FAZAIA MEDICAL COLLEGE
AIR UNIVERSITY

AIR UNIVERSITY

INTERNATIONAL RESEARCH CONFERENCE 2026

Innovation in Healthcare: From Discovery to Delivery

1 October 2026 | Islamabad, Pakistan



ABSTRACT BOOK

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MESSAGE FROM PATRON-IN-CHIEF

Air Marshal Abdul Moeed Khan, HI(M) (Retd.)
Vice Chancellor
Air University, Islamabad



It is a privilege to welcome you to the International Research Conference 2026, hosted by Fazaia Medical College, Air University, Islamabad, on 1 October 2026.

This year's theme, "Innovation in Healthcare: From Discovery to Delivery," reflects the need to translate scientific inquiry into practical improvements in patient care and community health. Advances in artificial intelligence, digital health, biotechnology, precision medicine, and other emerging fields are reshaping healthcare; their lasting value, however, depends on rigorous evidence, responsible implementation, and meaningful collaboration across disciplines.

Universities have a central role in fostering curiosity, critical thinking, and innovation. This conference brings together national and international experts, clinicians, researchers, educators, and undergraduate and postgraduate students to share findings, examine new ideas, and build collaborations that can extend beyond institutional and geographical boundaries.

The pre-conference workshops, scheduled from 23–29 September 2026, further strengthen this academic platform by providing opportunities for practical learning, professional development, and research capacity building.

I commend the organising committee, faculty, speakers, reviewers, presenters, and students whose efforts have made this conference possible. I encourage every delegate to participate actively, engage in thoughtful discussion, and use this opportunity to establish professional connections that support future research and innovation.

May the International Research Conference 2026 stimulate new ideas, strengthen partnerships, and contribute to healthcare solutions that move successfully from discovery to delivery.

I warmly welcome all delegates and wish the conference every success.

MESSAGE FROM PATRON

Maj. Gen. Muhammad Tahir Khadim, HI(M) (Retd.)
Dean, Faculty of Health Sciences, Air University
Principal, Fazaia Medical College



It gives me great pleasure to welcome you to the International Research Conference 2026, proudly hosted by Fazaia Medical College, Air University, Islamabad, on 1 October 2026.

The theme, "Innovation in Healthcare: From Discovery to Delivery," highlights an essential responsibility of health research: ensuring that new knowledge is translated into effective, ethical, and evidence-based solutions for patients, health systems, and communities.

Medical education must prepare future healthcare professionals not only to understand evidence but also to question, generate, and apply it. At Fazaia Medical College, research is an integral part of academic development, and we remain committed to nurturing scientific curiosity, critical appraisal, and responsible innovation among our students and faculty.

This conference provides a valuable forum for undergraduate and postgraduate researchers, clinicians, educators, and scientists to present their work, exchange perspectives, and learn from distinguished national and international speakers. The accompanying pre-conference workshops offer further opportunities to strengthen clinical, research, and professional skills.

I hope the discussions and collaborations developed through this conference will encourage high-quality research that responds to real healthcare needs and supports better outcomes for the populations we serve.

I extend my sincere appreciation to the organising team, speakers, reviewers, presenters, delegates, and students for their contribution to this academic endeavour.

I wish the International Research Conference 2026 every success.

MESSAGE FROM CHAIRPERSON

Prof. Dr. Rukhsana Khan
Head, Department of Community Medicine
Fazaia Medical College
Air University, Islamabad



It is with great pleasure and pride that I welcome you to the International Research Conference 2026, organised by Fazaia Medical College, Air University, Islamabad. As Chairperson of the conference and Head of the Department of Community Medicine, I am honoured to be part of an academic initiative that brings together students, researchers, clinicians, educators, and healthcare professionals committed to advancing knowledge and improving health outcomes.

Our theme, "Innovation in Healthcare: From Discovery to Delivery," reflects the purpose at the heart of meaningful research: generating knowledge and ensuring that it is translated into practical, measurable improvements in healthcare. The conference has therefore been designed as a multidisciplinary platform for scientific exchange, critical discussion, collaboration, and professional development.

- Sessions led by distinguished national and international speakers
- Undergraduate and postgraduate research forums
- Oral and poster research presentations
- A comprehensive programme of pre-conference workshops from 23–29 September 2026

The pre-conference workshops cover a broad range of contemporary clinical, research, and healthcare topics, providing participants with opportunities to strengthen practical skills before the main conference on 1 October 2026.

I am especially encouraged by the active participation of undergraduate and postgraduate students. Their involvement reflects a growing culture of inquiry and reinforces our commitment to developing future healthcare professionals who are analytical, research-minded, and prepared to contribute to evidence-based practice.

I sincerely thank the leadership of Air University and Fazaia Medical College, our organising committees, faculty members, speakers, reviewers, presenters, students, and all those who have contributed their time and expertise to this conference.

I hope the International Research Conference 2026 leads to meaningful discussion, new collaborations, and research that makes a tangible difference to healthcare.

I warmly welcome you and wish you an enriching and memorable conference experience.

SECTION 1

POSTER PRESENTATIONS

UNDERGRADUATE

TOTAL SUBMISSIONS: 40

ABSTRACT 01

Low-Dose Aspirin for Primary Prevention in Adults without Established ASCVD: A Systematic Review and Meta-Analysis with Trial Sequential Analysis and Meta-Regression

Urooj Amjad

Federal Medical & Dental College Islamabad

Introduction: The role of low-dose aspirin in the primary prevention of cardiovascular disease (CVD) remains controversial because modest reductions in cardiovascular events may be offset by an increased risk of major bleeding. Evidence focused specifically on middle-aged and older adults without established atherosclerotic cardiovascular disease (ASCVD) remains limited. We conducted a comprehensive systematic review and meta-analysis to evaluate the efficacy and safety of low-dose aspirin in this population.

Methodology: A PRISMA-compliant systematic review was conducted by searching PubMed, Embase, Scopus, ScienceDirect, and the Cochrane Library from database inception through March 2026. Randomized controlled trials and retrospective cohort studies comparing low-dose aspirin (75–100 mg/day) with placebo, usual care, or no aspirin in middle-aged and older adults without established ASCVD were included. Random-effects meta-analysis was performed using R, complemented by leave-one-out sensitivity analyses, trial sequential analysis, meta-regression, and GRADE certainty assessment. Thirteen studies (9 randomized controlled trials and 4 retrospective cohort studies) comprising 1,461,541 participants met the inclusion criteria.

Results: Low-dose aspirin significantly reduced the primary composite cardiovascular outcome (RR 0.93, 95% CI 0.88–0.99), overall cardiovascular disease events (RR 0.89, 95% CI 0.79–0.99), and transient ischemic attack (RR 0.82, 95% CI 0.71–0.95). However, aspirin did not significantly reduce all-cause mortality, cardiovascular death, stroke, fatal or nonfatal myocardial infarction, or angina. Aspirin was associated with significantly increased risks of gastrointestinal bleeding (RR 1.77, 95% CI 1.29–2.42), intracranial hemorrhage (RR 1.34, 95% CI 1.11–1.62), and epistaxis (RR 2.24, 95% CI 1.07–4.72). Meta-regression identified follow-up duration and study design as the principal sources of between-study heterogeneity. Trial sequential analysis demonstrated firm evidence supporting no mortality or stroke benefit despite adequate information size, whereas evidence for other outcomes remains inconclusive.

Conclusion: Among middle-aged and older adults without established ASCVD, low-dose aspirin provides modest reductions in selected cardiovascular outcomes but does not improve all-cause or cardiovascular mortality while significantly increasing the risk of major bleeding. These findings support contemporary guideline recommendations that aspirin should be prescribed only after individualized assessment of cardiovascular and bleeding risks rather than for routine primary prevention.

Keywords: Low-dose aspirin; Primary prevention; Cardiovascular disease; Meta-analysis; Trial sequential analysis

ABSTRACT 02

A CHILD'S OPERATIVE NOTE: A RECORD OR A ROADMAP? A CLOSED-LOOP AUDIT OF DOCUMENTATION STANDARDS IN PEDIATRIC SURGERY

Esha Habib, Aleea Abbas, Khurrum Arif, Hafsa Malik

Pakistan Institute of Medical Sciences, Islamabad

Introduction: In pediatric surgery, an operative note is more than a record of what has been done, rather it is a roadmap for what comes next. Paediatric patients often require staged procedures and re-do operations with follow-up, where operative notes guide future surgical decision-making, ensuring continuity of care. However, despite their critical role, documentation is frequently incomplete and lacks adherence to standardized guidelines, compromising communication, patient safety, and outcomes. We aimed to assess quality of operative note documentation in our pediatric surgery unit and following introduction of a standardized proforma, we evaluated improvement, to ensure better patient care and outcomes.

Methodology: This was a Closed-loop clinical audit conducted at Children Hospital, Pakistan Institute of Medical Sciences, Islamabad from May 2026 till July 2026. Operative notes collected during two cycles were reviewed against RCSEng guidelines. The initial audit included 204 notes, after which implementation of a standardized operative note template was done. Re-audit of 194 notes was performed, and data was entered in Microsoft Excel with analysis in R using Fisher's exact test for comparisons between cycles, to assess for compliance and improvement.

Results: After implementation of targeted interventions, documentation quality showed marked improvement with recording of date and time increasing from 0% to 44.3%, and documentation of operative urgency improving from 0% to 50%. Anaesthetist details rose from 52% to 90.2%, while blood loss estimation improved from 1% to 52.1%. Core operative components also showed high compliance following interventions, including diagnosis (81.9% to 97.4%), intra-operative findings (74% to 91.8%), and procedure performed (83.8% to 98.5%). Legibility improved from 54.4% to 74.2%. However, despite these improvements, substantial number of notes (64.9%) remained in the poor grade, indicating persistent gaps in documentation.

Conclusion: Implementation of a standardized operative note proforma significantly improved documentation quality, but to achieve optimal compliance and outcomes, system-driven efforts and accountability mechanisms are necessary.

Keywords: Clinical Audit; Documentation; Medical Records; Pediatric Surgery; Quality Improvement

ABSTRACT 03

Unveiling Multiple Endocrine Neoplasia Type 1 (MEN-1) in a Young Pakistani Male with Recurrent Hypoglycemia: A Diagnostic Odyssey in a Resource-Limited Setting

Hamna Khalid & Kanza Riaz

Wah Medical College

Introduction: Multiple Endocrine Neoplasia type 1 (MEN-1) is a rare autosomal dominant endocrine disorder involving multiple endocrine organs and may present with nonspecific manifestations, resulting in delayed diagnosis. We report a young male with recurrent severe hypoglycemia in whom MEN-1 was subsequently identified. The objective was to highlight the diagnostic and management challenges of atypical MEN-1 presentation in a resource-limited setting.

Methodology: This was a case report of a 32-year-old Pakistani male presenting with recurrent, severe hypoglycemia following hospitalization for typhoid fever. Clinical assessment, biochemical investigations, neuroimaging, abdominal imaging, parathyroid evaluation, octreotide scanning, and PET-CT were performed. Management and clinical response to pharmacological therapy were documented.

Results: The patient initially presented with unconsciousness and a blood glucose level of 21 mg/dL. Despite continuous intravenous dextrose, recurrent hypoglycemia persisted. HbA1c was 5.6%, with elevated C-peptide (8.2 ng/mL) and fasting insulin reported as markedly elevated, supporting endogenous hyperinsulinemia. He subsequently developed bitemporal hemianopia. MRI demonstrated a 7 × 14 × 6.7 mm pituitary lesion suggestive of microadenoma, while octreotide scanning identified a somatostatin-avid gastric lesion consistent with a neuroendocrine tumor. Prolactin was elevated at 405 mIU/L. Long-acting octreotide (30 mg monthly) reduced the frequency of hypoglycemic episodes. Neurosurgical intervention was deferred because of the risk of severe perioperative hypoglycemia.

Conclusion: MEN-1 should be considered in patients with unexplained recurrent hypoglycemia, particularly when biochemical evidence suggests endogenous hyperinsulinemia and additional endocrine abnormalities are present. Early endocrine evaluation, multidisciplinary management, appropriate imaging, and timely referral to specialized centers are recommended, particularly in resource-limited settings. Psychosocial support and access to essential therapies should also be incorporated into long-term care.

Keywords: Multiple Endocrine Neoplasia Type-1; Hypoglycemia; Hyperinsulinism; Pituitary Neoplasms; Neuroendocrine Tumors

ABSTRACT 04

Pattern of Antibiotic Use According to WHO Access, Watch, Reserve (AWaRe) Classification among Hospitalized Patients: A Multicentre Cross-Sectional Study

Tayyaba Sohail, Sidwas, Bisma Beenish

HITEC Institute of Medical Sciences

Introduction: Antibiotic resistance, driven partly by irrational antibiotic use, is a major global public health threat. The WHO developed the AWaRe tool to support rational antibiotic use, reduce antimicrobial resistance and adverse effects, and help monitor antibiotic consumption and costs.

Methodology: A multicentre point-prevalence survey was conducted among admitted patients in three secondary and tertiary care public and private hospitals in Taxila and Islamabad. The study was conducted over three months (April–June 2026) following approval from the Institutional Review Board (IRB). All patients who received at least one systemic antimicrobial during their hospital stay were included. Although the calculated sample size was 134, data were collected from 164 patients using convenience sampling. Data on demographic characteristics, indications for antibiotic use, and prescribed antimicrobial agents were collected. Antibiotic prescribing patterns were assessed according to the WHO AWaRe classification. Data were analysed using SPSS version 26, and descriptive statistics, including frequencies and percentages, were calculated for the study variables.

Results: The 164 hospitalized patients receiving antimicrobials were included in the study. Most patients were male (61.6%). The largest age group was 40–65 years (57 patients, 34.8%). Children under 5 years constituted 12.2% of the study population. Surgical procedures had been performed in 14.6% of patients. Regarding antimicrobial use, 58.5% of patients received a single antimicrobial, whereas 41.5% received combination therapy. The most common indication for antimicrobial use was community-acquired infections (45.1%), followed by medical prophylaxis (31.1%). Watch-group antibiotics constituted the majority of prescriptions (62.7%), Access antibiotics were used less frequently (35.2%), and Reserve antibiotics were rarely prescribed (2.1%)

Conclusion: Watch-group antibiotics are overutilized compared to WHO recommendations. The high use of Watch-group antibiotics may reflect the greater proportion of hospitalized patients with comorbidities and culture-confirmed antimicrobial resistance. However, the predominance of Watch antibiotics highlights the need for strengthened antimicrobial stewardship, culture-guided therapy, and continuous surveillance.

Keywords: Antimicrobial resistance; AWaRe classification; antibiotic prescribing; Pakistan; hospitalized patients; antimicrobial stewardship

ABSTRACT 05

Global Climate Change Awareness and Its Association with Climate Anxiety among Medical Students at HITEC-IMS: A Cross-Sectional Study

Abdul Rafay, Muhammad Daniyal, Muhammad Hissan Raza

HITEC Institute of Medical Sciences

Introduction: Climate change is an increasing source of psychological distress, with climate anxiety emerging as an important mental health concern. Medical students may be particularly vulnerable due to academic stress and awareness of climate-related health consequences. To assess climate change awareness and climate anxiety among medical students at HITEC-IMS, and to examine their relationship and associations with demographic factors.

Methodology: A cross-sectional analytical study was conducted among 351 undergraduate MBBS students aged ≥18 years at HITEC-IMS, Taxila, from January to June 2026, using convenience sampling. Data were collected using the validated Global Climate Change Awareness Scale and Hogg Climate Anxiety Scale and analyzed in SPSS version 26 using descriptive statistics, chi-square, and independent t-test, with $p < 0.05$ considered significant.

Results: Among 351 participants, 72.1% were female. Overall, students demonstrated greater awareness of the ecological impacts of climate change, particularly its effect on species extinction ($M = 4.05$), while awareness of specific human activities, such as increased rice cultivation, was lower ($M = 3.42$). Climate anxiety was significantly higher among hostel residents than day scholars ($p = 0.001$) and increased with academic progression, with first-year students reporting lower anxiety than second-year students ($p < 0.001$). Transportation mode and smoking status were also significantly associated with specific dimensions of climate change awareness.

Conclusion: Higher climate awareness among medical students may contribute to increased climate anxiety, highlighting the need for structured climate education and psychological resilience training within medical curricula.

Keywords: Climate Change; Climate Anxiety; Medical Students; Awareness; Health Knowledge; Attitudes

ABSTRACT 06

Urdu Version of Child Perceptions Questionnaire (CPQ11-14): A Cross-Cultural Adaptation and Validation Study

Sanaa Masood Aslam, Zeba Bibi, Wajahat Ghafoor, Syed Ahmed Ali Shah, Atiya Jamal, Shahmeen Khattak

FUSH (Foundation University Dental College)

Introduction: To evaluate Oral health related quality of life (OHRQoL) in children using the Child Perceptions Questionnaire (CPQ11-14), a key limitation often encountered is the instrument being one in English Language. Linguistically and culturally equivalent versions of this tool have been validated in many other languages, but none existed in Urdu, spoken by over 230 million people. The purpose of this study was to translate and adapt cross-culturally Urdu version of Child Perceptions Questionnaire (CPQ11-14) and evaluate its psychometric properties for measuring oral health related quality of life of school going children in Pakistan, while ensuring internal consistency, construct and determinant validity.

Methodology: The Urdu adaptation of CPQ11-14 questionnaire was developed in accordance with AMEE guide no 7 in a two-phase systematic sequential adaptation process. In the first phase following a literature review and focus group discussion with experts who confirmed the relevance of each item of the instrument. Next forward translations by two independent researchers were reconciled by a review committee. Blinded back translations followed. The preliminary Urdu item pool generated was piloted with qualitative interviewing (paraphrasing and verbal probing) at the pediatric dentistry department of a tertiary care hospital in Rawalpindi. The final Urdu version of CPQ11-14 questionnaire was administered to 252 school children who also received standard clinical examinations to record caries experience (DMFT) and malocclusion (DAI). Cronbach's alpha Statistical test was applied to check for internal consistency. Construct validity was tested using Spearman Correlation using IBM SPSS software V. 21. Discriminant validity was established using Kruskal-Wallis and Mann-Whitney U statistical tests across caries, malocclusion and gender.

Results: Mean total CPQ11-14 score was 79.43 (SD21.62; range 36-138). Internal consistency for all items was sufficiently high (Cronbach's Alpha=0.89). Total and most of the domains of the questionnaire were significantly associated with the domains as: for malocclusion severity total DAI, p=0.021, for functional limitation domain, p=0.014, emotional wellbeing, p=0.03. However, caries experience was not significant (total DMFT, p=0.206).

Conclusion: This first ever cross culturally adapted Urdu Version of CPQ11-14 is internally consistent and accurately differentiates children with varying scales and severity of malocclusion, thereby supporting its use as an OHRQoL measure for Urdu speaking adolescents. Its weak association with caries experience mirrors findings from India, Brazil and UK, Saudi Arabia which can be due to the limited impact of untreated dental caries particularly in the absence of pain or discomfort more so than a deficit in the instrument.

Keywords: Oral health related quality of life; CPQ11-14; Dental Aesthetic Index; DMFT; Dental Caries; Malocclusion

ABSTRACT 07

Efficacy and Safety of Mazdutide in Overweight, Obesity, and Type 2 Diabetes: A Systematic Review and Meta-Analysis of Randomized Controlled Trials with GRADE Assessment, Trial Sequential Analysis, and Meta-Regression

Aizaz Anwar Khalid, Ahmed, Rumman Javed, Yassar Sattar, Nara Machaelson

Peshawar Medical College, Ayub Medical College, Camden Clark Medical Centre USA, Harvard Medical School USA

Introduction: Mazdutide is a weekly dual GLP-1 and glucagon receptor agonist which has been shown to decrease body weight and glycaemic parameters in adults with overweight, obesity or diabetes, type 2 (T2DM). We assessed its effectiveness and safety against a placebo.

Methodology: PubMed/MEDLINE, Embase, Scopus, Web of Science, the Cochrane Library and ClinicalTrials.gov were searched from inception to 13 June 2026 for randomized controlled trials (RCTs) of once-weekly subcutaneous mazdutide in adults with overweight, obesity or T2DM. The random-effects meta-analyses yielded mean differences (MDs) and risk ratios (RRs) with 95% confidence intervals (CIs). Assessment of risk of bias, certainty of evidence, subgroup effects, meta-regression, leave-one-out sensitivity analyses and trial sequential analysis were performed.

Results: 11 randomized trials were included, all of which were trials with a duration of 12 to 60 weeks. Mazdutide lowered absolute body weight (MD, −9.15 kg), and percentage body weight (MD, −9.79 percentage points; 95% CI, −12.30 to −7.28) when compared to placebo. The weight reduction was more for participants without diabetes (MD, −12.47 percentage points) than for those with T2DM (MD, −4.16 percentage points). Mazdutide increased the likelihood of achieving ≥5% (RR, 5.78; 95% CI, 4.25–7.87), ≥10% (RR, 10.76; 95% CI, 6.93–16.71), and ≥15% weight loss (RR, 12.13; 95% CI, 8.30–17.72). In participants with T2DM, it reduced HbA1c (MD, −1.47 percentage points; 95% CI, −1.70 to −1.24) and fasting plasma glucose (MD, −1.93 mmol/L; 95% CI, −2.47 to −1.39). Mazdutide had more treatment-emergent adverse events (RR, 1.15; 95% CI, 1.11–1.20), adverse events after discontinuation (RR, 2.58; 95% CI, 1.19–5.60), nausea, vomiting and diarrhoea. No significant differences were observed between the groups in the occurrence of serious adverse events (RR, 1.19; 95% CI, 0.70–2.03). There was strong primary efficacy results on sensitivity analyses, albeit some significant heterogeneity for weight results. The level of certainty of evidence was mainly moderate to high.

Conclusion: Mazdutide was clinically significant for weight loss and for its glycaemic effects, but led to an increased rate of gastrointestinal adverse events and reduction in treatment adherence. Limited level of confidence in the exact effect estimates is due to marked heterogeneity, geographically concentrated evidence, correlated multiarm comparisons and limited long-term safety data. Large scale, multicenter and clinical-outcome trials are recommended.

Keywords: Mazdutide; Type 2 diabetes; GRADE assessment

ABSTRACT 08

Diagnostic Accuracy of Wireless Motility Capsule Compared with Gastric Emptying Scintigraphy in Patients with Suspected Gastroparesis: Systematic Review and Meta-Analysis

Faiza Hayat Qadri, Haider Imran, Taimoor Khan Gandapur, Suleman Saeed, Maria Usman, Zainab Yahya, Zainab Dar

Foundation University Medical College, Islamabad, Pakistan.; Saidu Medical College Swat; University College of Medicine and Dentistry, Lahore, Pakistan.; Ziauddin University, Karachi, Pakistan.; Army Medical College, Rawalpindi, Pakistan; Bahria University college of Medicine Islamabad

Introduction: Gastroparesis requires objective confirmation of delayed gastric emptying. Gastric emptying scintigraphy (GES) is the reference standard but involves radiation and prolonged testing. The wireless motility capsule (WMC) offers a radiation-free, whole-gut alternative, though its accuracy relative to GES remains incompletely defined.

Methodology: This systematic review and meta-analysis searched PubMed, Scopus, EMBASE, Cochrane Library, and ClinicalTrials.gov through 25 June 2026 for studies reporting extractable 2×2 data for WMC and/or GES in adults with suspected gastroparesis. Bivariate random-effects models generated pooled sensitivity, specificity, likelihood ratios, and diagnostic odds ratio; HSROC curves were constructed for each modality. QUADAS-2 assessed risk of bias.

Results: Five studies were included. Pooled WMC sensitivity was 78.5% (95% CI 58.7–90.4%) and specificity was 77.7% (95% CI 68.3–84.9%), with positive and negative likelihood ratios of 3.21 (1.79–5.76) and 0.29 (0.14–0.61), DOR of 12.15 (3.38–43.68) and HSROC AUC of 0.83. GES pooled sensitivity was 66.2% (95% CI 42.4–83.9%) and specificity was 67.1% (95% CI 53.1–78.7%), with likelihood ratios of 1.97 (1.01–3.83) and 0.48 (0.21–1.14), DOR 4.53 (0.94–21.89), and HSROC AUC 0.71. WMC showed numerically higher point estimates than GES across all metrics, though 95% confidence intervals overlapped substantially and no direct head-to-head comparison was performed. Sensitivity heterogeneity was high (I2=88.2%) and driven largely by one study, while specificity heterogeneity was moderate (I2=63.0%).

Conclusion: WMC demonstrates higher diagnostic accuracy, supporting its role as a clinically useful, radiation-free alternative rather than a proven replacement. Larger, harmonized head-to-head studies are needed.

Keywords: Gastroparesis; Gastric Emptying; Wireless Motility Capsule; Diagnostic Test Accuracy; Sensitivity; Specificity

ABSTRACT 09

Safety and Tolerability of GLP-1 Receptor Agonists in Pakistan: A narrative review of Real-World Evidence

Javeria Azkar, Dur E Nayab, Dr. Sidra Shahid

Bahria University Islamabad

Introduction: Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) are increasingly used in Pakistan for the management of type 2 diabetes mellitus and obesity. However, locally generated evidence regarding their safety remains limited. This review synthesizes findings from Pakistani studies evaluating adverse effects particularly associated with commonly used GLP-1 RAs.

Methodology: Relevant studies are searched from databases such as PubMed, Scopus, Web of Science, and Google Scholar using predefined keywords and Boolean operators (AND/OR). Studies are selected based on predefined inclusion and exclusion criteria, with emphasis on relevant peer-reviewed literature. Relevant information regarding reported adverse effects was extracted and thematically synthesized. The findings were critically compared across different GLP-1 receptor agonists.

Results: Gastrointestinal (GI) symptoms were consistently the most frequently reported adverse effects. In semaglutide-treated patients, decreased appetite was reported in 72.7%, dyspepsia in 17.8–21.4%, and nausea in 13.3–20.5%, with 9.8% discontinuing treatment, mainly due to GI effects. In a Pakistani study, 55.4% reported adverse effects, including bloating (24.6%), nausea (18.5%), and constipation (10.8%). Another 12-week study reported nausea (27.7%), diarrhea (11.9%), vomiting (8.9%), and constipation (6.9%), while 40.6% reported no adverse effects. Similar GI profiles were observed with liraglutide and dulaglutide. Most events were mild while rare serious events were reported, including one case of severe vomiting with acute kidney injury.

Conclusion: GLP-1 RAs appear generally well tolerated in Pakistani populations, with gastrointestinal symptoms representing the principal adverse-effect burden. Most events are mild and transient, while treatment discontinuation due to intolerance is relatively uncommon. Clinicians should counsel patients about gastrointestinal adverse effects and monitor them closely. Larger multicentre studies with longer follow-up are recommended to establish the long-term safety of GLP-1 RAs in Pakistan.

Keywords: GLP-1; safety; tolerability; gastrointestinal; adverse effects

ABSTRACT 10

Efficacy and Safety of Complement Targeted Therapies in Patients with C3 Glomerulopathy and Primary IC-MPGN: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Shameen Zahra, Sofia Zahoor, Aafia Muneer, Sania Malik

Quaid-e-Azam Medical College, Bahawalpur

Introduction: C3 glomerulopathy (C3G) and immune complex membranoproliferative glomerulonephritis (IC-MPGN) are progressive diseases driven by dysregulated alternative complement pathway . Most patients receive supportive renin-angiotensin system blockade or immunosuppressants, roughly half patients progress to kidney failure within decade , necessitating evaluation of complement inhibitor's efficacy and safety. To evaluate whether complement inhibitors improve filtration, lower proteinuria, attenuate histological inflammation and maintain safety.

Methodology: A search of PubMed, Embase, Scopus and CENTRAL was performed until September 2026 for randomized controlled trials comparing complement therapies with placebo or standard care in C3G and primary IC-MPGN. Risk of bias and certainty of evidence were evaluated using the Cochrane RoB 2 tool and GRADE respectively, assessing heterogeneity via I2.

Results: Four RCTs with 268 patients (135 active drug,133 placebo) looked at iptacopan, pegcetacoplan, danicopan and avacopan. After 26 weeks blocking the complement system kept the kidneys working. The average eGFR was 3.20 mL/min/1.73 m2 higher than in the placebo group (95% CI: 0.11 to 6.28; p = 0.04; I2 = 0%). The active treatment helped the kidneys more than the placebo. It improved the kidney result of stable eGFR plus at least 50% drop in proteinuria (RR = 8.57; 95% CI: 2.78 to 26.42; p = 0.0002; I2 = 22%) and also 50% drop in proteinuria alone (RR = 8.51; 95% CI: 3.45 to 21.01; p < 0.00001; I2 = 4%). Biopsy results showed decreased histologic activity (MD = -0.74; 95% CI: -1.49 to 0.00; p = 0.05; I2 = 0%). Total adverse events (RR = 1.02; 95% CI: 0.86 to 1.19) and serious adverse events (RR = 1.14; 95% CI: 0.51 to 2.58) was same as, with placebo.

Conclusion: Targeted complement inhibition provides measurable nephroprotection, marked proteinuria drops and reduced histological inflammation in C3G and IC-MPGN with short term safety matching placebo.

Keywords: C3 Glomerulopathy; Membranoproliferative Glomerulonephritis; Complement System Proteins; Glomerular Filtration Rate; Randomized controlled trial

ABSTRACT 11

Effectiveness of Intralesional Treatment Modalities for Improving Mouth Opening in Oral Submucosa Fibrosis: A Systematic Review

Sana Sardar, Zunaira Hussain Qazi, Sadiq-ur-Rahman, Asma Gul

Ayub College of Dentistry Abbottabad

Introduction: Oral submucosa fibrosis (OSMF) is a chronic, progressive, potentially malignant disorder characterized by fibrosis of the oral mucosa, leading to restricted mouth opening and impaired oral function. Various intralesional injection modalities have been proposed for its management; however, their comparative effectiveness remains uncertain. This systematic review aimed to evaluate the effectiveness of different intralesional injection modalities in improving mouth opening among patients with OSMF.

Methodology: The review was conducted in accordance with the PRISMA 2020 guidelines. Electronic searches were performed in PubMed, Embase, Web of Science, Cochrane Library, and CINAHL (EBSCO). A total of 533 records were identified, of which 311 remained after duplicate removal. Following title/abstract and full-text screening based on predefined eligibility criteria, 17 studies were included for qualitative synthesis. Data on study characteristics, interventions, and outcomes were extracted, and methodological quality was assessed using the RoB 2 and ROBINS-I tools for randomized and non-randomized studies, respectively.

Results: Corticosteroid-based regimens, particularly dexamethasone combined with hyaluronidase, were the most frequently investigated interventions. Platelet-rich plasma (PRP) demonstrated encouraging improvements in mouth opening in comparative studies, while corticosteroid-based combination therapies and placental extract also showed favourable clinical outcomes. Overall, all included intralesional injection modalities improved mouth opening and associated symptoms; however, heterogeneity in intervention protocols, comparator groups, follow-up duration, and outcome assessment methods limited direct comparison among modalities.

Conclusion: Risk-of-bias assessment indicated methodological limitations across several included studies. Intralesional injection therapies appear beneficial for improving mouth opening in patients with OSMF; however, the certainty of the available evidence is limited. Further well-designed randomized controlled trials with standardized intervention protocols are required to determine the optimal intralesional injection modality.

Keywords: Oral submucosa fibrosis; trismus; intralesional therapies; corticosteroids; hyaluronidase; platelet rich plasma

ABSTRACT 12

Polycystic ovary syndrome among female medical students in Islamabad, Pakistan: Prevalence, associated factors, and barriers to management

Noor Fatima, Areesha Arshad, Besam Ali, Tooba Zafar, Asma Irfan

Islamabad Medical & Dental College

Introduction: To estimate the prevalence of self-reported doctor-diagnosed polycystic ovary syndrome (PCOS) and assess associated factors and management barriers among female medical students in Islamabad, Pakistan.

Methodology: A descriptive cross-sectional survey was conducted (January–March 2026 among 351 female medical students at Islamabad Medical and Dental College using a structured self-administered questionnaire covering demographics, menstrual history, symptoms, family history, and management challenges. Data were analyzed using SPSS v26. Associations between PCOS diagnosis and selected risk factors were assessed using Chi-square tests ($p<0.05$).

Results: The prevalence of self-reported doctor-diagnosed PCOS was 14.6% significantly associated with family history of PCOS ($\chi2=60.2$, $p<0.001$) and menstrual irregularity ($\chi2=45.8$, $p<0.001$). The most frequently reported symptom was hair thinning/loss (11%). Key barriers to management included lack of awareness (33.0%), academic time constraints (24.5%), and low motivation for lifestyle change (24.5%). Most students (71.2%) expressed interest in PCOS workshops.

Conclusion: PCOS represents a substantial health concern among medical students, with clear opportunities for campus-based education, screening pathways, and student-centered support services.

Keywords: Polycystic ovary syndrome; PCOS; medical students; prevalence Pakistan; awareness

ABSTRACT 13

Neuroplasticity-Enhancing Interventions for Pediatric Stroke Recovery: A Systematic Review and GRADE-Assessed Meta-Analysis

Ahmad Khan, Aizaz Anwar Khalid, Zain Ul Abideen, Ayiz Jan, Naima khan, Priscilla Sirait, Amir Taj

Peshawar Medical College, Pakistan; KEMU Lahore; Saidu Medical College, Pakistan; Dow University of Health Sciences, Karachi, Pakistan; Faculty of Medicine, University Airlangga, Surabaya, Indonesia

Introduction: Multiple therapies including pharmacologic agents, non-invasive brain stimulation, behavioural and robotic rehabilitation, and stem cell based interventions aimed at enhancing neuroplasticity. These have shown to be of significance in improving recovery. We conducted this meta-analysis and systematic review to determine the efficacy, safety, and clinical impact of neuroplasticity-enhancing therapies for motor function, daily function independence and quality of life (QoL) improvement after stroke in children and adolescents.

Methodology: A thorough search was conducted across PubMed, Embase, clinical trials and Cochrane Central Register of Controlled Trials for relevant randomized and non-randomized controlled trials, cohorts up to Dec 2025. Mean difference (MD) and 95% CI were used to assess the effectiveness, safety of therapies. Main outcomes were improvement in motor function, QoL and daily function independence.

Results: A total of 9 studies were included. There was a robust and drastic significant improvement in motor function assessed through AHA scale with pooled MD of 4.42 (95% CI: 3.28 to 5.56; $p < 0.0001$). There was also significant improvement in QoL with pooled MD of 1.53 (95% CI: 1.37 to 1.70) assessed through COPM-S scale and pooled MD of 4.00 (95% CI: 3.58 to 4.43) assessed through PedsQL. Significant improvements occur in daily function independence using COPM-P scale (MD: 1.67; 95% CI: 1.55 to 1.79).

Conclusion: Our findings support the application of neuroplasticity-enhancing therapies including multimodal interventions for pediatric stroke recovery.

Keywords: Neuroplasticity; pediatric stroke; GRADE Assessment

ABSTRACT 14

Assessing Hematological and Biochemical Profiles in Cervical Cancer along with role of Moringa oleifera as treatment option

Rida Sana

NFC Institute of Engineering and Technology Multan

Introduction: Cervical cancer remains a major global health burden, with approximately 662,301 new cases and 348,874 deaths estimated worldwide in 2022. Persistent high-risk human papillomavirus (HPV) infection is the major cause of cervical cancer. Haematological and biochemical abnormalities may accompany disease and its treatment. This study compared haematological and biochemical profiles of cervical cancer patients with healthy controls and evaluated the potential supportive effects of Moringa oleifera leaf extract on haematological parameters.

Methodology: A hospital-based comparative observational study was conducted at MINAR Cancer Hospital, Multan, involving 116 cervical cancer patients and 58 healthy controls. Complete blood count (CBC), liver function tests (LFTs), and renal parameters were assessed. Data were analysed using SPSS version 24. Normality was assessed using Shapiro–Wilk and Kolmogorov–Smirnov tests, followed by t-tests and Spearman's correlation. Ex vivo, blood samples from 20 cervical cancer patients were treated with ethanolic M. oleifera leaf extract (0, 10, 30, and 50 µL) for three days. CBC and Giemsa-stained blood-smear microscopy were performed, while the extract was characterized using FTIR, HPLC, and TLC. 3

Results: Compared with controls, cervical cancer patients showed significantly lower RBC (3.97 ± 0.91 vs. 4.71 ± 0.39, $p < 0.001$), haemoglobin (10.38 ± 2.05 vs. 12.04 ± 1.41, $p < 0.001$), and HCT (32.89 ± 6.97 vs. 37.46 ± 3.14, $p = 0.01$), with increased RDW-CV ($p = 0.02$) and neutrophils ($p = 0.01$) and reduced lymphocytes ($p < 0.001$). Urea, AST, and ALT were significantly elevated. Urea correlated positively with WBC ($r = 0.45$, $p = 0.01$) and negatively with RBC ($r = −0.38$, $p = 0.02$). M. oleifera produced dose- and time-dependent changes; 50 µL significantly reduced WBC by Day 3 ($p = 0.02$), while RBC and platelet morphology remained preserved.

Conclusion: Cervical cancer was associated with significant haematological and biochemical alterations, supporting continuous clinical monitoring. M. oleifera showed potential for ex vivo haematological modulation without clear morphological damage. Further mechanistic, toxicity, dose-standardization, and clinical studies are recommended.

Keywords: Cervical cancer; Haematological profile; Moringa oleifera; Leaf extract; Supportive therapy

ABSTRACT 15

Synergistic Effects of Moringa oleifera with Metformin in Improving Glycemic Control in Type 2 Diabetics through a Randomized Controlled Trial

Hayah Bahroni, Dr. Saira Safdar, Prof. Dr. Asma Irfan

Islamabad Medical &Dental College (IMDC)

Introduction: Studies have shown the effect of Moringa leaves in reducing blood glucose levels in diabetic patients, however extensive human research on their effectiveness as an alternative diabetes treatment is lacking. This study evaluated the impact of Moringa leaf on glycemic control in diabetic patients, aiming to provide academically sound evidence regarding its potential use in diabetes management.

Methodology: A randomized controlled trial was conducted in Akbar Niazi Teaching Hospital (ANTH) Islamabad from February 2023 - November 2023. A sample size of 50 (25 controls and 25 cases) was calculated by the WHO calculator. Participants were type 2 diabetic patients from ANTH's outpatient department taking Metformin 500 mg bd, who gave written informed consent. Triple blinding was employed. The Case group received Metformin plus Moringa leaf Capsule containing 1 gm Moringa powder, while the Control group was given Metformin and Placebo. Blood glucose, HbA1c levels, LFTs, RFTs and lipid profile were monitored regularly. The study was registered at clinicaltrials.gov NCT06125873, with ethical approval taken from the institutional review board of IMDC. SPSS version 26 was used for data analysis; continuous variables as mean ± SD or median (min, max), categorical variables as frequencies/percentages. Paired T-test and Two-way ANOVA were applied to compare before and after treatment effects, with p value < 0.05 considered significant.

Results: It was observed that the case group exhibited a noteworthy improvement in their HbA1c levels, accompanied by enhanced regulation of Fasting Blood Glucose and Blood Pressure, as compared to placebo. Additionally, Moringa Oleifera had statistically insignificant impact on the BMI. LFTs, RFT, and lipid profiles remained unaltered during the study too. Some participants experienced mild gastric discomfort, resolved by dose reduction during the 1st week.

Conclusion: Moringa Oleifera capsules significantly improved HbA1c levels and enhanced regulation of FBG and BP compared to placebo, with negligible effect on BMI. LFT's, RFT's, and lipid profile remained stable, supporting the safety for Moringa Oleifera for human use.

Keywords: Moringa Oleifera; Metformin; Type-2 Diabetes; HbA1c; LFT; RFT

ABSTRACT 16

Diagnostic accuracy of lung ultrasound versus natriuretic peptides for acute heart failure in patients presenting with acute dyspnea: A Systematic Review and Meta-Analysis

Haider Imran, Ajeet Kumar, Muhammad Maaz Amjad, Suleman Saeed, Dure Nayab, Ahmad Shafi Antar

Foundation University Medical College, Islamabad, Pakistan, Ziauddin University, Karachi, Pakistan; Khyber Medical College, Peshawar, Pakistan, University College of Medicine and Dentistry, Lahore, Pakistan, King Edward Medical University, Lahore, Pakistan, Liaquat University of Medical and Health Sciences, Jamshoro, Sindh, Pakistan

Introduction: Rapid differentiation of acute heart failure (AHF) from other causes of acute dyspnea remains challenging in emergency settings. This systematic review and meta-analysis compared the diagnostic accuracy of lung ultrasound (LUS) and natriuretic peptides (BNP/NT-proBNP) for diagnosing AHF.

Methodology: PubMed, Scopus, EMBASE, Cochrane Library, and ClinicalTrials.gov were searched from inception to June 7, 2026. Prospective studies evaluating LUS and/or BNP/NT-proBNP in adults presenting with acute dyspnea were included. A bivariate random-effects model pooled sensitivity, specificity, likelihood ratios, diagnostic odds ratio (DOR), and hierarchical summary receiver operating characteristic (HSROC) curves.

Results: Eight prospective studies, including one randomized controlled trial, comprising 2,292 patients were included, of which five directly compared both modalities. LUS demonstrated a pooled sensitivity of 83.1% (95% CI, 69.3–91.5%) and specificity of 86.0% (95% CI, 82.2–89.1%), with an AUC of 0.887 and DOR of 32.11. BNP/NT-proBNP demonstrated higher pooled sensitivity (92.3%; 95% CI, 82.2–96.9%) but lower specificity (74.0%; 95% CI, 42.6–91.6%), with an AUC of 0.927 and DOR of 29.39. LUS demonstrated higher PPV (93.3% vs. 81.8%) and LR+ (5.49 vs. 3.60), whereas BNP/NT-proBNP demonstrated higher NPV (92.4% vs. 74.8%) and lower LR− (0.13 vs. 0.19). Risk-of-bias assessment demonstrated an overall low methodological risk across included studies.

Conclusion: LUS and BNP/NT-proBNP demonstrated comparable overall diagnostic performance. LUS showed greater specificity and rule-in capability, whereas BNP/NT-proBNP demonstrated superior sensitivity and rule-out performance, supporting their complementary use in the diagnostic evaluation of adults presenting with acute dyspnea.

Keywords: Acute Heart Failure; Acute Dyspnea; Lung Ultrasound; B-Type Natriuretic Peptide; Diagnostic Accuracy

ABSTRACT 17

Artificial Intelligence for Detection and Assessment of Periodontal Bone Loss on Dental Radiographs: A Systematic Review

Amna Zeb & Zainab Khalid

Margalla Institute Of Health Sciences

Introduction: Early and precise identification of periodontal bone loss (PBL) is essential for diagnosing and staging periodontitis. While developers increasingly introduce artificial intelligence (AI) models to automate radiographic interpretation, reported diagnostic accuracy varies across AI architectures, clinical tasks, and imaging modalities. This systematic review evaluated the overall diagnostic performance and clinical utility of AI algorithms in detecting and assessing PBL on dental radiographs.

Methodology: We performed a systematic search on PubMed to identify studies evaluating AI models for PBL detection, alveolar bone level measurement, or periodontitis staging on panoramic, periapical, and bitewing radiographs. We excluded secondary reviews, non-primary studies, and non-radiographic evaluations. Extracted data included AI methods, radiograph modalities, sample sizes, and diagnostic performance metrics. Because reference standards and target outcomes varied across studies, We synthesized the data qualitatively without quantitative pooling.

Results: The final synthesis included 22 primary original studies. Deep learning models (primarily YOLO variants, U-Net, and CNNs) showed high performance for landmark identification (CEJ and alveolar crest) and binary bone loss detection. Individual studies reported up to 98% accuracy, 100% sensitivity, and 98% specificity on panoramic images. Machine learning classifiers (Random Forest) reached up to 92% accuracy (AUC 0.97) on bitewings. AI measurements correlated strongly with expert consensus (Pearson r = 0.73 to 0.832; ICC up to 0.91). However, accuracy dropped when models performed multi-class periodontitis staging (72% to 77%) or detected complex defects like 1-wall infrabony defects and lower molar furcation involvement. Furthermore, AI assistance gave general dentists no statistically significant diagnostic improvement.

