%, physical and sexual combined 1.0-68.0% and any other type 6.9-90.0%.

Conclusion: The evidence generated will help notify policy-makers and health officials about the determinants and effects of intimate partner violence, making it easier to address these issues and identify victims as early as possible. It also sheds light on the limitations of this study: tools used by the published studies not specifically designed for Pakistan and there is no standardized definition of violence against women. This calls for more studies to be conducted to help find a solution.