Conclusion: AI shows high accuracy and strong reliability for basic landmark detection and binary bone loss screening. However, performance varies in multi-class staging and localized defect classification. Dentists must continue overseeing these tools during diagnostic workflows.

Keywords: Artificial Intelligence; Deep Learning; Periodontal Bone Loss; Radiography; Dental; Periodontitis

ABSTRACT 18

Exploring the Heart-Brain Connection: Emotional Regulation through Cardiac Neurons and Wearable Technology

Sabaina Aarzu, Muhammad Junaid Ghazali, Aimen Khan, Aafaq Ahmed;

NUST School of Health Sciences, Islamabad, Pakistan

Introduction: The heart-brain axis is a highly advanced and cutting-edge frontier in neurocardiology, as it allows a continuous and multi-modal communication between the cardiovascular system and the central nervous system. Central to this interface is the Intrinsic Cardiac Nervous System (ICNS) or colloquially also known as the "little brain". Far from being a passive effector organ, the heart appears to be a complex neurological processing centre with the ability to process information autonomously as well as modulating emotional states via a robust bi-directional dialogue. The main research objectives of this investigation are these: a. To examine the connection between local circuit neurons inside the heart and the regulatory process of emotional expression. b. To identify the specific biochemical modulators that assist communication across the heart-brain axis. c. To establish a strong methodology for the quantification of this relationship using the data acquired from smartwatches through Heart Rate Variability (HRV) and tri-axial accelerometer readings integrated with a subjective application featuring a mood-board.

Methodology: Capturing the nuances of the heart-brain connection in an ecological setting requires the use of biomedical systems engineering to wearable technology. Smartwatches deliver a continuous stream of physiological data at high resolution, but extracting meaningful insights into emotional states of the wearer requires rigorous signal processing to help manage the signal to noise ratio: The technical framework on which this integration is based is as follows: a. Collection of Heart Rate Variability (HRV): High -frequency data of Heart Rate Variability (HRV) is used to determine the dynamics of the Autonomic Nervous System as a means of measuring emotional resilience and stress. b. Utilization of Accelerometer Data: For accuracy, accelerometer data is used to filter "noise" created by physical movements. Subtracting out the heart rate increases attributed to metabolic demand (exercise) allows the "residual" heart rate to be isolated, which is a proxy for psychophysiological arousal. c. Mood-board Application Integration: Mobile application enables the users to record their subjective emotional states providing the "ground truth" needed for the validation of objective physiological signatures. This "filtering" logic is significant; it allows the system to distinguish between a heart rate spike triggered by ascending a flight of stairs and one produced by an acute anxiety response, ensuring the integrity of emotional state detection.

Results: The ICNS is a local processing centre which enables the heart to independently modulate its own behavior and process sensory information while having two way dialogue with the higher cortical centers. This synchronization confirms that physiological responses are valid for environmental and emotional stimuli. Biochemical signaling is a basic link between emotional arousal and physical cardiac well-being. Hormones such as oxytocin and cortisol are not only markers pf state, but also changes heart rhythm patterns. Cortisol having gender specific pathophysiological effects when elevated, such as in males causes cardiac arrest while in females it is causing myocardial ischemia, which explains link of psychogenic stress with long-term cardiovascular consequences. The possibility of being able to map the heart-brain axis using wearable technology provides quantitative framework for mental health. This change towards technology-driven, prophylactic monitoring provides an accessible solution for administering global mental health challenges. The heart is the central point between the terrestrial and the celestial, the centre of the human self. Emerging scientific data supports this metaphysical view of the heart, showing that the heart is a "little brain" with more than 40,000 neurons and neural cells making unto 60% of the mass. This biological complexity helps to carry on a constant dialogue with the brain, which makes the hearten organ of the conscience and of consciousness. Ultimately, the cleansing of the heart is put forth as the necessary prerequisite for spiritual salvation. The importance of pure heart is seen from the miracle of Isra & Mi'raj involving Hazrat Muhammad S.A.W. His heart was cleansed by the physical and spiritual removal of a blood clot. This event is to stress the importance of the purification of the heart as a basic requirement for a spiritual elevation.

Conclusion: The heart-brain connection is a vital path for the development of our understanding in the field of emotional regulation. The ICNS shows that the heart is much more than a mechanical pump, it is a complex sensory organ and processing centre. The ability to combine objective data from wearable technology (that is processed through movement filtering algorithms) and subjective data on mood provides a full picture of human wellbeing. This collaboration of neurocardiology and systems engineering provides an accessible, non-invasive path toward real-time mental health interventions and improved psychological awareness.

Keywords: Heart-brain connection; intrinsic cardiac nervous system; emotional regulation; heart rate variability (HRV); wearable technology

ABSTRACT 19

Redefining Fracture Fixation: A Systematic Review of Bone Adhesives Integrating Mechanical Strength, Biocompatibility, and Translational Potential

Maryam Amjad & Muhammad Hassan Omer

Introduction: The conventional methods of fracture fixation include plates and screws that are effective but have surgical morbidity and hardware-related problems The use of bone adhesives is emerging as a new frontier in traditional fixation techniques; the advantages of this technology include minimal invasiveness and enhanced osteogenesis. Recent progress has led to the development of bioactive, injectable bone adhesives, but their mechanical and biological efficacy has been reported intermittently in preclinical research. The study comprehensively describes the mechanical strength and biological of bone adhesives in current literature.

Methodology: The systematic review was used to examine bone adhesives under preclinical conditions. Relevant studies were identified through PubMed, Google Scholar and Scopus database searches which yielded 46 articles after screening. The extraction of the data was centered on the adhesive composition, mechanical strength, biodegradability, application methods and biological findings.

Results: The studies included considered synthetic (PMMA, cyanoacrylates), natural (fibrin, chitosan), and hybrid (magnesium phosphate, hydroxyapatite) adhesives embedded in polymeric matrix. The lap shear strength was between 0.27 and >10 MPa. Initial synthetic preparations had a less strength (0.81 ± 0.12 MPa), and newer hydrogel-based preparations exceeded 10 MPa. The major part of injectable systems was biodegradable, which disintegrated within 8-12 weeks with no serious cytotoxicity. The innovative formulations were characterized by high and quick self-healing tendencies. New bone formation, mineral density, and decreased inflammatory markers were consistently observed by histological analyses, which was indicative of positive osteogenesis in 4-6 weeks. The trend over the years indicated that there was a transition from synthetic adhesives to bioactive, injectable systems.

Conclusion: Bone adhesives exhibit positive mechanical characteristics and biocompatibility. Although the results are encouraging, clinical translation needs standardization of testing procedures and long-term validation in vivo with analysis of effects on neuro-vasculature and calculation of radiation exposure during the fixation process.

Keywords: Bone cements; Chitosan; Cyanoacrylates; Fibrin; Gelatin; Hydrogels; Polymerization; Polymethyl methacrylate; Osteogenesis

ABSTRACT 20

Efficacy of Gentamicin vs Normal Saline Wound Irrigation for the Prevention of Surgical Site Infections (SSIs) in Neurosurgical Procedures: A Systematic Review and Meta-Analysis

Maria Usman, Abdul Haseeb, Umme Hiba, Urooj Manan

Army Medical College

Introduction: SSIs remain a major postoperative complication. Intraoperative Gentamicin is used in neurosurgery although its efficacy is unclear. To evaluate the efficacy of gentamicin against SSI in neurosurgery.

Methodology: A systematic review was conducted following Cochrane guidelines, searching PubMed, Google Scholar, Cochrane Library, and Embase from inception to December 2025 and registered in PROSPERO (CRD420261296670). Three independent reviewers performed screening, extraction, and quality assessment using Cochrane Risk of Bias for RCTs and the Newcastle-Ottawa Scale for observational studies. Meta-analysis was conducted in RevMan 5.4.1 using a random-effects model. Risk ratios (RRs) with 95% CIs were calculated for dichotomous outcomes, with heterogeneity assessed using Higgins' I2. Leave-one-out and subgroup analyses were performed by study design, infection depth, and microbiological etiology.

Results: Out of 375 included and 248 studies screened only one RCT and two observational cohort studies comprising 620 patients (Gentamicin: n=267; Saline: n=353) with evaluation of infection in 28 days were included in the analysis. Pooled analysis demonstrate a 60% relative risk reduction in SSIs in patients with gentamicin irrigation. However, this trend does not achieve statistical significance (RR: 0.40; 95% CI: 0.13–1.22; p=0.11) and carries moderate heterogeneity (I2=54%). The observed non-significance (p=0.11) is primarily attributable to marked methodological heterogeneity (I2= 54%) which collectively shifted the pooled estimate toward the line of no effect. Subgroup analysis of study design reveals a statistical significance in observational cohorts (RR: 0.26; p=0.03). According to the GRADE assessment, the certainty of evidence for SSI was moderate. Publication bias was not assessed because fewer number of studies.

Conclusion: Gentamicin clinically reduce SSI risk, but limited, heterogeneous evidence warrants adequately powered multicenter RCTs.

Keywords: Gentamicins; Surgical wound infection; Neurosurgery

ABSTRACT 21

“Behind the Yawn: Exploring Prevalence and Patterns of Excessive Daytime Sleepiness among Individuals in Karachi – A Qualitative Cross-Sectional Study”

Basra Mumtaz, Sarah Khuhro, Fatima Khuhro, Tasbeeha Tariq.

Liaquat College of Medicine and Dentistry, Karachi, Pakistan.

Introduction: Excessive daytime sleepiness EDS is characterised by unintended sleep episodes during waking hours despite adequate nighttime sleep. Excessive Daytime Sleepiness has appeared as a public health concern. EDS disrupts mental acuity and emotional stability affecting academic, social, and professional performance. This study explored the perceived causes and patterns of excessive daytime sleepiness on the daily lives of individuals in Karachi, with particular emphasis on lifestyle, sleep related behaviours, academic or occupational stress, and digital device use.

Methodology: A qualitative cross-sectional design was adopted using a phenomenological approach to explore participants lived experiences of excessive day time sleepiness. Participants aged 15-59 years who reported frequent episodes of daytime sleepiness were recruited through purposive sampling. A total of 22 participants (18 females and 4 males) took part. The responses were analysed thematically. Informed consent was obtained from all participants.

Results: Thematic analysis found three major themes. First, academic, and occupational stress was often associated with fatigue, reduced concentration, and daytime sleepiness. Second, sleep-related and lifestyle behaviours, including late-night screen use, inconsistent sleep routines, anxiety, and stress. Third, participants reported several functional consequences, including reduced attention, lack of motivation for physical activity, perceived laziness Overall statistical interpretation In this sample of 22 respondents, daytime sleepiness was commonly reported: 86.4% experienced drowsiness at least occasionally, and 50% experienced it sometimes. Half of the respondents reported that daytime sleepiness affected their performance. The most frequently reported contributing factor was an irregular sleep schedule, while qualitative responses commonly described fatigue, reduced concentration, lethargy, disrupted routines, and difficulty with academic/work tasks.

Conclusion: This study underscores that excessive daytime sleepiness is often rooted in habitual lifestyle choices rather than pathology alone. Fostering restorative sleep behaviours and mindful digital consumption may mitigate its effects. Ongoing exploration is crucial to sculpt effective, culturally nuanced public health strategies in Pakistan.

Keywords: Excessive Daytime Sleepiness; Sleepiness; Sleep Disorders; Sleep Quality; Sleep-Wake Disorders

ABSTRACT 22

IVC Filters Increase Mortality and DVT Risk Without Significantly Reducing PE Recurrence in Patients with Acute Pulmonary Embolism Unable to Receive Anticoagulation: A Meta-Analysis

Muhammad Shahzaib Khan, Atrooba Zahid, Shafi Chishti, Saboor Chishti, Shanza Nayyab

Fazaia Medical College Islamabad

Introduction: Managing acute pulmonary embolism (PE) in high-risk patients with contraindications to anticoagulation (e.g., cancer, trauma, surgery) is challenging. Inferior vena cava filters (IVCFs) are commonly used as an alternative, yet their benefits and risks remain controversial. Current Society of Interventional Radiology (SIR) guidelines (2020) are based on limited data from only two studies. This meta-analysis consolidates data from eleven studies to clarify IVCF effects on mortality, PE recurrence, and deep vein thrombosis (DVT) recurrence. IVCF use in high-risk PE patients with anticoagulation contraindications would increase mortality and recurrent DVT rates without significantly reducing PE recurrence.

Methodology: A systematic review and meta-analysis were conducted using PubMed, Embase, and Cochrane Library databases, including studies up to October 2024. We analyzed studies comparing high-risk patients with anticoagulation contraindications (transient or permanent) who received IVCFs against those who did not. Primary outcomes were all-cause mortality, PE recurrence, and DVT recurrence. Data extraction and quality assessment followed standardized protocols, with hazard ratios (HR) and odds ratios (OR) calculated using a random-effects model.

Results: Eleven observational studies (n=186,109; IVCF=56,080) were included. IVCF use was associated with increased overall all-cause mortality (HR = 1.21 [95% CI: 1.07–1.36]) with long-term mortality (>180 days) showing considerably higher mortality HR=1.33 [95% CI 1.04-1.71] observed on subgroup analysis. IVCF use significantly increased DVT recurrence OR=1.58 [95% CI: 1.20 –2.08], while the recurrence of PE was not significantly affected (p = 0.4).

Conclusion: IVCF use in high-risk PE patients with anticoagulation contraindications is associated with increased all-cause mortality and DVT recurrence, but it does not significantly reduce PE recurrence. These findings highlight the importance of exploring anticoagulation when feasible and suggest the need for cautious IVCF use, particularly non-permanent or retrievable options. Further randomized trials are essential to validate these findings and address evidence heterogeneity.

Keywords: IVCF; Pulmonary embolism; DVT

ABSTRACT 23

Huge Right Pheochromocytoma: A Surgical and Anesthetic Challenge

Makhdoom Mohammad Shozab, Kiramat Ullah, Dr Husnain, Dr Durre Shohab, Dr Saeed Akhtar, Dr Saleem

Fazaia Medical College Islamabad

Introduction: Pheochromocytomas are rare catecholamine-secreting neuroendocrine tumors arising from chromaffin cells of the adrenal medulla. Although sustained hypertension is a common manifestation, some patients may present with nonspecific symptoms or remain relatively asymptomatic. Giant pheochromocytomas pose unique surgical and anesthetic challenges because of their hypervascularity, extensive local involvement, and proximity to major retroperitoneal vessels and adjacent organs. To highlight the importance of meticulous preoperative planning and multidisciplinary collaboration between urological, hepatobiliary, vascular, and anesthetic teams in the management of giant, locally invasive pheochromocytomas.

Methodology: A clinical case report was based on comprehensive preoperative reassessment with biochemical testing and cross-sectional and venographic imaging, followed by multidisciplinary surgical and anesthetic planning and documentation of perioperative management and outcome.

Results: A 32-year-old male presented with hypertension and right flank heaviness. Imaging revealed a massive right adrenal mass. The patient had previously undergone two attempted resections at another center, both of which were abandoned because of dense tumor adherence and intimate involvement of the liver, right kidney, inferior vena cava (IVC), duodenum, and right colon. Biopsy obtained during the previous attempts confirmed pheochromocytoma; however, preoperative plasma metanephrine levels were unavailable. At our institution, the patient underwent comprehensive reassessment, including baseline laboratory investigations, plasma metanephrine and normetanephrine measurements, contrast-enhanced computed tomography of the abdomen and pelvis, and magnetic resonance venography. Following multidisciplinary discussion and detailed vascular and anesthetic planning, complete tumor excision was achieved with IVC resection and graft interposition. Shortly after transfer to the surgical intensive care unit, the patient developed sudden cardiovascular collapse. Prompt recognition, immediate surgical re-exploration, and aggressive resuscitation by the combined surgical and anesthesia teams resulted in successful stabilization.

Conclusion: Giant pheochromocytomas with extensive local invasion represent formidable surgical and anesthetic challenges. This case demonstrates that even tumors with extensive involvement of major vessels and adjacent organs can be successfully resected when managed through meticulous preoperative planning, multidisciplinary surgical collaboration, advanced vascular reconstruction, and vigilant perioperative anesthetic management. Rapid recognition and aggressive management of postoperative hemodynamic complications are equally critical to achieving a favorable outcome.

Keywords: Pheochromocytoma; Adrenal tumor; Multidisciplinary surgery; Vascular reconstruction; Perioperative management

ABSTRACT 24

Gastric Outlet Obstruction Secondary to Ampullary adenocarcinoma with regional lymph node metastasis: A Case Report

Namrah Hussain, Laiba Eiman

Holy Family Hospital; Surgery Unit 2

Introduction: Gastric outlet obstruction (GOO) is a mechanical impediment to gastric emptying presenting with progressive vomiting and weight loss; malignancy is now the predominant cause, with duodenal neoplasms an uncommon but important etiology To report GOO due to a duodenal mass with pancreatic head

Methodology: A single-patient case report using clinical examination, upper GI endoscopy with duodenal biopsy, histopathology, and contrast-enhanced CT of chest, abdomen, and pelvis. Lab investigations including CBC, LFTs, RFTs, CA 19-9

Results: A 58 years old female, non-smoker, presented with four months of vomiting and unintentional weight loss. Vomiting was gradual, progressive, projectile, copious, contained food particles, aggravated by eating, progressing from solids to semi-solid foods, with fatigue and malaise. Past medical, surgical, and family history was nonsignificant, with no regular medications. He was emaciated with pallor; abdomen was soft and non-tender with epigastric fullness and a palpable non-tender mass. Endoscopy showed ulcerated friable growth at the D1/D2 junction with complete luminal obstruction involving 3rd part of duodenum; the scope could not pass deep into the duodenal mass. Superficial biopsy taken showed partial villous blunting and on going inflammation,. CECT revealed a 4.4x 3.1 x 4.3 cm heterogeneously enhancing D1-D2 mass causing high-grade GOO, with extension into the pancreatic head with no significant lymphadenopathy. Biopsy taken during Whipple procedure identifies moderately differentiated adenocarcinoma of ampulla, positive metastasis in 3 out of 12 lymph nodes while all resection margins and omentum is free of tumor. Pathological staging system reveals pT3b N1 stage of carcinoma

Conclusion: This case highlights diagnostic challenges of duodenal mass presenting with gastric outlet obstruction initially with non diagnostic biopsy, which afterwards from another biopsy taken during Whipple resection reveal adenocarcinoma of ampulla with metastatic invasion of pT3b N1 stage advanced into pancreatic and peri pancreatic tissue extension

Keywords: Gastric Outlet Obstruction; Duodenal Neoplasms; Vomiting

ABSTRACT 25

ASSOCIATION OF HEALTH LITERACY WITH KNOWLEDGE OF HPV INFECTION, IMMUNIZATION, AND SCREENING AMONG STUDENTS OF HITEC UNIVERSITY, TAXILA, PAKISTAN

Areej Khalid, Rao Danish Ali, Alishba Suleman

HITEC Institute Of Medical Sciences

Introduction: Human papillomavirus (HPV) is a common viral infection and a major cause of cervical cancer and other malignancies. Despite the effectiveness of HPV vaccination and screening, inadequate awareness and misconceptions remain common among young adults. Health literacy may influence HPV-related knowledge and preventive practices. To assess health literacy and knowledge regarding HPV infection, vaccination, and screening, and to determine the association between health literacy and HPV-related knowledge among students at HITEC University, Taxila.

Methodology: A cross-sectional study was conducted among 329 university students aged 18–30 years at HITEC University, Taxila from January to June 2026. Participants were selected using two-stage cluster sampling from 10 university departments. Data were collected using the validated European Health Literacy Survey Questionnaire (HLS-EU-Q47) and HPV Knowledge Questionnaire (HPV-KQ). Data were analyzed using SPSS version 25.0. Descriptive statistics and the Chi-square test were used, with $p \leq 0.05$ considered statistically significant.

Results: A substantial proportion of students had inadequate or problematic health literacy and limited knowledge regarding HPV infection, vaccination, and screening. A statistically significant positive association was observed between health literacy and HPV-related knowledge ($p \leq 0.05$), with students having higher health literacy demonstrating better HPV-related knowledge.

Conclusion: Inadequate health literacy and HPV-related knowledge remain important gaps among university students. Strengthening health literacy through structured HPV education may improve understanding of HPV prevention, vaccination, and screening.

Keywords: Human Papillomavirus; Health Literacy; HPV Vaccination; Cervical Cancer Screening; University Students

ABSTRACT 26

ASSESSMENT OF QUALITY OF BLOOD SAMPLING PRACTICES (PHLEBOTOMY) AMONG THE NURSING STAFF AT PRIVATE HOSPITAL: A CROSS-SECTIONAL ANALYTICAL STUDY

Abdul Rehman, Marrium Imran, Rufia Rasool, Kanzal Asad, Rameen Waseem, Nosheen Zaidi

Foundation University Medical College Islamabad

Introduction: To assess adherence to World Health Organization (WHO)-recommended phlebotomy practices among nursing staff at a tertiary care hospital and to identify factors associated with adequate practice.

Methodology: Cross-sectional analytical study. Place and Duration of Study: Medical and surgical wards of Private Hospital, Rawalpindi, Pakistan, from 7 to 20 August 2026. A structured questionnaire developed from the WHO Guidelines on Drawing Blood: Best Practices in Phlebotomy (2010) was administered to 135 internee and staff nurses recruited by convenience sampling. Seventeen phlebotomy-practice items were scored 1 (adherence) or 0 (non-adherence), yielding a total score of 0–17; a score ≥75% (13–17) was classified as adequate practice. Associations between practice level and designation, age, gender, department, years of experience, and formal training were assessed using Pearson's chi-square test, with $p \leq 0.05$ considered significant.

Results: Of 135 participants, 93 (68.9%) were internee nurses and 42 (31.1%) were staff nurses. Overall, 109 (80.7%) demonstrated adequate practice. Adequate practice was significantly more common among internee nurses than staff nurses (86.0% vs 69.0%; $\chi 2=5.361$, $p=0.021$; OR=2.76, 95% CI 1.15–6.64) and was significantly associated with age group ($p=0.028$) and years of experience ($p=0.004$). Gender, department, and formal training showed no significant association. Needlestick injury was reported by 73 (54.1%), and 88 (65.2%) reported appropriate post-exposure adherence.

Conclusion: Internee nurses demonstrated higher adherence to recommended phlebotomy practice than staff nurses. Hand hygiene, glove use, and specimen-transport temperature maintenance were the areas with the lowest adherence.

Keywords: Infection Control; Needlestick Injuries; Nursing Staff; Occupational Exposure; Patient Safety; Phlebotomy

ABSTRACT 27

Digital Media Usage and Cognitive Decline among Digital Natives

Khadeeja Umama, Noreeta Suleman

National Institute of Psychology, Centre of Excellence, Quaid e Azam University, Islamabad

Introduction: The present study was conducted to examine the role of digital media use in cognitive decline among digital natives.

Methodology: A sample of 300 university students (159 women and 141 men) were selected using purposive sampling. The research utilized the Digital Addiction Scale (DAS) (Kesici & Tung, 2018) and the Cognitive Failures Questionnaire (CFQ) (Goodhew & Edwards, 2024) to assess the levels of digital media addiction and cognitive decline respectively.

Results: Findings revealed a significant positive correlation between digital addiction and cognitive failure. The subcomponents of digital addiction including overuse, non-restraint, and dependence showed associations with cognitive issues such as attention deficits, memory failure, and executive dysfunction. Parental education and duration of digital media use were significantly associated with higher levels of digital addiction, which in turn correlated with greater cognitive failures. However, family income did not show a significant direct relationship with either digital addiction or cognitive decline.

Conclusion: The findings support Cognitive Load Theory and the concept of digital dementia proposed by Spitzer (2012), suggesting long-term implications of excessive digital exposure. The study highlights the need for awareness campaigns and preventive strategies to foster healthy digital habits among youth.

Keywords: Cognitive load; digital media; digital natives

ABSTRACT 28

Ovarian Clear Cell Carcinoma Presenting as a Large Complex Adnexal Mass Complicated by Early Postoperative Acute Kidney Injury: A Case Report

Aliza Faisal Rathod, Pranjal, Fatima Khalid, Dr Fauzia Ali, Dr Farida Sumbul,, Dr Shabnam Nadeem

Karachi Medical & Dental College; Abbassi Shaheed Hospital

Introduction: Ovarian masses often cause vague symptoms, so it can be hard to tell benign from malignant before surgery. Acute kidney injury (AKI) is a known risk after major pelvic surgery, but when it develops within days of a staging laparotomy, it needs rapid, coordinated care. We describe the perioperative course of a woman with a large adnexal mass who developed early AKI after surgery.

Methodology: A retrospective case review was conducted after obtaining informed written consent from the patient. All patient data has been fully anonymized to ensure confidentiality.

Results: A 42-year-old premenopausal woman presented with three years of worsening abdominal pain, bloating, constipation, urinary frequency, and weight loss. Imaging showed a 12 × 16 × 16.2 cm complex cystic-solid adnexal mass suspicious for malignancy; cytology and endometrial biopsy were negative. After prophylactic ureteric catheterization, she underwent staging laparotomy with total abdominal hysterectomy, bilateral salpingo-oophorectomy, omentectomy, appendectomy, and peritoneal washings. During surgery, the right ovarian cyst capsule was ruptured. On postoperative day one, her urine became concentrated and blood-tinged, then progressed to anuria with rising creatinine by day two. Ultrasound showed mild bilateral hydronephrosis with no intra-abdominal collection. After urology and nephrology consultations, she was transferred to the Sindh Institute of Urology and Transplantation (SIUT) for specialized renal care. Histopathology confirmed ovarian clear cell carcinoma, supported by positive PAX-8 and focal Napsin-A staining.

Conclusion: This case is a reminder to watch for renal failure after extensive pelvic surgery. Early recognition of AKI, prompt referral to a specialized center, and thorough histopathological evaluation, including immunohistochemistry, all help improve outcomes and guide the next steps in oncologic care.

Keywords: Ovarian Clear Cell Carcinoma; Adnexal Mass; Staging Laparotomy; Acute Kidney Injury; Gynecologic Oncology

ABSTRACT 29

Postpartum Quality of Life and Financial Burden after Caesarean Section in Pakistan: A Cross-Sectional Study

Sarah Ejaz Khan, Wadiha Waheed, Ihsanur Rahman, Prof. Dr Nosheela Javed

Department of Public Health, Institute of Health Sciences, Khyber Medical University, Islamabad, Pakistan

Introduction: The rising rate of caesarean section in Pakistan imposes substantial financial strain on households while potentially impairing maternal postpartum quality of life (QoL). Whether this burden is primarily driven by the immediate financial shock of surgery or by deeper, pre-existing socioeconomic vulnerabilities remains poorly understood. This study aimed to estimate direct, indirect, and opportunity costs of caesarean delivery, assess postpartum QoL across the four WHOQOL-BREF domains, and examine whether cost or socioeconomic/educational factors better predict QoL outcomes.

Methodology: A cross-sectional study was conducted at Pakistan Institute of Medical Sciences (PIMS), Islamabad, from August to November 2025. Of 290 women approached via systematic random sampling, 284 were eligible for analysis. A bilingual structured questionnaire captured economic data (direct, indirect, and opportunity costs) and quality of life (WHOQOL-BREF). An unadjusted linear regression model was followed by a model adjusted for socioeconomic status (SES) and education.

Results: 88.7% of households faced catastrophic health expenditure (>40% of income), a near-universal financial shock. Yet no cost variable was significant in the adjusted model. Middle SES was associated with better QoL than low SES (β=5.70, p=0.029), while Madrassa education was associated with lower QoL than no formal education (β=−11.21, p=0.015), indicating that socioeconomic position and education, not surgical cost, predicted QoL. Physical health was the lowest-scoring domain (42.40±21.63) and social relationships were the highest (85.87±23.48).

Conclusion: Financial protection schemes alone are insufficient to improve postpartum QoL. This study moves the discovery of an SES- and education-driven pathway toward its delivery in practice: structured antenatal and postnatal recovery programs, including individualised discharge planning and physical rehabilitation support, are needed to target socioeconomic and educational gaps, rather than uniform, cost-focused interventions alone.

Keywords: Cesarean Section; Quality of Life; Socioeconomic Factors; Health Expenditures; Pakistan

ABSTRACT 30

Median Arcuate Ligament Syndrome (MALS): Clinical Case Report & Management

Hashir Ali Khan, Hira Israr, Humail Muhammad Raja, Arooba Hafeez, Dr Sidra, Dr Hanif

Introduction: Median arcuate ligament syndrome (MALS) is a rare vascular compression syndrome caused by the median arcuate ligament of the diaphragm compressing the origin of the celiac artery. It leads to chronic mesenteric ischemia, typically presenting with postprandial abdominal pain and significant weight loss. First described by Adolf Kühner in 1963, MALS is most commonly observed in young females aged 20 to 40 years.

Methodology: Clinical case report based on the presentation, diagnostic evaluation, management, and documented outcome described by the authors.

Results: Patient: 42-year-old female Chief Complaint & History: Chronic postprandial epigastric pain lasting 18 months, accompanied by significant weight loss (~15 lbs). Pain worsens following large meals and radiates to the back, associated with nausea and vomiting. Physical Examination: Mid-epigastric tenderness on palpation; otherwise unremarkable. Vitals: Stable. Diagnostic Workup & Management Management of MALS involves a step-wise approach combining initial conservative measures, rigorous diagnostic workup, and surgical intervention when indicated: Conservative Management: Analgesics and antiemetics for symptomatic relief, nutritional support with high-calorie intake, avoidance of large meals in favor of small, frequent portions, and proton pump inhibitors (PPIs) to rule out coexisting peptic ulcer disease. Diagnostic Evaluation: CT Angiography (CTA) is the gold standard diagnostic tool, demonstrating classic narrowing of the celiac artery at its origin with post-stenotic dilatation (characteristic 'hook' or 'J-shaped' deformity). Doppler ultrasound serves as a useful non-invasive screening tool showing high peak systolic velocity (>200 cm/s) in the celiac artery during expiration which decreases on inspiration. Alternative abdominal pathologies (e.g., peptic ulcer disease, cholelithiasis, IBS) must be excluded. Surgical Intervention: Laparoscopic release of the median arcuate ligament represents the standard surgical approach, involving division of the ligament and neurolysis of the celiac plexus. Open surgical release or revision is reserved for complex or persistent cases.

Conclusion: MALS should be strongly considered in young patients presenting with unexplained postprandial abdominal pain, weight loss, and an otherwise negative gastrointestinal workup. The classic clinical triad—pain, weight loss, and abdominal bruit—is present in approximately 50% of cases. Delayed diagnosis is common due to the rarity of the condition and symptom overlap with common functional GI disorders. Consider MALS in chronic, unexplained postprandial pain with weight loss in young females. Classic triad includes postprandial pain, weight loss, and abdominal bruit. CT angiography and Doppler ultrasound are the primary diagnostic tools of choice. Laparoscopic surgical release offers excellent outcomes with symptom relief in most patients.

Keywords: Median arcuate ligament syndrome; Celiac artery compression; Postprandial pain; CT angiography; Surgical decompression

ABSTRACT 31

Burden of diseases, injuries, and risk factors for Pakistan and its provinces and territories: a comprehensive analysis of the Global Burden of Disease Study 2023

Mirza Muhammad Ali Baig

Islamic International Medical College

Introduction: Pakistan is undergoing a major transition in its health landscape, marked by a rising burden of non-communicable diseases (NCDs). Amid significant challenges, including low per capita expenditure on health, high fertility, low educational attainment, widespread poverty, political instability, and recurring environmental disasters, the federal government has initiated reforms such as the phased rollout of universal health coverage (UHC) in select provinces, aiming to expand access to essential health services and reduce out-of-pocket expenditures.

Methodology: We conducted a comprehensive analysis of mortality, morbidity, risk factors, and injuries in Pakistan from 1990 to 2023, utilizing Global Burden of Disease (GBD) data at national and subnational (provincial) levels. Trends in life expectancy (LE), healthy life expectancy (HALE), years of life lost (YLLs), years lived with disability (YLDs), and disability-adjusted life years (DALYs) were assessed.

Results: Between 1990 and 2023, Pakistan's LE rose from 62.1 years (95% UI: 61.5-62.7) to 70.0 years (95% UI: 69.1-70.9)-a gain of 8 years. All provinces saw improvements in LE; the largest increase was in Azad Jammu & Kashmir (9.6 years), but Punjab and Sindh remained below national averages of neighboring countries. HALE increased by just over 6 years, from 53.5 to 59.6 years. Ischemic heart disease (IHD) was the leading age-standardised cause of death with a rate of 130.47 per 100,000 population (95% UI: 101.55-163.79), virtually unchanged compared to 130.54 in 1990. Stroke was the second leading cause, with a rate of 81.77 (58.61 to 114.87) and Chronic Obstructive Pulmonary Disease (COPD) the third with a rate of 75.74 (54.76 to 110.00). Age-standardised diabetes mortality increased by 43% since 1990. Deaths from diarrheal diseases and tuberculosis fell by 78% and 72%, respectively, and measles deaths declined by 99%. Malnutrition persists as a dual burden, with child stunting and micronutrient deficiencies coexisting alongside rising overweight and obesity. Similar to 1990, in 2023, neonatal disorders ranked as the leading cause of age-standardized DALYs, with 184,081 deaths in 2023. In 2023, particulate matter pollution was the leading risk factor for age-standardized mortality for both sexes, followed by high blood pressure and high fasting plasma glucose. High body mass Index (BMI) showed the largest increase since 1990 (+114.8%).

Conclusion: Pakistan's health system faces a convergence of crises: rising NCDs, mental health disorders, persistent infectious disease, and deepening gender and regional disparities. Progress has been modest and uneven, with women losing ground and Pakistan failing to keep pace with its 2 neighbors. Expansion of UHC provides a critical opportunity to reorient toward prevention, early detection, and equitable access, but urgent action is needed to address both emerging and unfinished agendas including air quality and risk factors such as obesity and diabetes.

Keywords: GBD; global burden of disease; disability-adjusted life years; mortality; causes of death; risk factors; Pakistan

ABSTRACT 32

A Critical Diagnostic Pitfall: Infliximab-Induced Miliary Tuberculosis Presenting as a Neurosarcoidosis Flare

Laiba Hashmi, Hamna Waseem

Introduction: TNF-α inhibitors risk reactivating latent tuberculosis (TB) in sarcoidosis. Overlapping symptoms complicate distinguishing flares from infection. We report infliximab-induced miliary TB mimicking neurosarcoidosis, emphasizing infection exclusion before escalating immunosuppression

Methodology: This single-patient clinical case report utilized serial imaging, laboratory evaluations, cerebrospinal fluid (CSF) analysis, and bronchoscopic diagnostics. Microbiological confirmation included acid-fast bacilli staining, GeneXpert MTB/RIF Ultra, and liquid culture. Treatment response was assessed using standard clinical measures and 6-month follow-up imaging.

Results: A 46-year-old male on infliximab presented with fevers (39°C), confusion, nuchal rigidity, and elevated inflammatory markers (CRP: 150 mg/L, ESR: 95 mm/hr, ACE: 110 U/L). PET-CT revealed hypermetabolic lymphadenopathy (SUV 13.4) and widespread miliary lung micronodules. Bronchoalveolar lavage confirmed M. tuberculosis via AFB stain (2+), GeneXpert Ultra, and liquid culture. Brain MRI showed basal cistern leptomeningeal enhancement and hydrocephalus. CSF analysis demonstrated lymphocytic pleocytosis (120 cells/μL, 95% lymphocytes), elevated protein (1.2 g/L), and low glucose (35 mg/dL). Despite negative CSF GeneXpert, presumptive tuberculous meningitis (TBM) was diagnosed. Discontinuing infliximab while initiating anti-tuberculous therapy and dexamethasone resolved fevers in 7 days, cleared neurological deficits by week 3, and resolved miliary nodules at 6 months.

Conclusion: In immunosuppressed sarcoidosis patients, new neurological symptoms and fever must be aggressively treated as an opportunistic infection rather than a disease flare. Upon confirming systemic tuberculosis, immediate empiric therapy for neurotuberculosis is mandatory even with negative CSF molecular tests to prevent irreversible neurological damage or death.

Keywords: Neurosarcoidosis; Infliximab

ABSTRACT 33

Extensive Allergic Fungal Rhinosinusitis with Orbital and Skull-Base Erosion in a Young Immunocompetent Woman: A Case Report

Ahmed Mujahid, Muhammad Abdullah

Fazaia Medical College Islamabad

Introduction: Allergic Fungal Rhinosinusitis (AFRS) is a non-invasive type of chronic rhinosinusitis that is characterized by the development of nasal polyposis and inflammation driven by fungi. AFRS is usually a non-invasive type of rhinosinusitis, but in cases when the disease is longstanding, significant sinus enlargement, bone remodeling and destruction take place, which make diagnosis difficult due to their resemblance to cancer or invasive fungal rhinosinusitis.

Methodology: A case of a 23-year-old immunocompetent female who had symptoms of progressive bilateral nasal blockage, rhinorrhea, headaches, periorbital pain, facial pressure, and anosmia was studied. The study included clinical examination, endoscopy, and imaging studies like laboratory tests, CT scans, and MRI. A multidisciplinary approach including Otorhinolaryngology, Ophthalmology, and Neurosurgery was taken, after which bilateral functional endoscopic sinus surgery (FESS) was done.

Results: Examination showed bilateral nasal polyposis with poor nasal patency. Investigations showed peripheral eosinophilia and increased serum level of IgE (>2000 IU/ml). CT scan showed extensive pansinusitis with sinonasal polyposis and erosion/remodeling of the lamina papyracea, cribriform plate, sphenoid area, sellar floor and clivus, along with left intra-orbital involvement. MRI helped to define the relationship between orbit, skull base and sella turcica, with superior displacement of the pituitary gland. Despite the abnormal findings on imaging studies, there was no visual disturbance or extraocular movement restriction. Bilateral FESS was performed with clearance of extensive fungal and allergic materials. Postoperative management included intranasal steroids, antihistamines, alkaline nasal irrigation and itraconazole. Symptoms of the patient were improved significantly.

Conclusion: Extensive AFRS can produce remarkable orbital and base of skull erosion without the presence of invasive pathology or functional deficits. Computed tomography is mandatory for evaluation of bone involvement, whereas magnetic resonance imaging helps identify important orbital and skull base relationships. Importantly, bony erosion in AFRS should not be equated with invasive disease.

Keywords: Allergic Fungal Rhinosinusitis; Nasal Polyps; Paranasal Sinuses; Skull Base; Orbit

ABSTRACT 34

Exploring the Link between Research Orientation Attitude and Impostor Syndrome among Medical and Dental Undergraduates at HITEC-IMS, Taxila: A cross-sectional survey

Laiba Islam, Elsa Rubab

HITEC Institute of Medical Sciences Islamabad

Introduction: Imposter syndrome is common among Pakistani medical students and undermines confidence in academic participation. Alongside this, many students recognize the importance of research yet struggle to develop positive attitudes toward it. Deficient skills and inadequate mentorship contribute to a confidence gap, where appreciation for research contrasts with limited support and self-efficacy. To determine the prevalence of imposter syndrome and level of research-oriented attitude and to analyze the correlation between these two variables among medical and dental undergraduates of HITEC-IMS, Taxila.

Methodology: An analytical cross-sectional study was conducted at HITEC-IMS Taxila from January to June. Using stratified random sampling, 226 medical and dental undergraduates were selected by discipline and year. Data were collected through a structured questionnaire comprising sociodemographic variables, the Clance Impostor Phenomenon Scale, and the Revised Research-Oriented Attitude Scale, with informed consent and confidentiality maintained. SPSS version 26 was used for analysis. For continuous variables, mean and standard deviation and for categorical variables frequency and percentages were used. Chi-square and Spearman correlation to see the association between IS & R-ATR. Significance level was set at $p < 0.05$.

Results: Of 257 undergraduates, 159 (61.9%) were female and 187 (72.8%) MBBS students. Overall, 131 (51%) reported few impostor characteristics, 103 (40%) moderate, and 23 (9%) frequent. MBBS students more often showed few traits (99; 53%), while BDS students more often reported moderate levels (36; 51%). Research attitude was predominantly moderate (167; 65%), with low in 77 (30%) and high in 13 (5%), all MBBS. BDS students showed no high attitude, with most in the moderate category (43; 61%). A significant association was found between impostor syndrome and research attitude, influenced by discipline and living arrangements ($p < 0.001$).

Conclusion: The study observed few to moderate impostor feelings were common while frequent ones were rare, and most students hold a moderate research-oriented attitude. A significant negative correlation was found between impostor syndrome and research orientation, indicating that higher impostor feelings may hinder confidence and reduce research engagement. These findings highlight the importance of institutional support and mentorship to address impostor experiences and strengthen students' research involvement.

Keywords: Impostor Syndrome; Research-Oriented Attitude; Medical and Dental Undergraduate

ABSTRACT 35

Neurotoxic Snakebite Presenting as Acute Abdominal Pain: An Occult Neuroparalytic Envenomation in a Child

Humaail M. Raja, Arooba Hafeez, Hira Israr, Hashir Ali Khan, Afrah Malik, Ammarah Saeed, Sohail Ahmed

Department of Medicine, Pakistan Air Force Hospital, Islamabad, Pakistan

Introduction: Snakebite envenomation is a major but under-recognised tropical health problem, particularly in South Asia. Neurotoxic snakebites may remain undiagnosed when the bite is unwitnessed and local signs (such as fang marks or swelling) are absent. Nonspecific gastrointestinal symptoms, particularly acute abdominal pain, may precede neuroparalysis by several hours, making early recognition and neurological assessment extremely challenging.

Methodology: A clinical case report was based on serial neurological assessment, electrophysiological testing, neuromuscular-junction antibody testing, differential diagnosis, treatment response, and short-term clinical outcome.

Results: Patient: 14-year-old male from rural Talagang. Chief Complaints: Presented with acute crampy abdominal pain upon waking in the morning. Within hours, he developed progressive ptosis, diplopia, and respiratory distress. History: History noted ankle swelling, but no external fang marks or witnessed bite. Physical & Vital Signs: GCS 8/15, SpO2 60% on room air, Pulse 140 bpm, BP 100/70 mmHg, Temp 36.8°C. Rapidly developed Type II respiratory failure requiring endotracheal intubation and mechanical ventilation. Diagnostic Evaluation & Differential Diagnosis The rapid onset of weakness and respiratory failure presented a diagnostic dilemma, requiring differentiation among Guillain-Barré syndrome (GBS), botulism, myasthenia gravis, and neurotoxic snakebite: Electrophysiology: NCS and EMG ruled out GBS and botulism. Serology & NMJ Testing: Repetitive nerve stimulation initially showed >10% decrement suggestive of a neuromuscular junction disorder, but AChR and MuSK antibodies were negative, and the clinical presentation was atypical for myasthenia gravis. Diagnostic

Conclusion: The clinical sequence of acute abdominal pain followed by rapidly progressive neuroparalysis, paired with nocturnal exposure and rural residence, confirmed occult neurotoxic snake envenomation (likely krait). Pathophysiology Neurotoxic elapid venom (especially from kraits and cobras) contains presynaptic and postsynaptic neurotoxins that disrupt acetylcholine-mediated transmission at the neuromuscular junction. Early autonomic and neuromuscular excitation can induce non-specific gastrointestinal symptoms (abdominal pain, nausea, vomiting) hours before overt skeletal muscle weakness and respiratory muscle paralysis manifest. Management & Outcome Airway & Ventilation: Endotracheal intubation and mechanical ventilation for Type II respiratory failure. Specific Antidote: Administration of Anti-Snake Venom (ASV). Neuromuscular Support: Symptomatic support with Pyridostigmine and Atropine. Outcome: The patient was successfully weaned off mechanical ventilation and extubated the following day. Complete reversal of motor weakness occurred within 3 days, with no residual neurological deficits at discharge. Repeat nerve conduction study after discontinuing pyridostigmine was normal. High Index of Suspicion: Think Beyond the Abdomen: Acute abdominal pain combined with rapidly progressive weakness, ptosis, or respiratory distress should prompt immediate suspicion of neurotoxic snake envenomation. Occult Nature of Krait Bites: Krait bites are characteristically nocturnal, painless, and frequently lack swelling or visible fang marks. Clinical Diagnosis: Diagnosis is primarily clinical; absence of a clear bite history or fang marks must never exclude envenomation. Early Intervention: Early administration of ASV alongside prompt airway management is life-saving and leads to rapid full recovery.

Keywords: Snakebite envenomation; Neurotoxicity; Acute abdominal pain; Neuroparalysis; Pediatrics

ABSTRACT 36

“The cardiac metastasis secondary to blue cell tumor with pleural, pericardial and peritoneal effusion”

Muhammad Umer

Fazaia Medical College Islamabad

Introduction: Lung adenocarcinoma is the most frequent cause of confirmed cytological malignant pericardial effusion. The most common presentation of mediastinal lymphoma is superior vena cava syndrome, but we reported the rare presentation of mediastinal lymphoma presented as cardiac metastasis with pericardial, pleural and peritoneal involvement.

Methodology: A clinical case report was based on emergency clinical assessment, chest radiography, echocardiography, pericardiocentesis, repeat examination for lymphadenopathy, and histopathological confirmation by lymph-node biopsy.

Results: A 6-year-old child presented with exertional shortness of breath, chronic cough and fever in ED. The patient was treated for sore throat multiple times. The heart sounds were muffled with increased JVP. The abdomen is distended, and the liver is enlarged. The chest X-ray revealed an enlarged cardiac silhouette and bilateral pleural effusion. The 2-D echo was suggestive of massive pericardial effusion with multiple atrial clots. The pericardiocentesis was done. The bedside echo after pericardiocentesis reveals multiple atrial masses. The patient was re-examined for lymph nodes and found to have cervical lymphadenopathy. The biopsy was taken and is suggestive of Non-Hodgkin T-cell Lymphoblastic Lymphoma (blue cell tumour).

Conclusion: A persistent non-resolving cough in children warrants careful evaluation, as it may reflect a serious underlying disease like lymphoma. Malignant pericardial effusions tend to have higher volumes and tend to involve all three body cavities, like the peritoneum, pleura and pericardium. Unlike the adult non-Hodgkin lymphoma, which presents with lymph node diseases, in the children the clinical presentation is extranodal.

Keywords: Small round cell tumors (SRCT); Non Hodgkin Lymphoma; cardiac metastasis

ABSTRACT 37

Innovation in Healthcare: Discovery to Delivery: Experimental Evaluation of Dietary Polyphenol Blends from Pakistani Foods for Inhibiting Glycoxidative Stress in Pre-Diabetes

Sahabia Mazhar, Mahnoor Tariq

Karachi Metropolitan University

Introduction: Pre-diabetes is a stage for preventing diabetes and vascular complications. Persistent hyperglycemia promotes oxidative stress, advanced glycation end products (AGEs), and reactive dicarbonyls such as methylglyoxal (MGO), contributing to glycoxidative damage. Standard approaches target glycemic control, while glycoxidative pathways remain incompletely addressed. Polyphenols possess antioxidant, antiglycation, metal-chelating, and carbonyl-trapping properties. However, limited evidence exists on standardized combinations of polyphenol-rich Pakistani foods targeting multiple glycoxidative pathways. This study aims to evaluate a 1:1:1:1 blend of curry leaves, green tea, pomegranate peel, and turmeric.

Methodology: An in-vitro and ex-vivo study will be conducted. Shade-dried materials will be extracted with 70% ethanol, standardized for total phenolics/flavonoids, and combined 1:1:1:1. AGE inhibition will be assessed using BSA + 500 mM glucose for 28 days, with fluorescence at 370/440 nm and aminoguanidine as control. Antioxidant activity will be assessed by DPPH and FRAP; Fe2+ chelation by ferrozine assay. CuSO4-induced LDL oxidation will be measured by TBARS/MDA at 532 nm. MGO trapping will be evaluated by OPD derivatization and HPLC. AAPH-induced RBC hemolysis will assess erythrocyte protection at 540 nm. Assays will be performed in triplicate (n=3), with aminoguanidine, ascorbic acid, and EDTA controls. Data will be analyzed one-way ANOVA with Tukey's test ($p<0.05$).

Results: The blend is expected to inhibit AGE formation by >60%, demonstrate antioxidant and Fe2+-chelating activity, reduce MGO, inhibit LDL oxidation, and protect RBCs from hemolysis. Greater activity than individual extracts would suggest additive or synergistic effects.

Conclusion: The study will assess whether a standardized Pakistani food blend can target multiple glycoxidative pathways. Findings could support further investigation of an affordable, culturally relevant strategy for pre-diabetes. Studies should optimize blend ratio/dose and evaluate phytochemical composition, safety, bioavailability, and clinical efficacy.

Keywords: Pre-Diabetes; Polyphenols; Glycation End Products; Advanced; Oxidative Stress; Methylglyoxal

ABSTRACT 38

Caudal Regression Syndrome Presenting with Neurogenic Bladder, Bilateral Grade V Vesicoureteral Reflux, and Recurrent Urinary Tract Infections: A Case Report

Sumaira Kiran

Fazaia Medical College

Introduction: Caudal regression syndrome (CRS), also known as sacral agenesis, is a rare congenital malformation characterized by varying degrees of development failure early in gestation of the caudal spine and spinal cord. The exact etiology is elusive, though maternal diabetes, genetic factors, and vascular hypo perfusion might play roles. Recently, the role of teratogens has been studied in animal models. CRS may involve multiple organ systems, particularly the genitourinary, gastrointestinal, and musculoskeletal system. Urological manifestations, including neurogenic bladder, vesicoureteral reflux (VUR), hydronephrosis, and recurrent urinary tract infections (UTIs), may result in significant morbidity. In severe cases, prominent maldeveloped hind limb is observed e.g. sirenomelia.

Methodology: Clinical case report based on the presentation, diagnostic evaluation, management, and documented outcome described by the authors.

Results: A 1-year-old female presented with decreased urine output, fecal soiling, and recurrent UTIs since birth. She also had systemic symptoms, scanty and turbid urine, and a severe perianal rash. Abdominal examination revealed tenderness, with pain on palpation of the flank region. Upon taking obstetric history from mother it was found that she took misoprostol during her first trimester without doctor's recommendation for stomach ulcers. This was taken before the confirmation of her pregnancy. Micturating cystourethrogram (MCUG) demonstrate a neurogenic bladder with bilateral grade V vesicoureteral reflux. MRI findings of the lumbosacral spine were consistent with Type 1 caudal regression syndrome. The urinary bladder was thick-walled and trabeculated, with mild bilateral hydronephroureter. DMSA renal scan demonstrated relatively preserved right renal function (75.26%) but significantly reduced left renal function (24.74%). Ultrasound KUB further revealed moderate-to-gross left hydronephrosis. For UTIs high dose anti-bacterial therapy was given and zinc oxide paste was applied for perineal rash. For urological complications vesicostomy was performed twice because of stenosis of stromal opening after first vesicostomy. Later she presented with sudden, multiple, and severe episodes of vomiting for which she got admitted to hospital, was suspected for intestinal intussesseption. She developed severe metabolic acidosis due to AKI during her hospital stay which progressed to multi-organ dysfunction syndrome (MODS). These complications lead to septic shock and cardiopulmonary arrest which ultimately caused her death.

Conclusion: This case highlights the teratogenic effect of misoprostol, causing caudal regression syndrome in infants presenting with recurrent UTIs, abnormal bladder function, fecal soiling, and renal abnormalities. Early identification of associated neurogenic bladder and high-grade vesicoureteral reflux, followed by appropriate urological evaluation and renal function assessment, is essential to prevent progressive renal damage and preserve long-term renal function.

Keywords: Caudal regression syndrome; neurogenic bladder; vesicoureteral reflux; recurrent urinary tract infections; sacral agenesis; hydronephrosis

ABSTRACT 39

Severe depressive illness with psychotic features, marked suicidal risk culminating in an electrocution attempt, associated physical/neurological trauma, prolonged psychiatric management, and consideration/use of ECT with subsequent clinical improvement.

Rida Fatima

Fazaia Medical College Islamabad

Introduction: Psychotic depression is a severe psychiatric condition associated with significant functional impairment and an increased risk of suicidal behaviour. in such cases, the clinical presentation becomes particularly complex. Electroconvulsive therapy (ECT) may be considered in severe depressive illness, particularly when there is prominent suicidality or psychotic symptomatology.

Methodology: A clinical case report was based on longitudinal psychiatric history, emergency medical and neurological assessment after self-harm, inpatient psychiatric monitoring, family-supported treatment planning, and consideration of electroconvulsive therapy.

Results: My patient a 51-yr old male presented to the ER in a semiconscious state following a severe head injury caused by a fall when he was trying to electrocute himself with live wire. His history revealed progressive depressive symptoms since the last 8 months characterized by low mood, pessimistic ideation, social withdrawal, reduced functioning, and disturbed biological functions. His illness was accompanied by prominent suspicions and persecutory ideas, with the clinical documentation subsequently describing severe depression with psychotic symptoms. The psychiatric deterioration progressed to suicidal behaviour, including an attempt to kill himself 2 times. The symptoms aggravated in the last 15-20 days following a period of extreme stress. Due to the fall, he developed physical and neurological complaints including occipital pain, headache, backache, dizziness, and vertigo. He also sustained an occipital scalp injury requiring suturing. And was assessed for medical and neurological evaluation, CT imaging documented occipital subgaleal soft-tissue swelling, while the available records did not demonstrate a major intracranial traumatic abnormality. Laboratory investigations did not demonstrate a major metabolic abnormality that readily explained the psychiatric presentation. Him and his family were counselled for ECT. But he later denied signing any consent form. Is wife also denied upon request. He was then put on medications. On follow ups he showed improved biological functions. The patient did start to consider the possibility that his belief was formed due to depression being severe thus showed that his delusion was now shakeable. multiple deaths were reported in his family. His father was also considered to have mental illness though he himself denied. His family reported that he had always been astute, well-behaved kind and diligent but isolated himself in times of stress.

Conclusion: This case demonstrates the complex clinical interface between severe psychotic depression and high-risk suicidal behaviour. The longitudinal course also illustrates the importance of intensive psychiatric monitoring, family involvement in treatment planning, and consideration of ECT in severe depressive illness associated with psychotic symptoms and substantial suicide risk. The case provides a clinically important example of the need for integrated psychiatric and medical management following an unusual and potentially lethal method of self-harm.

Keywords: electrocution; suicidal; psychosis; neurological trauma

ABSTRACT 40

Association between Low Ascitic Fluid Protein Level and Spontaneous Bacterial Peritonitis in Patients With Liver Cirrhosis.

Khizra Fatima, Kashish Kumari, Ishrat.

Introduction: Liver cirrhosis is a major chronic liver disease and is commonly complicated by ascites. Spontaneous bacterial peritonitis (SBP) is a serious and potentially life-threatening complication of cirrhosis. Ascitic fluid proteins, including complement and other opsonic factors, play an important role in antibacterial defense. Low ascitic fluid protein (<1.0 g/dL) may reflect reduced antibacterial defense and increased susceptibility to SBP. Although previous studies have linked low ascitic protein with SBP, recent evidence remains conflicting. Evidence from the Pakistani population is limited. Rationale: Determining this association may help identify cirrhotic patients at higher risk of SBP and support appropriate risk-based management. To determine the association between low ascitic fluid protein level and spontaneous bacterial peritonitis among patients with liver cirrhosis.

Methodology: Study Design: Cross-sectional study. Setting: Department of Medicine/Gastroenterology, Muhammad Medical College, Mirpurkhas. Duration: 8 months. Sample: 97 adults with clinically, biochemically, and ultrasonographically confirmed liver cirrhosis with ascites. Simple random sampling. Method: History, exam, labs recorded via questionnaire. Diagnostic paracentesis done. Ascitic fluid analyzed for protein, albumin, PMN count, culture, and SAAG. Patients grouped by ascitic protein and SBP status. Analysis: SPSS version 20. Chi-square/Fisher's for categorical, t-test/Mann-Whitney for continuous. $P<0.05$ significant.

Results: Patients with low ascitic fluid protein concentration are expected to have a significantly higher frequency of spontaneous bacterial peritonitis compared with patients having normal ascitic fluid protein levels.

Conclusion: This study is expected to provide locally relevant evidence regarding the association between low ascitic fluid protein concentration and spontaneous bacterial peritonitis in patients with liver cirrhosis. The findings may assist clinicians in identifying high-risk patients, facilitating early diagnosis, and improving evidence-based management strategies. Ascitic fluid protein should be considered as one component of SBP risk assessment. Patients at increased risk should receive appropriate clinical monitoring.

Keywords: Liver cirrhosis; Ascites; Low ascitic fluid protein; Spontaneous bacterial peritonitis; Ascitic fluid; Pakistan

SECTION 2

POSTER PRESENTATIONS

POSTGRADUATE

TOTAL SUBMISSIONS: 22

ABSTRACT 01

Effectiveness of an Advocacy Campaign on HIV-Related Awareness and Infection Prevention and Control Practices Observed by Patients and their Attendants in a Tertiary Care Hospital in Pakistan: A Quasi-experimental Study

Hamna Fiaz, Alina Fatima, Misbah Razzaq, Dr Omar Saeed Khan, Dr Shamaila Mohsin

Department of Public Health, AFPGMI, NUMS Pakistan

Introduction: Pakistan has experienced repeated HIV outbreaks linked to unsafe healthcare practices, highlighting persistent and preventable gaps in IPC practices. Patients and attendants are directly exposed to these risks during routine hospital visits. An educational advocacy campaign may improve HIV-related knowledge and promote safer healthcare practices. Therefore, this study aims to evaluate the effectiveness of a structured advocacy campaign on HIV-related awareness and IPC practices observed by patients and their attendants in a tertiary care hospital in Pakistan.

Methodology: A Quasi-experimental, single group pre-test and post-test study design was used. The study was conducted from 1st-31st July 2026 in PEMH, Rawalpindi. A total of 414 eligible participants were recruited via convenience sampling, out of which 400 participants, who completed their pre- and post-intervention assessment, were included. Intervention: Participants attended a single 25 minutes face-to-face advocacy session delivered in small groups using interactive presentations, educational videos, and IEC material. Changes in HIV knowledge were assessed using a validated HIV Knowledge Questionnaire-18 (HIV-KQ-18) developed by Carrey et al and observed IPC practice scores were assessed by a questionnaire adapted from a study by Chelenyane et al.

Results: The results were analyzed using SPSS version 23.0. The median HIV knowledge score increased from 10 (IQR 8-11) to 14 (IQR 11-16) following the intervention ($Z = -13.93$, $p<0.001$). The median IPC practice score increased from 6 (IQR 4-8) to 12(IQR 11-15) ($Z = -17.02$, $p<0.001$). Female participants had significantly higher IPC practice scores than males ($p=0.01$), whereas knowledge scores didn't differ significantly by gender or education levels (p-value 0.05).

Conclusion: Significant post-intervention improvements were seen in HIV awareness and observed IPC practices among the patients and attendants. Further studies are needed to assess the long-term retention of knowledge and to evaluate the effectiveness of the program in different healthcare settings.

Keywords: HIV Infections; Health Education; Infection Control; Health Knowledge; Attitudes; Practice; Health Advocacy

ABSTRACT 02

Exploring the Enablers and Barriers to Public-Private Partnership in Addressing the HIV Burden in Pakistan: A Qualitative Study

Dr Atiqa Bashir, Prof Dr Sajida Naseem

Health Services Academy Islamabad

Introduction: Human immunodeficiency virus remains an important public health concern in Pakistan, where gaps in diagnosis, treatment linkage, retention in care, stigma reduction, and service coordination continue to affect the national HIV response. Public-private partnerships are considered important for improving HIV prevention, diagnosis, treatment, care, referral, outreach, and community-based support services. This study explored the enablers and barriers to public-private partnership in addressing the HIV burden in Pakistan.

Methodology: A qualitative exploratory study design was used. The study was conducted in Islamabad and Rawalpindi among stakeholders linked with public-sector services, NGO/private sector activities, development partner support, programme management, and community engagement. A total of 25 participants were included through purposive and snowball sampling. The participants included National AIDS Control Programme (NACP) representatives (20%), PIMS clinical service providers (20%), NGO/private sector representatives (24%), development partner/programme managers (16%), and community representatives (20%). Data were collected through semi-structured interviews and analyzed using thematic analysis.

Results: The findings identified six major themes: enablers of PPPs, barriers to PPPs, governance and coordination issues, financing and resource challenges, stigma and community engagement, and recommendations for strengthening PPPs. Defined roles and referral pathways were reported by 18 participants, weak governance and unclear contracts by 19 participants, stigma and confidentiality concerns by 17 participants, fragmented financing and donor dependency by 15 participants, and fragmented data and reporting systems by 13 participants. The most common recommendation was the need for a formal PPP framework and standard operating procedures, reported by 20 participants.

Conclusion: The study concluded that effective PPPs required formal governance structures, clear referral pathways, sustainable financing, integrated and confidential data systems, routine coordination, and meaningful community participation. Strengthening these areas may support a more coordinated, equitable, stigma-sensitive, and sustainable HIV response in Pakistan.

Keywords: HIV; public-private partnership; enablers; barriers; stigma; community engagement; Pakistan

ABSTRACT 03

WhatsApp-Based Self-Management Support for Post-Dengue Recovery: A Digital Health Intervention to Improve Fatigue and Daily Functioning in Pakistan

Dr Farrah Gardezi, Col Syed Fawad Mashhadi

Department of Public Health, AFPGMI/NUMS

Introduction: Post-dengue fatigue syndrome (PDFS) can negatively affect daily functioning, productivity and quality of life. This study evaluated the effectiveness of a WhatsApp-based self-management support programme as a digital health intervention to improve fatigue severity and daily functioning among adults recovering from dengue in Rawalpindi, Pakistan.

Methodology: A quasi-experimental mixed-methods study was conducted over the study period among 60 adults recovering from documented dengue. Participants were allocated into a WhatsApp-supported intervention group (n=30) and usual follow-up group (n=30). The four-week intervention included recovery education, pacing strategies, graded activity guidance, hydration, nutrition, sleep support and digital communication through WhatsApp. Fatigue severity was measured using the Fatigue Severity Scale and daily functioning was assessed using a structured instrument. Quantitative data were analysed using paired t-tests, independent t-tests and ANCOVA adjusted for baseline values and age. Qualitative data were analysed using a pragmatic deductive-inductive thematic framework. Ethical approval was obtained prior to study commencement, and informed consent was obtained from participants.

Results: The WhatsApp-supported group showed significantly greater improvement in fatigue severity and daily functioning compared with usual follow-up. Fatigue scores improved by 1.25 points in the WhatsApp group compared with 0.29 points in the usual follow-up group (between-group difference $p<0.001$). Daily functioning improved by 10.23 points in the WhatsApp group compared with 2.90 points in the usual follow-up group ($p<0.001$). Participants reported improved self-management behaviours, acceptability of digital support and relevance of educational content.

Conclusion: A WhatsApp-based self-management support programme demonstrated potential as an accessible digital health approach for post-dengue recovery. Integration of structured digital follow-up into post-infection care may improve patient support. Larger randomized studies are recommended to evaluate long-term effectiveness.

Keywords: Digital Health; WhatsApp; Post-Dengue Fatigue Syndrome; Self-Management; Mixed-Methods Research

ABSTRACT 04

Integrating Public Health Technician-Led Behavioural Advocacy into Routine Blood Donation Services in Pakistan: A Single-Group Pre–Post Evaluation

Dr Yumnah Babar, Shamaila Mohsin, Sadia Ali, Nimbal Imtiaz, Saqib Khurshid

AFPGMI, NUMS, Rawalpindi Pakistan

Introduction: Misconceptions about blood donation can discourage voluntary and repeat donation yet, structured behavioral communication is rarely integrated into routine services in low- and middle-income countries. This study evaluated changes in misconceptions and donation intentions following a Public Health Technician-led advocacy integrated into transfusion services in Pakistan.

Methodology: A prospective single group pre-post study, was conducted over three months at a tertiary care transfusion center in Rawalpindi, Pakistan. Trained Public Health Technicians delivered a structured LAIR-framework based advocacy intervention during routine donor navigation. Donors completed a questionnaire adapted from previous literature, before and after. The primary outcomes were within-participant changes in endorsement of four prespecified binary misconception items. Secondary outcomes included future intention, confidence, satisfaction and emotional responses. Paired changes were analyzed using Mc Nemar's and Wilcoxon tests.

Results: Of 231 enrolled donors, 214 (92.6%) completed both assessments. All donors were male with a median age of 29 years (IQR 24-34). Post-intervention, significant reductions were observed in misconceptions including donation transmits HIV/hepatitis (18.2% vs 0.9%; $p<0.001$), women shouldn't donate (37.9% vs 8.4%; $p<0.001$) and blood diversion (57% vs 22.4%; $p<0.001$). No significant change was observed for prolonged weakness ($p=0.503$). Intention to donate again improved modestly ($Z=3.923$, $p<0.001$, $r=0.27$) as did confidence ($Z=2.461$, $p=0.014$, $r=0.17$). Donor satisfaction was high (97.7%).

Conclusion: A structural behavioral advocacy intervention delivered by trained Public Health Technicians was associated with reduced misconceptions and improved donation intentions. However, the all-male sample limits generalizability to female donors. This approach may represent a feasible strategy for further evaluation in other transfusion service settings.

Keywords: Blood Donors; Blood Donation; Health Education; Health Personnel; Health Behavior

ABSTRACT 05

AI Software in CT Lung Cancer Screening: Systematic Review of Test Accuracy Studies

From Detection to Better Decisions, Summayia Sabir

Islamabad Medical & Dental College

Introduction: Lung cancer mortality remains a leading cause of death globally. Low-Dose Computed Tomography (LDCT) screening is critical for early detection, but manual interpretation presents key challenges due to small nodule sizes, variable appearance, and high false-positive rates. Artificial Intelligence (AI) aims to assist in diagnosis, improve reader efficiency, and reduce false positives. This systematic review evaluates the diagnostic test accuracy and clinical utility of AI software in LDCT lung cancer screening.

Methodology: Search Strategy: Comprehensive literature search conducted across PubMed, Embase, Web of Science, Cochrane, and IEEE Xplore. Inclusion Criteria: Studies evaluating AI algorithm performance (sensitivity, specificity, accuracy, AUC, ROC curve analysis) in LDCT lung cancer screening. Data Extraction: Extraction of study design, AI model architectures, key validation datasets, and diagnostic accuracy metrics. AI Pipeline & Common Architectures The integration of AI into LDCT screening follows a multi-step pipeline: 1. Nodule Detection: Utilizing 2D/3D Convolutional Neural Networks (CNNs), U-Net, 3D-Net, and ResNet for primary lesion identification. 2. Segmentation & Volumetry: Automated 3D segmentation and accurate volumetric measurements. 3. Radiomics & Characterization: Extracting shape, texture, intensity, and deep learning radiomic features for nodule characterization. 4. Malignancy Risk Assessment: Computer-Aided Diagnosis (CADx) models trained on large databases (e.g., LIDC-IDRI, LUNA16) to estimate malignancy risk. 5. Risk Prediction: Machine learning/logistic regression models providing risk predictions for patient management. 6. Clinical Integration: Integrating imaging data with clinical and behavioral factors (age, smoking history, family history, chronic lung disease) for personalized decision support.

Results: Overall Performance: High diagnostic performance demonstrated across studies with sensitivity ranging from 85% to 98%, variable specificity, and Area Under the Curve (AUC) between 0.80 and 0.95. Common Models & Key Datasets: NLST (National Lung Screening Trial), LIDC-IDRI, LUNA16, and various institutional datasets. Validation: Validation frameworks span technical validation, clinical validation, and real-world performance metrics. Trade-Off Analysis & Clinical Utility Advantages: High sensitivity and specificity, improved workflow efficiency, reduced reader cognitive burden, and standardized interpretations acting as a reliable 'second reader'. Challenges & Limitations: Variability across scanner vendors and protocols, potential over-reliance on AI output, algorithm domain shifts, and integration barriers into existing picture archiving and communication systems (PACS).

Conclusion: AI software is highly accurate in nodule detection, segmentation, and risk prediction in LDCT lung cancer screening. While AI enhances screening, improves workflow, and reduces radiologist workload, it serves as a supportive tool rather than a replacement for human expertise. Rigorous clinical validation and human-AI collaboration remain essential to ensure safe, effective, and improved patient outcomes.

Keywords: Artificial intelligence; Low-dose CT; Lung cancer screening; Diagnostic accuracy; Deep learning

ABSTRACT 06

A One Health Perspective on the Social Determinants of Antimicrobial Resistance and Antibiotic Use Among Undergraduate University Students in Sukkur: A Sequential Mixed-Methods Study.

Nimra Hayat

Health Services Academy Islamabad

Introduction: Antimicrobial resistance (AMR) is a growing global public health challenge driven by inappropriate antimicrobial use and broader social determinants of health. University students are an important population because their antibiotic use behaviors can influence future antimicrobial stewardship. However, evidence regarding the social determinants of AMR from a One Health perspective among university students in Pakistan remains limited. This study examined the social determinants of AMR among undergraduate university students in Sukkur using a sequential explanatory mixed-methods design.

Methodology: A sequential explanatory mixed-methods study was conducted among undergraduate students from Aror University and Ziauddin University, Sukkur. In the quantitative phase, 422 students were selected using simple random sampling and completed a structured questionnaire adopted from the World Health Organization (WHO) Multi-country Public Awareness Survey on Antimicrobial Resistance and a validated One Health awareness questionnaire. Quantitative data were analyzed using descriptive statistics and Chi-square tests in SPSS version 27. In the qualitative phase, semi-structured interviews were conducted with 9 purposively selected participants until data saturation. Interview transcripts were analyzed using Braun and Clarke's thematic analysis, and quantitative and qualitative findings were integrated through a joint display.

Results: Most participants demonstrated poor knowledge regarding antibiotic use (60.0%) and antimicrobial resistance (57.1%). More than half showed poor attitudes (55.0%) and inappropriate antibiotic use practices (49.8%), while only 18.5% had good awareness of the One Health concept. Household income was significantly associated with antibiotic use practices, whereas gender, age, household income, and household composition were significantly associated with attitudes toward antimicrobial resistance ($p < 0.05$). Qualitative findings revealed limited formal understanding of One Health despite intuitive recognition of the interconnection between human, animal, and environmental health. Participants identified misconceptions regarding antibiotics, self-medication, financial constraints, easy access to antibiotics, inappropriate antibiotic use in livestock, environmental contamination, and inadequate public awareness as important contributors to AMR.

Conclusion: Antimicrobial resistance among undergraduate students is influenced by inadequate knowledge, inappropriate antibiotic practices, and underlying social determinants, particularly socioeconomic conditions. Integrating One Health and antimicrobial stewardship education into university curricula, strengthening public awareness initiatives, enforcing regulations on antibiotic sales, and promoting coordinated human, animal, and environmental health interventions are essential to improve responsible antibiotic use and combat antimicrobial resistance in Pakistan.

Keywords: Antimicrobial resistance; One Health; Social determinants of health; Antibiotic use; Sequential mixed methods

ABSTRACT 07

Artificial Intelligence Applications in Magnetic Resonance Imaging for Automated Stroke Detection, Segmentation, and Outcome Prediction

Dr. Shahzeb Jawwad

PAF Hospital

Introduction: Stroke ('brain attack') is a medical emergency caused by disrupted blood flow, classified into ischemic (blockage), hemorrhagic (bleeding), and transient ischemic attack (TIA). Gold standard MRI sequences include Diffusion-Weighted Imaging (DWI) for cytotoxic edema, Fluid-Attenuated Inversion Recovery (FLAIR) for tissue edema/gliosis, and Perfusion-Weighted Imaging (PWI) for penumbra assessment. However, manual MRI interpretation faces challenges like inter-observer variability, time delays, and cognitive fatigue. To evaluate the role of Explainable AI (XAI) tools in automating stroke detection, lesion segmentation, and outcome prediction while bridging algorithmic predictions with clinical trust and regulatory standards.

Methodology: The pipeline integrates large-scale MRI datasets and advanced machine learning models with explainability frameworks: Data Sources: Large, diverse MRI datasets (e.g., ATLAS, ISLES, clinical cohorts). Preprocessing: Rician noise reduction (Mean + Median filter), intensity normalization, and anonymization. Model Architectures: Supervised and deep learning techniques including 2D/3D CNNs and U-Net for lesion segmentation, along with SVM, Random Forest, and Ensemble models for classification. Explainability (XAI): Grad-CAM for spatial lesion localization, SHAP for feature attribution, and LIME for patient-specific decision rationales.

Results: Top Test Accuracy: Demonstrated 96%–99% sensitivity in lesion detection and an AUC of 0.89–0.92 in predicting 90-day functional recovery on MRI scans. Explainability Metrics: Grad-CAM achieved a 92% spatial overlap with expert radiologist Regions of Interest (ROIs). SHAP feature attribution increased clinician agreement by 78%. LIME provided 85% expert concordance for patient-specific rationale, and ICE plots confirmed high model stability (R2 = 0.87). Clinical Utility: Faster triage during stroke code protocols, improved interpretation consistency, reduced radiologist burden, and optimized patient-specific treatment pathways. Future Directions Federated Learning: Implementation of federated learning for multi-center datasets without compromising privacy. Resource Optimization: Adaptation of models to low-field MRI for resource-limited settings. Edge Computing: Deployment of edge computing for offline triage. Continuous Monitoring: Establishment of continuous model learning and monitoring frameworks.

Conclusion: AI integration into MRI stroke pathways represents a paradigm shift toward objective, rapid, and personalized neuro-vascular care. Incorporating XAI methodologies ensures diagnostic transparency, enhancing physician trust and enabling safe clinical translation.

Keywords: Artificial intelligence; Magnetic resonance imaging; Stroke; Automated detection; Segmentation; Outcome prediction

ABSTRACT 08

Effectiveness of a mHealth Intervention on Heat-Related Illness Knowledge, Perceptions, and Adaptive Practices Among Pregnant Women: A Quasi-Experimental Study Using the Health Belief Model

Iffat Kalsoom, Dr Nadia Noor, Hurmat Waheed, Khola Syed, Dr Shamaila Mohsin

AFPGMI, NUMS

Introduction: Rising temperatures increase maternal and fetal health risks, yet Pakistan's National Heatwave Guidelines do not address vulnerabilities specific to pregnancy, and pregnant women remain an under-targeted population for heat-related illness education. An educational advocacy campaign combined with mobile health (mHealth) messaging may improve heat-related illness knowledge and promote safer adaptive practices. Therefore, this study aimed to evaluate the effectiveness of a structured advocacy campaign combined with a WhatsApp-based mHealth intervention on heat-related illness knowledge, Health Belief Model (HBM) perceptions, and adaptive practices among pregnant women attending a tertiary care hospital in Rawalpindi, Pakistan.

Methodology: A quasi-experimental, two-arm, pre-test/post-test design was used. A total of 140 pregnant women (70 intervention, 70 control) were recruited via consecutive sampling; sample size was calculated using a medium effect size (Cohen's d=0.5, power=80%, alpha=0.05). Both arms received a single 25-minute face-to-face advocacy session; the intervention arm additionally received 4 weeks of WhatsApp-based educational messages. A structured, pilot-validated questionnaire (Cronbach's alpha=0.78) assessed knowledge, HBM constructs, and practices pre- and post-intervention. Wilcoxon signed-rank and Mann-Whitney U tests were used for within- and between-group comparisons.

Results: Post-intervention scores improved significantly within the intervention arm across most domains. Knowledge improved in 3 of 8 items (38%); perceived vulnerability, severity, benefits, barriers, and cues to action each showed 100% item-level significance, as did all 18 adaptive practice items. Between-group comparisons favored the intervention arm in 45 of 50 items (90%), with knowledge gains lagging behind perception and practice change.

Conclusion: A low-cost WhatsApp-based mHealth intervention meaningfully improved heat-related illness perceptions and adaptive practices among pregnant women, though knowledge gains were more limited. Structured educational and mHealth interventions should be integrated into routine antenatal care, with future content emphasizing concrete, scenario-based messaging and extended follow-up to assess retention.

Keywords: Hot Temperature; Health Belief Model; Pregnant Women; Text Messaging; Health Education

ABSTRACT 09

A comprehensive computed tomographic analysis of sphenoid sinus in terms of volume and protrusions of optic nerve/internal carotid artery in a subset of Pakistani population

Asma Aijaz, Naheed Khan, Sahar Mubeen, Beenish Rasheed

Karachi Medical & Dental College; Dow International Medical College

Introduction: Sphenoid sinus is a deeply situated paranasal sinus with complex anatomy and a challenging surgical approach. It is closely related to vital neurovascular structures, particularly the optic nerve (ON) and internal carotid artery (ICA), which may demonstrate anatomical variations and are vulnerable to injury during endoscopic transsphenoidal surgery (ETS). Rationale: Although sinus pneumatization influences neurovascular relationships, evidence regarding the association between sphenoid sinus volume and ON and ICA protrusions are limited in Pakistani population. Defining this relationship may enhance CT-based preoperative risk assessment and contribute to safer surgical planning. To determine the clinically significant association between the volume of sphenoid sinus and protrusions of optic nerve and internal carotid artery.

Methodology: The cross-sectional study was conducted from October 2020 to February 2021 at the Radiology Department of Dow University of Health Sciences, Karachi, and comprised males and females aged 20-60 years having no SS bony abnormality. Sphenoid volume, ON and ICA protrusions were examined in the computed tomography scans of the paranasal sinus. Based on the protrusions, the scan findings were split into four groups: Group 1 had no protrusion, Group 2 had ON protrusion, Group 3 had ICA protrusion, and Group 4 had protrusions of both the ON and ICA. Data was analyzed using GraphPad Prism 9.

Results: Of the 300 subjects, 171(57%) were males and 129(43%) were females. The overall mean age was 39.27±10.9 years. There were 147(49%) subjects in group 4, followed by 72(24%) in group 3, 42(14%) in group 2 and 39(13%) in group 1. Statistically significant difference was observed between sphenoid volume across the study groups for both male and female subjects ($p<0.001$).

Conclusion: There was significant relationship between internal carotid artery and optic nerve protrusions and sphenoid volume. Hence, a detailed CT sinus examination is strongly recommended prior to transsphenoidal surgical procedure.

Keywords: Optic nerve; Internal carotid artery; Sphenoid sinus; Computed tomography; Sphenoid bone

ABSTRACT 10

Incidence rate and outcome of positive and negative blood cultures in hematological malignancies on active treatment: A cross-sectional study.

Farzana Batool, Zara tul ain, Afifa Fahim, Muskbar

National Institute of Blood Disease & Bone Marrow Transplantation (NIBD)1 South City Hospital2

Introduction: The infectious diseases in hematological malignancies are a common problem, leading to adverse outcomes in patients. Hematological malignancy patients are extremely vulnerable to BSI because of the immunocompromised state caused by the condition and the treatment methods. Antimicrobial resistance makes matters worse in this case. Therefore, it is imperative that the common bloodstream pathogens be known along with their antimicrobial susceptibilities. The study was conducted primarily to assess the frequency and incidence rate of bloodstream infections. The study also identified the common pathogens with their antibiotic resistance patterns and the risk factors of BSI.

Methodology: A prospective cross-sectional study was carried out at the National Institute of Blood Diseases and Bone Marrow Transplantation (NIBD), Karachi, with sample of n = 174 blood cultures. The patients were enrolled through a consecutive non-probability sampling techniques. Patients with hematological malignancies receiving chemotherapy who had blood cultures obtained ≥48 hrs were included from July to December 2025. Demographic, clinical, microbiological data were collected from medical and lab records. Data were analyzed on SPSS 23.0, using descriptive and inferential statistics. The BSI incidence rate was calculated per 1000 patient-days, and factors associated with BSI were identified through univariable and multivariable logistic regression.

Results: Among 174 cultures, there were 16 (14.9%) BSI episodes, corresponding to an incidence rate of 25.92 per 1000 patient-days and 148 (85.1%) non-BSI cultures. The Gram-ve organism (57.7%) predominated with E. coli (19.2%), followed by Klebsiella pneumoniae (11.5%), while Staph. aureus and Micrococcus luteus were leading Gram+ve strains. The antimicrobial susceptibility testing revealed high antimicrobial resistance among Gram -ve isolates, particularly against carbapenems, cephalosporins, gentamicin and ciprofloxacin. On multivariable logistic regression model, only fever at admission emerged as independent predictors of BSI. patients who had fever at admission had 3.82 times significantly higher odds of developing an infection compared to patients who had no history of fever at admission (adjusted OR = 3.825; 95% CI: 1.08 - 13.53); p = 0.038). In the univariate analysis, fever at admission (p = 0.026), prior antibiotic use (p = 0.052), and prophylactic antibiotic use (p = 0.029) were identified as potential predictors of the emergence of BSI.

Conclusion: & Recommendation: The BSI were mainly due to Gram -ve bacteria, in which Escherichia coli was the most common isolate. Local surveillance of pathogens and their resistance patterns is advised for the appropriate use of empirical antibiotics.

Keywords: Hematologic Neoplasms; Bacteremia; Gram-Negative Bacteria; Drug Resistance; Bacterial; Microbial Sensitivity Tests

ABSTRACT 11

“Effectiveness of a Structured Nurse-Led Educational Intervention on Knowledge and Oral Anticoagulant Adherence Among Patients Following Cardiac Valve Replacement: A Quasi- Experimental Study”

Naheed Mushtaq

Faisalabad Institute of Cardiology

Introduction: Despite the continuous developments in cardiac surgery, a substantial number of patients continue to experience preventable complications following cardiac valve replacement, primarily due to lack of knowledge and poor adherence to oral anticoagulant therapy (Park & Jang, 2021; Gezer et al., 2021). In Pakistan, suboptimal warfarin compliance has been documented, with improvement during follow-up (Nazir et al., 2021). Nurse-led education has shown potential to improve anticoagulation knowledge and adherence (Eltheni et al., 2021). However, evidence from cardiac follow-up settings in Pakistan remains limited. To evaluate the effectiveness of a nurse-led educational intervention on knowledge and adherence to oral anticoagulant therapy among patients following cardiac valve replacement.

Methodology: A quasi-experimental one-group pretest–posttest study was conducted at the Faisalabad Institute of Cardiology, Pakistan. Sixty patients receiving oral anticoagulant therapy participated. The intervention was delivered over four weeks through three educational contacts addressing medication use, INR monitoring, safety precautions, missed doses, and adherence support. pre- and post-intervention outcomes were compared using paired analysis at $p < 0.05$.

Results: Median age was 34.5 years (range: 22–65); 33 (55.0%) were female and 27 (45.0%) males. Knowledge scores increased from 13.37 ± 3.79 to 23.10 ± 3.79 ($p < 0.001$). MMAS-8 adherence scores increased from 4.82 ± 0.72 to 7.15 ± 0.73 ($p < 0.001$) after intervention.

Conclusion: The intervention was associated with improvements in knowledge and adherence, supporting integration of structured nurse-led education into anticoagulation follow-up services. However, the one-group design limits causal inference. Controlled multicenter studies with samples and longer follow-up are warranted.

Keywords: Cardiac Valve Replacement; Oral Anticoagulants; Anticoagulation; Nurse-Led Education; Medication Adherence; Patient Knowledge; INR Monitoring; Quasi-Experimental Study

ABSTRACT 12

Sepsis as the Leading Cause of ICU Admission in a Tertiary Care Medical ICU in Pakistan: A Retrospective Study

Shireen Shah, Muhammad Nasir Khoso

South City Hospital, Karachi, Pakistan

Introduction: Sepsis remains a major cause of critical illness and mortality worldwide, with a substantial burden in low- and middle-income countries. Despite this burden, contemporary data describing sepsis-related ICU admissions and outcomes in Pakistan remain limited. This study aimed to determine the burden of sepsis among medical ICU admissions and describe patient characteristics, severity of illness, organ support requirements, and clinical outcomes.

Methodology: A retrospective observational study was conducted using prospectively collected data from the Pakistan Registry of Intensive Care. All adult patients discharged from the Medical ICU of South City Hospital, Karachi, between January 1 and December 31, 2025, were included. Demographics, admission diagnoses, APACHE II and eTropICS severity scores, organ support requirements, and ICU outcomes were analyzed using descriptive statistics.

Results: Among 915 ICU discharges, sepsis was the leading cause of admission, accounting for 398 cases (43.5%), followed by pneumonia (20.9%). The median age was 70 years (IQR 58–78), and 48.31% of patients were male. Mechanical ventilatory support was required in 35.52% of patients, while 6.56% required renal replacement therapy. The median APACHE II score was 11 (IQR 8–15), and overall ICU mortality was 7.43%.

Conclusion: Sepsis was the leading cause of medical ICU admission, highlighting its substantial critical-care burden in this Pakistani tertiary-care setting. Strengthening early sepsis recognition, timely evidence-based management, and infection-prevention strategies should remain clinical priorities. Continued registry-based surveillance studies can support quality improvement, resource planning, and locally informed strategies to improve critical-care outcomes in resource-limited settings.

Keywords: Sepsis; Intensive Care Units; Critical Care; Pakistan; Mortality

ABSTRACT 13

Momordica charantia L. Extracts Restore Ovarian Function in Estradiol-Induced Polycystic Ovarian Syndrome in Rats

Anosh Tahir, Saira Saeed Khan, Sadaf Naeem

Dow University of Health Sciences, Karachi, Pakistan, Department of Pharmacology, Faculty of Pharmacy & Pharmaceutical Sciences, University of Karachi, Karachi, Pakistan; Jinnah Sindh Medical University, Karachi, Pakistan; Baqai Medical University, Karachi, Pakistan

Introduction: Polycystic ovary syndrome (PCOS) is a common endocrine-metabolic disorder affecting 8-13% of reproductive-age women worldwide, causing hormonal imbalance, anovulation, and metabolic disturbances. Conventional pharmacotherapy is limited by side effects and poor adherence, prompting interest in plant-derived alternatives. Momordica charantia L. (bitter gourd) is traditionally valued for antioxidant, anti-inflammatory, and hypoglycemic properties. This study evaluated the therapeutic potential of aqueous fruit and seed extracts of M. charantia in restoring ovarian function and metabolic parameters in an estradiol-induced rat model of PCOS.

Methodology: PCOS was induced in female Wistar rats via a single intramuscular injection of estradiol valerate (4.5 mg/kg). Groups (n=6/group) were treated with M. charantia fruit and seed extracts at 500 and 1000 mg/kg/day for 60 days. In vitro assays (MTT cytotoxicity, DPPH antioxidant activity, luminol-based anti-inflammatory assay) were performed alongside in vivo assessment of estrous cyclicity, body and ovarian weight, fasting blood sugar, lipid profile, reproductive hormones (LH, FSH, estradiol), antioxidant enzyme activity, and ovarian histopathology, analyzed with $p<0.05$ considered significant.

Results: M. charantia extracts showed dose-dependent DPPH scavenging, peaking at 83.6±3.6% (fruit) and 56.6±1.43% (seed) versus 98.21±2.15% for ascorbic acid, and anti-inflammatory activity of 21.9% and 11.4% ROS inhibition, respectively, versus 73.2±1.4% for ibuprofen. In vivo, both doses significantly reduced body weight and fasting blood glucose ($p<0.01$), decreased LH and estradiol while increasing FSH ($p<0.01$), and improved lipid profile (reduced TC, TG, LDL; raised HDL; $p<0.01$) after 60 days versus PCOS controls. Estrous cyclicity was restored, ovarian cysts resolved, and histoarchitecture improved, with seed extract showing a slight advantage over fruit extract.

Conclusion: Aqueous fruit and seed extracts of Momordica charantia L. ameliorate hormonal imbalance, metabolic disturbances, and ovarian histopathological changes in estradiol-induced PCOS rats, supporting its potential as a natural adjunct therapy for PCOS. Further translational and clinical studies are recommended to confirm efficacy and safety in humans.

Keywords: Polycystic Ovary Syndrome; Momordica charantia; Antioxidants; Anti-Inflammatory Agents; Estrous Cycle

ABSTRACT 14

Correlation Between the Modified CT Severity Index and Complications of Acute Pancreatitis

AZWA MALIK, Muhammad Nazim Khan, Mannan Masud, Sidra Shabbir, Umer Fayyaz Ghani, Armghana Basharat

PAF Hospital Islamabad

Introduction: To determine the correlation between the Modified CT Severity Index (MCTSI) and complications of acute pancreatitis, and to evaluate its predictive ability for clinical outcomes.

Methodology: An analytical cross-sectional study was conducted at Pakistan Aeronautical Complex (PAC) Hospital, Kamra, and PAF Hospital, Islamabad, between October 2020 and September 2025. Non-probability consecutive sampling of patients with acute pancreatitis yielded a sample of 50. All patients underwent contrast-enhanced computed tomography (CECT) of the abdomen and were classified using MCTSI. Local and systemic complications, ICU admission, requirement for intervention, and length of hospital stay were assessed. Fisher's exact test, Spearman correlation, and ROC curve analysis were used.

Results: The mean age of patients was 35.70 ± 10.5 years. ICU admission increased progressively with the severity of acute pancreatitis. Local complications included pseudocysts (24%) and abscesses (2.6%) and were predominantly identified in patients with higher MCTSI grades. Systemic complications occurred in 6% of patients and were significantly associated with severe acute pancreatitis ($p < 0.001$). MCTSI showed a strong correlation with the total number of complications ($r = 0.68$, $p < 0.001$). ROC analysis demonstrated good predictive performance for complications, with sensitivity of 81% and specificity of 78%.

Conclusion: MCTSI is associated with complications of acute pancreatitis and provides a useful prediction of adverse clinical outcomes, supporting its use for early risk identification and clinical decision-making.

Keywords: Intensive Care Units; Length of Stay; Acute Pancreatitis; Prognosis; ROC Curve; Severity of Illness Index; Computed Tomography

ABSTRACT 15

Correlation of Tumor Biology (ER/PR/HER2) With SLN Metastasis

Dr Sidra Shabbir

Assistant Professor Surgery, Surgery Department, PAF Hospital, Islamabad, Pakistan; Dr Nawal Ashfaq; Resident Surgery, Surgery Department, PAF Hospital

Introduction: Breast cancer is a complex disease, meaning it can have different biological characteristics and spread to other parts of the body. SLNB is a crucial procedure used in the axillary staging of early breast cancer, which is clinically node-negative. Estrogen receptor (ER), progesterone receptor (PR) and human epidermal growth factor receptor 2 (HER2) are tumor biology markers that could affect the risk of lymphatic spread. To determine the correlation of ER, PR and HER2 status with sentinel lymph node metastasis among patients with Stage I–II invasive breast carcinoma.

Methodology: In this descriptive analytical study, 85 women with histologically confirmed Stage I–II invasive breast carcinoma who had sentinel lymph node biopsy were included. The study was conducted at a Tertiary Care Hospital of Rawalpindi, over a period of six months, from January 2026 to June 2026. Patients who received neoadjuvant therapy, had locally advanced breast cancer, had distant metastasis or had recurrent disease were excluded. Data regarding demographic features, tumor stage, tumor grade, lymphovascular invasion, ER status, PR status, HER2 status and sentinel lymph node findings were recorded. Chi-square test or Fisher's exact test was used to determine the association of tumor biology markers with sentinel lymph node metastasis, and logistic regression was used to determine the value of tumor biology markers as predictors of SLN positivity. The p value < 0.05 was regarded as statistically significant.

Results: The mean age of patients was 48.7 ± 10.6 years. Stage II disease was present in 54 patients (63.5%), while Stage I disease was present in 31 patients (36.5%). Sentinel lymph node metastasis was identified in 28 patients (32.9%), whereas 57 patients (67.1%) were SLN-negative. ER-negative tumors showed a higher rate of SLN metastasis than ER-positive tumors (48.3% vs 25.0%, p=0.041). PR-negative tumors were also more frequently associated with SLN positivity than PR-positive tumors (44.4% vs 24.5%, p=0.049). HER2-positive tumors demonstrated the highest SLN positivity rate compared with HER2-negative tumors (52.0% vs 25.0%, p=0.015). SLN metastasis was also significantly associated with Stage II disease, T2 tumor size, Grade III tumors and lymphovascular invasion. On logistic regression, HER2-positive status, ER-negative status, Stage II disease, Grade III tumor and lymphovascular invasion were significant predictors of SLN metastasis.

Conclusion: Sentinel lymph node metastasis was observed in nearly one-third of patients with Stage I–II invasive breast carcinoma. ER-negative, PR-negative and HER2-positive tumors were more frequently associated with SLN involvement. HER2 positivity, ER negativity and lymphovascular invasion were important predictors of sentinel lymph node metastasis. Assessment of tumor biology markers along with clinicopathological features may improve nodal risk stratification in early-stage breast cancer.

Keywords: Breast Cancer; Sentinel Lymph Node; ER Status; PR Status; HER2 Status; Tumor Biology; Lymph Node Metastasis

ABSTRACT 16

Real-World Experience with GLP-1–Based Therapies in Adults in Pakistan: A Prospective Cohort Study

Shireen Shah, Muhammad Nasir Khoso, Imran Ulhaq

Research Department, South City Hospital, Karachi, Pakistan Department of Critical Care Medicine, South City Hospital, Karachi, Pakistan Department of Endocrinology and Diabetes, South City Hospital, Karachi, Pakistan

Introduction: Obesity is an increasing public health challenge in low- and middle-income countries, contributing substantially to diabetes and cardiometabolic disease. GLP-1 receptor agonists and dual GIP/GLP-1 receptor agonists have demonstrated clinically meaningful weight reduction in randomized trials. However, prospective real-world evidence from Pakistan remains limited. This study aimed to evaluate the short-term effectiveness and tolerability of GLP-1–based therapies in routine clinical practice.

Methodology: This single-center prospective observational cohort study included adults with overweight or obesity receiving semaglutide or tirzepatide-based therapy at South City Hospital, Karachi. Consecutive eligible participants were enrolled and followed for three months. Outcomes included change in body weight, achievement of ≥5% weight loss, treatment persistence, and adverse events.

Results: A total of 40 participants were included; 31 (77.5%) received tirzepatide and 9 (22.5%) received semaglutide. At three months, the mean overall weight reduction was 5.0 kg, with 19/40 (47.5%) participants achieving ≥5% reduction in baseline body weight. Mean weight reduction was 6.5 kg with semaglutide and 4.5 kg with tirzepatide. Nausea was reported by 14/40 (35.0%) participants and heartburn by 11/40 (27.5%), predominantly during the first two days following administration. Gastrointestinal adverse effects were more frequently observed with semaglutide than tirzepatide. No serious treatment-related adverse events were observed.

Conclusion: GLP-1–based therapies combined with lifestyle modification were associated with clinically meaningful short-term weight reduction and an acceptable tolerability profile. Tirzepatide-based therapy appeared particularly well tolerated, while transient nausea and heartburn were the predominant adverse effects observed with semaglutide. Larger studies with longer follow-up are required to evaluate durability of weight loss, metabolic outcomes, and comparative effectiveness between therapies.

Keywords: Obesity; Glucagon-Like Peptide-1 Receptor Agonists; Tirzepatide; Semaglutide; Weight Loss

ABSTRACT 17

Prevalence and Clinical Impact of Dengue–Malaria Co-Infection Among Adults with Acute Febrile Illness in Islamabad, Pakistan: A Cross-Sectional Study

Safina Hameed Qureshi, Sania Hameed Qureshi, Fatash Ur Rehman, Aisha Hameed Qureshi, Syed Fahad Shah, Hassan Shafique

Medical Unit 3, Federal Government Polyclinic Hospital, Islamabad, Pakistan

Introduction: Dengue and malaria are endemic vector-borne diseases in Pakistan, and their overlapping presentations often complicate diagnosis in resource-limited settings. National studies report co-infection rates of 15–22% among febrile patients, but evidence on severity is inconsistent, and data from Islamabad remain limited. This study aimed to determine the frequency of dengue–malaria co-infection among adults with confirmed dengue and evaluate its association with disease severity and laboratory parameters.

Methodology: A cross-sectional study was conducted at Federal Government Polyclinic Hospital, Islamabad, from September to December 2025. Ninety-two consecutive adults (aged 18 years or older) with laboratory-confirmed dengue (positive NS1 antigen and/or anti-dengue IgM) were enrolled. Malaria was confirmed by blood smear and/or rapid immunochromatographic testing. Severity was classified per WHO criteria. Data were analyzed in SPSS v25; continuous variables were compared using the Mann–Whitney U test and categorical variables using Fisher's exact test. Multivariable logistic regression identified independent predictors of severity, and ROC analysis assessed the predictive performance of alanine aminotransferase (ALT).

Results: Co-infection was identified in 14/92 (15.2%) patients. Overall, 41/92 (44.6%) met criteria for severe disease, occurring more often in co-infected than mono-infected patients (57.1% vs 42.3%), though not statistically significant (p=0.385). Co-infected patients had significantly lower hemoglobin (median 11.75 vs 13.30 g/dL; p=0.007). On multivariable analysis, elevated ALT independently predicted severe disease (adjusted OR 1.009; 95% CI 1.001–1.016; p=0.020), while co-infection status, albumin, and hemoglobin were not independent predictors. ALT showed moderate discriminatory performance (AUC=0.628).

Conclusion: Dengue–malaria co-infection was present in 15.2% of adults with confirmed dengue in Islamabad and was associated with lower hemoglobin, though not independently with severity. Elevated ALT emerged as a significant, accessible predictor of severe disease. Routine malaria screening in dengue patients and incorporation of ALT into severity assessment are recommended, alongside larger multicenter studies to confirm these findings.

Keywords: Dengue; Malaria; Coinfection; Severity of Illness Index; Alanine Transaminase

ABSTRACT 18

Frequency of Hypothyroidism Among Patients with Type 2 Diabetes Mellitus

Maleeha Iftikhar, Fuad Ahmad Siddiqi, Fayyaz Hassan, Muhammad Naeem Qureshi, Kanaz Ahmad Siddiqi, Laila Yaseen

CMH Rawalpindi

Introduction: Hypothyroidism and type 2 diabetes mellitus (T2DM) are common endocrine disorders with a significant metabolic relationship, primarily mediated by insulin resistance. Their coexistence may complicate disease management and increase the risk of cardiovascular and metabolic complications. Despite the rising burden of T2DM in Pakistan, data on associated hypothyroidism remain limited. This study investigated the frequency of hypothyroidism among patients with T2DM to support early detection, integrated management, and improved clinical outcomes. To determine the frequency of hypothyroidism among patients with type 2 diabetes mellitus (T2DM).

Methodology: This descriptive cross-sectional study was conducted at Combined Military Hospital, Rawalpindi, from January 2024 to June 2024. A total of 200 patients with T2DM, aged 20–60 years, were included. Demographic and clinical data, including gender, age, duration of diabetes, body mass index (BMI), HbA1c, thyroid-stimulating hormone (TSH), and free thyroxine (FT4) levels, were collected. Hypothyroidism was defined as an elevated TSH level (>5 mU/L) with a low free T4 level (<0.9 ng/dL). Data were analyzed using SPSS version 23, with subgroup analyses performed according to gender, age, duration of diabetes, and BMI.

Results: The prevalence of hypothyroidism among patients with T2DM was 14.5%. The gender-specific prevalence was slightly higher in males (14.89%) than in females (14.15%). Age-specific prevalence was highest among patients aged 51–60 years (27.78%) and lowest among those aged 31–40 years (5.41%). Regarding the duration of diabetes, the highest prevalence was observed among patients with 5–10 years of diabetes (23.08%). BMI-based analysis showed the highest prevalence among normal-weight participants (20.78%) and the lowest among overweight participants (8.62%).

Conclusion: The prevalence of hypothyroidism among patients with T2DM was 14.5%, indicating a substantial burden of coexisting thyroid dysfunction. The prevalence was slightly higher among males and increased with advancing age. A higher frequency of hypothyroidism was also observed among normal-weight participants compared with obese and overweight patients. Routine thyroid function assessment may facilitate early detection and appropriate management of hypothyroidism in patients with T2DM.

Keywords: Type 2 Diabetes Mellitus; Hypothyroidism; Body Mass Index (BMI); Thyroid-Stimulating Hormone (TSH). POSTER PRESENTATIONS — POSTGRADUATE

ABSTRACT 19

CATCHING WHAT THE STETHOSCOPE MISSES: A CLINICAL AUDIT ON CRITICAL CONGENITAL HEART DISEASE (CCHD) SCREENING

Dr. Anum Shah

Fellow Neonatal Pediatrics, PAF Hospital

Introduction: Severe heart defects in newborns where survival depends on a patent ductus arteriosus (PDA), if the condition is missed and treatment- delayed it can be disastrous within hours. Pulse oximetry serves as a vital safety net to catch Critical Congenital Heart Disease (CCHD) that stethoscope examinations may miss. The object of the audit was to measure the percentage of eligible neonates receiving CCHD screening within the recommended timeframe (> 24 hours of life). The audit targeted >95% screening compliance (international benchmark), 100% documentation of results, and 100% prompt referrals for failed screenings.

Methodology: Audit conducted prospectively at NICU, PAF Hospital Islamabad over a period of 6 months from July to Dec' 2026. Inclusion Criteria: All neonates >24 hours of life, both term and preterm babies once stable on minimum oxygen support, not on an FiO2 > 0.3. Exclusion Criteria: Infants with known/antenatally diagnosed CHD, severe cardiorespiratory failure, or unstable clinical status. Numerator: Eligible neonates with pre-ductal (right hand) and post-ductal (either foot) SpO2 recorded and documented, completed within 24–28 hours or prior to discharge, with results clearly documented as pass/fail. Denominator: Total eligible neonates excluding known CHD or unstable infants.

Results: From July to September 2026, it was seen that the compliance rate was lower initially (77-88 % compliance) owing to to concept newness among newly trained staff, unwritten documentations, early discharges, and certain equipment factors. Following staff training sessions, monthly refreshers and structural improvements introduced around late september (eg screening checklists and handouts, dedicated documentation logbooks, and portable pulse oximeter availibilty) performance and compliance significantly improved meeting the benchmark of > 95 % and idenftification of congenital heart defects needing urgent intervention with timely referrals.

Conclusion: The audit concluded that pulse oximetery is a simple, bedside rapid screening test that helps catching a major disease and its disastrous effects on a neonate. By awareness into actionable compliance the department successfully sustained the international benchmark of screening ensuring that no vulnerable neonate missed the saftey net.

Keywords: Critical congenital heart disease; Pulse oximetry screening; Clinical audit; Newborn screening; Quality improvement

ABSTRACT 20

Treatment Patterns and Responses in Adult Primary Immune Thrombocytopenia Patients: A Single-Centre Study

Zainab Sarfraz, Fuad Ahmad Siddiqi, Maryam Khan, Kanaz Ahmad Siddiqi, Ayesha Ashraf Cheema, Kashaf ad Duja Awais

CMH Rawalpindi

Introduction: Adult primary immune thrombocytopenia (ITP) is an autoimmune disorder causing platelet destruction and an increased risk of bleeding, often progressing to chronic disease. Although treatment follows established first-, second-, and third-line approaches, real-world practices may vary due to accessibility and affordability, particularly in emerging healthcare systems. This study assessed treatment patterns and effectiveness among adults with primary ITP at a tertiary care center and identified clinical and demographic factors associated with treatment response. To characterize real-world treatment patterns and outcomes among adults with primary immune thrombocytopenia (ITP) treated at a tertiary care hospital.

Methodology: A retrospective observational study was conducted at Combined Military Hospital, Rawalpindi, involving adults (≥18 years) diagnosed with primary ITP between January 2023 and December 2024. Demographic, clinical, laboratory, and treatment data were extracted from electronic medical records. Treatment responses were assessed based on changes in platelet counts using the Wilcoxon signed-rank test. Multiple linear regression was used to evaluate predictors of treatment response, including age, sex, baseline platelet count, comorbidities, and blood group. Analyses were performed using SPSS version 29, with Institutional Review Board approval and a waiver of informed consent.

Results: Among 56 adults with primary ITP, corticosteroid-based first-line therapy significantly increased median platelet counts from 40 to 98 × 109/L ($p < 0.001$), with a 91.5% complete response rate. Second-line therapy, primarily eltrombopag and azathioprine, increased median platelet counts from 52.5 to 94 × 109/L ($p < 0.005$), with an 81.3% response rate. Older age and blood group B were associated with better treatment responses, whereas higher baseline platelet counts and comorbidities were associated with poorer responses. Sex was not significantly associated with treatment response.

Conclusion: The study confirms the established treatment sequence for primary ITP while highlighting patient-specific predictors of treatment response, including age, comorbidities, baseline platelet count, and blood group. These findings support a personalized approach to treatment, particularly in resource-limited settings. Larger multicenter studies are needed to validate these predictors and inform individualized treatment strategies.

Keywords: Purpura; Thrombocytopenic; Idiopathic; Platelet Count; Corticosteroids/therapeutic use; Eltrombopag/therapeutic use; Azathioprine/therapeutic use; Splenectomy; Thrombopoietin Receptor Agonists; Treatment Outcome; Retrospective Studies; Predictive Value of Tests

ABSTRACT 21

Dysphagia and Medullary Stroke

Ms. Sadaf Zahoor, Ms. Tehnait Fazal, Dr. Sadaf Noveen

Department of Speech & Language Therapy; National Institute of Rehabilitation Medicine, (NIRM)

Introduction: Dysphagia is a condition that is characterized by the difficulty in swallowing. It can result from the crico-pharyngeal dysfunction, a problem with the crico-pharyngeus muscles caused by the medullary stroke. The medulla contains the swallowing central pattern generator, and damage in this area can impair the both oral and pharyngeal phases, leading to serious complications such as aspiration pneumonia, dehydration, and mal-nutrition. The purpose of this study is to highlight the importance and awareness of compensatory swallowing therapy. The study aimed to evaluate the role of speech and language therapist in the recovery of dysphagia due to crico-pharyngeal dilation followed by the medullary stroke.

Methodology: A 55 year old male with left medullary infarction was presented with severe dysphagia. The clinical bedside assessment and video fluoroscopic swallow study revealed the incomplete relaxation of upper esophageal sphincter (UES), 70% pharyngeal residue and aspiration during 80% of thin liquid trials (Penetration- Aspiration Scale Score: 07). A structured dysphagia rehabilitation program was implemented, including Mendelsohn maneuver, chin tuck with resistance, masako maneuver, shaker exercises, super supra glottis swallows, postural management, and diet modifications. The patient was introduced ice chips after 10 days of indirect therapy with combination of electrical stimulation therapy. The progress was monitored weekly over 30 days.

Results: The post intervention modified Barium Swallow test revealed that the airway was cleared and food entered in the stomach. The pharyngeal residue reduced to 20% and aspiration events to 10 % of thin liquids trials. Swallow efficiency improved sufficiently to allow safe oral intake of soft solids and mildly thickened liquids with postural management. Functional Oral Intake Scale (FOIS) score improved from Level 2 to Level 5, though PEG tube feeding remained necessary for primary nutrition.

Conclusion: The compensatory swallowing therapy is reliable for dysphagia followed by medullary stroke. The researches revealed that medullary stroke recovered in 3 months but clinical experience supports that the dysphagia followed by medullary stroke recovered in 30 days. In conclusions, awareness and speech and language therapists play a significant role in the recovery of dysphagia followed by medullary stroke.

Keywords: Aspiration Pneumonia; Crico- Pharyngeal Dysfunction; Medullary Stroke. POSTER PRESENTATIONS — POSTGRADUATE

ABSTRACT 22

Beyond Hemoglobin Does Intravenous Iron Improve Maternal Recovery After Childbirth?

Prof. Dr. Shamsa Rizwan & Dr. Afia Ayyaz

Institution: | Department of Obstetrics & Gynaecology, PAF Hospital Islamabad

Introduction: Postpartum iron deficiency and anemia affect up to 45% of mothers worldwide. Maternal fatigue, cognitive symptoms, and delayed emotional recovery can significantly impair postpartum functioning. Oral iron therapy is limited by slow absorption, gastrointestinal adverse effects, and adherence challenges. Intravenous ferric carboxymaltose (FCM) provides rapid, high-dose iron replacement. This study evaluated patient-centred recovery outcomes in addition to standard hematological recovery.

Methodology: Single-centre, randomized controlled, parallel-group trial with 1:1 allocation. Setting: PAF Hospital, Islamabad. Participants: Clinically stable postpartum women diagnosed with iron deficiency anemia within 24–48 hours after delivery. Intervention: Single intravenous ferric carboxymaltose (FCM) infusion. Control: Standard daily oral ferrous sulfate therapy. Primary Outcome: Maternal fatigue measured using the Multidimensional Fatigue Inventory (MFI-20). Follow-up: Baseline, 2 weeks, 6 weeks, and 12 weeks postpartum. Blinding: Treatment was open-label; outcome assessment was blinded.

Results: 1. Maternal Fatigue (MFI-20) Fatigue was primary measured using the Multidimensional Fatigue Inventory (MFI-20) across follow-up intervals: Baseline MFI-20: IV iron 60 vs. oral iron 61 ($p = 0.5828$), indicating comparable baseline fatigue between groups. At 2 Weeks: IV iron 49 vs. oral iron 58; mean difference 9.0 (95% CI: 5.41–12.59; $p < 0.0001$). At 6 Weeks: IV iron 36 vs. oral iron 40; mean difference 4.0 (95% CI: 2.79–5.21; $p = 0.349$). Key Finding: The greatest between-group difference in fatigue reduction was observed at 2 weeks post-treatment. 2. Breastfeeding & Mood Outcomes Breastfeeding Self-Efficacy (2 Weeks): Significantly higher in the IV iron group (63.5 ± 6.8 vs. 59.8 ± 7.1, $p = 0.003$). Exclusive Breastfeeding Rate (6 Weeks): 50.7% with IV iron vs. 40.3% with oral iron ($p = 0.24$). EPDS Score (2 Weeks): Edinburgh Postnatal Depression Scale score was significantly lower in the IV iron group (14.0 ± 4.7 vs. 16.0 ± 4.7, $p = 0.01$). EPDS Score (6 Weeks): Maintained significant improvement in the IV iron group (6.3 ± 4.4 vs. 8.2 ± 2.9, $p = 0.01$). 3. Hematological Recovery Metrics Parameter / Marker | IV Ferric Carboxymaltose | Oral Ferrous Sulfate | p-value | Significance Ferritin (μg/L) at Follow-up | 99.2 | 49.4 | $p = 0.001$ | Statistically Significant Hemoglobin (g/dL) at 2 Weeks | 9.4 | 8.9 | $p = 0.001$ | Statistically Significant Hemoglobin (g/dL) at 6 Weeks | 10.1 | 9.5 | $p = 0.040$ | Statistically Significant

Conclusion: Intravenous ferric carboxymaltose (FCM) was associated with a more rapid early improvement in maternal fatigue compared to standard oral ferrous sulfate therapy. Furthermore, FCM treatment demonstrated significant clinical benefits, including higher breastfeeding self-efficacy, lower EPDS depression scores, and markedly greater replenishment of systemic iron stores and hemoglobin recovery. These findings strongly support incorporating patient-centred functional recovery metrics alongside conventional hemoglobin levels when evaluating postpartum anemia treatment strategies. Further multicentre studies are recommended to establish broader generalizability across diverse populations.

Keywords: Postpartum anemia; Ferric carboxymaltose; Oral iron; Maternal fatigue; MFI-20; Breastfeeding self-efficacy; EPDS. Developing a Multilevel Framework for Structured Language Intervention in Linguistically Diverse Clinical Contexts: A Qualitative Study of Speech-Language Pathologists Naima Farooq

SECTION 3

ONLINE PRESENTATIONS

UNDERGRADUATE

TOTAL SUBMISSIONS: 12

ABSTRACT 01

Effects of Chlorogenic Acid and Chlorogenic-Acid-Rich Preparations on Glycemic Control and Cardiometabolic Health in Adults With Metabolic Dysfunction: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Manahil Ikram, Sofia Zahoor, Wajiha Fatima, Amna Tahir, Mehak Shamshad

Department of Human Nutrition and Dietetics ·The Islamia University of Bahawalpur, Pakistan ·BS Human Nutrition and Dietetics

Introduction: Metabolic dysfunction, including prediabetes, insulin resistance, type 2 diabetes, metabolic syndrome, dyslipidemia, obesity with metabolic abnormality, and polycystic ovary syndrome (PCOS), is associated with cardiometabolic risk. Chlorogenic acid (CGA), a bioactive polyphenol found in coffee and plant sources, has been investigated for glycemic, lipid, and anthropometric benefits, with proposed mechanistic actions on metabolic pathways, but evidence across CGA formulations and cardiometabolic outcomes remains fragmented. This systematic review and meta-analysis evaluated the effects of CGA and CGA-rich preparations on glycemic and cardiometabolic outcomes in adults with metabolic dysfunction.

Methodology: This PRISMA 2020–compliant systematic review was prospectively registered in PROSPERO (CRD420261488698). Randomized controlled trials comparing oral isolated/purified CGA, standardized CGA-rich preparations with quantified CGA content, or CGA-containing combination products with placebo/sham were eligible. Searches covered seven prespecified databases and trial registries. Primary outcomes were fasting blood glucose (FBG), total cholesterol (TC), and low-density lipoprotein cholesterol (LDL-C). Random-effects meta-analyses generated mean differences (MDs) with 95% confidence intervals (CIs). Risk of bias was assessed using RoB 2 and certainty using GRADE.

Results: Nine RCTs contributed to the final quantitative synthesis. CGA-containing interventions reduced FBG (7 RCTs; MD −8.76 mg/dL, 95% CI −13.36 to −4.17; I2=61%), TC (9 RCTs; MD −12.63 mg/dL, 95% CI −20.89 to −4.38; I2=54%), and LDL-C (9 RCTs; MD −11.63 mg/dL, 95% CI −18.77 to −4.49; I2=52%). Favorable effects were also observed for fasting insulin, HOMA-IR, HbA1c, HDL-C, triglycerides, and hs-CRP, whereas body weight, blood pressure, and other inflammatory/hepatic outcomes showed more limited or inconsistent evidence. Full-study analyses were retained where previous heterogeneity-driven exclusions had occurred, with exclusions evaluated as sensitivity analyses.

Conclusion: CGA and CGA-rich preparations may improve key glycemic and lipid outcomes in adults with metabolic dysfunction. However, heterogeneity across populations, formulations, doses, and treatment durations limits definitive conclusions. Larger RCTs using standardized CGA interventions and adequate follow-up are warranted.

Keywords: Chlorogenic acid; glycemic control; lipid profile; metabolic dysfunction; meta-analysis

ABSTRACT 02

Association Between Sugar-Sweetened Beverage Consumption and Depressive Symptoms Among Adolescents: A Systematic Review and Meta-Analysis

Wajiha Fatima, Manahil Ikram

Department of Human Nutrition and Dietetics, Islamia University of Bahawalpur, Pakistan

Introduction: Adolescent depression represents a growing global public health burden, yet modifiable dietary risk factors remain understudied. Sugar-sweetened beverages (SSBs) are among the most widely consumed dietary items in adolescent populations worldwide, with plausible neurobiological links to mood dysregulation via glycaemic, inflammatory, and gut-brain axis pathways. No prior meta-analytic synthesis of the SSB-depression association in adolescents existed. This review estimated the pooled association between SSB consumption and depressive symptoms in adolescents aged 10–19 years.

Methodology: This review followed PRISMA 2020 guidelines with an OSF-registered protocol (DOI: 10.17605/OSF.IO/9BDTE). Five databases (PubMed, Google Scholar, OpenAlex, BASE, Cochrane Library) were searched from March to May 2026. Eligible studies were observational studies reporting adjusted odds ratios for the SSB-depression association in adolescents. Of 213 identified records, 182 were screened and 7 included in quantitative synthesis. A random-effects meta-analysis was conducted using REML estimation with Hartung-Knapp-Sidik-Jonkman adjustment. Certainty of evidence was assessed using GRADE.

Results: Seven cross-sectional studies (N = 263,476; South Korea, China, Malaysia, United States) were included. High SSB consumption was significantly associated with greater odds of depressive symptoms (aOR = 1.50, 95% CI: 1.19–1.89, p = 0.005; prediction interval: 0.82–2.74). Substantial heterogeneity was observed (I^2 = 96.83%). The association was directionally consistent across all seven studies and robust to leave-one-out sensitivity analysis. No subgroup variable significantly moderated the association. GRADE certainty was rated Very Low.

Conclusion: High SSB consumption is consistently associated with greater odds of depressive symptoms in adolescents. Causal inference is not warranted given cross-sectional designs and high heterogeneity. These findings support consideration of SSB consumption as a potentially modifiable dietary correlate of adolescent mental health. Future research should prioritise prospective cohort studies with validated depression instruments across diverse geographic populations.

Keywords: sugar-sweetened beverages; depressive symptoms; adolescents; meta-analysis; nutritional psychiatry

ABSTRACT 03

Effect of Digital Intervention on Awareness and Lifestyle Management about PCOS Among Women of Reproductive Age At An OPD in Two Tertiary Care Hospitals In Rawalpindi; A Quasi Experimental Study

Dr. Syed Fawad Mashhadi, Dr. Nadia Sultan, Dr. Komal Usman, Asifa Bibi, Mishaal Fatima, Sana Ahmed

Army Medical College Rawalpindi

Introduction: Polycystic ovary syndrome (PCOS) is a prevalent endocrine disorder among women of reproductive age, often associated with poor awareness and suboptimal lifestyle practices. Digital health interventions have emerged as a promising tool to improve health education and self-management in chronic conditions. To evaluate the effect of a video-based digital educational intervention on awareness and lifestyle management regarding PCOS among women of reproductive age. Additionally, to assess changes in knowledge, attitude, and practices (KAP), early symptom recognition, and health-seeking behavior following the intervention.

Methodology: A quasi-experimental study was conducted among women of reproductive aged 15-45 years in OPDs of two tertiary care hospitals in Rawalpindi from December 2025 to February 2026. Participants were selected using non-probability purposive sampling. Pre test data was collected by using a validated 25-item questionnaire assessing awareness, menstrual health knowledge, and lifestyle practices. A post-test was conducted followed by a structured video-based digital intervention. Data were analyzed using SPSS, with paired t-test applied to compare pre- and post-intervention scores, and p-value < 0.05 was considered statistically significant.

Results: A total of 423 eligible participants completed both pre- and posttest questionnaires. Mean ± standard deviation awareness score prior to intervention was 16.72±3.87, which is increased to 20.75±2.11 after the intervention. This increase indicated a better understanding of the disease condition when tested using the paired t-test (t= -29.092; p=0.0001).

Conclusion: Digital intervention significantly improved awareness and lifestyle management among women with PCOS. These findings support the integration of digital health strategies into routine patient education programs for PCOS management in resource-limited settings.

Keywords: Polycystic Ovary Syndrome; Health Education; Digital Health; Lifestyle; Patient Compliance; Reproductive Age Women

ABSTRACT 04

Efficacy and Safety of Theta Burst Stimulation for Obsessive-Compulsive Disorder: A Systematic Review and Meta-analysis of Randomized Controlled Trials

Sofia Zahoor, Amna Tahir, Hafiz Shahbaz Zahoor, Manahil Ikram, Shameen Zahra

Quaid-E-Azam Medical College, Bahawalpur

Introduction: Obsessive-compulsive disorder (OCD) is one of the ten most disabling psychiatric diseases, and it often remains inadequately controlled despite pharmacological and psychological interventions. Theta burst stimulation (TBS), a novel form of repetitive transcranial magnetic stimulation, has emerged as a promising non-invasive neuromodulation strategy for treatment-resistant OCD. This study aimed to evaluate the efficacy and safety of TBS versus sham stimulation in OCD patients by assessing changes in clinical response rate, total Y-BOCS, Y-BOCS subscales including obsession and compulsion, anxiety and depression, CGI, and adverse events.

Methodology: A systematic search was conducted across PubMed, CENTRAL, Scopus, Google Scholar, and ClinicalTrials.gov until June 18, 2026, identifying 5 RCTs involving 159 patients. Data was analysed using RevMan 5.4 to evaluate the effects of TBS on OCD patients. Risk of bias was assessed with the Cochrane ROB 2 tool, and publication bias with CMA 4.0 software. The certainty of evidence was appraised using the GRADEpro GDT approach. Pooled results were expressed as relative risks (RRs) and mean difference with 95% confidence intervals.

Results: Evaluation of RCTs concluded that patients receiving active TBS were more likely to achieve a clinically meaningful treatment response compared to sham stimulation (RR 1.77, 95% CI: 1.05–2.98, P=0.03, I2=9%). However, active TBS did not significantly improve total Y-BOCS scores versus sham stimulation (MD = −1.66, 95% CI: −5.53 to 2.21; P = 0.40), with substantial heterogeneity (I2=72%). Likewise, no noticeable differences were observed for obsession or compulsion subscale, depression, anxiety, or CGI outcomes. The estimated risk of adverse events was higher with TBS than sham stimulation, although the difference was not statistically significant (RR = 2.77, 95% CI: 0.71–10.84; P = 0.14).

Conclusion: TBS did not significantly improve continuous OCD symptoms but may increase clinically meaningful treatment response; however, safety estimates remain imprecise.

Keywords: Obsessive Compulsive Disorder; Theta burst stimulation; Clinical Response rate; Yale-Brown Obsessive Compulsive Scale; Efficacy; Safety

ABSTRACT 05

Dark Personality and Risky Cybersecurity Behaviour among IT Professionals

Ayesha Zahid

National Institute of Psychology; Quaid-i-Azam University, Islamabad

Introduction: Human behavior is a critical component of cybersecurity because employees' decisions and actions can create vulnerabilities despite technical safeguards. Personality traits may influence risk perception, self-regulation, rule compliance, and responses to online threats. The Dark Triad comprises Machiavellianism, narcissism, and psychopathy, which are associated with manipulation, self-interest, impulsivity, and reduced concern for social norms. Rationale: Although psychological factors are increasingly recognized in cybersecurity, limited research has examined the relationship between Dark Triad traits and risky cybersecurity behavior among professionals in Pakistan. Objective: This study examined the relationship between Machiavellianism, narcissism, psychopathy, and risky cybersecurity behavior and investigated differences according to age, gender, work experience, and organizational sector.

Methodology: A quantitative, cross-sectional research design was used. Three hundred (N = 300) office-based employees from public and private sector organizations in Islamabad and Rawalpindi were recruited through convenience sampling. Participants completed the Short Dark Triad (SD3) and Risky Cybersecurity Behaviors Scale (RScB). Data were analyzed using descriptive statistics, Pearson correlation, regression analysis, independent-samples t-tests, and ANOVA.

Results: Machiavellianism ($r = .218$, $p < .01$), narcissism ($r = .257$, $p < .01$), and psychopathy ($r = .392$, $p < .01$) showed significant positive relationships with risky cybersecurity behavior. The overall Dark Triad score was also positively associated with risky cybersecurity behavior ($r = .406$, $p < .01$). Regression analysis showed significant prediction of risky cybersecurity behavior by the Dark Triad ($\beta = .66$, $p < .001$), with psychopathy emerging as the strongest predictor. Younger and less experienced employees reported higher risky cybersecurity behavior. Public sector employees showed higher risk engagement than private sector employees ($p < .01$), whereas gender differences were nonsignificant ($p > .05$).

Conclusion: Dark Triad traits, particularly psychopathy, are associated with greater risky cybersecurity behavior. Organizations should complement technical safeguards with psychologically informed cybersecurity awareness, behavioral interventions, self-regulation training, and targeted prevention strategies for higher-risk employee groups.

Keywords: Dark Triad; risky cybersecurity behavior; cybersecurity; personality traits; IT professionals

ABSTRACT 06

Aetiological Categories and In-Hospital Outcomes of Cytopenias in Children Admitted to a Tertiary Care Hospital in Karachi, Pakistan

Noor Un Nisa Masqati, Seema Aftab, Madhia Abid, Falak Abro, Iqra Rehman, Muhammad Mustafa, Wajiha Asim, Saljok Ali

Department of Paediatrics, Dow University Hospital, Dow University of Health Sciences, Karachi; Dow International Medical College, Dow University of Health Sciences, Karachi

Introduction: Cytopenia in children arises from infectious, nutritional and malignant causes, and the underlying aetiology largely determines prognosis. Contemporary local data remain limited. This study determined the aetiological categories and in-hospital outcomes of children admitted with cytopenias, and factors associated with outcome.

Methodology: A cross-sectional study was conducted in the Department of Paediatrics, Dow University Hospital, Karachi, from August 2025 to April 2026. Children aged 1 month to 18 years admitted with cytopenia (haemoglobin <10.5 g/dL, total leucocyte count <4.0 × 109/L, or platelets <150 × 109/L) were enrolled by non-probability consecutive sampling; 101 were studied. Data were recorded on a structured proforma. Aetiology was categorised as nutritional deficiency, infectious disease, or malignancy/lymphoproliferative disorder/aplastic anaemia, and outcome as recovered, referred/on treatment, or expired/left against medical advice (LAMA). Analysis used SPSS v26 with Kruskal-Wallis (Bonferroni-corrected pairwise) and Fisher's exact tests; $p < 0.05$ was significant.

Results: Median age was 85 months (IQR 36–144) and 64 (63.4%) were male. Fever was commonest (86.1%), then pallor (45.5%). Aetiology was infectious in 74 (73.3%), malignancy/lymphoproliferative/aplastic anaemia in 17 (16.8%) and nutritional deficiency in 10 (9.9%). Overall, 83 (82.2%) recovered, 9 (8.9%) were referred or on treatment and 9 (8.9%) expired or left against advice. Aetiology was strongly associated with outcome ($p < 0.001$): 70 of 83 recovered children had infection, whereas 7 of 9 referred and 7 of 9 expired/LAMA had malignancy/lymphoproliferative/aplastic anaemia. Haemoglobin and platelet count differed across aetiological groups (both $p < 0.001$), and platelet count was the only continuous variable associated with outcome ($p = 0.001$).

Conclusion: Infection accounts for most paediatric cytopenias here and carries a favourable prognosis, whereas malignancy, lymphoproliferative disorders and aplastic anaemia account for most adverse outcomes. Children whose cytopenia is not readily explained by infection, particularly those with marked thrombocytopenia, warrant early bone marrow evaluation.

Keywords: Pancytopenia; Child; Anemia; Thrombocytopenia; Treatment Outcome

ABSTRACT 07

Robot-Assisted versus Video-Assisted Minimally Invasive Esophagectomy for Esophageal Cancer: An Updated Systematic Review and Meta-Analysis

Samreen Shahid, Muhammad Faizan Shaikh, Abdul Wasay, Idrees Shabbir, Nikhil Duseja, Muhammad Hashir

Karachi Medical and Dental College, Karachi, Pakistan

Introduction: Esophageal cancer is a leading cause of cancer-related mortality worldwide, and surgical resection with lymphadenectomy remains the cornerstone of curative treatment. Video-assisted minimally invasive esophagectomy (VAMIE) improved perioperative outcomes over open surgery, while robot-assisted minimally invasive esophagectomy (RAMIE) was introduced to overcome the technical limitations of the video-assisted approach; whether it offers measurable clinical benefit over VAMIE remains uncertain. We aimed to compare the intraoperative and postoperative outcomes of RAMIE versus VAMIE in patients with esophageal cancer.

Methodology: This systematic review and meta-analysis followed PRISMA 2020 guidelines and was registered on PROSPERO (CRD420251160918). PubMed, Cochrane Central, and Embase were searched from inception to 2025 for randomized controlled trials (RCTs) and observational studies comparing RAMIE with VAMIE. Two reviewers independently screened studies and extracted data, with disagreements resolved by a third reviewer. Risk of bias was assessed using RoB 2 and ROBINS-I. A random-effects model pooled standardized mean differences (SMDs) and odds ratios (ORs) with 95% confidence intervals (CIs); heterogeneity was quantified using the I2 statistic.

Results: 17 studies comprising around 5000 patients were included. RAMIE achieved a significantly greater lymph node harvest (SMD 0.73; 95% CI 0.29 to 1.17) and a significantly shorter postoperative hospital stay (SMD −0.39; 95% CI −0.76 to −0.02). Intraoperative blood loss, operative time, intensive care unit stay, anastomotic leakage, 90-day mortality, recurrent laryngeal nerve palsy, and total complications showed no significant differences.

Conclusion: RAMIE provides a more complete lymph node dissection and faster recovery than VAMIE without increasing perioperative morbidity or mortality. Given substantial heterogeneity and predominantly observational evidence, large RCTs with long-term oncological follow-up are recommended.

Keywords: Esophagectomy; Esophageal Neoplasms; Robotic Surgical Procedures; Thoracoscopy; Lymph Node Excision

ABSTRACT 08

Analysis of Aversion to Visual Dental Stimuli Among Dental Patients: A Cross-Sectional Study

D Iraj Shariq, Prof. Dr. Mehwish Kashif

Karachi Metropolitan University

Introduction: Dental fear and anxiety are widespread in the Pakistani population, creating a barrier to receiving oral health care. Visual dental stimuli such as dental instruments, procedures, and environment, can trigger negative emotional response, contributing to anxiety and avoidance behavior, yet limited evidence is available regarding visual dental aversion among Pakistani patients. The aim of this study was to evaluate visual dental aversion among Pakistani patients, investigate its association with dental fear, and determine the dental visual stimuli perceived as most aversive.

Methodology: A cross-sectional online study was conducted among Pakistani adults with current or previous dental treatment experience. Data was collected between March till May 2026, using a self-administered structured questionnaire. The survey comprised demographic information, the standardized 20-item Kleinknecht Dental Fear Survey (DFS), and a visual dental aversion assessment in which participants rated 33 high-resolution images of dental instruments, clinical environments, and dental procedures on a five-point Likert scale. Statistical analyses were performed using JASP (Version 0.18.3). Descriptive statistics, Pearson's correlation, and regression analyses were used to evaluate the data, with statistical significance set at $p < 0.05$.

Results: A total of 201 participants completed the study. Overall dental aversion was moderate, with invasive dental stimuli eliciting significantly greater aversion than routine dental stimuli ($p < .001$). Tooth extraction, suturing, and root canal treatment were identified as the most aversive visual stimuli, whereas routine items such as a toothbrush and a lab coat elicited the lowest aversion. A significant moderate positive correlation was observed between total dental fear and total dental aversion ($r = 0.614$, $p < .001$).

Conclusion: & Recommendation: Aversion to visual dental stimuli is strongly associated with dental fear among Pakistani population, with invasive dental treatments triggering greater aversive responses. Recognition of these visually aversive stimuli may facilitate dental professionals to adapt targeted anxiety-management strategies and enforce positive dental experience.

Keywords: dental anxiety; dental fear; patient behavior; pain perception; visual dental stimuli

ABSTRACT 09

Knowledge, Attitude and Practices Regarding Breast Self-Examination Among Female Undergraduate Students at Baqai Medical University

Ramza Ibrahim, Omama Syed, Muhammad Yasir Rishi

Baqai Medical University Karachi

Introduction: Breast cancer is the most common cancer among women worldwide, and Pakistan has one of the highest incidence rates in Asia. Breast self-examination is an inexpensive method for early detection, yet its practice remains low because of limited awareness and inadequate training. To assess the knowledge, attitude, and practices regarding breast self-examination among female undergraduate students at Baqai Medical University.

Methodology: A descriptive cross-sectional study was conducted from July to November 2025 among 264 female undergraduate students enrolled in MBBS, BDS, DPT, Pharm D, and MLT programs. Participants were selected using stratified random sampling. Data were collected through a validated self-administered online questionnaire and analyzed using IBM SPSS Statistics version 26. Chi-square test was applied to determine associations, with $p<0.05$ considered statistically significant.

Results: Overall awareness of breast self-examination exceeded 74%, and 86.4% of participants demonstrated positive attitudes. However, only 16.7% had adequate knowledge and the same proportion practiced breast self-examination regularly. Knowledge gaps were identified regarding risk factors, examination timing, and technique. Only 23.9% had received formal training, while 44.7% relied on internet-based information. Significant associations were observed between academic program and knowledge ($p=0.004$), attitude ($p=0.001$), and practice ($p=0.047$).

Conclusion: Although awareness and attitudes were generally positive, knowledge and regular practice of breast self-examination remained inadequate. Integrating practical training and structured educational interventions into undergraduate health sciences curricula may improve early detection practices among future healthcare professionals.

Keywords: Breast self-examination; breast cancer; knowledge; attitude; practice; undergraduate students

ABSTRACT 10

Effects of Exercise on Brain-Derived Neurotrophic Factors in Patients with Diabetes Mellitus: A Systematic Review and Meta-analysis of Randomized Controlled Trials

Rumeesa Parveen

Jinnah Sindh Medical University Karachi

Introduction: DM is a metabolic disorder causing elevated blood sugar and is a major risk factor for neurodegeneration. Brain-derived neurotrophic factor (BDNF) is a neurotrophin, important for brain circuit development, and its disturbance is related to neurodegeneration in diabetics. Exercise has emerged as a non-pharmacological intervention to elevate BDNF. Previous meta-analyses mostly evaluated BDNF in only one type of diabetes, leaving gaps regarding Type 1 and gestational DM, broader age groups, and Neuromuscular Electrical Stimulation (NMES). This review evaluates exercise effects (aerobics, resistance, combined training, and NMES) on serum BDNF and metabolic outcomes across all diabetes types, spanning adolescents to older adults.

Methodology: After screening 37 articles, 4 studies (3 RCTs, 1 crossover trial) with 131 participants were included. Searches were conducted on PubMed, ScienceDirect, EMBASE, Scopus, and Cochrane Central from inception to June 2025. PRISMA guidelines were followed. Two reviewers independently screened titles/abstracts and full texts, with a third resolving conflicts. Two reviewers extracted data. Two assessed risk of bias using Cochrane RoB 2. Data pooled using random effects model. PROSPERO registration: CRD420251116372.

Results: Serum BDNF was higher in the exercise group (MD = 73.50 pg/mL, 95% CI: 0.43–146.58; p = 0.05; I2 = 68%). Body fat percentage showed a non-significant reduction (MD = −1.24%, p = 0.17; I2 = 72%). Body weight (MD = 0.97 kg, p = 0.65; I2 = 0%) and FBG (MD = −1.51 mmol/L, p = 0.31; I2 = 99%) showed no significant differences. Moderate to high heterogeneity was noticed across the data analyzed.

Conclusion: Regular exercise positively affects serum BDNF levels in diabetics. However, conclusions are limited due to small trial numbers and sample sizes. Large-scale RCTs are required to confirm long-term neurological effects of exercise in diabetics.

Keywords: Diabetes Mellitus; Brain-Derived Neurotrophic Factor; Exercise

ABSTRACT 11

MACHINE LEARNING MODELS FOR PREDICTING MORTALITY IN PATIENTS WITH SEPSIS-ASSOCIATED ACUTE KIDNEY INJURY: AN UPDATED SYSTEMATIC REVIEW AND META-ANALYSIS OF MODEL PERFORMANCE AND VALIDATION.

Sabika Zehra, Fizza Haider

Dow Medical College Karachi

Introduction: To determine how accurately machine learning (ML) models predict mortality in sepsis-associated acute kidney injury (SA-AKI). Machine learning (ML) models have become promising tools for predicting mortality, potentially outperforming traditional clinical severity scores. A prior systematic review and meta-analysis conducted by Lv et al. (2024) assessed ML-based mortality predictions in S-AKI; however, two further reviews and a significant number of additional primary studies have been published since then, including independent external validation. We therefore conducted an updated systematic review and meta-analysis to integrate the new evidence, focusing specifically on the external validation of ML models.

Methodology: PubMed was searched from 20 July 2024 to 22 June 2026. The primary outcome was model discrimination, assessed using the area under the receiver operating characteristic curve (AUROC). Risk of bias was assessed using the Prediction Model Risk of Bias Assessment Tool (PROBAST).

Results: The pooled AUROC of ML models for predicting mortality in SA-AKI patients across 11 studies was 0.785 (95% CI: 0.758–0.810), with substantial heterogeneity (I2= 94%). The pooled AUROC remained relatively stable irrespective of validation type (internal 0.802 vs. external 0.771, P=0.29) and mortality endpoint (in-hospital 0.775 vs. 28-day 0.810, P=0.42). CatBoost and XGBoost, though, had comparable discrimination (0.791 vs. 0.802, P= 0.66); heterogeneity differed markedly between these two (17% vs. 97%). Different sensitivity analyses, including leave-one-out, precision-based, alternative external-dataset and Debray-derived standard error values, confirmed the robustness of the primary analyses.

Conclusion: ML models have acceptable-to-good discriminative capacity for mortality prediction in SA-AKI patients, confirming findings of Lv et al. 2024, but significant heterogeneity warrants prospective multicentre studies with extensive external validation before practical implementation. The lower heterogeneity of CatBoost, suggesting its reproducibility, makes it preferable for real-world utilisation.

Keywords: Machine learning; Sepsis-associated acute kidney injury; Mortality prediction; Predictive models; Systematic review; Meta-analysis

ABSTRACT 12

A cross-sectional study of Knowledge, Attitudes, and Practices Regarding Needle-Stick Injuries Among Medical and Nursing Students of Foundation University Islamabad.

Shafaq Aziz, Mariam Rafique, Ayemah Abbasi, Noura Dawood, Prof Dr Naila

Foundation University Medical College Islamabad

Introduction: The aim of this study is to assess and compare knowledge, attitudes, and practices about prevention of needle-stick injuries among the clinical-year MBBS and nursing students at Foundation University, Islamabad.

Methodology: A quantitative, cross-sectional analytical study was carried out among 282 clinical-year MBBS and nursing students using a non-probability convenience sampling technique. Data were collected using a structured and self-administered questionnaire. The questionnaire consisted of 4 sections; demographic data, knowledge, attitudes, and practices towards needle-stick injuries prevention. SPSS software version 27 was used for data analysis. Study design: Quantitative, Cross-sectional analytical study Place and Duration of Study: Department of Community Medicine at Foundation University, Islamabad. Starting date: 1st March, 2026 Completion date: 30th July, 2026

Results: Out of 282 respondents, 169 (59.9%) were MBBS students and 113 (40.1%) were nursing students. The overall percentages of moderate knowledge, neutral attitude, and good preventive practices towards needle-stick injuries among the participants were 56.8%, 55.9%, and 52.5%, respectively. The knowledge and practice scores among the nursing students was higher than the MBBS students, while attitudes were comparable between the two groups.

Conclusion: Clinical-year MBBS and nursing students demonstrated moderate knowledge, predominantly neutral attitudes, and generally good practices regarding needle-stick injury prevention. Nursing students had significantly higher knowledge and practice scores than MBBS students, while attitudes were comparable between the two groups. These findings highlight the need to strengthen infection-control education and practical training, particularly among MBBS students, to promote safer clinical practices.

Keywords: Attitude; Clinical training; Knowledge; Medical students; Needle-stick injuries; Nursing students

SECTION 4

ONLINE PRESENTATIONS

POSTGRADUATE

TOTAL SUBMISSIONS: 13

ABSTRACT 01

UGT gene polymorphism and its impact on the pharmacokinetics of valproic acid: Genetic association study conducted in Pashtun patients with epilepsy

Dr M.Saleh Faisal, Prof Dr Niaz Ali

Khyber Medical College Peshawar

Introduction: Ethnic diversity plays a vital role in clinical practice, significantly influencing the pharmacokinetics and pharmacodynamics of drugs. UDP-glucuronosyl transferase (UGT) is one of the most important phase II drug metabolizing enzyme, responsible for metabolism of many antiepileptic drugs which is expressed by UGT gene. The current study ascertains potential impacts of UGT gene polymorphisms on the metabolism of valproic acid in epileptic patients of Khyber Pakhtunkhwa.

Methodology: This longitudinal study enrolled 120 epileptic patients who visited the Lady Reading Hospital and Khyber Teaching Hospital, Peshawar. They were screened according to inclusion/exclusion criteria. Baseline interviews were conducted to collect the demographic data and details about seizures were documented on the structured proforma. Patients were prescribed valproic acid at recommended dosages and blood samples were drawn at three different phases. At the baseline visit, blood was collected for routine investigations and the genetic profiling of patients. DNA was extracted from blood samples by salting-out principle and targeted regions of UGT genes were amplified by PCR. Sanger sequencing was performed for genotype analysis and drug plasma levels were measured through HPLC. Clinical outcome was also observed in terms of reduction in the seizures frequency. As an end-point analysis, drug plasma levels, and clinical outcomes were correlated with patients' genetic profiles to determine the impact of chosen SNPs on the metabolism of VPA.

Results: The total number of enrolled patients with epilepsy were 120 with a notable prevalence of male participants at 66.3%. The mean age of subjects was 26.1 ± 13.5 years. The most common type of seizure was Generalized tonic-clonic whereas the most prevalent age group was 21-30 years. Regarding the distribution pattern of genotypes, heterozygous variants were more common in all the SNPs of UGT genes except UGT2B7-G211T where the homozygous wild genotype was present in 99.4% of patients. Statistically, no significant differences were observed in the genotype distribution between genders and seizure types. In VPA treated group, the lower plasma concentrations and poor seizure control were significantly correlated with homozygous mutants and heterozygous variants of UGT1A6. Nevertheless, no significant correlation was found between any of the UGT2B7-T161C genotypes and plasma concentrations.

Conclusion: The study concluded that homozygous and heterozygous variants of UGT1A6 are most likely associated with lower plasma concentrations of valproic acid in our study population.

Keywords: UGT polymorphism; Valproic acid; Pharmacokinetics; Epilepsy; Pharmacogenetics

Machine Learning-Based Prediction of GPCR Activation States to Guide Rational Inhibitor Design

Ayesha Saleem

Fazaia Medical college

Introduction: G-protein-coupled receptors (GPCRs) are the target of nearly one-third of approved drugs, yet distinguishing structural states relevant to inhibitor (antagonist) versus activator (agonist) design remains challenging. This study aimed to develop machine learning models classifying GPCR activation states, and to test whether the model's key structural biomarker also distinguishes antagonist-bound from agonist-bound conformations, supporting its use in inhibitor-design pipelines.

Methodology: A dataset of 1,822 GPCR structures (267 receptors) was assembled from GPCRdb. Structural distance features and ESM-2 sequence embeddings were used to train thirteen model architectures (XGBoost, Graph Neural Networks, Graph Attention Networks, ensembles) classifying structures as Active, Inactive, or Intermediate. Structures were additionally cross-referenced against RCSB PDB metadata to label 291 structures as agonist- or antagonist-bound, and the model's top structural feature was compared statistically (Mann-Whitney U test) between these two pharmacological groups.

Results: The best model (class-weighted XGBoost with fused sequence and structural features) achieved 90.31% accuracy (F1-macro 0.823). The TM3-TM7 helix distance emerged as the dominant predictive feature, corresponding to the established DRY-to-NPxxY activation motif. Antagonist-bound structures showed significantly larger TM3-TM7 distances than agonist-bound structures (21.12 Å vs 17.59 Å, n=291, $p<0.0001$), independently validating this feature's relevance to inhibitor binding (Figure 1).

Conclusion: Machine learning models combining structural and sequence data can reliably classify GPCR activation states, and their key structural biomarker significantly distinguishes antagonist- from agonist-bound conformations. This provides a computational, statistically validated screening signal to prioritize candidate inhibitor-bound conformations in early-stage drug discovery.

Keywords: GPCR; machine learning; inhibitor design; drug discovery; protein structure

Cross-Cultural Adaptation and Validation of Oral Health Education Resources in Pakistani Sign Language for Children with Hearing Impairment

Maria Moin

Bahria University Dental College Karachi

Introduction: Children with hearing impairment may experience communication barriers to oral health education (OHE), creating a need for culturally and linguistically appropriate resources. This study aimed to adapt an American Sign Language (ASL) OHE video into Pakistani Sign Language (PSL), validate the adapted video, and develop and validate a PSL knowledge, attitude, and practice (KAP) questionnaire.

Methodology: A methodological cross-cultural adaptation and validation study was conducted. An eligible ASL OHE video was translated into PSL through forward translation, synthesis, back translation, expert review, and professional editing. Content validation used the Patient Education Materials Assessment Tool for Audiovisual Materials (PEMAT-A/V) with three public health specialists. One school was randomly selected, and 30 children aged 12–16 years were recruited by simple random sampling for face validation using the Face Validity Index (FVI). Eleven key OHE messages were used to develop a 17-item English KAP questionnaire. Six public health professionals assessed content validity using the Content Validity Index (CVI). The questionnaire was adapted into PSL and face validated among 30 children. Descriptive statistics and validity indices were calculated.

Results: The PSL-adapted video retained semantic consistency with the original messages. PEMAT-A/V scores were 76.7% for understandability and 100% for actionability. Video S-FVI/Ave values were 0.91 for clarity and 0.82 for comprehension. All 17 questionnaire items achieved an I-CVI of 1.00 for relevance; S-CVI/Ave values were 1.00 for relevance, 0.84 for clarity, 0.83 for simplicity, and 0.96 for ambiguity. Six items were revised. The PSL questionnaire achieved S-FVI/Ave values of 0.93 for clarity and 0.95 for comprehension.

Conclusion: The adapted OHE video and PSL KAP questionnaire demonstrated acceptable validity for children with hearing impairment. Their use is recommended for culturally appropriate oral health education and assessment, with further evaluation in larger, diverse samples.

Keywords: Hearing Loss; Health Education; Dental; Sign Language; Surveys and Questionnaires; Validation Study

ABSTRACT 04

Effectiveness of Structured Digital Diabetes Self-Management Education (DSME) on Glycemic Control in Type 2 Diabetes in Jhelum, Pakistan: A Randomized Controlled Trial

Sumaira Riaz

AFPGMI, NUMS

Introduction: It is an established fact that Diabetes, a chronic disorder diminishes the quality of life of people in all age groups worldwide with the greatest burden beard by low- and middle-income countries like Pakistan. Lifestyle modification significantly improves the glycemic control in Type 2 Diabetic patients. However, one of the key challenges faced in Diabetes self-management education is that the routine conventional counselling in busy outpatient departments is often very brief, unfocused, fragmented and insufficient for sustainable behavioral change. There is an urgent requirement for low cost, culturally adapted and scalable interventions for improving the behavioral practices in resource limited settings that can be efficient in urban/semiurban settings. As more than 137 million of population of Pakistan uses smartphones, mHealth based intervention can be as an effective tool to improve the self-management practices in Pakistan. The primary objective of this study was to evaluate the effectiveness of structured digital diabetes self-management and education compared to conventional counseling on glycemic control (HbA1c) in T2DM patients in CMH Jhelum, Pakistan, over 3 months. The study also aimed to assess changes in self-efficacy and diabetes-related self-care behaviors between the intervention and control groups.

Methodology: This single-center, parallel-group randomized controlled trial was conducted at a tertiary care hospital in Jhelum, Pakistan. A total of 158 participants were stratified into male and female groups as per their recruitment percentages during screening for eligible patients, with random allocation of 79 participants into each of the intervention and control group. The intervention group received a structured Diabetes Self-Management Education through WhatsApp based messages delivered 2-3 times per week covering domains of diet, exercise, diabetes complications, medication adherence and periodic glucose monitoring, over a period of 12 weeks duration with their fasting blood sugar logging through mySugr App. The control group followed the routine hospital-based visits and subsequent counselling without any active intervention. Primary outcome was changes in HbA1C with changes in DSES and SDSCA sores being the secondary outcomes over three months. Data was analyzed using ANCOVA adjusting for baseline values and Intention to Tret Analysis was utilized as the primary approach. Trial Registration: IRCT.ir ID 20260703070054N1

Results: The results of this randomized controlled trial provides robust evidence for the effectiveness of the 12-week digital Diabetes Self-Management Education intervention in improving glycemic control, self-care behavior, and diabetes self-efficacy in patients with Type 2 Diabetes Mellitus. With Intention to Treat Analysis within both arms, all three primary outcome measures demonstrated statistically significant and clinically meaningful improvements in the intervention arm: HbA1c declined by 1.29 percentage points ($t = 10.958$, $p < .001$, Cohen's $d = 1.27$), SDSCA scores increased by 19.3% ($t = -10.440$, $p < .001$, Cohen's $d = 1.19$), and DSES scores increased by 14.7% ($t = -7.342$, $p < .001$, Cohen's $d = 0.84$). In contrast, the control arm demonstrated no significant HbA1c change ($p = .199$), and both SDSCA and DSES scores declined significantly over the same period, suggesting active deterioration in self-care behaviors and self-efficacy without structured support. Between-group comparisons confirmed that the intervention arm significantly outperformed the control arm on all three outcome change scores: HbA1c ($t(151) = 7.463$, $p < .001$), SDSCA ($t(88.7) = 11.469$, $p < .001$), and DSES ($t(115.8) = 7.451$, $p < .001$). Gender subgroup analyses showed that the intervention's glycemic effect was consistent across male and female participants (both $p < .01$ against their respective controls). One-way ANOVA confirmed that the magnitude of HbA1c improvement was not significantly moderated by age group, marital status, occupation, education or number of diabetic years, in either arm, suggesting that the DSME program is broadly effective across the demographic spectrum represented in this cohort.

Conclusion: In conclusion, it can be said with certainty that this RCT provides valuable evidence on the use of cost effective, scalable, culturally adapted digital applications (WhatsApp/mySugr app) for improvement in glycemic levels (HbA1C), self-efficacy and diabetes related self-care behaviors in Jhelum, Pakistan. This study offers an acceptable, effective and scalable answer to the problem of this growing epidemic burden in Pakistan`s resource constraint setting. Generalized implementation of such interventions can reduce the complications related to diabetes and improve the quality of life of millions of diabetic patients across the country and globally as well.

Keywords: Conventional counseling; Digital DSME interventions; Glycemic control Self-management; Self-efficacy; Semi-urban; Treatment adherence; Type 2 diabetes; Urban

ABSTRACT 05

BARRIERS AND ENABLERS TO ADVERSE DRUG REACTION REPORTING AMONG HEALTHCARE PROFESSIONALS AND STRATEGIES FOR IMPROVEMENT: A MIXED-METHODS STUDY AT A TERTIARY CARE TEACHING HOSPITAL

Dr Urooj Alam

AFPGMI, NUMS

Introduction: ADR under-reporting remains major pharmacovigilance challenge in Pakistan despite DRAP reporting mechanisms. Existing PV studies focus on Lahore and Karachi, with limited evidence from smaller cities in Punjab, leaving significant gap in understanding operational, cultural and administrative dynamics of tertiary hospitals in south Punjab, particularly Bahawalpur. Study objectives included, to explore the barriers and enablers influencing ADR reporting among HCPs, to assess current ADR reporting practices at a tertiary-care teaching hospital and to propose strategies for strengthening pharmacovigilance practice.

Methodology: A sequential explanatory mixed-methods approach was used. Quantitatively, 239 HCPs were consecutively sampled using a structured, pre-tested questionnaire covering sociodemographic, ADR reporting, under-reporting reasons, motivators and improvement measures; data were analyzed in SPSS v26 using descriptive/multiple-response analysis, chi-square/Fisher's exact tests and binary logistic regression ($p<0.05$). Qualitatively, 8 purposively selected HCPs were interviewed until thematic saturation, with data analyzed using Braun and Clarke's six-phase framework in NVivo v15.

Results: Of 239 HCPs (48.5% staff nurses, 43.5% physicians), 79.5% reported at least one ADR during their career. Professional experience ($\chi2=11.21$, $p=0.011$) and familiarity with ADR reporting systems ($\chi2=24.83$, $p<0.001$) were significantly associated with reporting; both remained independent predictors on logistic regression (OR=2.79, $p=0.023$ and OR=1.78, $p=0.004$, respectively; 84.1% classification accuracy). The commonest reasons for under-reporting were the perception that the ADR was already known (34.5%), uncertainty about procedure (29.8%) and difficulty reporting mere suspicion (29.8%); Training (51.9%), reminders (44.4%), feedback (41.4%) and simplified forms (40.2%) were the recommended improvements. Thematic analysis of interviews yielded five themes that converged with and contextualized the quantitative findings.

Conclusion: ADR reporting among HCPs is shaped by individual & organizational factors, with professional experience and system familiarity as independent predictors of reporting behaviour. Strengthening training, simplifying reporting pathways and fostering non-punitive reporting culture may improve ADR reporting and patient safety in tertiary-care settings in Pakistan.

Keywords: Adverse Drug Reaction; Drug Safety; Healthcare Professionals; Mixed-Methods Research; Pharmacovigilance

ABSTRACT 06

Predictors of Men's Attitudes Toward Domestic Violence Against Women: Religious Interpretations, Joint-Family Living, and Economic Pressures in Taxila, Punjab, Pakistan

Muhammad Ilyas

PhD Candidate, Faculty of Nursing, Thammasat University, Thailand; Principal, Isra College of Nursing, Isra University, Islamabad Campus

Introduction: Domestic violence against women remains a major public-health problem in Pakistan, where approximately one-third of ever-married women report intimate-partner violence and attitudinal acceptance of wife-beating persists. Men's attitudes are a key modifiable driver, yet male-focused multi-predictor studies are limited. This study examined the association and predictive contribution of religious interpretations, joint-family living, and economic pressures to men's attitudes toward domestic violence against women among married men in Taxila, Punjab.

Methodology: A quantitative cross-sectional survey was conducted among 400 currently married men selected by multistage probability sampling from urban and rural union councils of Taxila. Data were collected using a structured, content-validated questionnaire (S-CVI/Ave = 0.94) with four Likert subscales. Internal consistency was high (Cronbach's α = 0.90–0.95). Analyses included Pearson correlations, t-tests, ANOVA, and hierarchical multiple linear regression in SPSS, adjusting for socio-demographic covariates.

Results: Effective response rate was 95.2%. Mean attitude score was 2.76 (SD = 0.82) on a 1–5 scale. All three predictors correlated positively with accepting attitudes: religious interpretations (r =.46, p <.001), joint-family living (r =.42, p <.001), and economic pressures (r =.32, p <.001). Hierarchical regression showed the three predictors jointly explained 42.7% of variance (R2 =.427, adjusted R2 =.413). Each remained independently significant: religious interpretations (β =.33, p <.001), joint-family living (β =.31, p <.001), and economic pressures (β =.22, p <.001). Higher education was protective (β = −.13, p =.011).

Conclusion: Patriarchal religious interpretation, joint-family constraint, and perceived economic pressure independently predict men's acceptance of domestic violence. Prevention should prioritise religiously grounded egalitarian messaging, family-level engagement, and economic support linked to provider-identity reframing. Nurses are well placed to integrate attitude-focused education and referral into community practice. Longitudinal and intervention studies are recommended.

Keywords: Domestic Violence; Attitude of Health Personnel; Men; Religion and Medicine; Pakistan

ABSTRACT 07

Choosing Wisely: Exploring Perspectives of Medical Overuse and Evaluating Effectiveness of Brief Educational Videos among Patients and Healthcare Professionals: A Mixed Methods Study

Hajra Ikram

Introduction: Medical overuse, including unnecessary tests, medicines, procedures, and referrals, increases costs, exposes patients to avoidable harm and strains limited health-system resources. The Choosing Wisely initiative promotes clinician–patient discussions to reduce low-value care but its applicability in Pakistan is unclear and not captured by existing evidence. This study explored perceptions of medical overuse among physicians and patients and assessed whether a brief Choosing Wisely-based video was associated with improved physician and patient awareness and understanding of unnecessary care.

Methodology: A mixed-methods study was conducted in a tertiary healthcare setting combining qualitative exploration (16 physician IDIs; four patient FGDs, n = 21), followed by a quasi-experimental, post-test-only, non-equivalent group design. Qualitative findings informed the development of two culturally tailored educational videos, separate for physicians and patients. In the quantitative phase, 320 participants (160 physicians and 160 patients) were stratified by role (GPs vs. consultants) and patients by education level (low vs. high) yielding 80 participants per subgroup and allocated to either a no-video control group or a video intervention group. Data were analysed using descriptive statistics, chi-square, Mann–Whitney U, and linear regression.

Results: Qualitative findings identified physicians highlighting diagnostic uncertainty, fear of missed diagnoses, defensive practice, time pressure, patient expectations, and weak system controls as key drivers of overuse. Patients commonly viewed tests as reassuring and were influenced by trust in physicians, family expectations, and limited understanding of potential harms. Quantitatively, video exposure was associated with higher physician awareness ($B=0.343$, $p=0.005$), empowerment ($B=0.397$, $p=0.001$), composite alignment with Choosing Wisely principles ($B=0.471$, $p<0.001$) and lower defensive barriers ($B=-0.175$, $p=0.038$). Patients showed improved understanding ($p=0.002$) and recognition of consequences ($p=0.040$).

Conclusion: A brief, low-cost, culturally tailored video may improve awareness and acceptability of Choosing Wisely among physicians and enhance patient understanding of medical overuse, partially supporting the alternative hypothesis. Given the non-equivalent post-test-only design, findings should be interpreted as associations rather than definitive causal effects. Reducing medical overuse in Pakistan will likely require not only awareness interventions but also repeated education, shared decision-making, institutional guidance and system-level strategies.

Keywords: Choosing Wisely; educational video; medical overuse; mixed methods; post-test-only design

ABSTRACT 08

“Cold Chain Integrity: A Critical Link in Drug Safety and Distribution Management: A Cross-Sectional Study ”

Dr. Raja Muhammad Shahid Mushtaq

AFPGMI/ NUMS

Introduction: Cold chain management is vital to preserve the safety, potency, and effectiveness of vaccines and other temperature sensitive pharmaceuticals. The global expansion of the bio-pharmaceutical industry, coupled with increasingly complex sourcing and distribution networks, has intensified the challenges of maintaining proper cold chain conditions.(Fahrni et al., 2022; Feyisa et al., 2021). Pakistan faces significant challenges in maintaining effective cold chain systems, particularly under the Expanded Program on Immunization.(Buledi et al., 2017). This cross-sectional study aims to assess the integrity and effectiveness of the cold chain system implemented within pharmaceutical distribution setups.

Methodology: A descriptive cross-sectional study was conducted in District Rawalpindi to evaluate the knowledge, attitudes, and practices of cold chain handlers employed in registered pharmaceutical distribution facilities. A two-stage sampling method was employed. Simple random sampling was used to identify cold chain distribution facilities that stock cold chain medicines, while purposive sampling was applied to select study participants. A structured questionnaire was administered to 234 cold chain handlers, including pharmacists and cold chain managers, employed in registered distribution setups within the district of Rawalpindi. The collected data were entered into the full version of SPSS and analyzed using descriptive statistics. Chi-square tests were conducted to assess associations between dependent and independent variables.

Results: The findings demonstrated that even though many Cold Chain Handlers and facilities showed satisfactory performance in several aspects of cold chain management, important gaps and challenges still exist. Among 234 respondents, 56.8% had four to six years of professional experience, while 52.1% had not received formal cold chain management training. Knowledge was high among cold chain handlers for heat and freeze sensitive vaccines (100%), temperature monitoring (95.7%), EEFO/FIFO and SOP (95.7%), and correct vaccine arrangement in ice-lined refrigerators (90.6%). However, important knowledge gaps were identified among cold chain handlers regarding the Shake test procedure (43.6%), Adverse Events Following Immunization (44.4%), and the Open Vial Policy (49.6%). Most respondents reported satisfactory cold chain practices, including regular physical stock counting (93.6%), proper vaccine arrangement (89.7%), and maintenance of stock records (77.8%). Chi-square analysis demonstrated significant associations between respondents’ work experience and knowledge regarding cold chain management areas, including interpreting vaccine vial monitors, temperature monitoring, and understanding shake tests.

Conclusion: The study findings suggest that pharmaceutical distribution setups in the district of Rawalpindi generally maintain reliable cold chain management systems and infrastructure. However, gaps were identified in staff training, advanced vaccine handling practices, biomedical waste management, and implementation of some Cold Chain procedures, including shake tests and others. Supportive supervision, regular training, improvement in quality assurance systems, development of infrastructure, adaptation of contingency plans and emergency preparedness are necessary measures to improve cold chain management practices and ensure quality, safety, and effectiveness of vaccines across cold chain distribution facilities.

Keywords: Pharmaceutical cold chain; temperature monitoring; vaccines; vaccine storage

ABSTRACT 09

An Innovative Approach to Assessing Metacognition in Medical Education: Validation of a Shortened Metacognitive awareness inventory

Dr Numera Yousaf

JSMU Karachi

Introduction: Metacognitive awareness plays an important role in self-regulated learning and academic achievement. The original 52-item Metacognitive Awareness Inventory (MAI) may impose considerable respondent burden, while the shortened 19-item version has not been psychometrically validated among Pakistani medical students. This study aimed to establish the reliability and validity of the shortened MAI, compare metacognitive awareness across academic years, and examine its association with academic performance.

Methodology: A cross-sectional study with a psychometric validation component was conducted among undergraduate MBBS students at Jinnah Sindh Medical University. Using stratified quota sampling, 389 students from first to final year participated. The 19-item shortened MAI underwent expert content validation by three subject experts. Internal consistency was assessed using Cronbach's alpha, while construct validity was examined using principal component analysis. Differences in MAI scores were assessed using independent-samples t-test, and the relationship between MAI scores and cumulative grade point average (CGPA) was examined using Spearman's correlation.

Results: The shortened MAI demonstrated excellent content validity, with S-CVI/Ave values of 0.98 for relevance and 0.93 for clarity. Internal consistency was high (Cronbach's $\alpha = 0.875$). The mean MAI score was 65.37 ± 11.46. No significant differences were observed across academic years ($F = 2.106$, $p = 0.079$), age groups ($F = 1.875$, $p = 0.155$), or gender ($t = -0.97$, $p = 0.331$). A weak but statistically significant positive correlation was found between MAI score and CGPA ($\rho = 0.122$, $p = 0.018$). Exploratory factor analysis supported the theoretically proposed two-component structure of awareness and regulation of cognition.

Conclusion: The shortened 19-item MAI demonstrated good reliability and acceptable validity among Pakistani medical students. Its reduced respondent burden offers an innovative and feasible approach for integrating metacognitive assessment into medical education, with potential to support the development of reflective and self-regulated future healthcare professionals. Multicenter studies are recommended to establish its broader applicability in Pakistan.

Keywords: Metacognition; Academic Performance; Medical Education; Psychometrics

ABSTRACT 10

Effectiveness of a Multi-Component School-Based Educational Intervention on Improving Water, Sanitation, and Hygiene (WASH) Practices among Primary School Children in Rawalpindi: A Randomized Controlled Trial

Dr Paaras Suleman

Armed Forces Postgraduate Medical Institute; NUMS

Introduction: Poor water, sanitation, and hygiene (WASH) facilities remain a major public health challenge in Pakistan, particularly in public schools, where inadequate handwashing infrastructure contributes to preventable infectious diseases and school absenteeism. Although hygiene education is widely implemented, knowledge alone does not consistently translate into sustained hygiene practices. This study evaluated a multi-component intervention combining hygiene education, environmental cues, and student-led participation to improve handwashing behaviour among primary school children. To assess the effectiveness of a multi-component school-based WASH intervention in improving handwashing with soap (HWWS) practices and reducing sickness-related absenteeism among primary school children in peri-urban Rawalpindi.

Methodology: A two-arm, parallel cluster-randomized controlled trial was conducted among 188 primary school children aged 6–12 years in public schools of peri-urban Rawalpindi. Schools were allocated to intervention and control clusters. The four-week intervention included interactive hygiene education, provision of soap, environmental nudges (mirrors and painted footprints), and student-led WASH committees. Data were collected through structured handwashing observations and a validated questionnaire assessing hygiene knowledge, attitudes, and practices. Longitudinal changes were analysed using Generalized Linear Mixed Models adjusted for baseline variables and clustering effects. Trial Registration: Iranian Registry of Clinical Trials (IRCT), registration number IRCT20230814059147N2.

Results: The intervention significantly improved observed handwashing practices and technical proficiency. Mean handwashing technique scores increased from 6.88 at baseline to 8.68 post-intervention and 8.92 at three-month follow-up, indicating sustained behavioural adoption. Improvements were particularly evident in complex handwashing steps, including rubbing fingertips and backs of hands, with increases of up to 30.3%. At three-month follow-up, illness prevalence was lower in the intervention group than in controls (21.9% vs 38.5%).

Conclusion: A multi-component school-based WASH intervention integrating behavioural nudges, infrastructure support, and student engagement effectively improved handwashing practices and reduced sickness-related absenteeism among primary school children in peri-urban Rawalpindi. Integrating behaviour-change strategies with supportive school environments may offer a scalable approach to strengthening child health and hygiene outcomes in resource-limited settings. Schools should shift from informational lectures toward structural cues, empower student committees to support local facility maintenance, and scale user-centred health-system approaches across urban Pakistan.

Keywords: Water; sanitation and hygiene (WASH); handwashing with soap; school health; behavioural intervention; cluster randomized controlled trial; Pakistan; absenteeism

ABSTRACT 11

Vaping: Changing What Students Know, Not What They See. A Quasi-Experimental Evaluation of a Multimodal Anti-Vaping Campaign Among University Students.

Alina Tariq, Dr. Farwah Javed, Syeda Andleeb Zahra Hamdani, Mariyam Chaudry.

Department of Public Health, Armed Forces Post Graduate Medical Institute, Rawalpindi.

Introduction: As vaping becomes increasingly popular among young people, public health efforts must move beyond simply raising awareness to changing what the students know and believe about vaping. This study evaluated a multimodal anti-vaping campaign in Pakistan, assessing how digital innovations bridge the discovery-to-delivery gap in public health education.

Methodology: A quasi-experimental, two-arm study evaluated 200 public-sector university students recruited via convenience sampling. A face-to-face interactive seminar (Phase 1) was followed by a one-month reinforcement phase (Phase 2), comparing an active WhatsApp digital group with passive campus Information, Education and Communication IEC materials. Factual awareness and normative beliefs were assessed using adapted instruments. Data were analyzed using Wilcoxon Signed-Rank (Phase 1), independent-sample t-tests, Mann-Whitney U, and Chi-square tests (Phase 2).

Results: Immediate post-seminar factual awareness improved significantly ($Z = -8.687$, $p < .001$, $r = .434$), with 71.0% demonstrating increased factual awareness. In contrast, immediate normative beliefs showed no overall significant change ($Z = -0.762$, $p = .446$). At one-month follow-up, aggregate scores did not differ significantly between the WhatsApp (49.44 ± 6.44) and IEC (50.19 ± 9.09) arms ($t = 0.673$, $p = .502$). However, item-level analysis showed significantly higher factual-awareness responses across evaluated domains in the WhatsApp arm (all $p < .001$) and favorable shifts in specific pro-vaping normative beliefs, related to enjoyment ($p < .001$), social appeal ($p = .003$) and weight control ($p = .008$)

Conclusion: While single educational seminars deliver immediate factual knowledge, they are insufficient to shift deeply rooted peer norms. Active digital reinforcement effectively sustains factual retention and dismantles targeted normative misconceptions better than passive materials. Public health frameworks should prioritize multi-modal digital delivery to optimize educational interventions.

Keywords: Electronic Nicotine Delivery Systems; Health Education; Vaping; Smartphone; Students; Universities

ABSTRACT 12

EFFECTIVENESS OF VIRTUAL REALITY REHABILITATION IN IMPROVING UPPER LIMB FUNCTIONING IN post-stroke PATIENTS.A SYSTEMATIC REVIEW

Kiran Latif, Naila Nabi

Zia ud din University Karachi

Introduction: Stroke frequently causes upper-limb impairment, reducing functional independence and quality of life. Virtual reality (VR) offers interactive, task-specific rehabilitation that may enhance motor recovery. However, inconsistent findings across studies warrant further synthesis. This systematic review evaluates the effectiveness of VR compared with conventional therapy for improving upper-limb function after stroke.

Methodology: A systematic search of studies on randomized controlled trials on the effectiveness of rehabilitation using virtual reality (VR) technology to improve upper extremity motor functioning in stroke survivors was conducted across databases such as PubMed, PEDro, and Google Scholar. Articles that were written in English in peer-reviewed journals that compared VR-based exercise therapy (with or without regular exercise therapy) against regular exercise therapy or no therapy were selected. Duplicates were removed and 62 articles were screened; 35 full-text articles were evaluated, and 25 studies met the inclusion criteria. Screening and data extraction of studies were performed by two independent reviewers using a structured form

Results: Twenty-five studies met the eligibility criteria for inclusion in this systematic review. The included studies evaluated the effectiveness of virtual reality training on upper limb functioning in post-stroke patients compared with conventional physiotherapy. Overall, the interventions primarily targeted upper limb motor function, dexterity, functional performance, and activities of daily living.

Conclusion: This systemic review shows that VR-based rehabilitation is safe and efficacious as an additional method of rehabilitation to traditional rehabilitation for recovery of upper limb functions after a stroke. VR systems which are immersive and combinatory were found to have more pronounced positive effect, while home-based VR had promising results in terms of accessibility and motivation. Yet, VR does not necessarily exceed the efficacy of traditional rehabilitation if the intensity of therapy was the same. Due to differences in patients' health condition, amount and nature of intervention, type of VR used and other factors, comparison was quite difficult to conduct

Keywords: Virtual reality rehabilitation; upper-limb functioning; Post-stroke patient; conventional physiotherapy

ABSTRACT 13

Multimodal Therapy With Metformin, Inositol and Dietary Restriction Improves Insulin Resistance and Endocrine Outcomes in Women With Polyendocrine Metabolic Ovarian Syndrome: A Randomized Controlled Trial

Noor ulAin Irfan

Islamabad medical and dental college

Introduction: Polyendocrine Metabolic Ovarian Syndrom (PMOS) is characterized by insulin resistance, hyperandrogenism, and ovulatory dysfunction. Inositol isoforms act as insulin second messengers and play a critical role in ovarian physiology. Evidence on their clinical efficacy in South Asian women—who exhibit a high metabolic-risk PMOS phenotype remains limited. To evaluate the effects of combined myo-inositol and D-chiro-inositol therapy on metabolic, hormonal, anthropometric, and reproductive parameters in women with PMOS.

Methodology: This 12-week randomized, parallel-group controlled trial was conducted at Shaheed Zulfiqar Ali Bhutto Medical University in collaboration with Pakistan Institute of Medical Sciences, Islamabad (ClinicalTrials.gov: NCT07380841). Women aged 18–40 years diagnosed with PMOS according to the Rotterdam criteria were randomized into four groups; the present analysis reports outcomes of the inositol arm. Participants received myo-inositol 2 g plus D-chiro-inositol 50 mg twice daily. Primary outcomes were HOMA-IR, serum testosterone, and LH/FSH ratio. Secondary outcomes included body mass index (BMI), waist circumference, lipid profile, menstrual regularity, ovarian morphology, and Ferriman–Gallwey score. Pre- and post-intervention comparisons were performed using paired t-tests.

Results: Forty-eight participants completed the inositol intervention. Significant reductions were observed in body weight (−7.15 ± 1.75 kg), BMI (−2.80 ± 0.71 kg/m2), and waist circumference (−7.56 ± 1.91 cm) ($p < 0.001$). Fasting glucose, fasting insulin, and HOMA-IR decreased by −15.45 ± 3.81 mg/dL, −6.76 ± 2.19 μU/mL, and −2.06 ± 0.66, respectively ($p < 0.001$). Serum testosterone declined by −22.80 ± 8.87 ng/dL, with normalization of the LH/FSH ratio. Menstrual regularity improved from 31.2% to 79.2%, and polycystic ovarian morphology decreased from 83.3% to 54.2% ($p < 0.001$). Lipid parameters improved significantly. No serious adverse events were reported, and treatment adherence exceeded 80%.

Conclusion: Combined myo-inositol and D-chiro-inositol therapy significantly improves insulin resistance, hyperandrogenism, body composition, and menstrual cyclicity in women with PMOS. This safe and well-tolerated intervention represents an effective fertility-friendly therapeutic option for metabolically high-risk South Asian populations.

Keywords: Polycystic syndrome; Myo-inositol; D-chiro-inositol; Insulin resistance; Hyperandrogenism; Randomized controlled trial

SECTION 5

IN-PERSON PRESENTATIONS

UNDERGRADUATE

TOTAL SUBMISSIONS: 40

ABSTRACT 01

Are We Over-Imaging Headaches? Assessing Appropriate Use Of Neuroimaging Based On NICE CG150 Criteria

Esha Habib

Pakistan Institute of Medical Sciences

Introduction: Primary headache disorders are a leading cause of neurological consultations. Despite established NICE CG150 guidelines, neuroimaging is frequently overutilized in the absence of red flag features, contributing to unnecessary radiation exposure and increased healthcare burden. To evaluate the extent of CT neuroimaging use in primary headache patients and assess adherence to guideline-based imaging practices.

Methodology: This observational study was conducted at Pakistan Institute of Medical Sciences, Islamabad, from December 2025 to March 2026. A total of 144 patients aged >12 years presenting with primary headache disorders were enrolled using convenience sampling from outpatient and emergency settings, while patients with secondary underlying causes were excluded. Data was analyzed using SPSS and Shapiro wilk test was used to test for normality and Chi square test was used to assess the association between study variables and outcome.

Results: The mean age was 30.5 ± 12.45 years, with a female predominance (77%). Tension-type headache (47.9%) and migraine (39.6%) were the most common diagnoses. CT neuroimaging was performed in 15.3% of patients, with overall guideline compliance of 84.7%. Imaging was significantly associated with case type (new vs old). Symptoms such as dizziness, tinnitus, and numbness showed significant association with imaging, while typical migraine features did not. Increased imaging trends were observed in severe cases and when managed by postgraduate residents.

Conclusion: Overall, CT utilization was largely guideline-concordant, demonstrating appropriate use in most clinical scenarios. Despite this general adherence, we identified reduced imaging rates among patients presenting with certain neurological red flags which needs further consideration.

Keywords: Headache; Neuroimaging; Neurology; NICE Guidelines; Clinical Audit

ABSTRACT 02

Emotional Intelligence and Conflict Management Styles in Hospital Staff of a Tertiary Care Hospital: A Correlational Study

Dr. Nadia Ramzan, Sameen Asim, Namra Shafique, Mukarram Ahmad, Sohaib Azeem, Hamza Gul

CMH Rawalpindi

Introduction: Interpersonal conflicts are common in healthcare settings. International studies have shown that higher Emotional Intelligence (EI) is linked with better Conflict Management Styles (CMS).2, The association of EI with CMS among healthcare staff has remained under-explored, despite its impact on patient care and workplace environment. This study aimed to identify predominant CMS among healthcare professionals in Pakistan and determine its correlation with Emotional Intelligence.

Methodology: An analytical cross-sectional study was conducted at PEMH and CMH, Rawalpindi, from May–July 2026. Out of 340 participants calculated using the Cochrane formula, 293 valid responses were obtained using non-probability purposive sampling. Inclusion criteria included registered doctors, house officers, nurses, paramedics, and admin staff of PEMH and CMH. Exclusion criteria included individuals with a history of psychiatric illness, psychotherapy, or psychiatric medication. Data were collected using pre-tested questionnaires, ROCI-II and WLEIS, administered via Google form, and analyzed using IBM SPSS v29.0.5

Results: Among 293 responses, Avoidance was the most preferred conflict management style (27.6%). Regulation of Emotion was the most prevalent EI subscale (43.3%). Low EI staff predominantly preferred Avoidance (31.3%), while High EI staff preferred Competition (35.6%). EI, age, and length of service were significantly associated with an individual's preferred CMS ($p < 0.001$). Significant positive associations were found between EI and CMS, strongest with Cooperation ($\rho = 0.57$, $p < 0.001$).

Conclusion: This study confirmed that EI positively correlated with CMS, with Avoidance as the predominant conflict management style. These findings highlight the need for targeted EI development programs to improve conflict resolution and patient care quality.

Keywords: Behavior; Emotional Intelligence; Health Personnel; Hospital; Interpersonal Relations

ABSTRACT 03

Patient Satisfaction with the Sehat Sahulat Program (SSP) Among Enrolled Inpatients at Rehman Medical Institute, Peshawar, Pakistan: A Cross-Sectional Study

Sahibzada Salman Wali, Muhammad Saad, Muhammad Uzair Asif, Muhammad Sadiq

Rehman Medical College Peshawar

Introduction: Pakistan remains among the lowest per-capita spenders on health globally, with out-of-pocket payments historically exceeding 60% of national health expenditure. The Sehat Sahulat Program (SSP), launched by the Government of Khyber Pakhtunkhwa in 2015, is a cashless, publicly financed health insurance scheme designed to reduce this financial burden. Rehman Medical Institute (RMI), a private tertiary care hospital in Peshawar empanelled under SSP, lacks institution-specific evidence on beneficiary satisfaction. This study aimed to assess patient satisfaction with SSP among enrolled inpatients at RMI.

Methodology: This descriptive cross-sectional study was conducted among 384 SSP-enrolled inpatients at RMI, selected through non-probability consecutive sampling. Data were collected using a validated, structured 22-item, 7-point Likert-type questionnaire covering six subscales: awareness, expectation fulfillment, perceived value, satisfaction, complaints, and trust. Total satisfaction scores (range 22–154) were categorized as dissatisfied, neither, or satisfied. Data were analyzed in SPSS using independent-samples t-tests and one-way ANOVA, with $p<0.05$ considered significant.

Results: The mean total satisfaction score was 134.80 ± 10.52 (87.5% of maximum); 382 participants (99.5%) were classified as satisfied and 2 (0.5%) as neither satisfied nor dissatisfied. Subscale scores were highest for trust (94.6%) and expectation fulfillment (94.0%), and lowest for awareness of program policies (68.8%). Satisfaction differed significantly by education level ($F=6.52$, $p<0.001$), length of hospital stay ($F=5.03$, $p=0.002$), and service type ($F=2.35$, $p=0.041$), but not by gender ($p=0.088$) or family income ($p=0.896$).

Conclusion: SSP-enrolled inpatients at RMI reported high overall satisfaction, driven largely by trust, expectation fulfillment, and perceived value, despite limited awareness of program policies. Hospitals and policymakers should strengthen patient education on SSP procedures, provide additional support for prolonged admissions, and sustain the service-quality dimensions already valued by beneficiaries.

Keywords: Sehat Sahulat Program; Universal Health Coverage; Patient Satisfaction; Health Insurance; Pakistan

ABSTRACT 04

AI-Assisted Classification of Endo-Perio Lesion Patterns on Radiographs

Laraib Ameer Khan & Mahadd Malik

Islamabad Medical & Dental College

Introduction: Endodontic–periodontal lesions can present with overlapping radiographic features, making differentiation between lesion patterns challenging. Artificial intelligence may assist clinicians by standardizing radiographic pattern recognition and supporting clinical decision-making. To evaluate the ability of an AI-based image classification model to classify endoperiodontal lesions on periapical radiographs into five clinically defined categories.

Methodology: A dataset of 481 periapical radiographs was divided into training (384), validation, and test sets. Radiographs underwent preprocessing using CLAHE and unsharp filtering before being provided three-channel feature images. An ImageNet-pretrained DenseNet-121 model was trained using a two-stage strategy, categorical focal loss with class-balanced weights, data augmentation, and progressive fine-tuning. Model performance was evaluated using accuracy, macro ROC-AUC, macro PR-AUC, and class-specific recall and F1 scores.

Results: The DenseNet-121 model achieved 57.14% five-class accuracy, with a macro ROC-AUC of 0.834 and macro PR-AUC of 0.535 on the test set. True combined lesions demonstrated the strongest performance, with 85% recall, an F1 score of 0.76, and an ROC-AUC of 0.917. When the five categories were converted into a three-class triad, accuracy increased to 71.43%, with 90% recall and an F1 score of 0.83 for combined endo-periodontal disease.

Conclusion: The AI model demonstrated promising radiographic discrimination, particularly for combined endo-periodontal disease. However, the small and uneven dataset and observed generalization gap limit the interpretation of these findings. Larger, balanced datasets and external validation are required before clinical application. The model should currently be regarded as an educational proof of concept and decision-support tool rather than a replacement for clinical diagnosis.

Keywords: Artificial intelligence; Endo-periodontal lesions; Dental radiographs; Image classification; Deep learning

ABSTRACT 05

Temporal Trends, Cross-Country Inequalities, Benchmarking, and Future Projections of Mortality and Disability Attributable to High Fasting Plasma Glucose in South Asia, 1990–2050: A Global Burden of Disease 2023 Analysis

Aizaz Anwar Khalid, Suleman Khan, Nara Michaelson, Yasar Sattar, Simran Joshi

Peshawar Medical College; Harvard Medical School

Introduction: High fasting plasma glucose is a major modifiable metabolic risk factor in South Asia. We assessed long-term trends, cross-country inequalities, uncertainty-aware rankings, and future HFPG-attributable mortality and DALY burden.

Methodology: We analysed GBD 2023 estimates for five South Asian countries including Bangladesh, Bhutan, India, Nepal, and Pakistan from 1990–2023, examining age-standardised HFPG-attributable mortality and DALY rates by sex. We assessed trends and inequalities using joinpoint regression, annual percentage change, rate gaps/ratios, coefficients of variation, benchmarking, and 1,000 Monte Carlo ranking simulations. We validated ARIMA, exponential-smoothing, and random-walk-with-drift models in 2016–2023 data and used them to forecast burden through 2050.

Results: From 1990–2023, regional HFPG-attributable mortality rose from 63.7 to 85.1 per 100,000 and DALYs from 1,872.0 to 2,485.0 per 100,000 (annual increases: 0.91% and 0.90%). In 2023, Pakistan had the highest DALY rate (2,637.2/100,000) and India the highest mortality rate (87.4/100,000). Inequality narrowed modestly but persisted, and ranking simulations confirmed Pakistan and India as the most affected countries for DALYs and mortality, respectively. By 2050, regional DALYs and mortality are projected to increase by 25.0% and 25.7%, with India showing the largest rise. Forecast accuracy was strong (median MAPE 1.34%).

Conclusion: HFPG-attributable mortality and disability are increasing, unequally distributed, and projected to remain substantial across South Asia through 2050. Country-specific prevention, earlier glycaemic detection, sustained cardiometabolic care, and equity-focused health-system planning are urgently required.

Keywords: High fasting plasma glucose; South Asia; Mortality; Disability-adjusted life years; Global Burden of Disease; Forecasting

ABSTRACT 06

Mediating Role of Coping Strategies in the Relationship Between Resilience and Quality of Life Among Patients with Chronic Illness

Sibal Saeed • Maheen Abid

Institute of Nursing, Wah Medical College, Wah Cantt.

Introduction: Chronic illnesses create persistent physical, psychological, and social challenges that significantly reduce patients' quality of life. While resilience enables individuals to adapt to long-term health conditions, the mechanisms through which it improves well-being remain underexplored. The objective of this study was to examine whether coping strategies mediate the association between resilience and quality of life in patients with chronic illness.

Methodology: An analytical cross-sectional study with correlation and mediation analysis was conducted at Pakistan Ordnance Factories (POF) Hospital, Wah Cantt, with n = 150 adult patients diagnosed with chronic illnesses for at least three to four months. Patients with acute medical or psychiatric conditions, individuals under 18 years, bedridden or terminally ill patients, and those unwilling to participate were excluded. Data were collected using validated instruments: the CD-RISC-10 for resilience, the Brief COPE for coping strategies, and the WHOQOL-BREF for quality of life. Mediation analysis was performed using the PROCESS macro in SPSS with 5,000 bootstrap resamples, with significance set at $p < 0.05$.

Results: indicated that resilience was positively associated with coping strategies ($B = 0.22$, $SE = 0.12$, $t = 1.78$, $p = .077$), though this relationship did not reach statistical significance. Coping strategies were significantly positively associated with quality of life ($B = 0.56$, $SE = 0.08$, $t = 6.61$, $p < .001$). The direct effect of resilience on quality of life remained significant and negative ($B = -0.34$, $SE = 0.13$, $t = -2.65$, $p = .009$), while the indirect effect of resilience on quality of life through coping strategies was not statistically significant at the 95% confidence interval ($B = 0.12$, 95% CI [−0.01, 0.26]), indicating that coping strategies did not mediate this relationship in the present sample. The total effect of resilience on quality of life was also not significant at the 95% confidence interval ($B = -0.22$, $SE = 0.12$, $t = -1.78$, $p = .077$).

Conclusion: this study in the discipline of Nursing investigated resilience, coping strategies, and quality of life among patients with chronic illness using a cross-sectional design with 150 patients. While coping strategies were significantly related to quality of life, they did not significantly mediate the relationship between resilience and quality of life at the conventional 95% confidence level. These results suggest that interventions aimed at improving QoL in patients with chronic illness should address both resilience and coping skills independently, while future research should explore additional pathways through which resilience may affect well-being.

Keywords: Coping Behavior; Psychological Resilience; Quality of Life; Chronic Disease; Psychological Adaptation

ABSTRACT 07

SELF-ASSESSMENT OF RESIDENTS SKILLS IN BREAKING BAD NEWS USING SPIKE PROTOCOL AND BARRIERS FACED BY THEM

Aqsa Bibi

Foundation University Medical College Islamabad

Introduction: Breaking bad news is a critical yet challenging component of clinical practice. Effective communication significantly influences patient understanding, psychological adjustment, and trust in healthcare systems. Despite its importance, many residents lack proper training and confidence. 1. To assess residents' knowledge of the SPIKES protocol. 2. To evaluate residents' skills in delivering bad news. 3. To identify barriers faced by residents. 4. To determine SPIKES awareness and the type of training received associated with the residents' skills Of delivering bad news.

Methodology: This was a cross-sectional study conducted at FFH, Rawalpindi, over a period of six months following ethical approval. The study population comprised of various specialty residents. Participants were selected using convenience sampling, and the sample size was calculated using OpenEpi.

Results: A total Of 151 residents participated, with an overall mean P-SPIKES score Of 54.53 ± 15.06, indicating a moderate level of skill in breaking bad news. Internal consistency was excellent for both the P-SPIKES (Cronbach's a 0.93) and barriers scale (a = 0.95). The most commonly reported barriers were lack of a suitable private place, insufficient time, and lack of prior training. p value was less than 0.05 that shows significant association between awareness of the SPIKES protocol and type of training with higher skill levels, while gender, age, specialty, clinical experience, and prior handson experience were not significantly associated with SPIKES scores ($p > 0.05$).

Conclusion: Residents demonstrated a moderate level Of competence in delivering bad news using the SPIKES protocol, with important gaps in practical skills and communication. Structured training, better provision of private spaces, adequate time and improved awareness of SPIKES may enhance residents' competence in breaking bad news.

Keywords: (MeSH): Communication; Communication Barriers; Disclosure; Health Communication; Physicians

ABSTRACT 08

Assessment of cognizance of United Nations Sustainable Developmental Goals (SDGs) among medical students of Foundation University, Islamabad.

Shaiza Khan, Anfaal Fatima, Fabeha Ahmed Qureshi, Toseef Ashraf

Foundation University Medical College, Islamabad

Introduction: The 2030 Agenda for Sustainable Development established 17 Sustainable Development Goals to guide global action on health, education, equity, and sustainable development. Medical education can help future healthcare professionals understand and address these interconnected priorities. This cross-sectional study was conducted to assess baseline knowledge, perception of the impact of Sustainable Development Goals on professional practice, primary sources of information, and attitudes toward integration of Sustainable Development Goals into the curriculum among pre-clinical and clinical medical students.

Methodology: A structured questionnaire was administered to 252 undergraduate medical students selected through convenience sampling at Foundation University Medical College, Islamabad. Students enrolled in the first to fifth year of the Bachelor of Medicine and Bachelor of Surgery program were eligible. The study was approved by the Ethical Review Board. Data were collected anonymously through Google Forms from June to July 2026 and analyzed using descriptive and inferential statistics in IBM Statistical Package for the Social Sciences Statistics version 26.0.

Results: Clinical students had significantly higher Sustainable Development Goal knowledge scores than pre-clinical students ($p<0.001$). In contrast, pre-clinical students demonstrated significantly more favorable attitudes toward integration of Sustainable Development Goals into the undergraduate curriculum ($p=0.005$) and perceived greater professional relevance of Sustainable Development Goals ($p<0.001$). Clinical students were significantly more likely to identify the formal medical curriculum and university seminars as sources of Sustainable Development Goal information (both $p<0.001$), while no significant differences were observed for informal information sources.

Conclusion: Clinical students demonstrated greater knowledge of the Sustainable Development Goals, while pre-clinical students showed more positive attitudes toward their curricular integration and professional relevance. Introducing Sustainable Development Goal-related content earlier in undergraduate medical education may enhance engagement while strengthening knowledge throughout clinical training.

Keywords: Sustainable development; Medical students; Health education; Knowledge; Curriculum integration

ABSTRACT 09

DYNAMIC FACILITATION SPLINT (DFS) A Systematic Review-Informed, Low-Cost Adjustable Upper-Limb Rehabilitation Prototype for Facilitation, Progressive Resistance and Functional Hand Training

Waresha Farooq, Noorulain Rashid

Program / Institution Doctor of Physical Therapy (DPT), Ziauddin University, Karachi; Pakistan

Introduction: Upper-limb weakness, limited wrist and finger extension, abnormal muscle tone, and reduced hand dexterity can affect functional activities after neurological injuries, particularly stroke and radial nerve dysfunction. Dynamic orthoses and assistive technologies may help support wrist and hand positioning while encouraging repetitive, task-oriented practice. To review recent evidence related to dynamic splinting, adjustable orthotic assistance, functional upper-limb training, and low-cost orthotic development, and to use this evidence to support the design of a Dynamic Facilitation Splint (DFS).

Methodology: A focused literature search was conducted using PubMed-indexed studies and reference chaining. The search mainly focused on publications from 2020–2026 and included evidence on dynamic hand orthoses, splinting, stroke rehabilitation, radial nerve injury, wearable and assistive devices, and cost-effective orthotic design.

Results: Current evidence suggests that dynamic orthotic assistance may support hand function and task-based practice. However, the available evidence is varied, with several studies involving small sample sizes or having a risk of bias. Recent research also demonstrates the feasibility of developing customized and affordable orthotic technologies. Prototype contribution: The DFS combines a dial-based adjustable resistance mechanism with elastic assistance/resistance and a pen-side gripping mechanism designed to support functional grasp and writing-related activities. The resistance can be gradually adjusted according to the user's ability and progress.

Conclusion: DFS is a low-cost and adaptable prototype based on principles of dynamic orthotic assistance, repetitive task practice, and individualized progression. Further clinical studies are needed to determine its effectiveness and establish its clinical benefits.

Keywords: dynamic orthosis; rehabilitation splint; stroke; radial nerve palsy; upper limb; hand function; adjustable resistance; task-oriented training; low-cost assistive technology; functional grasp

ABSTRACT 10

Elevating Implant Success: Densah Bur-Assisted Crestal Sinus Floor Elevation in Limited Residual Bone Height

Hiba Khurram and Hanzala Kaleem

Introduction: Implant placement in the posterior maxilla with reduced residual bone height (RBH) below 8 mm and oblique sinus floor anatomy usually requires sinus floor elevation (SFE). Osseodensification with Densah burs is a minimally invasive alternative, elevating the sinus membrane with reduced perforation risk. Rationale: Evidence for osseodensification-assisted SFE in oblique morphology with moderate RBH (4–7 mm) remains limited. To evaluate crestal SFE with Densah burs and implant placement in oblique-floor sites (RBH 4–7 mm), assessing seating torque, vertical elevation, and resonance frequency analysis (RFA).

Methodology: Sixty partially edentulous patients needing posterior maxillary rehabilitation were randomized equally: Group I received Densah-bur crestal SFE alone, and Group II received crestal SFE with adjunctive grafting. Osteotomies were prepared using sequential Densah burs. Sampling & Criteria: Inclusion required RBH of 4.0–7.0 mm, confirmed oblique sinus floor, and good systemic health (ASA I/II). Sample Size: A sample size of 30 per group (n = 60) provided 80% power to detect a 10% difference in primary outcomes. Tools & Analysis: Primary outcomes were seating torque, vertical elevation gain, and RFA-based stability (Osstell ISQ), analyzed using SPSS 29 with the independent samples t-test ($p \leq 0.05$).

Results: Seating Torque: Group I = 40.33 ± 4.5 Ncm; Group II = 38.66 ± 3.9 Ncm ($p = 0.133$, no statistically significant difference). Vertical Elevation: Group I achieved significantly greater vertical elevation compared to Group II (4.22 ± 0.55 mm vs. 3.96 ± 0.29 mm; $p = 0.042$). Implant Stability (ISQ): Group II demonstrated significantly higher secondary implant stability ISQ scores compared to Group I (74.33 ± 4.86 vs. 67.76 ± 4.05; $p < 0.001$).

Conclusion: Crestal SFE with Densah burs, with or without adjunctive grafting, is a safe, minimally invasive option in oblique-floor maxillary sites with 4–7 mm RBH. Elevation gain was greater without grafting due to the membrane-tenting effect, whereas grafting yielded higher secondary stability, favoring its use when early loading is planned. Longer-term follow-up is recommended.

Keywords: Dental Implants; Sinus Floor Augmentation; Bone Density; Osseodensification

ABSTRACT 11

Efficacy and Safety of Erector Spinae Plane Block in Laparoscopic Surgeries: A Systematic Review and Meta-Analysis of Randomized Controlled Trials with GRADE Assessment MARYAM AMJAD · AILIYA BATOOL · Muhammad Hassan Omer · Hafiz Muhammad Haris

Mubashir Raza · Maheen Rizwan

Wah Medical College, King Edward Medical Colege, Baqai Medical University

Introduction: Opioids remain a mainstay for postoperative pain control after laparoscopic surgery but carry risks of nausea, vomiting, and delayed recovery. The erector spinae plane block (ESPB) is an ultrasound-guided regional technique increasingly used in multimodal analgesia, yet its comparative efficacy and safety across laparoscopic procedures remain unclear. This meta-analysis evaluated the effect of ESPB on postoperative pain, opioid consumption, and nausea/vomiting in adults undergoing laparoscopic surgery.

Methodology: PubMed and Google Scholar were searched without date restriction for RCTs comparing ESPB with sham, no-block control, TAP block, QLB, or other active analgesic techniques in adults undergoing laparoscopic surgery. Outcomes were postoperative pain scores, opioid consumption (morphine milligram equivalents), and PONV. Random-effects meta-analysis was performed with subgroup analysis by comparator; risk of bias was assessed using Cochrane RoB 2.0, and certainty of evidence was graded using GRADE.

Results: Forty-three RCTs were included. ESPB significantly reduced opioid consumption versus all comparators combined (MD –5.15, 95% CI –7.05 to –3.25; I2 = 95.9%), with the largest reductions versus sham (MD –17.53) and no-block controls (MD –8.36). PONV incidence was also reduced overall (RR 0.74, 95% CI 0.61–0.91), driven mainly by comparisons with other active agents (RR 0.55). No significant difference in pain scores was observed overall (MD 0.00, 95% CI –0.38 to 0.39). Certainty of evidence ranged from high (ESPB vs. sham) to very low (most other comparisons), and publication bias was identified for opioid consumption.

Conclusion: ESPB reduces postoperative opioid consumption and PONV in laparoscopic surgery, with the most consistent and high-certainty benefit observed versus sham controls. Evidence for pain score reduction and for superiority over other active regional techniques remains limited and of low to very low certainty, warranting further well-designed, adequately blinded RCTs.

Keywords: Erector spinae plane block; laparoscopic surgery; postoperative pain; opioid consumption; regional anesthesia; meta-analysis

ABSTRACT 12

Diagnostic Delays in Cancer Care and Associated Factors: A Hospital-Based Analytical Cross-Sectional Study Among Oncology Patients in Pakistan

Muhammad Abdullah Ghumman, Yesha Hadia Saleem, Abdul Touheed Khalid, Usama Munawar, Rida Waseem Akhtar, Prof Dr Tahira Amjad

Foundation University Medical College, Foundation University Islamabad

Introduction: Delayed cancer diagnosis is a potentially modifiable contributor to poor outcomes. In Pakistan, patient- and health system–related factors may prolong diagnostic pathways and contribute to late-stage presentation. Understanding these delays is essential for improving early cancer diagnosis and care. To determine the extent of diagnostic delay and identify socio-demographic, patient and health system–related factors associated with delayed cancer diagnosis among oncology patients at a tertiary care hospital in Pakistan.

Methodology: An analytical cross-sectional study was conducted from June–September 2026 following institutional ethical approval (FF/FUMC.215-786Phy/26; 11 June 2026). Consecutive sampling identified 216 patients aged ≥18 years with confirmed cancer diagnoses and complete records. Data were collected using a structured, interviewer-administered Urdu questionnaire and medical record review. Data were analyzed in SPSS v25. Shapiro–Wilk test, descriptive statistics, chi-square, correlation analysis, and logistic regression were performed; $p<0.05$ was considered statistically significant.

Results: Among 216 oncology patients, mean age was 50.0±13.8 years and 66.7% were female. Diagnostic delay >3 months occurred in 127 (58.8%). Significant associations included age group, marital status, awareness of cancer warning signs, initial response to symptoms, comorbidity, distance to healthcare facility, stage at diagnosis ($p=0.008$), and number of healthcare visits ($p<0.010$). Lack of awareness (47.4%) and perceiving symptoms as non-serious (42.3%) were leading patient-related contributors, while long waiting times (69.1%) and multiple referrals (37.4%) predominated at health-system level.

Conclusion: More than half experienced substantial cancer diagnostic delay. Strengthening cancer awareness, promoting timely care-seeking, and streamlining referral and diagnostic pathways could facilitate earlier diagnosis in Pakistan.

Keywords: Awareness; Delayed Diagnosis; Early Detection of Cancer; Health Services Accessibility; Health Behavior; Patient Delay; Referral and Consultation

ABSTRACT 13

Nomophobia and Sleep Quality among Medical Students: An Analytical Cross-Sectional Study from Islamabad, Pakistan

Sheeba Shoaib Wazir, Khadeeja Tul Kubra, Maryam Tanveer, Zunaira Fatima, Professor Dr. Tahira Amjad

Foundation University Medical College, Islamabad

Introduction: Medical education involves considerable academic and psychological demands that may contribute to sleep disturbances and problematic smartphone use. Nomophobia, the fear or anxiety of being without a smartphone, is increasingly recognized among medical students, but evidence regarding its relationship with sleep quality in Pakistan remains limited. To determine the prevalence of nomophobia, assess sleep quality, and evaluate their association among medical students.

Methodology: An analytical cross-sectional study was conducted from July to September 2026 at a private medical college in Islamabad following Institutional Ethical Review Committee approval (FF/FUMC/215-806 Phy/26; 14 July 2026). A total of 276 consenting medical students were included through self-selected purposive sampling. Students with diagnosed psychiatric illness or receiving medication or therapy for depression were excluded. Data were collected online using validated Nomophobia Scale–Short Form Questionnaire (NMP-SFQ) and the Pittsburgh Sleep Quality Index–Brief (B-PSQI), instruments with permission and analyzed in SPSS v25 using normality tests, descriptive statistics, Spearman's correlation, and non-parametric tests; $p<0.05$ was considered statistically significant.

Results: Of 276 students, 215 (77.9%) were female, 76.1% were using smart phones for social browsing, 66.3% had moderate and 20.3% severe nomophobia, while 63.8% demonstrated poor sleep quality. No significant correlation was observed between nomophobia and PSQI scores ($\rho=-0.105$, $p=0.082$). Nomophobia was also not significantly associated with binary sleep quality (Monte Carlo two-sided $p=0.788$), three-category sleep quality ($p=0.541$).

Conclusion: Moderate to severe nomophobia and poor sleep quality were highly prevalent, although no significant association was demonstrated. These findings identify important coexisting student wellbeing concerns and can inform health promotion initiatives encouraging healthier smartphone use and sleep practices. Longitudinal studies are warranted to explore these concerns which may help inform student-wellbeing initiatives, promote healthier smartphone use, and guide future research on academic and psychological outcomes.

Keywords: Nomophobia; Sleep Quality; Pittsburgh Sleep Quality Index (PSQI); Smart phone use

ABSTRACT 14

LONG-TERM PROTON PUMP INHIBITOR USE: A CROSS-SECTIONAL STUDY OF KNOWLEDGE, ATTITUDES, AND EXPERIENCES REGARDING DISCONTINUATION AND ADVERSE EFFECTS IN TERTIARY CARE

Abdul Rafay Rashid, Talha Khalid, Mian Hassan Yar Mohal, Muhammad Talha Shaikh. Prof. Dr. Naila Azam

Department of Community Medicine and Public Health, FUMC

Introduction: To assess long-term PPI use among adults at a tertiary-care hospital and evaluate knowledge, attitudes, and experiences regarding adverse effects and discontinuation, and associations between participant characteristics and knowledge.

Methodology: A cross-sectional analytical study was conducted using convenience sampling among 200 eligible adults attending Fauji Foundation Hospital, Islamabad. Data was collected using a structured, self-administered questionnaire and analyzed using SPSS version 26. Frequencies and percentages were used for categorical variables, while means and standard deviations were used for continuous variables.

Results: Omeprazole was the most frequently used PPI; 54.0% were current users, and 30.0% reported use beyond one year. Mean knowledge score was 2.70±2.17/11; only 10.5% had adequate knowledge (≥6 correct answers). Education was significantly associated with adequate knowledge ($\chi 2=13.00$, $p<0.001$). Higher knowledge was associated with willingness to follow physician advice to stop ($p=0.017$) and to stop if considered safe ($p=0.001$). Of 156 participants who attempted discontinuation, 39.1% reported return of symptoms.

Conclusion: Knowledge of long-term PPI safety was poor, particularly regarding magnesium, vitamin B12, kidney disease, and fracture risk. Despite this, most participants were receptive to clinician guided reduction or discontinuation. Regularly reviewing the indication for PPI therapy and providing patient-centered counselling about treatment duration, dose reduction, possible rebound symptoms, and individualized deprescribing may support safer and more appropriate long-term use.

Keywords: Deprescribing; Drug Discontinuation; Drug Utilization; Drug-Related Side Effects and Adverse Reactions; Health Knowledge; Attitudes; Practice; Hospitals; Tertiary Care; Proton Pump Inhibitors

ABSTRACT 15

Early Detection Matters: Screening and Awareness of Color Vision Deficiency among School Children and Their Coping Strategies

Muhammad Muddasir, Alishba Naeem, Muhammad Adnan, Iqra Nazir, Dr Mahwish Akhtar

Fazaia Medical College Islamabad

Introduction: Color vision deficiency (CVD) is a visual impairment that affects an individual's ability to perceive and differentiate between certain colors, typically caused by cone cell abnormalities. It has broad implications for daily functioning, academic performance, and future occupational choices. Despite its prevalence, public health discourse rarely prioritizes CVD screening, leaving a significant gap in awareness. The objective of this study was to screen for CVD, assess awareness levels, and identify classroom coping strategies among school children in Islamabad.

Methodology: An analytical cross-sectional study was conducted from February to September 2026 among school children aged 6–15 years at PAF School, E-9, Islamabad (N = 297). Non-invasive color vision screening was performed using the Ishihara 14-plate test alongside a semi-structured questionnaire to evaluate awareness, daily difficulties, and adaptive coping mechanisms. Data were analyzed using SPSS version 25 using descriptive statistics, Chi-Square tests, and correlation analysis.

Results: A highly significant relationship was found between teachers using colors while teaching and the daily learning difficulties experienced by students ($p < 0.001$). There was also a significant overall association between students' awareness of color blindness and their adoption of classroom coping strategies ($p < 0.001$). Furthermore, a statistically significant negative correlation was observed between students having known eye problems and their understanding of color vision deficiency ($p = 0.026$), highlighting a clear gap in knowledge even among students with existing visual concerns.

Conclusion: Color-dependent instructional methods significantly impact students with undetected color vision impairments. The observed lack of knowledge underscores the urgent need for early institutional screening and targeted awareness initiatives. Integrating routine CVD screening into school health policies, alongside educator awareness training, is essential to foster inclusive learning environments and effective classroom coping strategies.

Keywords: Color Vision Deficiency; Early Screening; Ishihara Test; Classroom Coping Strategies; School Health

ABSTRACT 16

Stress Among Infertile Couples and Their Coping Mechanisms

Muhammad Ahmad Subhani, Noor Shaukat Hayat, Rimsha Nawaz, Suhaib Abbas, Dr Mahwish Akhtar

Fazaia Medical College Islamabad

Introduction: Infertility is a significant psychosocial stressor that can adversely affect the psychological well-being and quality of life of couples. Understanding infertility-related stress and coping mechanisms is important for providing appropriate psychological and supportive care.

Methodology: An analytical cross-sectional study was conducted among 47 infertile couples visiting Australian Concept Infertility Medical Center (ACIMC), Islamabad, for infertility treatment. Participants were selected through purposive non-probability sampling. Data were collected using a structured questionnaire comprising socio-demographic characteristics, the Depression Anxiety Stress Scale-21 (DASS-21) for assessment of stress, and the Brief COPE Inventory for assessment of coping mechanisms. Data were analyzed using descriptive statistics, cross-tabulation, chi-square test, and Spearman's correlation.

Results: Among the 47 infertile couples, the level of psychological stress was assessed using the DASS-21 stress subscale. The study also identified the predominant coping mechanisms used by participants using the Brief COPE Inventory. To assess stress levels between male and female partners chi square was applied which showed significant p value of less than 0.005. We applied Spearman's Rank Correlation to assess the effect of coping mechanisms on stress levels of couples giving us significant p value of less than 0.005 especially with regard of emotional support as coping mechanism.

Conclusion: The study demonstrates the psychological burden associated with infertility and highlights the importance of assessing stress and coping mechanisms among couples undergoing infertility treatment. Incorporating appropriate psychological counseling and supportive interventions and strengthening the bond between couples and their families may help couples manage infertility-related stress more effectively.

Keywords: Infertility; Infertile Couples; Psychological Stress; Coping Mechanisms; DASS-21; Brief COPE; IVF; Assisted Reproductive Technology

ABSTRACT 17

Anxiety in Hospital Waiting Rooms: Patient and Environmental Drivers - A Comparative Cross-Sectional Study of Government and Private Hospitals in Islamabad

Abdul Monim, Qalb Abbas, Tafseer Fatima, Nida Fatima, Dr Mahwish Akhtar

Fazaia Medical College Islamabad

Introduction: Outpatient departments (OPDs) are often the first point of institutional contact for patients and attendants. Situational anxiety experienced there can affect satisfaction, cooperation, and communication with healthcare providers. In low- and middle-income countries, overcrowding, long waits, and resource constraints may intensify this anxiety, yet comparative evidence from government versus private settings remains limited. This study aimed to determine anxiety levels among patients and attendants in hospital waiting areas of Islamabad and to identify associated sociodemographic, emotional, and environmental drivers, comparing government and private hospitals.

Methodology: A comparative cross-sectional study was conducted in the OPD and pre-operative waiting areas of a government and a private tertiary care hospital in Islamabad. Adult patients and attendants (aged ≥18 years) were recruited through non-probability consecutive sampling; 80 questionnaires were analyzed. Anxiety was measured using the State-Trait Anxiety Inventory-State (STAI-S, 20 items) alongside a self-structured Emotional and Environmental Perception scale. Data were analysed in SPSS 25 using descriptive statistics and chi-square tests.

Results: Mean age was 36.75±12.62 years; 51.2% were female. Based on STAI-S, 43.8% had normal anxiety, 18.8% mild, 21.3% moderate, and 16.3% severe. Anxiety level was significantly associated with emotional perception ($\chi2=25.02$, $p < 0.001$), environmental perception ($\chi2=17.43$, $p = 0.008$), overall perception score ($\chi2=26.46$, $p < 0.001$), gender ($\chi2=10.68$, $p = 0.014$; higher among females) and monthly income ($\chi2=21.36$, $p = 0.011$). Severe anxiety was more frequent in government (22.0%) than private hospitals (10.3%), though the difference approached but did not reach significance ($\chi2=7.41$, $p = 0.060$).

Conclusion: More than half of patients and attendants experienced clinically significant (mild-to-severe) anxiety in OPD and pre-operative waiting areas, strongly linked to emotional and environmental perceptions and to gender and income. Government hospitals showed a trend toward higher severe anxiety. Low-cost environmental and communication-focused interventions, particularly in government-sector waiting areas, are recommended to reduce patient anxiety and improve care experience.

Keywords: Anxiety; Waiting Rooms; Outpatient Clinics; Hospital; Hospitals; Public; Hospitals; Private

ABSTRACT 18

Figurative Art as an Educational Tool for Enhancing Empathy Among Medical Students in Islamabad

M. Ahmed Mujahid, Sophia Shahryar, Mehveen Farhan Baig, M. Abdul Wadood Quarni, Prof. Dr. Rukhsana Khan, Dr. Iffat Noreen

Fazaia Medical College Islamabad

Introduction: Empathy is essential for patient-centered care but may decline during medical education, a phenomenon termed empathy erosion. Pakistani medical education emphasizes biological sciences and clinical skills amid substantial academic and clinical pressures. Medical humanities, including figurative art, provide opportunities for observation and perspective-taking. This study evaluated whether a figurative art-based educational intervention was associated with changes in empathy among undergraduate medical students and whether changes differed by gender or academic year.

Methodology: A quasi-experimental one-group pre-post study included 100 MBBS students from 3rd, 4th, and 5th year at Fazaia Medical College, Islamabad, selected through simple random sampling. The 20-item Jefferson Scale of Empathy–Student version (JSE-S) was administered before and after a 4-week intervention comprising four sessions using Visual Thinking Strategies, guided art observation, reflective questioning, perspective-taking, and contextual interpretation. Paired-samples t-test was used to compare pre- and post-intervention scores, with subgroup analyses by gender and academic year.

Results: Mean JSE-S scores increased from 101.05 ± 18.77 at baseline to 108.89 ± 16.27 post-intervention, with a mean improvement of 7.84 points (95% CI: 3.01–12.67; $t(99) = 3.22$; $p = 0.0017$; Cohen's $d_z = 0.32$). Overall, 63.0% of students demonstrated improved empathy scores. Internal consistency was high at both assessments (Cronbach's $\alpha = 0.887$ pre-test; 0.879 post-test). Improvement did not differ significantly by gender ($p = 0.394$) or academic year ($p = 0.561$).

Conclusion: Guided engagement with figurative art was associated with a statistically significant improvement in empathy. Further research should explore arts-based medical humanities interventions within undergraduate MBBS curricula in Pakistan, including comparative and controlled study designs.

Keywords: Empathy; Medical Students; Medical Humanities; Art; Education

ABSTRACT 19

Accuracy of AI Chatbots Regarding Management of Patients Reporting in Emergency Department of a Tertiary Care Hospital in Islamabad and Rawalpindi

Muhammad Bin Zafar, Sumaira Kiran, Minahil Ayesha, Hamyl Habib, Prof. Dr. Arshia Bilal, Dr. Malik Muhammad Zaryab Haider

Fazaia Medical College

Introduction: While AI expands globally, data on its clinical accuracy within Pakistan's emergency care infrastructure remains scarce. This study evaluated the frequency, purposes, and barriers of AI chatbot usage among junior physicians (Stage 1), and validated the diagnostic and management accuracy of ChatGPT, Google Gemini, and DeepSeek against specialist-derived reference responses across 72 emergency scenarios (Stage 2).

Methodology: A 9-month validation study in 2026 surveyed 69 junior doctors (HOs and PGs) in Stage 1. In Stage 2, 72 clinical cases across four domains-Trauma, Neurology, CVS, and GIT- were collected from public and private hospital EDs in the twin cities. Two Surgery specialists reviewed trauma cases, while two Medicine specialists reviewed GIT, CVS, and Neurology cases. Responses were merged into reference standards using component-based scoring (components identified by both specialists = 2 points; one = 1 point; omitted = 0; unreferenced recommendations unscored). AI responses were evaluated against these benchmarks using paired-samples t-tests in SPSS version 27.0.

Results: Stage 1 revealed 91.30% AI adoption among junior doctors, primarily using ChatGPT (60.87%) for diagnostic support (43.48%). Daily use was significantly higher among practitioners with under 1 year of experience (50.0%, $p = 0.040$). A clear trust-use paradox emerged, with 72.46% citing lack of trust and accuracy concerns as primary barriers. Stage 2 paired t-tests confirmed human specialists ($M=13.44$, $SD=2.45$) significantly outperformed all AI models ($p < 0.001$). Among platforms, DeepSeek achieved the highest average performance ($M=12.17$, $SD=2.22$, Cohen's $d=1.39$) and strongest specialist correlation ($r=.927$, $p < 0.001$). ChatGPT occupied an intermediate tier ($M=10.89$, $d=1.66$), while Gemini showed the widest gap ($M=10.17$, $d=1.51$).

Conclusion: AI chatbot incorporation is a norm among junior physicians, though demonstrates diagnostic unreliability. Human specialists consistently exceed AI clinical judgment across all ER presentations. DeepSeek tracks specialist judgment most reliably, while ChatGPT remains popular despite sub-optimal performance.

Keywords: AI Chatbots; Emergency Medicine; Accuracy

ABSTRACT 20

Quality of Life Among Patients with Parkinson's Disease Receiving Physiotherapy and Pharmacotherapy: A Cross-Sectional Study

Eisha Tanveer, Ayma Tahir, Samia Arshad, Muhammad Abdullah, Dr. Arshia Bilal, Dr. Malik Muhammad Zaryab Haider

Fazaia Medical College Islamabad

Introduction: Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by motor symptoms such as tremor, rigidity, bradykinesia, and postural instability, along with non-motor complications that may impair functional independence and quality of life. Physiotherapy is an important component of multidisciplinary management; however, limited local evidence is available regarding its association with quality of life in patients with PD.

Methodology: A cross-sectional study was conducted among diagnosed patients with PD attending selected healthcare and rehabilitation facilities in Islamabad and Punjab. A total of 52 participants were included according to predefined criteria. Data were collected using a semi-structured questionnaire and the 39-item Parkinson's Disease Questionnaire (PDQ-39), assessing eight quality-of-life domains. Quantitative data were summarized using mean ± standard deviation, while categorical data were presented as frequencies and percentages. Inferential tests were used to compare PDQ-39 domain scores, with $p < 0.05$ considered statistically significant.

Results: The mean age of participants was 63.35 ± 11.84 years. Of the 52 participants, 39 (75.0%) received physiotherapy alone or in combination with pharmacotherapy, while 13 (25.0%) received pharmacotherapy alone. No statistically significant differences were found between treatment groups in Mobility ($p = 0.312$), Activities of Daily Living ($p = 0.165$), Emotional Well-being ($p = 0.736$), Stigma ($p = 0.324$), Social Support ($p = 0.431$), Cognition ($p = 0.270$), Communication ($p = 0.252$), or Bodily Discomfort ($p = 0.975$). According to gender, significant differences were observed in Activities of Daily Living ($p = 0.029$) and Stigma ($p = 0.014$), while other domains were not statistically significant.

Conclusion: No statistically significant differences in PDQ-39 domain scores were observed between treatment groups. Physiotherapy remains an important component of multidisciplinary PD management. Larger longitudinal studies are recommended to further examine their association with quality of life.

Keywords: Parkinson's Disease; Physiotherapy; PDQ-39; Quality of Life; Rehabilitation; Pharmacotherapy

ABSTRACT 21

Accuracy and Reliability of AI-Generated Patient Histories versus Traditional Clerkship by Medical Students: A Comparative Study

Hamna Hanif, Noor Tahir, Fiza Batool, Shehr Bano, Dr. Rukhsana Khan, Dr. Iffat Noreen

Fazaia Medical College Islamabad

Introduction: History-taking accounts for up to 80% of diagnostic data, serving as the cornerstone of clinical decision-making. While medical students bring essential empathy and adaptive clinical reasoning, human performance remains susceptible to fatigue, stress, and procedural variability. Conversely, Artificial Intelligence (AI) offers unwavering consistency and systematic thoroughness. This study evaluates the comparative accuracy and reliability of AI-generated versus medical student–elicited patient histories within undergraduate medical education in Pakistan. By establishing empirical evidence on AI performance, this research aims to guide the integration of AI tools into clinical workflows while optimizing educational strategies that preserve human-centered care.

Methodology: This comparative cross-sectional analytical study was conducted in the Medicine ward of PAF Hospital, Islamabad, over seven months (February–August 2026). The study population comprised 4th and 5th-year MBBS students from Fazaia Medical College attending medical rotations; non-consenting or absent students were excluded. Using total population sampling, data was gathered using two instruments: the validated Artificial Intelligence-Powered Medical History-Taking Training and Evaluation System (AMTES) to assess LLM-guided virtual history-taking performance, and a structured questionnaire to evaluate student feedback and acceptance.

Results: In a study comparing N = 30 medical student clerkships (60% female, 70% 4th-year MBBS) against AI-generated patient histories, AI achieved significantly higher performance in overall quality ($p = 0.004$), accuracy ($p = 0.011$), and completeness ($p = 0.025$). No statistically significant differences were observed regarding clinical relevance or diagnostic reliability. The AI system demonstrated a 100% safety profile with zero critical diagnostic hallucinations. Student acceptance was high: 86.7% of participants rated the AI evaluation tool as useful for clerkship training, and 80.0% expressed intention to adopt AI history-taking systems in their future clinical practice.

Conclusion: While AI models will not replace medical trainees, our findings show they offer remarkable precision, completeness, and structure in patient history-taking without compromising clinical safety. Rather than viewing AI as a substitute, medical institutions should adopt it as a supportive teaching tool and supervised clinical assistant. We recommend embedding practical AI training into medical school curricula and conducting multi-center studies to evaluate how these tools perform in real-time, face-to-face patient interactions across various specialties.

Keywords: Artificial Intelligence; Medical History Taking; Medical Education; Clinical Clerkship; Machine Learning

ABSTRACT 22

From Awareness to Action: Evaluating The Effect Of Basic Life Support Training Among Medical Students

Aleeha Maryam, Mirza Hannan Shabbir Baig, Javeria Abbasi, Momina Malik, Prof. Dr. Arshia Bilal, Dr. Malik Muhammad Zaryab Haider

Fazaia Medical College

Introduction: Out-of-hospital cardiac arrest (OHCA) is a major global health burden, and prompt bystander cardiopulmonary resuscitation (CPR) can double or triple survival. Despite this, bystander CPR rates remain low in Pakistan, reported as low as 2.3%, largely due to gaps in knowledge, training, and confidence. Medical students, as future first responders, often possess theoretical awareness but lack practical competence. This interventional study assessed the effectiveness of structured Basic Life Support (BLS) training in improving pre-clinical medical students' knowledge, skills, and confidence regarding bystander BLS.

Methodology: A pre- and post-interventional study was conducted at Fazaia Medical College, Islamabad, among 43 undergraduate medical students of basic sciences (1st to 3rd year), selected via simple random sampling. A self-designed, structured questionnaire based on AHA 2020 BLS guidelines assessed baseline knowledge and barriers. Participants then underwent hands-on BLS training, delivered by AHA-trained researchers using mannequins, followed by post-training knowledge assessment and practical demonstration scoring (maximum score 12). Pre- and post-training scores were compared using a paired t-test at 5% significance.

Results: Mean BLS knowledge score improved significantly from 7.60 ± 2.77 pre-training to 12.07 ± 1.65 post-training (mean difference -4.47, 95% CI -5.27 to -3.66; $t(42) = -11.17$, $p < 0.001$), with a large effect size (Cohen's $d = 1.70$). Self-reported confidence in performing CPR and completing the full BLS sequence improved substantially, while perceived barriers such as fear of causing harm, panic, and lack of confidence declined. Overall, 88.4% of participants expressed willingness to perform CPR in an emergency.

Conclusion: Structured hands-on BLS training significantly improves medical students' knowledge, practical skills, and confidence in bystander CPR. Mandatory, periodic BLS training should be integrated into the undergraduate medical curriculum to sustain competence and strengthen the community chain of survival.

Keywords: Basic Life Support; Cardiopulmonary Resuscitation; Bystander Response; Medical Students; Training Program

ABSTRACT 23

The Remote Paradox: How Digital Flexibility Influences Social Disconnection and Psychological Stress

Ushna Ali, Taqdees Zahra, Muhammad Daniyal, Ali Zaman, Dr Mahwish Akhtar

Fazaia Medical College Islamabad

Introduction: Remote work has become increasingly common since the COVID-19 pandemic, providing employees with greater digital flexibility and autonomy. However, prolonged remote work may reduce face-to-face interaction and contribute to social disconnection and psychological stress. This study explores the remote paradox, in which the benefits of digital flexibility may coexist with psychosocial challenges among remote workers. To assess digital flexibility, social disconnection, and psychological stress among remote workers in Islamabad and examine their relationships.

Methodology: We conducted an analytical cross-sectional study on 66 remote workers in Islamabad from January to September 2026. Participants were recruited through non-probability snowball sampling. Data were collected using a structured questionnaire assessing digital flexibility, social disconnection, and psychological stress. Descriptive statistics were used to categorize participants into low, moderate, and high levels of the study variables. Cross tabulation and the chi square test were applied using SPSS v25.

Results: The majority of participants demonstrated moderate digital flexibility (60.6%) followed by high flexibility (33.3%). Social disconnection was predominantly moderate (62.1%) with a considerable proportion experiencing high social disconnection (27.3%). Psychological stress was mainly reported at a moderate level (75.8%) while a smaller proportion experienced high stress. Overall, the findings indicate that although remote workers experience considerable digital flexibility, this may coexist with social disconnection and psychological stress.

Conclusion: The study highlights the remote paradox, demonstrating that the flexibility and autonomy offered by remote work may occur alongside social and psychological challenges. Promoting effective communication, social connectedness, organizational support, and healthy work–life boundaries may help address these challenges among remote workers.

Keywords: Remote work; Digital flexibility; Social disconnection; Psychological stress; Remote paradox; Work from home; Mental health

ABSTRACT 24

Effect of Play-Based Interventions on Fear and Anxiety in Children Receiving Nebulization Therapy: A Quasi-Experimental Study

Ayat Ul Eman, Zaryab, Madina, Faryal Zafar, Dr Saleha Afridi

Fazaia Medical College Islamabad

Introduction: Nebulization is a commonly performed respiratory treatment in pediatric practice. Although the procedure is non-invasive, young children may perceive the mask, sound of the nebulizer and unfamiliar environment as threatening. Fear and anxiety can lead to crying, resistance to the mask, removal of the device and poor cooperation, potentially making treatment more difficult for both the child and healthcare staff. Play and distraction are child-centered approaches that may reduce procedure-related distress by increasing familiarity with the equipment and shifting attention away from the medical procedure. The present study evaluated a combined strategy consisting of a toy nebulizer and cartoon viewing before and during nebulization. To assess the effect of a play-based distraction strategy on fear and anxiety in children receiving nebulization therapy.

Methodology: A quasi-experimental pre-test/post-test study was conducted at Pakistan Institute of Medical Sciences (PIMS) and Pakistan Ordinance Factories Hospital (POF Hospital), during December 2025 to September 2026. Thirty children were recruited through non-probability convenience sampling, with 15 participants in each group. The intervention group received toy-nebulizer play and cartoon viewing before and during nebulization, while the control group received routine nebulization. Fear and anxiety were assessed using the Children's Fear Scale (CFS) and modified Yale Preoperative Anxiety Scale (mYPAS) before and immediately after nebulization.

Results: In the intervention group, mean fear decreased from 1.87 ± 1.302 to 0.33 ± 0.488 and mean anxiety from 67.89 ± 17.700 to 35.33 ± 8.913 (both $p < 0.001$). in contrast, mean fear increased from 0.60 ± 0.986 to 2.73 ± 1.751 and mean anxiety from 35.00 ± 14.001 to 77.22 ± 28.141 in the control group (both $p < 0.001$). Post-procedural anxiety differed significantly between groups ($p < 0.001$) and fear-category distribution also differed significantly ($\chi 2=15.055$, $df=3$, $p = 0.002$).

Conclusion: In this sample, the combined play-based distraction strategy was associated with lower fear and anxiety after nebulization compared with routine care. Larger randomized studies with balanced baseline characteristics are needed to confirm the finding.

Keywords: play-based intervention; therapeutic play; nebulization; children; fear; anxiety; Children's Fear Scale; modified Yale Preoperative Anxiety Scale

ABSTRACT 25

Effectiveness of a Structured Multimodal Educational Intervention in Improving Cybersecurity Knowledge, Attitudes, and Practice (KAP) among Medical Students: A Quasi-Experimental Study

Arooj Azhar, Maheen Laeeq Bukhari, Laraib Zaffar, M. Usama Ismail, Dr Saleha Afridi

Fazaia Medical College Islamabad

Introduction: Previous studies have reported suboptimal cyber-security practices among students, with many demonstrating inadequate cyber-hygiene behaviors despite having basic knowledge of digital safety. Following the COVID-19 pandemic, rapid digital transformation in medical education and healthcare system has further increased exposure to cybersecurity risks across academic and personal environments. Addressing this gap is important because medical students increasingly rely on digital technologies for learning, communication, research, and access to patient information during clinical rotations. To compare pre- and post-intervention cybersecurity KAP scores, and assess the association between these domains to determine the effectiveness of the educational intervention.

Methodology: A quasi-experimental study was conducted among 97 Fazaia Medical College MBBS students at Islamabad using non-probability convenience sampling from December 2025 to September 2026. Pre and post -intervention cybersecurity KAP were assessed using a modified Human Aspects of Information Security Questionnaire (HAIS-Q). The Multimodal intervention included structured lecture, followed by a Kahoot-based quiz and simulation-based activity. Data was analyzed using SPSS version 2023.

Results: Paired t-test used to compare pre- and post-intervention scores showed a significant improvement in all Knowledge, Attitude and Practice domains following the intervention. Mean Knowledge scores increased from 18.89 to 24.01 ($p = 0.003$), Attitude scores from 21.48 to 25.08 ($p < 0.001$), and Practice scores from 32.63 to 37.10 ($p < 0.001$). The overall KAP score also increased from 73.00 to 86.19 ($p < 0.001$).Pearson correlation analysis assessing the association between cybersecurity KAP domains showed a significant positive correlation was observed between post-attitude and post-practice ($p < 0.001$).

Conclusion: Cybersecurity is an emerging Public Health concern as healthcare increasingly depends on digital systems and electronic health information. Future studies should include larger samples from different medical institutions and assess long-term impact of cybersecurity education.

Keywords: Quasi-Experimental Study; Cybersecurity Training; Knowledge; Attitude; Practices; HAIS-Q

ABSTRACT 26

Lifestyle Behaviors Among School-Going Adolescents in Islamabad: A Comparative Cross-Sectional Study

Syeda Sarah Shah, Hadia Afzal, Muneeb ul Hasan, Sarfaraz Imam, Prof Dr Rukhsana Khan, Dr Iffat Noreen

Fazaia Medical College Islamabad

Introduction: Health-related behaviors established during adolescence can affect long-term well-being, but context-specific evidence from Pakistani schools remains limited. This study assessed lifestyle behaviors among adolescents attending PAF and government schools in Islamabad and examined associations with demographic characteristics.

Methodology: A comparative cross-sectional study was conducted from February to August 2026 among 341 students aged 12–19 years in Grades 7–10. The study protocol specified stratified sampling. Participants completed a 46-item Adolescent Lifestyle Profile–Revised 2 questionnaire. Data were analyzed using SPSS with descriptive statistics and Pearson chi-square tests.

Results: Of 341 participants, 188 (55.1%) were female and 153 (44.9%) were males, 194 (56.9%) attended PAF schools, and 147 (43.1%) attended government schools; mean age was 14.76 ± 1.22 years. The mean overall lifestyle score was 167.65 ± 22.88 (maximum 230). Lifestyle scores were moderate in 259 (76.0%), high in 75 (22.0%), and low in 7 (2.1%). High scores occurred in 25.9% of government-school students versus 19.1% of PAF-school students ($\chi 2 = 7.162$, $p = 0.028$). Lifestyle category was also associated with grade group ($\chi 2 = 9.293$, $p = 0.010$), but not gender ($p = 0.678$). Furthermore, 43.4% never or rarely avoided junk food, and 37.5% never attended preventive-health programs. Several chi-square cells had expected counts below five.

Conclusion: Most adolescents reported moderate lifestyle behaviors. Schools should strengthen nutrition education and preventive-health engagement. Observed school- and grade-related differences require cautious interpretation and further assessment using tests appropriate for sparse categories.

Keywords: Adolescent; Health Behavior; Lifestyle; Schools; Pakistan

ABSTRACT 27

Effect of an Educational Intervention on HPV Knowledge, Beliefs, and Vaccination Uptake Among Girls: A Quasi-Experimental Study in Islamabad

Saba Farooq, Saqib Mahmood, Hadiya Irfan, Umer Siddiqui, Dr. Jaweriya Omer, Dr. Inzamam Khalil

Fazaia Medical College Islamabad

Introduction: Human papillomavirus (HPV) vaccination is an effective strategy for preventing HPV-related cervical cancer, yet uptake remains limited in capital by inadequate knowledge, misconceptions and vaccine hesitancy. In Pakistan, the introduction of a national HPV vaccination campaign has increased the need to understand barriers to vaccination. This study assessed baseline knowledge, beliefs and willingness regarding HPV vaccination and evaluated changes following a structured educational intervention.

Methodology: A quasi-experimental pre-post-intervention study was conducted among 87 parents of daughters aged 9–26 years in Islamabad using purposive sampling. Data were collected using a self-structured, self-administered questionnaire assessing HPV-related knowledge, beliefs, willingness to vaccinate and awareness of the government vaccination campaign. An educational intervention addressed HPV, cervical cancer, vaccine benefits, safety concerns, myths and misconceptions. The same questionnaire was administered after the intervention. Data were analyzed using SPSS version 27. Descriptive statistics, paired-samples t-tests, McNemar testing and chi-square/Fisher's exact tests were used, with $p < 0.05$ considered statistically significant.

Results: The mean knowledge score increased from 3.71± SD 1.51 pre-intervention to 8.44± SD 1.06 post-intervention ($p < 0.001$). The mean positive belief score increased from 6.48± SD 3.36 to 8.37± SD 2.64 ($p < 0.001$). Willingness to accept HPV vaccination increased from 18.4% (16/87) to 73.6% (64/87), with a significant paired change (exact McNemar $p < 0.001$). At baseline, 54.0% reported having seen or heard the government HPV vaccination campaign, while only 5.7% reported knowing that HPV vaccination was included in the EPI.

Conclusion: Substantial improvements in HPV-related knowledge, positive beliefs and willingness to accept vaccination were observed following the educational intervention. Recommendations Government vaccination programes should strengthen pre-vaccination education by involving doctors and other trained healthcare professionals in educating parents about HPV and vaccine safety, actively addressing myths and misconceptions, and providing dedicated parent-awareness sessions before school-based vaccination.

Keywords: Human Papillomavirus; Papillomavirus Vaccines; Vaccination Hesitancy; Health Education; Parents

ABSTRACT 28

Validation of a Smartphone-Based Acoustic and Photoplethysmographic Screening Protocol for Cardiopulmonary Triage: A Diagnostic Accuracy Study

Muhammad Arhum Mehtab, Amna Abrar, Rameen Wajid, Makhdoom Muhammad Shozab, Prof Dr Rukhsana Khan, Dr Iffat Noreen

Fazaia Medical College Islamabad

Introduction: Manual auscultation remains the primary cardiopulmonary triage tool in resource-limited Pakistani outpatient settings despite documented operator-dependency and ambient noise vulnerability. Trainee-level cardiac auscultatory accuracy has been reported as low as 20%. This study evaluates a freely available, provider-operated smartphone bimodal protocol: combining acoustic spectral analysis of forced expiratory cough with contact photoplethysmography (PPG), against manual auscultation using Senior Consultant Assessment as the reference standard.

Methodology: A within-subject non-randomized diagnostic accuracy study was conducted at the Pulmonology OPD, Unit-2 PAF Teaching Hospital, Islamabad. 83 adults aged 18-70 years with cardiopulmonary complaints were consecutively enrolled. Each participant underwent manual auscultation followed by the smartphone bimodal protocol (Phyphox audio spectrum module and Instant Heart Rate PPG application) and blinded Senior Consultant Assessment within a single visit. Nine acoustic biomarkers were extracted from Phyphox FFT exports and simultaneous WAV recordings via Python librosa. Diagnostic performance, incremental yield (McNemar's test), and agreement (Cohen's Kappa) were analysed in SPSS version 27. Patient acceptability was assessed through structured qualitative responses to three open-ended questions.

Results: Technically adequate data were obtained for 58 (manual auscultation), 57 (PPG), and 70 (acoustic) participants. Manual auscultation achieved sensitivity 70.0% (95% CI: 55.4-82.1%) and specificity 75.0% (34.9-96.8%). PPG demonstrated sensitivity 18.0% (8.6-31.4%) and specificity 85.7% (42.1-99.6%), with PPG correctly flagging 3 Senior Consultant-confirmed abnormalities missed by auscultation (incremental yield 5.6%, $p < 0.001$). All acoustic biomarker AUCs were non-significant (range 0.353-0.574), with no feature exceeding the 0.70 discriminative threshold. Mean protocol time was 4.29 minutes (SD±2.13). Patient comprehension was 82.4% and acceptability 80.6%.

Conclusion: Univariate smartphone acoustic biomarkers lack sufficient discriminative capacity for standalone cardiopulmonary triage in real-world OPD conditions, warranting multivariate machine learning approaches in future work. Smartphone PPG demonstrates utility as a high-specificity adjunct, successfully identifying critically ill patients overlooked by manual auscultation. The protocol is feasible, time-efficient, and patient-acceptable in a low-resource Pakistani OPD, supporting community deployment of the PPG component.

Keywords: Diagnostic accuracy; Photoplethysmography; Acoustic biomarkers; mHealth; Cardiopulmonary triage

ABSTRACT 29

Evaluating the Role of Healthcare Responsiveness on Patient Treatment Adherence, Satisfaction Level and Acceptance of Artificial Intelligence: An Analytical Cross-Sectional Study in Private/Public Hospitals of Islamabad

Mahnoor Riaz, Muhammad Hadi Amin, Muhammad Faheem, Dr Juwayria Omar, Dr Inzamam Khalil

Fazaia Medical College Islamabad

Introduction: Patient withholding of information and medication non-adherence significantly affect treatment and doctor-patient trust. Low privacy, presence of attendants during consultation, and shyness are considered key barriers. Positive perception towards Artificial Intelligence is emerging as a tool to improve adherence. This study evaluated the frequency of information withholding and treatment adherence with privacy, presence of attendants, environmental amenities, satisfaction and the role of AI perception.

Methodology: A cross-sectional study was conducted among patients attending public and private hospitals of Islamabad. Patients with chronic illness were included after consent through purposive sampling. A structured questionnaire was used to assess information regarding patient's expectations for the treatment, knowledge about the illness, expectation about doctor-patient communication followed by direct observation by the investigator, and then a post-consultation questionnaire regarding withholding, reasons for withholding, privacy, respect, doctor's behavior, presence of attendant and attendant's attitude, medication adherence and AI perception. Data was analyzed using SPSS 25. Chi-square test was applied. P-value <0.05 was considered significant with 95% confidence intervals (CIs).

Results: Shyness/embarrassment for information withholding 24.3%. Privacy and having attendants was significantly associated with withholding information respectively ($p = 0.004$) & ($p = 0.027$). Doctor's time ($p = 0.001$), overall satisfaction ($p = 0.002$), education ($p = 0.01$) and positive perception towards AI ($p < 0.05$), showed significantly higher medication adherence. AI acceptance is with lesser age ($p = 0.001$), with increased satisfaction ($p = 0.001$) and with better doctor-patient communication ($p = 0.028$). Having satisfaction was associated with (Space in waiting area $p = 0.001$, how fast being attended by hospital staff $p = 0.001$, distance to hospital $p = 0.001$, behavior of nurse $p = 0.001$, receptionist $p = 0.001$, attendants $p = 0.007$, time spent in waiting area $p = 0.001$, respected by staff $p = 0.002$, doctor's behavior $p = 0.001$, explanation of the disease $p = 0.001$, time given for explanation=0.001, income $p = 0.04$, increased age $p = 0.007$, asking for consent $p = 0.001$).

Conclusion: Findings suggest an integrated approach with better environment, confidentiality, improved satisfaction and use of AI improve treatment adherence. Larger controlled studies with longer follow-up are recommended.

Keywords: Information withholding; Medication adherence; Artificial intelligence

ABSTRACT 30

Effect of an AI-Empowered Digital Health Intervention on Children's Diabetes Self-Management and Caregiver Burden in Type 1 Diabetes Mellitus: A Quasi-Experimental Study in Islamabad

Rijja Arif, Syeda Hania Batool, Lawaiza Aamir, M Kamran Mujahid, Dr. Jaweriya Omer, Dr. Inzamam Khalil

Fazaia Medical College Islamabad

Introduction: Type 1 diabetes mellitus (T1DM) requires continuous self-management and may contribute to diabetes-related distress and caregiver burden. This pilot study evaluated whether DiaBuddy, an AI-enabled digital intervention providing education, monitoring, and reminders, could improve self-management/adherence while reducing distress, caregiver burden, and caregiving time.

Methodology: A single-arm, pre–post pilot study included children aged 6–14 years with T1DM and their caregivers recruited from The Diabetes Center, Bara Kahu and PIMS–Children's Hospital. Participants used DiaBuddy for 3 weeks. Modified Self-Care Inventory–Revised (SCI-R) assessed self-management/adherence and distress, modified Zarit Burden Interview (ZBI) assessed caregiver burden, and caregiving time was assessed separately. Data were analyzed using SPSS 25. Normality was assessed using Shapiro–Wilk testing, and paired-samples t-tests with 95% confidence intervals (CIs) compared pre- and post-intervention means. Nineteen participants completed both assessments.

Results: SCI-R scores increased from 34.68 to 45.05, indicating improved self-management/adherence (mean difference +10.37; $W=0.978$, $p = 0.915$; $t=4.61$, $p < 0.001$; 95% CI: 5.64–15.09). ZBI scores decreased from 28.63 to 19.79, reflecting reduced caregiver burden (mean difference −8.84; $W=0.954$, $p = 0.463$; $t=-3.94$, $p = 0.001$; 95% CI: −13.56 to −4.12). Distress scores decreased from 32.84 to 24.63, indicating less diabetes-related distress (mean difference −8.21; $W=0.974$, $p = 0.850$; $t=-3.22$, $p = 0.005$; 95% CI: −13.57 to −2.85). Reported caregiving time decreased from 20.84 to 4.26 hours/day, representing 16.58 fewer hours of diabetes-related caregiving ($W=0.657$, $p < 0.001$; $t=-8.02$, $p < 0.001$; 95% CI: −20.92 to −12.24). Although caregiving-time data were non-normal, the paired analysis showed a significant reduction.

Conclusion: Three weeks of DiaBuddy use were associated with improved self-management/adherence and reduced diabetes-related distress, caregiver burden, and caregiving time. These findings suggest potential for an integrated digital approach to support pediatric diabetes management while reducing caregiver demands. Larger controlled studies with longer follow-up are recommended to determine whether these changes are sustained and to evaluate effectiveness across broader pediatric populations.

Keywords: Type 1 diabetes mellitus; Self-management; Diabetes distress; Caregiver burden; Artificial intelligence

ABSTRACT 31

Association Between Digital Dependence and Virtual Autism: A Cross-Sectional Study of Punjab Children (0-5 Years)

Khaizran Ali, Yamna Sajid, Visha Asif, Anas Majeed, Prof. Dr. Arshia Bilal, Dr. Malik Muhammad Zaryab Haider

Fazaia Medical College Islamabad

Introduction: In an era dominated by smartphones, toddlers face a silent neurodevelopmental crisis: "virtual autism." Excessive screen dependence triggers severe communication delays mimicking classical Autism Spectrum Disorder (ASD), driving widespread misdiagnosis across Pakistan due to entrenched social taboos. Strikingly, this study uncovers the staggering link between early digital dependence and virtual autism risk among children aged 0–5 across Punjab. By evaluating 90 young children via validated M-CHAT-R metrics, this research exposes the alarming impact of screen time onset, duration, and sociodemographic variables.

Methodology: An analytical cross-sectional study was conducted over 9 months (January–September 2026) in health centers across Islamabad and Gujranwala. Non-probability convenience sampling yielded 90 children aged 0–5 years. A structured, Urdu-translated questionnaire comprising M-CHAT-R, the Behavioral Characteristics Assessment (BCA) for digital dependence based on WHO criteria, and demographic profiles was administered. Analysis was performed in SPSS v27 using Chi-square and Student's t-tests ($p < 0.05$).

Results: Among 90 children (mean age: 38.07±12.8 months; 62.2% male), 93.33% met criteria for digital dependence. Overall, 63.33% were classified as high-risk for VA, 34.44% moderate-risk, and 2.22% low-risk. Daily screen time ≥ 2 hours (32.40 ± 5.64 vs 19.31± 3.32) and early onset ≤ 12 months (25.3 ± 7.66 vs 32.00 ± 6.19) were strongly associated with higher VA severity ($p < 0.001$). Lower household income (≤ 200,000 PKR) was the only demographic significantly linked to high-risk VA (70.2% vs 51.5%, $p = 0.007$).

Conclusion: Excessive screen exposure and early initiation significantly increase the risk of virtual autism. Promoting parental awareness and strictly adhering to WHO screen guidelines are critical to prevent developmental delays and misdiagnosis.

Keywords: Virtual Autism; Digital Dependence; Screen Time; M-CHAT-R; Child Development

ABSTRACT 32

Effect of a School-Based Health and Hygiene Education Intervention on Awareness of Diarrheal Diseases among School-Going Children in Islamabad: A Pre-Post Study

M. Kabbas, Memoona Maryam, Maryium Munawar, Laiba Shahid, Dr. Juwayria Omar, Dr. Muhammad Inzamam Khalil

Fazaia Medical College Islamabad

Introduction: Diarrheal diseases remain a primary cause of preventable childhood morbidity and school absenteeism in low- and middle-income nations like Pakistan. Many school-aged children have limited knowledge about diarrhea, dehydration and proper hygiene practices. The study aims to highlight the effectiveness of a structured school-based health education intervention in enhancing diarrheal disease knowledge and promoting appropriate hygiene practices among school-going children.

Methodology: A pre-post quasi-experimental study was conducted among 200 school-going children aged 7-14 years from selected private and semi-public schools in Islamabad. Participants were recruited through convenience sampling. Baseline knowledge and hygiene practices were assessed using a structured questionnaire. A standardized educational intervention was delivered, followed by immediate post-intervention assessment. Data were analyzed using SPSS v27.0 with paired-samples t-tests, Wilcoxon signed-rank tests, and McNemar's test at a significance level of $p < 0.05$.

Results: The sample included 51.5% females and 48.5% males (68.5% aged 11-14 years), with a high baseline 4-week diarrhea history (33.0%). Following the intervention, adherence to key hygiene practices rose significantly: washing hands with soap before meals increased from 63.5% to 96.0%, post-toilet soap use rose from 76.0% to 96.0%, handwashing after outdoor play improved from 59.5% to 93.5%, and avoidance of uncovered canteen food increased from 62.5% to 94.0%. Mean hygiene practice scores increased from 21.84M ± 4.12SD to 28.52M ± 2.14SD out of 30 (gain: +6.68, $p < 0.001$). Total knowledge scores improved from 11.23M ± 3.42SD to 18.64M ± 1.58SD out of 20 ($p < 0.001$), with marked gains in diarrhea definition (45.5% to 96.0%).

Conclusion: A short interactive school-based health education session effectively improved knowledge and promoted positive hygiene practices among children. Incorporating structured diarrheal disease and WASH education into school curricula may be a practical, high-impact and cost-effective strategy to improve child health.

Keywords: Diarrheal diseases; school health education; hand hygiene; child health

ABSTRACT 33

Effect of Smartphone Addiction on Attention Span and Memory of Medical Students in Pakistan: A Cross-Sectional Study

Muhammad Abdullah, Shabi Zainab Pirzada, Muhammad Adnan, Hafsa Parveen, Dr. Arshia Bilal, Dr. Malik Muhammad Zaryab Haider

Fazaia Medical College (FMC), Islamabad, Pakistan

Introduction: Excessive smartphone use may interfere with cognitive processes relevant to medical education, but objective assessment of attention and memory among Pakistani medical students remains limited. This study assessed smartphone addiction and its association with attention and memory among MBBS students at Fazaia Medical College (FMC), Islamabad.

Methodology: A cross-sectional study included 87 MBBS students selected by simple random sampling. Smartphone addiction was assessed using the Smartphone Addiction Scale–Short Version (SAS-SV) with sex-specific cut-offs. Attention was assessed using Digit Span Forward/Backward and Trail Making Test (TMT)-A/B; memory was assessed using immediate and 5-minute delayed word recall. Data were analyzed in SPSS version 27.0 using independent-samples t-tests and Pearson chi-square tests; $p < 0.05$ was considered statistically significant.

Results: Of 87 participants, 44 (50.6%) were classified as smartphone-addicted. TMT-B attention deficit was more frequent among addicted than non-addicted students (21/44, 47.7% vs 10/43, 23.3%; $\chi 2=5.678$, $p = 0.025$). TMT-A deficit did not differ significantly (29.5% vs 20.9%; $p = 0.461$). Mean Digit Span Forward scores were 6.89±1.19 versus 7.05±1.19 ($p = 0.532$), and Backward scores were 6.32±1.24 versus 6.09±1.67 ($p = 0.476$). Immediate recall (7.77±2.48 vs 8.67±2.08; $p = 0.070$), delayed recall (6.89±2.94 vs 7.65±2.82; $p = 0.219$), and total recall (14.66±5.16 vs 16.33±4.69; $p = 0.119$) were not significantly different.

Conclusion: Smartphone addiction was associated with a higher proportion of TMT-B-defined attention deficit, while other cognitive measures showed no statistically significant group differences. Balanced smartphone use and digital well-being strategies may be considered. Larger, multicentre longitudinal studies are recommended to clarify temporal relationships.

Keywords: Smartphone addiction; Attention; Memory; Medical students; Cognitive performance

ABSTRACT 34

Prevention of Healthcare-Associated Infections Through Improved WASH Practices in Islamabad

Bisma Noman, Hafsa Faruq, Romaisa Areej, Ahmad Shah, Dr. Arshia Bilal, Dr. Malik Muhammad Zaryab Haider

Fazaia Medical College Islamabad

Introduction: Inadequate Water, Sanitation and Hygiene (WASH) practices contribute substantially to preventable infectious diseases. This study assessed WASH practices, their association with household illness, and the effect of a structured WASH educational intervention among households in Islamabad.

Methodology: A pre- and post-intervention study was conducted among 119 participants from households in the areas served by selected health centers in G-7 and I-10, Islamabad. Participants were recruited through convenience sampling. Data were collected using a self-developed, Urdu-translated and pretested structured questionnaire. An interactive WASH education session of at least 30 minutes was delivered, supported by pictorial brochures demonstrating appropriate WASH practices. Pre- and post-intervention data were analyzed using SPSS version 27. Descriptive statistics, paired-samples t-tests, McNemar exact tests, and Pearson's chi-square/Fisher's exact tests were applied as appropriate, with statistical significance set at $p < 0.05$.

Results: The mean WASH knowledge score increased from 5.41±1.843 before the intervention to 9.87±0.366 afterwards ($t(118)=26.742$, $p < 0.001$; Cohen's $d=2.451$). Knowledge of ORS preparation also increased significantly from 0.09±0.291 to 0.97±0.181 ($t(118)=28.603$, $p < 0.001$). Reported household illness decreased from 63.9% pre-intervention to 13.4% post-intervention, with a significant McNemar exact test ($p < 0.001$). Gastrointestinal illness decreased from 41.2% to 7.6% ($p < 0.001$). URTI and skin illness did not show statistically significant paired changes. Participants identified drinking-water treatment and proper water storage as the most difficult WASH behaviors to implement (51.3%). These findings suggest that interventions requiring resources, regular household management, or changes in existing practices may be more challenging for participants to adopt and sustain.

Conclusion: The intervention was associated with substantial improvement in WASH-related knowledge and a significant reduction in reported household illness, particularly gastrointestinal illness. Strengthening practical WASH education, particularly regarding safe water treatment, storage, hand hygiene and household sanitation, may support infection prevention in community settings.

Keywords: Water; Sanitation and Hygiene; Health-Associated Infections; WASH Education; Household Illness; Infection Prevention

ABSTRACT 35

Bridging fear and opportunity: Assessing Fear of job displacement and Enablers of Artificial intelligence (AI) adoption among young medical professionals of Islamabad, An analytical cross-sectional study

Rida Fatima, Naeem Ahmad, Fatima Ishfaq, Shuja Ahmad

Dr Rukhsana Khan, Dr Iffat Noreen

Fazaia Medical College Islamabad

Introduction: Artificial intelligence (AI) is increasingly being incorporated into healthcare and clinical decision-making. Its adoption among young medical professionals may be influenced by their knowledge, attitudes, willingness to adapt, perceived risk of job displacement, and the availability of institutional and infrastructural support. Understanding these factors is important for preparing healthcare professionals for the integration of AI into clinical practice.To assess knowledge and attitudes of young medical professionals regarding AI adoption in clinical practice, determine their perceived fear of AI-related job displacement and willingness to adapt to AI, identify key enablers of AI adoption, and assess demographic and professional factors associated with perceived fear of job displacement.

Methodology: A cross-sectional study was conducted among 100 young medical professionals. Data were collected using a structured questionnaire consisting of five-point Likert-scale items assessing knowledge, attitudes, perceived fear of job displacement, adaptive willingness, and potential enablers of AI adoption. Descriptive statistics were used to summarize the data, while correlations were established using chi square tests. The overall questionnaire demonstrated good internal consistency (Cronbach's alpha=0.80).

Results: The mean age of participants was 26.29±2.57 years, with females comprising 60% and males 40% of the sample. Knowledge regarding AI was predominantly moderate, with 59% of participants falling into the moderate category, while 21% demonstrated high knowledge. Attitudes toward AI were predominantly moderate (71%), with 21% demonstrating more favourable attitudes. Perceived fear of job displacement was moderate in 85% of participants, while 9% demonstrated high fear. In contrast, 50% demonstrated high willingness and adaptability toward AI adoption. Among the proposed enablers, adequate training of healthcare professionals was endorsed by 84% of participants, followed by reliable internet and digital infrastructure (80%), inclusion of AI in the medical curriculum (75%), government support (74%), and availability of funding (70%). Fear of job displacement differed significantly by gender ($p=0.0065$), whereas no significant association was observed with age ($p=0.722$), professional designation ($p=0.781$), or specialty ($p=0.317$).

Conclusion: Young medical professionals demonstrated predominantly moderate knowledge and attitudes toward AI, alongside moderate perceived fear of job displacement and substantial willingness to adapt to AI in clinical practice. Training, reliable digital infrastructure, curriculum integration, government support, and funding were commonly identified as important facilitators of AI adoption. These findings highlight the importance of structured AI education and institutional preparedness in supporting the integration of AI into future medical practice.

Keywords: AI, Adoption, adaptive willingness, key enablers, medical professionals

ABSTRACT 36

Effectiveness of a Digital Health Educational Intervention on Exclusive Breastfeeding among Pregnant Females in the Third Trimester in Islamabad: A Pre- and Post-Study Design

Ehsan ul Haq, Ayesha Sharif, Manahil Ahmad, Abdullah Siddiqui, Dr. Juwayria Omar, Dr. Inzamam

Fazaia Medical College Islamabad

Introduction: Exclusive breastfeeding for the first six months lowers mortality, but local rates remain low. Traditional guidance often fails due to various barriers, making digital health platforms a practical tool. This research highlights the role of digital health education in promoting breastfeeding, determining bottle versus exclusive feeding frequencies, raising third-trimester awareness for reduced infant infections.

Methodology: An interventional pre and post study was conducted among 68 pregnant females in their third trimester across Islamabad with mean age of 39 yrs, residents of G9 and 18 sectors ISB. who gave consent, who had smartphones and Wi-Fi access were included. Those who had diseases like HIV, T.B, mental illness in preterm labor were excluded. Educational intervention was delivered via WhatsApp groups using daily reminders, infographics, e-brochures and videos based on WHO guidelines followed by follow up on alternate days. Data were analyzed using SPSS version 27. Descriptive statistics were done by calculating frequencies and percentages. Inferential analysis was done using Chi-Square test.

Results: showed substantial rise in maternal knowledge and practices. Postnatally exclusive breastfeeding increased 48.5%, breastfeeding rates 90%, mothers with mixed feeding reported a significantly higher frequency of infant infections ($p < 0.05$) Cross-tabulation between antenatal visits with maternal knowledge ($p = 0.003$) and parity ($p = 0.002$). breastfeeding knowledge and post-birth initiation ($p = 0.04$) colostrum awareness and reduced infant infections ($p = 0.018$) breastfeeding status and reduced infection rates ($p = 0.05$). Maternal feeding plans strongly predicted actual breastfeeding status ($p < 0.001$) feeding method ($p < 0.001$) and mixed-feeding proportions ($p < 0.001$), despite of previous knowledge of breastfeeding mothers used mixed feeding because of various reasons ($p < 0.002$)

Conclusion: Digital health education significantly improves maternal breastfeeding practices and decreases infant morbidity, offering a reliable strategy to support infant health in urban communities.

Keywords: Breastfeeding; pregnant; intervention

ABSTRACT 37

Effect of Social Media on Mental Health of Air University Students in Islamabad: A Cross-Sectional Study

Haider Ali, Asadullah, Mahar Babar, Muazmil Umer, Dr Juwayria Omar, Dr Inzamam Khalil

Fazaia Medical College Islamabad

Introduction: The transition to hyper-digitized connectivity has positioned social media as a central ecosystem for university students. While offering communication and connectivity benefits, excessive engagement poses notable psychological and physical risks. The aim of our study to evaluate the effects of social media usage patterns on mental health, sleep quality, self-esteem, and perceived addiction among Pakistani university undergraduates.

Methodology: An analytical cross-sectional study was conducted among 196 students at Air University (60.2%) and Fazaia Medical College (39.8%) using simple random sampling after their consent from different classes. Data was collected via a structured questionnaire regarding the use and effect of social media on mental health of students. Data was entered and analyzed using SPSS version 27. Descriptive analysis was done by calculating frequencies and percentages. Inferential analysis was done by Chi-square tests, and Fisher's exact tests, with statistical significance set at $p < 0.05$.

Results: High daily social media engagement was prevalent: 60.2% of respondents spent 3–5 hours online daily, and 28.6% spent over 5 hours. Instagram was the most used individual platform (30.6%). Over half of participants (52.6%) reported feeling addicted to social media. Higher usage duration significantly increased sleep reduction, reaching 78.6% among students online for over 5 hours daily ($p = 0.004$). Social comparison strongly predicted adverse mental health outcomes: 77.8% of students who always compared themselves to peers reported negative impacts on self-esteem ($p < 0.001$), while 62.9% experienced heightened anxiety ($p < 0.001$). Additionally, 61.7% reported feeling lonely after social media use. Female students demonstrated significantly higher awareness of online mental health resources (56.9%) compared to male students (40.0%; $p = 0.051$).

Conclusion: Increased social media use significantly correlates with self-perceived addiction, severe sleep disruption, anxiety, and diminished self-esteem among university students. Interventions prioritizing platform screen-time management and gender-targeted mental health awareness are strongly indicated.

Keywords: Social Media; Mental Health; Students

ABSTRACT 38

Association of Social Media Appearance-Editing Practices with Body Image and Self-Esteem among Adolescents and Young Adults

Mariyam Shafique, Malaika Faheem, Ashir Abdullah, Arooba Aslam, M. Adil, Dr. Saleha Afridi

Fazaia Medical College, Air University, Islamabad

Introduction: With edited and filtered photos becoming the norm on visual-centric social media platforms like Instagram, TikTok, and Snapchat, young people are constantly exposed to idealized looks that fuel appearance comparison and body dissatisfaction. This analytical cross-sectional study examines how habits surrounding filtered social media content shape body image and self-esteem among university students in Pakistan. To assess the frequency and patterns of exposure to filtered social media images, evaluate students' body image and self-esteem using standardized scales, and evaluate the associations between filter exposure, body image, self-esteem, and demographic influences.

Methodology: An analytical cross-sectional study was conducted among 300 active social media users aged 16–30 years at Air University between January and September 2026. Data were collected via an online structured survey incorporating selected domains of the Multidimensional Body-Self Relations Questionnaire (MBSRQ)—specifically Appearance Evaluation (AE), Appearance Orientation (AO), and Body Areas Satisfaction (BAS)—the Rosenberg Self-Esteem Scale (RSES), and a self-structured questionnaire on filter exposure patterns. Participants with conditions or life events significantly altering physical appearance or severe psychiatric conditions were excluded. Data were processed in SPSS using descriptive statistics, Pearson correlation, Spearman's rank correlation, and linear regression analysis.

Results: Among the respondents, 63.9% were aged 19–22 years, 52.8% were female, and 74.1% belonged to medical fields. Most students spent 3–4 hours (42.6%) or 5+ hours (36.1%) daily on social media, with Snapchat (33.3%) and Instagram (19.4%) as the leading picture-taking platforms. While only 3.7% always filtered photos, 34.3% reported filtering "sometimes" and 18.5% "most of the time". Linear regression evaluating demographic predictors (Age, Gender, Residence, Field of Study) on self-esteem yielded a significant model constant ($B = 13.730$, $p < 0.001$), though individual demographic factors did not show statistically significant direct effects.

Conclusion: Exposure to digitally filtered content and frequent social media usage are highly prevalent among university students. Psychological screening and digital literacy initiatives are recommended on campuses to foster healthy digital habits and protect student mental well-being.

Keywords: Social Media Filters; Body Image; Self-Esteem; MBSRQ; Rosenberg Scale; Young Adults

ABSTRACT 39

Maternal Perspective on Elective C-Section Among Pregnant Women Attending a Tertiary Care Hospital in Islamabad

Awwab Zulfiqar, Kinza, Sabahat, Talha Jan, Dr. Rukhsana Khan, Dr. Iffat Noreen

Fazaia Medical College

Introduction: Caesarean section (CS) is an important obstetric intervention when medically indicated; however, preference for elective CS may be influenced by maternal knowledge, perceptions, previous birth experiences, psychological concerns, and sociocultural factors. This study aimed to assess maternal perspectives and knowledge regarding elective C-section and normal vaginal delivery, determine the proportion preferring elective C-section, and examine associations between maternal preference and demographic, psychological, and sociocultural factors.

Methodology: An analytical cross-sectional study was conducted among 74 pregnant women attending the Gynaecology and Obstetrics Department of a tertiary-care hospital in Islamabad. Participants were recruited through non-probability purposive sampling. Data were collected using a structured questionnaire assessing sociodemographic characteristics, knowledge, perceptions, psychological factors, sociocultural influences, and preferred mode of delivery. Data were analysed using SPSS. Frequencies, percentages, and mean age were calculated, while associations were assessed using the chi-square test. Statistical significance was set at $p \leq 0.05$.

Results: The mean age of participants was 30 years; 73% were urban residents and 67.5% were multigravida. Although 50% considered normal vaginal delivery preferable overall and 47.3% considered CS preferable, 66.3% preferred elective CS for their current pregnancy. Furthermore, 68.9% perceived CS as less painful and 58.1% considered it more convenient. Fear of labour pain was reported by 83.8%, anxiety regarding complications by 90.5%, and previous traumatic birth experience by 47.3%. Family preference influenced 52.7% of participants, while 62.2% reported influence of their husband's opinion. Previous traumatic birth experience was significantly associated with preferred mode of delivery ($p = 0.031$), while cultural beliefs were significantly associated with perceived better mode of delivery ($p = 0.010$). Fear of labour pain, anxiety, residence, and education were not significantly associated with preferred mode of delivery.

Conclusion: Maternal preference for elective CS was multifactorial. Antenatal counselling should address previous traumatic birth experiences, misconceptions regarding pain, recovery, and safety, and relevant family and cultural influences while maintaining maternal autonomy. Balanced, evidence-based counselling should support informed decision-making regarding both modes of delivery.

Keywords: Elective Caesarean Section; Maternal Preference; Fear of Childbirth; Antenatal Counselling

ABSTRACT 40

ASSOCIATION BETWEEN SCREEN TIME AND DRY EYE SYMPTOMS AMONG STUDENTS OF AIR UNIVERSITY: AN ANALYTICAL CROSS-SECTIONAL STUDY

Rumaissa Fatima, Sania Bashir, Muhammad Azizullah, Alishba Noor, Kaneez Fatima, Dr Saleha Afridi

Fazaia Medical College

Introduction: Dry eye disease (DED) is increasingly reported among university students and may be associated with prolonged digital device use. Extended screen time may reduce blinking and can contribute to dryness, irritation, blurred vision, and eye discomfort. This study aimed to assess the relationship between screen time and dry eye symptoms among Air University students. To determine the prevalence and severity of dry eye symptoms, assess digital device use behaviours, and examine their association with dry eye severity among students of Air University.

Methodology: An analytical cross-sectional study was conducted among 199 Air University students aged 18-26 years in Islamabad from December 2025 to September 2026. Participants were selected through non-probability convenience sampling. Symptom presence and severity were assessed using the validated Ocular Surface Disease Index (OSDI) questionnaire administered via a semi-structured Google Form alongside questions on digital ergonomics after obtaining informed consent. Students with pre-existing eye disease, previous LASIK surgery, incomplete responses, or contact lens use were excluded.

Results: The prevalence of symptomatic dry eye disease was 59.3% (mean OSDI: 20.8 ± 19.2), 54.8% of students reported >6 hours of daily screen time. While total daily screen duration showed no significant association ($p = 0.301$), multivariable regression identified hourly screen breaks as strongly protective (aOR = 0.115, $p < 0.001$), whereas viewing distance <30 cm (aOR = 4.124, $p = 0.031$) and consistent eyeglass use (aOR = 5.748, $p = 0.006$) significantly increased disease risk.

Conclusion: The study found a considerable burden of dry eye symptoms among university students. Ergonomic habits like screen breaks and viewing distance dictate dry eye risk more strongly than total daily screen duration. These findings indicate that DED is an important ocular health concern among students in the digital age.

Keywords: Dry eye disease, screen time, electronic devices.

SECTION 6

IN-PERSON PRESENTATIONS

POSTGRADUATE

TOTAL SUBMISSIONS: 23

ABSTRACT 01

Assessment of Antibiotic Prescribing Practices and Proxy Indicators of Antimicrobial Resistance in Healthcare Facilities of Kabul, Afghanistan: A Cross-Sectional Study

Dr. Waleed Hamas

Introduction: Antimicrobial resistance (AMR) is a major global health threat, associated with an estimated 1.27 million deaths in 2019 and projected to cause up to 10 million deaths a year by 2050. The burden falls heavily on low-resource settings such as Afghanistan, where fragile health systems and irrational prescribing accelerate resistance, and where context-specific evidence remains scarce. This study aimed to promote rational drug prescribing in Kabul by describing antibiotic prescribing practices and using proxy indicators to estimate the risk of resistance.

Methodology: A facility-based cross-sectional study was conducted between April and August 2026 in public and private facilities in Kabul. Two components were analysed separately: a review of 384 prescriptions selected by multistage sampling, and a questionnaire completed by 49 prescribers working in the sampled departments. Data were analysed using descriptive statistics, the Pearson chi-square test, Fisher's exact test where expected counts were low, and Cramer's V as a measure of effect size.

Results: Twelve antibiotic agents were recorded, with prescribing concentrated in co-trimoxazole (14.6 per cent), metronidazole (13.5 per cent), gentamicin (12.2 per cent) and amoxicillin (11.7 per cent). Access-group agents accounted for 52.1 per cent of prescriptions, below the WHO target of at least 60 per cent, while Watch and Reserve agents together made up 47.9 per cent and Reserve agents alone 2.6 per cent. Broad-spectrum agents were used in 60.9 per cent of prescriptions and injectable formulations in 41.7 per cent, well above the WHO reference range, in a sample that was 71.4 per cent outpatient. Among prescribers, awareness of the AWaRe classification was low at 38.8 per cent and 61.2 per cent never applied it; 89.8 per cent prescribed antibiotics often or always and 61.2 per cent prescribed for suspected viral illness. A laboratory was available to 67.3 per cent yet 75.5 per cent used testing rarely or never; guidelines reached 38.8 per cent, and no facility conducted prescription audits or operated a stewardship programme. Prescribers aware of the AWaRe classification reported less broad-spectrum use (Fisher's exact, $p < 0.001$).

Conclusion: Antibiotic prescribing in Kabul is frequent, broad-spectrum and largely empirical, and falls short of WHO AWaRe targets in a system with almost no stewardship support. Introducing the AWaRe classification into training and guidelines, establishing basic stewardship structures, strengthening diagnostics and regulating over-the-counter sales are the priority actions.

Keywords: Antimicrobial Resistance; Anti-Bacterial Agents; Drug Prescriptions; Antimicrobial Stewardship; Afghanistan

ABSTRACT 02

Patterns Of Antibiotic Misuse in Livestock And Associated Risk Factors To Human Health: A Cross-Sectional Analytical Study in Attock, Punjab, Pakistan

Rameen Ashfaq

Health Services Academy

Introduction: Antimicrobial resistance (AMR) driven by antibiotic misuse in livestock is a growing One Health concern, particularly in low and middle-income countries where veterinary oversight and regulatory enforcement remain limited. Evidence from district-level, mixed farming settings in Pakistan is scarce, despite the country's large livestock population and heavy reliance on livestock-based livelihoods. This study aimed to characterize patterns of antibiotic use among livestock farmers in District Attock, Punjab, Pakistan; to assess patterns of antibiotic misuse; and to identify pathways through which livestock antibiotic misuse may pose risks to human health.

Methodology: A descriptive cross-sectional study was conducted among 134 livestock farmers selected through multistage sampling across District Attock. Data were collected using a structured, pretested behaviors, and human health risk factors. Data were analyzed using descriptive statistics, chi-square tests of association, Pearson correlation, and multivariable logistic regression.

Results: Antibiotic use was (97.0%), with over two-thirds of farmers (67.0%) administering antibiotics without veterinary consultation and more than half (55.0%) combining multiple antibiotics simultaneously. Knowledge of antibiotic use and AMR was poor across all items tested and only 14.2% of respondents understood the concept of a withdrawal period. Attitudes were more favorable in principle, with 59.7% recognizing AMR as a serious health threat, though the attitude scale showed considerable neutrality. Actual stewardship practices were the weakest domain: only 32.1% always completed a full antibiotic course, and all respondents (100%) reported selling or consuming animal products during antibiotic treatment. Knowledge, attitude, and practice scores were all significantly but weakly correlated ($r = 0.198$-0.271, $p < 0.01$). Poor practice was significantly associated with higher antibiotic misuse (89.0% vs. 53.8%, $p < 0.001$). Nearly half of respondents reported no protective measures (46.3%) or open disposal of antibiotic waste (47.0%), and 64.2% fell into the poor overall risk category.

Conclusion: Livestock farmers in Attock exhibit widespread antibiotic use accompanied by low knowledge, ambivalent attitudes, and poor stewardship practices, creating multiple pathways for human exposure to antibiotic residues and resistant organisms through food, occupational contact, and environmental disposal. These findings highlight an urgent need for strengthened veterinary oversight, farmer education, and enforceable withdrawal-period regulations within a One Health framework to reduce antimicrobial misuse and its associated public health risks.

Keywords: Antibiotic Misuse; Antimicrobial Resistance; Livestock; One Health; Stewardship Practices; Pakistan

ABSTRACT 03

“An assistant, not a replacement”: a qualitative inquiry of the perceptions of postgraduate nursing students about the concept of Integrating artificial intelligence in nursing education in Pakistan.

Sana Khan

NUMS Rawalpindi

Introduction: Artificial intelligence (AI) is actively transforming nursing education in countries around the world, but there is a gap in the evidence of low and middle-income areas. Current studies are mostly quantitative and undergraduate in nature and the views of postgraduate nursing students who are at the same time advanced learners, as well as experienced clinicians and upcoming researchers have not been explored extensively in Pakistan.

Methodology: The qualitative exploratory descriptive design was used and its basis is an interpretivist paradigm with the Technology Acceptance Model as a sensitising framework. A purposive sample size of twenty postgraduate nursing students was selected in two institutions (one in the public and one in the private sector) in two provinces. Two focus group discussions were conducted with the help of a semi-structured, expert-reviewed, and pilot-tested guide and analysed with the help of Braun and Clarke six-phase thematic analysis with NVivo 15. The report is based on COREQ guidelines.

Results: Five themes were identified: (1) AI is a transformative academic and clinical support tool, appreciated by students as a research, clinical decision support, and time-saving tool; (2) institutional readiness and exposure to AI, made possible through curricular exposure and connection but limited by infrastructure and unequal access to paid tools; (3) ethical, academic, and professional issues, focusing on decreased critical thinking, privacy, and the quality of AI output; (4) maintaining human judgement, compassion, and nursing identity, with students identifying AI as a supplement and not a substitute; and structured curriculum, training, and policy support. The acceptance of AI by students was conditional, as they valued its usefulness and at the same time expressed strong ethical and professional reservations.

Conclusion: AI proponents in postgraduate nursing students in Pakistan are enthusiastic users with their adoption being conditional on institutional, ethical, and pedagogical protective mechanisms as opposed to negative attitudes. The main obstacles to meaningful integration are structural and institutional and not attitudinal. In this context, it will be necessary to address infrastructure, ethical governance, and planned curricular integration to realise the potential of AI in education responsibly.

Keywords: Artificial intelligence; nursing education; postgraduate nursing students; qualitative research; focus groups; Technology Acceptance Model

ABSTRACT 04

EFFECTIVENESS OF AN ARTIFICIAL INTELLIGENCE-ASSISTED PERSONALIZED HEAT-RISK ALERT SYSTEM IN REDUCING HEAT-RELATED ILLNESS AMONG ADULTS WITH CHRONIC CONDITIONS: Study Protocol For A RANDOMIZED CONTROLLED TRIAL IN PAKISTAN

Dr Mubra Noor

AFPGMI, NUMS

Introduction: Pakistan faces a growing burden of extreme heat, with adults living with chronic conditions particularly vulnerable to heat-related illness. Yet PMD heat-health warnings do not account for individual clinical vulnerability. This limitation highlights the need for personalized risk communication integrating clinical and environmental factors. This study aims to determine whether an AI-assisted personalized heat-risk alert system reduces heat-related illness symptom burden compared with a generic Pakistan Meteorological Department (PMD) heat-health advisory among adults with chronic conditions.

Methodology: A two-arm, parallel-group superiority randomized controlled trial will enroll 120 adults (60/group) with hypertension, type 2 diabetes, chronic kidney disease, cardiovascular disease, and/or obesity from selected public-sector tertiary-care hospital OPDs in Gujranwala, Pakistan. Participants will be randomized 1:1 using computer-generated variable blocks of 4 and 6, stratified by chronic-condition category. Over six weeks, both groups will use the same patient-facing mobile application. When the PMD same-day forecast maximum temperature is ≥36°C, intervention participants will receive personalized low-, moderate-, or high-risk alerts generated by a locked AI prediction model using clinical characteristics and temperature. Controls will receive a generic PMD advisory without AI-based risk stratification or clinical personalization. The primary outcome is the Week-6 Heat-Related Illness Symptom Score (HRISS; 0–20). Secondary outcomes include heat-protective behaviors, knowledge, attitudes, practices (KAP), heat-related emergency visits, hospital admissions, and app engagement. The AI model will be developed and internally validated using a separate historical dataset.

Results: The between-group difference in Week-6 HRISS will be assessed using intention-to-treat ANCOVA adjusted for baseline HRISS and the stratification variable. Secondary outcomes will be analyzed using appropriate comparative and regression methods. The protocol specifies 120 participants and six weeks of follow-up; outcome data are not yet available.

Conclusion: This trial will assess whether AI-personalized heat alerts can reduce symptom burden among adults with chronic conditions. If effective, the approach could inform scalable and climate-resilient digital health strategies for heat-health risk management in Pakistan.

Keywords: Artificial Intelligence; Heat-Related Illness; Heat-Health Warning System; Digital Health; Chronic Disease; Randomized Controlled Trial

ABSTRACT 05

The Appropriateness of Cardiac Telemetry Based on Real-Time Data: A Case Series of 5 Patients from a Tertiary Care Hospital in Pakistan

Ayesha Akram

Introduction: Continuous cardiac telemetry is a noninvasive method to monitor heart rate and rhythm in healthcare settings. With rising healthcare expenditures in Pakistan, unnecessary telemetry use increases costs without improving outcomes and contributes to alarm fatigue. The American Heart Association (AHA) 2023 practice standards recommend guideline-based telemetry, yet overuse persists. This case series describes 5 patients to illustrate the clinical and financial impact of implementing EMR-based guideline adherence in a tertiary care hospital in Rawalpindi, Pakistan

Methodology: This was a prospective case series conducted at a tertiary care hospital in Rawalpindi, Pakistan with 200 telemetry beds and 99% occupancy. Study design: Consecutive case selection from a quality improvement initiative. Sampling: Patients aged 18-105 placed on continuous telemetry without AHA 2023 indication. Sample size: 5 representative cases. Tools: EMR data extraction and AHA 2023 ECG monitoring criteria. Intervention: EMR updates required 1) documented indication for every telemetry order, 2) addition of indication to the problem list, and 3) a predetermined duration. Analysis: Clinical course, telemetry duration, cost, and safety outcomes were reviewed descriptively.

Results: *Case 1*: 34-year-old male with atypical chest pain. Telemetry stopped on Day 1. Discharged Day 2. Cost saved: PKR 15,000. *Case 2*: 52-year-old female with vasovagal syncope. Telemetry discontinued after EMR hard-stop. *Case 3*: 68-year-old male with COPD exacerbation. 3 telemetry days avoided. Cost saved: PKR 45,000. *Case 4*: 45-year-old male post ORIF tibia. Auto-discontinuation at 24h prevented 1 unnecessary telemetry day. *Case 5*: 29-year-old female with palpitations. Stepped down to monitor. Zero telemetry alarms in 24h. Across the 5 cases, guideline-based de-escalation freed telemetry beds and reduced projected costs. No adverse events, increased length of stay, or mortality occurred.

Conclusion: Implementing AHA 2023 guideline-based EMR hard-stops with required indication and duration is feasible and safe in a Pakistani hospital setting. These 5 cases demonstrate potential to reduce unnecessary telemetry use, costs, and alarm fatigue. We recommend hospital-wide adoption, daily telemetry review in rounds, and larger studies to validate cost savings.

Keywords: Cardiac telemetry; AHA guidelines 2023; case series; cost savings; quality improvement; Pakistan

ABSTRACT 06

Pregnancy in a Woman with Grey Platelet Syndrome, Celiac Disease, and Gestational Diabetes Mellitus: A Case Report with Adverse Neonatal Outcome

Dr Mehr un Nisa, Dr Tahreem Farah, Prof Dr Shamsa Rizwan, Dr Hania Batool

PAF Hospital Islamabad

Introduction: Grey Platelet Syndrome (GPS) and Bernard–Soulier Syndrome (BSS) are characterised by abnormally large platelets and impaired platelet function. This report explains the case of a primigravida, known case of GPS, coeliac disease and GDM, with platelet aggregation abnormalities similar to those of BSS. She reported to have multiple blood transfusions and family history of GPS. Fetal anomaly and growth scans were normal. At 37 weeks and 5 days, an elective caesarean section was performed with massive blood transfusion per-operatively. Male neonate, 1.4 kgs, was delivered with immediate cry. On 2nd day of life, he was diagnosed with hypoplastic left heart syndrome (HLHS). He was ventilated in NICU, but died on 10th day of life. The complex management of pregnancy in women with rare inherited platelet diseases in relation to autoimmune disorders is demonstrated, as a multidisciplinary approach is required for their antenatal care and fetal assessment.

Methodology: Retrospective case report. All documents and materials collected from patient's hospital records.

Results: Not applicable

Conclusion: This case exemplifies the difficulties of pregnancy management in women with rare inherited platelet disorders in the setting of autoimmune diseases and metabolic disorders. The multidisciplinary approach allowed successful management of the mother; however, the poor outcome for the neonates in this case was due to the presence of an undiagnosed congenital cardiac anomaly, highlighting the need for careful fetal evaluation, including fetal echocardiogram, in high-risk pregnancies.

Keywords: Grey platelet syndrome; Bernard-Soulier Syndrome; Hypoplastic Left Heart Syndrome; Diabetes Gestational

ABSTRACT 07

Thoracic Paravertebral versus Epidural for Postoperative Analgesia in Patients Undergoing Unilateral Thoracic Surgery

Dr Ayesha Zaheer

HBS General Hospital

Introduction: Thoracic surgery is associated with significant postoperative pain, which can impair respiratory mechanics, coughing and mobilization and increase opioid requirements and pulmonary complications. Thoracic epidural analgesia (TEA) is an established technique, while thoracic paravertebral block (PVB) provides unilateral analgesia with potentially better hemodynamic stability. This study compared the analgesic efficacy and safety of TEA and PVB in patients undergoing unilateral thoracic surgery. To compare postoperative analgesia, hemodynamic stability, rescue analgesic requirements and patient satisfaction between TEA and PVB.

Methodology: A prospective comparative study was conducted in the Department of Anesthesiology, HBS General Hospital, Islamabad, from July 2025 to July 2026. Forty adult patients aged 18–70 years from both genders, ASA I–III, undergoing elective unilateral thoracic surgery were included. Group A received TEA and Group B received ultrasound-guided single space PVB by placing an epidural catheter at T6 to T7. Both groups received standardized general anesthesia, 0.25% bypivacaine intra operatively and 0.125 bupivacaine postoperatively and multimodal analgesia with and inj nalbuphine 0.15 mg/kg and inj ketorolac 0.42mg/kg. Postoperative pain was assessed using the Visual Analogue Scale (VAS from 0 to 10) at recovery, 2, 6, 12 and 24 hours postoperatively along with patient satisfaction on a scale from 0 to 3. Secondary outcomes included hypotension, rescue analgesic consumption mg per 24 hours, postoperative nausea and vomiting, urinary retention etc.

Results: Postoperative VAS scores at all assessed time points were comparable between TEA and PVB (3.24 ± 1.35 vs 3.45 ± 2.14, respectively; p = 0.716). Rescue analgesic consumption during the first 24 hours was significantly lower in the TEA group compared with the PVB group (10.5 ± 2.45 vs 12.4 ± 1.56 mg; p = 0.004). Hypotension, defined as a fall in MAP >15%, occurred in two patients in Group A, whereas no hypotension was observed in Group B. Patient satisfaction scores were similar between the two groups (2.50 ± 0.46 vs 2.46 ± 0.38; p = 0.763).

Conclusion: Thoracic PVB provided comparable postoperative analgesia to TEA in unilateral thoracic surgery with a better hemodynamic stability and may be considered an effective alternative to TEA, particularly in patients where avoidance of hypotension is desirable. Recommendations: Multicentric studies on larger samples are recommended to establish the efficacy of thoracic paravertebral blocks to an alternative to thoracic epidural analgesia in unilateral thoracic surgery.

Keywords: Thoracic Paravertebral; Epidural Analgesia; Unilateral Thoracic Surgery

ABSTRACT 08

Comparative Safety and Effectiveness of Apixaban Versus Rivaroxaban for the Treatment of Venous Thromboembolism: A Systematic Review and Meta-Analysis

Muhammad Hamza, Aizaz Anwar Khalid, Hasnain Wajeeh Saqib, Zohad Khattak, Anoosha Ashfaq, Mahad Ahmad, Talha Khan

Abbottabad International Medical Institute, Abbottabad, Pakistan, Peshawar Medical College, Peshawar, Pakistan, Riphah International University Islamic International Medical College, Pakistan, Frontier Medical and Dental College, Abbottabad, Pakistan, Allama Iqbal Medical College, Lahore, Pakistan

Introduction: Apixaban and rivaroxaban are widely used direct oral anticoagulants (DOACs) for the treatment of venous thromboembolism (VTE). However, comparative evidence regarding their effectiveness and safety remains inconsistent. We conducted a systematic review and meta-analysis to compare the effectiveness and safety of apixaban versus rivaroxaban in patients with VTE, incorporating both observational evidence and a recently published randomized controlled trial.

Methodology: PubMed/MEDLINE, Scopus, and the Cochrane Library were searched for studies directly comparing apixaban with rivaroxaban in patients with VTE. Randomized controlled trials and prospective or retrospective observational cohort studies were eligible. The primary outcomes were recurrent VTE, all-cause mortality, major bleeding, and clinically relevant non-major bleeding (CRNMB), while gastrointestinal (GI) bleeding was assessed as a secondary outcome. Risk of bias was assessed using the ROBINS-I tool for non-randomized studies and the RoB 2 tool for randomized trials. Hazard ratios (HRs) with 95% confidence intervals (CIs) were pooled using random-effects models with restricted maximum likelihood estimation. Sensitivity and prespecified subgroup analyses were performed. Results

Results: Nine studies comprising 95,689 patients were included, including eight observational studies and one randomized controlled trial, published between 2018 and 2026. Apixaban was associated with a numerically lower risk of recurrent VTE compared with rivaroxaban, although the difference was not statistically significant (HR 0.76, 95% CI 0.51–1.15; p = 0.19; I2 = 66.8%). Apixaban was associated with significantly lower risks of major bleeding (HR 0.66, 95% CI 0.50–0.86; p = 0.002; I2 = 68.9%) and CRNMB (HR 0.59, 95% CI 0.42–0.84; p = 0.003; I2 = 65.3%). GI bleeding was also significantly lower with apixaban (HR 0.75, 95% CI 0.61–0.92; p = 0.0058; I2 = 0%). All-cause mortality was not significantly different between apixaban and rivaroxaban (HR 0.91, 95% CI 0.75–1.11; p = 0.369; I2 = 52.5%). In sensitivity analyses, removal of Dawwas 2018 for recurrent VTE shifted the pooled estimate toward the null (HR 0.91, 95% CI 0.70–1.18; p = 0.456) and reduced heterogeneity to I2 = 0%. Removal of Castellucci 2026 for major bleeding yielded an HR of 0.73 (95% CI 0.61–0.87; p = 0.0007; I2 = 46.0%), while removal of Wysokinski 2019 for CRNMB yielded an HR of 0.66 (95% CI 0.48–0.90; p = 0.008; I2 = 58.7%). Removal of Castellucci 2026 for mortality produced an HR of 0.93 (95% CI 0.77–1.12; p = 0.4463; I2 = 55.4%), and removal of Sindet-Pedersen 2018 for GI bleeding yielded an HR of 0.71 (95% CI 0.57–0.88; p = 0.002; I2 = 0%). Subgroup analyses demonstrated significant between-group differences for mortality according to age (p = 0.0087), major bleeding according to cancer status (p = 0.0159), and CRNMB according to follow-up duration (p = 0.0132); however, these analyses were limited by the small number of studies contributing to several subgroups.

Conclusion: In patients treated for VTE, apixaban was associated with significantly lower risks of major bleeding, CRNMB, and GI bleeding compared with rivaroxaban, while no statistically significant difference was observed in recurrent VTE or all-cause mortality. The reduction in recurrent VTE was attenuated after removal of an influential study, whereas the significant bleeding findings remained consistent in sensitivity analyses. Given that eight of the nine included studies were observational and several outcomes demonstrated substantial heterogeneity, these findings should be interpreted cautiously. Apixaban may offer a more favorable bleeding profile than rivaroxaban, particularly when bleeding risk is an important consideration, although treatment selection should be individualized according to patient characteristics and thrombotic and bleeding risk.

Keywords: Apixaban; Rivaroxaban; Venous thromboembolism; Major bleeding; Direct oral anticoagulants; Meta-analysis

ABSTRACT 09

Clinical course management and outcome of tubercular empyema. A prospective study in high TB area of Pakistan.

Dr Muhammad Yasin, Dr Mohsin Khan

Ayub Medical Teaching Institute

Introduction: Mycobacterium tuberculosis (MTB) rarely presents as purulent empyema compared with other bacterial pathogens. This study aimed to characterize the clinical course, radiological findings, pleural fluid biochemical features, management strategies, complications, and outcomes of tubercular empyema.

Methodology: This case-control study was conducted in Pulmonology Unit at Ayub Teaching Hospital from July 2023 to January 20, 2026. Empyema subtypes were compared using one-way analysis of variance (ANOVA) for normally distributed continuous variables, including age, total leukocyte count, and pleural fluid protein levels. Homogeneity of variances was assessed using Levene's test, followed by Tukey's or Games–Howell post hoc analysis as appropriate. Multinomial logistic regression was performed to examine associations between clinical variables and empyema type, with results expressed as odds ratios (ORs) and 95% confidence intervals (CIs). A p-value <0.05 was considered statistically significant.

Results: Thirty-eight patients were enrolled over 2.7 years; 53% were male, with a mean age of 46 ± 18 years (range, 14–75 years). Most patients (78%) were from K.P.K. Tubercular empyema accounted for 47% of cases, bacterial empyema for 42%, and mixed etiology for 11%. The common presenting symptoms were cough, fever, and dyspnea (67%). Acid-fast bacilli smear was positive in 33%, TB culture in 44%, Gene-Xpert in 56%, and 33% were diagnosed via Abram's pleural biopsy.

Conclusion: Tubercular empyema demonstrates distinct clinical and radiological characteristics. The Abraham biopsy yield is quite good then reported previously in T.B empyema.

Keywords: TB Pleurisy; Extra-pulmonary Tuberculosis; X-pert MTB/XDR; Bacterial empyema; pleural calcification; Abram pleural biopsy

ABSTRACT 10

Improving Aseptic Compliance During Emergency Foley's Catheterization: A Clinical Audit Cycle & QIP

Dr Nadia Iqbal, Dr Zoila Shah

PAF Hospital Islamabad

Introduction: Foley's catheterization is a high-frequency invasive procedure in the Emergency Department (ED). Aseptic catheter insertion and appropriate infection-prevention practices are essential to reduce the risk of catheter-associated urinary tract infections (CAUTIs).1, Hand hygiene is a key component of infection prevention during catheter-related procedures.2In fast-paced emergency environments, heavy workloads and operational pressures may contribute to variations in procedural practice. To evaluate baseline compliance with recommended infection-prevention and aseptic practices during Foley's catheterization in the ED and establish a practical quality-improvement framework.

Methodology: A baseline clinical audit was conducted in the ED of PAF Hospital, Islamabad. Using direct observation, 45 consecutive Foley's catheterization procedures were evaluated across seven core criteria: hand hygiene, sterile gloves, appropriate meatal cleaning, sterile lubrication, correct balloon inflation, catheter securement, and procedural documentation. Compliance rates were calculated individually and overall.

Results: Across the 45 observed procedures, overall baseline compliance was 58.4%. Technical execution and selected infection-prevention measures showed high adherence. Sterile lubrication, balloon inflation, and catheter securement achieved 100%, while hand hygiene reached 91.1%. Significant gaps were identified in barrier precautions and documentation. Sterile glove use stood at 13.3%, appropriate meatal cleaning at 4.4%, and procedural documentation at 0%.

Conclusion: The audit revealed a striking clinical paradox: strong mechanical execution contrasted sharply with critical gaps in barrier protection and record-keeping. These findings highlight the need for targeted, systems-level interventions. Evidence-based recommendations emphasize hand hygiene, aseptic technique, sterile equipment, and appropriate catheter insertion practices. Actionable quality-improvement measures, including staff education, bedside visual guides, standardized procedural checklists, and dedicated catheterization trolleys, are being implemented ahead of a scheduled re-audit cycle.

Keywords: Foley catheterization; Aseptic technique; Clinical audit; Quality improvement; Catheter-associated urinary tract infection

ABSTRACT 11

Quality of Life After Laparoscopic Sleeve Gastrectomy in Obese Patients at a Private Hospital in Karachi

Dr Umama

South City Hospital Karachi

Introduction: To evaluate the impact of laparoscopic sleeve gastrectomy on quality of life in obese patients by calculating the mean change in Short Form-36 score.

Methodology: Descriptive case-series study. Place and Duration of Study: South City Hospital, Karachi, from July 2025 to Jan 2026. Consecutive obese patients aged 16-65 years with body mass index (BMI) ≥30 kg/m2 who underwent laparoscopic sleeve gastrectomy were included. Patients with previous bariatric or major abdominal surgery, gastroesophageal reflux disease, symptomatic hiatal hernia with severe sweet-eating disorder, or documented psychiatric illness were excluded. BMI and SF-36 scores were recorded preoperatively and six months postoperatively. Paired-samples t-test was applied, with p ≤0.05 considered significant.

Results: A total of 100 patients were analysed. Mean age was 40.01 ± 10.41 years; 65 (65.0%) were females. BMI decreased from 43.20 ± 5.10 to 33.53 ± 5.09 kg/m2, with a mean difference of -9.67 kg/m2 (95% CI -10.11 to -9.24; p<0.001). SF-36 total score increased from 46.09 ± 7.03 to 66.50 ± 6.69, with a mean change of 20.41 (95% CI 19.58 to 21.25; p<0.001). All eight SF-36 domains improved significantly. Postoperative complications occurred in 15 (15.0%) patients.

Conclusion: Laparoscopic sleeve gastrectomy was associated with significant six-month improvement in SF-36 quality-of-life scores and BMI among obese patients in this cohort.

Keywords: Bariatric surgery; Gastrectomy; Laparoscopy; Obesity; Quality of life; SF-36

ABSTRACT 12

Navigating Horizontal and Vertical Feedback in Residency Training: A Mixed-Methods Study Using Mini-Peer Assessment Tool (Mini-PAT)

Dr Nazia Ibrahim, Prof Dr Sumreena Mansoor

Shifa Tameer e Millat University

Introduction: Feedback is central to competency-based residency training, yet the educational value of feedback may vary by hierarchical source. This study examines how horizontal (peer) and vertical (faculty) feedback generated through Mini-PAT is experienced and used within a postgraduate training context.

Methodology: An explanatory sequential mixed-methods study was conducted at Fazaia Postgraduate Medical Institute, Pakistan. Phase 1 comprised 209 Mini-PAT assessments, including 147 peer and 62 faculty assessments. Competency ratings across 15 domains were summarized descriptively and compared between assessor groups. Phase 2 uses purposive semi-structured interviews and focus group discussion with residents, peer assessors and faculty assessors to explain quantitative findings. Preliminary qualitative data were analyzed using hybrid inductive-deductive reflexive thematic analysis.

Results: Overall competency ratings were broadly similar between peer and faculty assessments (mean composite score 3.09±0.49 vs 3.07±0.53 on a four-point scale). However, faculty ratings more frequently classified residents as above expectations overall than peer ratings (33.9% vs 25.2%). Only 69/209 assessors (33.0%) reported any prior Mini-PAT training, while 83/209 (39.7%) wished to discuss their feedback with the resident. Preliminary qualitative findings indicate that faculty feedback is perceived as carrying greater credibility and weight because of seniority and experience, whereas peer feedback contributes useful day-to-day, teamwork and practical perspectives. Emerging themes also highlight hierarchy-related hesitation in seeking clarification, differing psychological-safety concerns, and possible peer leniency or score inflation.

Conclusion: Quantitative findings suggest substantial convergence in competency ratings, while qualitative findings indicate that the two feedback sources are not experienced as interchangeable. Mini-PAT may be strengthened by explicit rater preparation, feedback dialogue, and resident feedback-literacy training, with deliberate use of peer and faculty feedback as complementary sources. Ongoing qualitative data collection will further refine these findings.

Keywords: Mini-PAT; peer feedback; faculty feedback; residency training; mixed methods

ABSTRACT 13

Developing a Multilevel Framework for Structured Language Intervention in Linguistically Diverse Clinical Contexts: A Qualitative Study of Speech-Language Pathologists

Dr. Naima Farooq

Riphah International University

Introduction: Linguistic diversity represents a critical barrier to the delivery of equitable and successful interventions in speech-language pathology, particularly in under-resourced and multilingual contexts. Despite the prevalence of structured language facilitation methods, there remains a notable absence of frameworks reflecting the specific cultural and linguistic needs of participants. This research aimed to design a multilevel framework outlining factors that influence the adoption of structured language intervention approaches based on the perceptions of Speech-Language Pathologists (SLPs).

Methodology: Study Design & Duration: Qualitative study conducted over a 6-month period from August 2023 to February 2024. Participants & Sampling: Included n = 43 Speech-Language Pathologists with varying clinical experience across diverse practice settings, recruited via purposive sampling. Data Collection: Data gathered using a semi-structured interview guide developed following extensive literature review, expert panel review by SLPs, and pilot testing. Data Analysis: Reflexive thematic analysis was employed to identify core themes regarding intervention practices, contextual constraints, and clinical decision-making in multilingual settings.

Results: The thematic analysis revealed six primary themes categorized across three structural levels: Systemic Level Factors: Lack of standardized intervention protocols, insufficient availability of culturally adapted materials, and inadequate professional training opportunities. Practitioner Level Factors: Individual variations in adapting interventions, conducting assessments, and implementing evidence-based practice. Sociocultural Level Factors: Importance of the mother tongue, family member involvement, frequency of target language exposure, and parental expectations.

Conclusion: The proposed multilevel framework offers a comprehensive perspective on how systemic, clinical, and sociocultural determinants collectively dictate the success of language intervention programs in linguistically diverse populations. Although grounded in an Urdu-speaking clinical context, the resulting framework offers significant global relevance across varied multilingual healthcare settings.

Keywords: Language impairment; Language intervention; Linguistic diversity; Multilevel framework

ABSTRACT 14

Assessing the performance of the WEBAC Score in predicting wound infections after Cholecystectomy

Atia Khatoon, Irmaghana Basharat, Sidra Shabbir, Rehan Ahmed khan, M. Nazim Khan, Mannan Masud.

Department of Surgery, PAF hospital Islamabad, Riphah International University, Rawalpindi.

Introduction: Laparoscopic cholecystectomy is one of the most common surgery performed worldwide due to gallstone disease. Surgical site infection (SSI) is the most common healthcare-associated infection and contributes to increased length of hospitalization. The WEBAC score, designed to predict wound infection risk, considers factors like wound classification, the nature of the surgery (elective or emergency), bile spillage, prophylactic antibiotics, and patient comorbidities. This prospective cohort study aims to revalidate the WEBAC score with current clinical data to improve its predictive accuracy and enhance patient care by targeting infection prevention strategies.

Methodology: The data of patients who underwent cholecystectomy in PAF Hospital Islamabad from June 2024-December 2024 were collected prospectively. To assess the risk of SSIs, a scoring system WEBAC was utilized, based on five variables: wound classification, preoperative ERCP, retrieval bag use, age ≥ 60years, and smoking history. Each variable was assigned a score of 1 when present. The SSI was assessed before discharge and at a 1-month follow-up. Variables that were independently predictive of the increased SSIs were included in the risk score.

Results: Among the 184 patients who underwent cholecystectomy, 7 (3.8%) developed SSIs. Factors significantly associated with SSIs included age ≥ 60 years ($p = 0.045$), a history of smoking ($p = 0.004$), non-use of a retrieval bag ($p = 0.005$), preoperative ERCP ($p = 0.02$), and wound classifications III or IV ($p = 0.007$). Patients in the no-infection group had a mean WEBAC score of 0.85 (±0.3), whereas those in the infection group had a significantly higher mean score of 2.7 (±0.6). The likelihood of developing an SSI increased with higher WEBAC scores. Patients with scores of 0–1 had a low SSI probability of 1.2%, those with scores of 2–3 had a moderate risk of 8.7%, and those with scores of 4–5 were at high risk, with a probability of 27.3%.

Conclusion: These findings highlight the importance of identifying high-risk patients preoperatively and implementing targeted strategies to minimize the risk of SSIs. The WEBAC score represents a convenient and simple tool to predict the probability of SSI in the patients who underwent cholecystectomy and might increase the surgeons' awareness of postoperative SSI.

Keywords: SSI; WEBAC; Laparoscopic cholecystectomy; postoperative outcomes

ABSTRACT 15

Development of a Bioactive HA/PCL Scaffold Seeded with Mesenchymal Stem Cells for Osteogenic and Angiogenic Enhancement in Maxillofacial Bone Tissue Engineering

Khurram Latif, Sara Riaz, Hira Zubair

Introduction: Reconstructing critical-sized maxillofacial bone defects resulting from ablative trauma, surgical tumor resection, congenital deformities, and osteomyelitis presents a major clinical challenge in Oral and Maxillofacial Surgery (OMFS). Current gold-standard autogenous bone grafts suffer from notable limitations, including severe donor-site morbidity, limited availability, unpredictable graft resorption, and an inability to reproduce intricate craniofacial geometry. While biomaterial scaffolds offer an alternative, clinical translation is frequently impeded by poor internal vascularization, limited cell survival, and sub-optimal osteogenic integration. This 12-month project aims to fabricate, characterize, and evaluate a bioactive hydroxyapatite/polycaprolactone (HA/PCL) composite scaffold seeded with human mesenchymal stem cells (MSCs). We hypothesize that incorporating MSCs into an optimized HA/PCL matrix will synergistically enhance cell viability, proliferation, osteogenic differentiation, and angiogenic activity compared to non-seeded constructs.

Methodology: The research is structured across five integrated phases using a rigorous 3-group design (Group A: Blank HA/PCL scaffold [Negative Control]; Group B: Human MSCs on 2D Tissue Culture Plastic [Baseline Control]; Group C: MSC-seeded HA/PCL scaffold [Experimental Treatment]; with n=6 biological replicates per group across triplicate runs, powered at 80%): Scaffold Fabrication & Characterization: Composite HA/PCL scaffolds will be synthesized via solvent-casting/particulate leaching or additive manufacturing, and characterized for surface morphology (SEM), porosity, pore architecture, and mechanical strength. MSC Seeding & Cytocompatibility: Human MSCs (passages 3–5) will be seeded on scaffolds. Cell viability and growth kinetics will be measured via MTT assays on Days 1, 3, and 7, while cell attachment and spreading will be examined using SEM. Osteogenic Differentiation: Biochemical evaluation of alkaline phosphatase (ALP) activity (Days 7, 14) and Alizarin Red mineralization assays (Day 21) will be paired with qPCR analysis of key osteogenic marker genes (RUNX2, ALP, OCN, COL1A1). Angiogenic Potential: Pro-angiogenic gene expression (VEGFA qPCR) will be combined with functional Human Umbilical Vein Endothelial Cell (HUVEC) tube formation assays (measuring branch points, junction counts, and total tube length from scaffold conditioned media). Statistical Analysis: Data will undergo normality (Shapiro-Wilk) and variance testing prior to Two-Way Repeated Measures ANOVA (MTT), Two-Way ANOVA (ALP), and One-Way ANOVA with Tukey's/Dunnett's post-hoc tests (GraphPad Prism/SPSS, $p < 0.05$).

Results: The project is anticipated to yield a fully characterized, highly biocompatible HA/PCL tissue engineering construct capable of simultaneous osteogenesis and angiogenesis. By demonstrating robust mineralization alongside functional VEGF-mediated vascular capillary formation, the study is intended to establish a translational proof-of-concept platform for patient-specific craniofacial repair.

Conclusion: The proposed HA/PCL-MSC construct is intended to establish a translational proof-of-concept platform for patient-specific craniofacial repair by supporting simultaneous osteogenesis and angiogenesis.

Keywords: Maxillofacial Bone Tissue Engineering; Hydroxyapatite/Polycaprolactone (HA/PCL); Mesenchymal Stem Cells (MSCs); Osteogenesis; Angiogenesis; VEGF; Pre-clinical Bone Reconstruction

ABSTRACT 16

Association of Nurses' Followership Styles with Patient Satisfaction in Intensive Care Units: A Cross-Sectional Analytical Study

Miss Naila Kanwal, Brig. Khadija Qamar, Lt Col. Shahida, Maj Sumaira Nosheen (Rtd)

National University of Medical Sciences, Rawalpindi, Army Medical College, Rawalpindi 3, College of Nursing, AFPGMI

Introduction: Nurses' followership behaviours may influence teamwork, communication, decision-making, and the quality of patient care, particularly in intensive care units where patients require continuous and complex nursing support. This study aimed to describe nurses' followership styles, assess patient satisfaction, and determine the association between nurses' followership characteristics and patient satisfaction in adult intensive care units.

Methodology: A cross-sectional analytical study was conducted across 15 adult intensive care units in five hospitals, involving 80 registered nurses and 320 intensive care unit patients. Nurses' followership was assessed using Kelley's Followership Questionnaire, focusing on critical thinking and active engagement, while patient satisfaction was assessed using the Patient Satisfaction with Nursing Care Quality Questionnaire.

Results: Preliminary findings showed that the Pragmatist followership style was most prevalent (36.3%), followed by Passive (21.3%), Conformist (17.5%), Exemplary (17.5%), and Alienated (7.5%). The overall mean patient satisfaction score was 49.75 (SD = 13.14) out of 105, with variation observed across intensive care units. It is anticipated that stronger critical thinking and active engagement among nurses will be positively associated with patient satisfaction at the intensive care unit level.

Conclusion: The study may provide valuable evidence for nursing leadership, followership development, teamwork, and quality improvement initiatives aimed at enhancing patient care in intensive care settings.

Keywords: Followership Styles; Patient Satisfaction; Intensive Care Units; Nurses; Kelley's Followership Model

ABSTRACT 17

Comparison of buccal midazolam versus intramuscular midazolam in control of seizures

Dr. Faiza Iqbal, Dr. Asma Shabbir

PAF HOSPITAL, ISLAMABAD.

Introduction: Generalized convulsive seizure is a serious and potentially life threatening medical emergency that requires prompt intervention. Administration of buccal midazolam is an efficient and easier method for control of seizures without the need for intravenous cannulation expertise or intramuscular injections. To compare the outcome of buccal midazolam versus intramuscular midazolam in children presenting with seizures.

Methodology: randomized control trial Settings: Pediatric Medicine Department, PAF hospital, Islamabad Study Duration: 15th January 2022 to 14th July 2022 A total of 90 patients of both genders, 6 months to 12 years of age, presenting with seizures were included. Children with cardiac arrest or hemodynamic instability at presentation, head trauma or drowning, metabolic disorders, CKD were excluded. All the patients were divided into two groups by lottery method. In group A, children were given intramuscular midazolam in the thigh at 0.05 ml/kg (maximum 1.6 ml). In group B, children were given buccal midazolam at 0.06 ml/kg (maximum 2 ml). They were followed till resolution of symptoms. If seizure resolved within 5 minutes, then success was labelled.

Results: Duration of resolution of seizure by intramuscular midazolam was 3.12 ±0.39 minutes and by buccal midazolam was 2.20 ± 0.21 minutes (p value 0.0001). Buccal midazolam was effective in 39 (86.67%) patients while intramuscular midazolam effectivity was seen in 26 (57.78%) patients.

Conclusion: This study concludes that buccal midazolam is better as compared to intramuscular midazolam in controlling seizures in children.

Keywords: Acute seizures; Buccal; Intramuscular; midazolam

ABSTRACT 18

Rhino-Orbital Mucormycosis: A Diagnostic Challenge in a Diabetic Patient

Dr Riaz Nadeem, Professor Dr. Talat Najeeb

PAF Hospital Islamabad

Introduction: Rhino-orbital mucormycosis is a rapidly progressive invasive fungal infection caused by Mucorales, with a predilection for immunocompromised individuals, particularly those with poorly controlled diabetes mellitus. Early recognition and prompt multidisciplinary management are critical to limit orbital and intracranial complications.

Methodology: A clinical case report was based on ENT and orbital examination, CT and contrast-enhanced MRI, endoscopic sinus surgery, fungal culture and histopathological assessment, and documentation of antifungal management and clinical response.

Results: A 53-year-old female, known to have diabetes mellitus, hypertension and chronic rhinosinusitis, presented to the ENT department with diplopia, blurring of vision, nasal obstruction, postnasal discharge and right-sided headache. Nasal endoscopy revealed yellowish-green secretions in the right nasal cavity. Orbital examination demonstrated incoherent extraocular movements with bilateral sixth cranial nerve palsy. CT of the nose and paranasal sinuses demonstrated a rounded mixed-density lesion in the posterior right nasal cavity with involvement of the sphenoethmoidal recess and associated bony changes, along with right-sided maxillary and sphenoid sinusitis. Contrast-enhanced MRI demonstrated a right posterior ethmoidal sinus lesion extending into the medial orbital wall with compressive effects. The patient underwent right functional endoscopic sinus surgery. Intraoperatively, the right maxillary, posterior ethmoid and sphenoid sinuses contained extensive fungal material. Specimens were obtained for fungal culture and histopathological examination. Histopathology revealed broad, ribbon-like, irregular, aseptate fungal hyphae with right-angle branching and submucosal infiltration, consistent with mucormycosis. Following confirmation, multidisciplinary consultation was obtained and liposomal Amphotericin B therapy was initiated, with subsequent step-down therapy with posaconazole planned following clinical response.

Conclusion: Rhino-orbital mucormycosis should be considered in diabetic patients presenting with sinonasal disease and orbital or cranial nerve manifestations. Early endoscopic assessment, appropriate imaging, histopathological confirmation, aggressive surgical management and timely antifungal therapy are essential to control disease progression.

Keywords: Rhino-orbital mucormycosis; Mucorales; invasive fungal rhinosinusitis; diabetes mellitus; orbital involvement; endoscopic sinus surgery; Amphotericin B

ABSTRACT 19

Retroperitoneal Ectopic Pregnancy Presenting as a Massive Retroperitoneal Hematoma

Dr Tehreem Farah, Dr Mehrunnisa, Prof Dr Shamsa Rizwan

PAF Hospital Islamabad

Introduction: A 23-year woman, G4P2+1, presented to Emergency Department (ED) with history of amenorrhea for six weeks and recent vaginal bleeding. Her past obstetric history revealed that she had two normal vaginal deliveries and one ectopic pregnancy followed by right salpingectomy. She was vitally stable with a normal uterus and no evidence of intrauterine gestational sac on trans-vaginal ultrasound. Her hemoglobin was 12.7 g/dl, platelets 273 ×109 /L, β-hCG was 6520 IU/L initially and increased to 12016 IU/L after 48 hours with still no evidence of intrauterine pregnancy. However, on the next day, the patient developed pain in the epigastrium, pallor and vomiting with blood pressure dropping to 90/50 mmHg and a pulse of 99 beats/min. The ultrasound then revealed fluid in Morrison's pouch, pouch of Douglas and a heterogeneous lesion in the right adnexa, giving the impression of a ruptured ectopic pregnancy; for which, an urgent laparotomy was planned. Peroperatively, the uterus and the left tube were normal, and the right tube was absent. There was no collection of any blood or fluid in the pelvis. Exploration of the upper abdomen revealed a large 20×15 cm retroperitoneal hematoma, behind the left colonic mesentery, extending from the epigastrium to the left iliac fossa (Figure 1). For the management of the retroperitoneal ectopic pregnancy (REP), a vascular surgeon was involved in exploring the retroperitoneal space and clearing the hematoma. A bleeding ectopic pregnancy attached through small feeding vessels, on the left side of the aorta above the inferior mesenteric artery, was located. The aorta was slinged above the coeliac plexus, and pregnancy tissue was excised with the ligation of feeding vessels (Figure 2). The hemostasis was secured and drains were kept in the pelvis and paracolic gutter. The patient was transfused four units of blood during the surgery. The β-hCG levels repeated on the first postoperative day showed a level of 1315 IU/L. Injection methotrexate 50 mg was given on 2nd postoperative day β-hCG repeated on 7th postoperative day, which showed a value of 370 IU/L. The stitches were removed and she was discharged on 10th postoperative day.

Methodology: Retrospective case report. All documents and materials collected from patient's hospital records.

Results: Not applicable

Conclusion: The histopathological evaluation of the excised tissue revealed hemorrhagic and decidual tissue next to chorionic villi, confirming the diagnosis of a REP. REP is an extremely rare condition. So far, less than 25 cases have been reported globally. Such pregnancies have a tendency to implant along the major vessels in the abdomen and pelvis, Hall et al. reported a case of REP in 1973. Sotus reported a similar case in 1977. Both these pregnancies were located between the left side of the aorta and superolateral side of the left iliac artery. Okorie reported a case of REP located similarly over the aorta and inferior vena cava near the second and third part of the duodenum. It was postulated that such REPs result from either dissemina tion of cells or tissue fragments through vascular or lymphatic channels or due to trophoblastic invasion and penetration of the peritoneum. Clinical manifestations can vary from mild symptoms to hypovolemic shock and death, making timely diagnosis and multidisciplinary approach with the removal of the placental tissue, followed by methotrexate essential for saving lives. The diagnosis of such a pregnancy presents a major challenge. The rising β-hCG with no detectable pregnancy on transvaginal ultrasound should raise suspicion and alternate imaging techniques, such as MRI can be helpful.

Keywords: Retroperitoneal ectopic pregnancy; Retroperitoneal hematoma; Ectopic pregnancy; Hemorrhage; Case report

ABSTRACT 20

Beyond the Aural Polyp: Diagnostic Challenges and Clinical Spectrum of Glomus Tympanicum A Four-Case Series

Dr. Hassan, Prof. Dr. Tallat Najeeb

Department of Otorhinolaryngology and Cochlear Implant, PAF Hospital Islamabad

Introduction: Glomus Tympanicum is the most common paraganglioma of the middle ear and represents an uncommon yet clinically critical vascular neoplasm. Clinical presentation ranges from classic pulsatile tinnitus and conductive hearing loss to an apparently innocuous aural polyp, creating a major diagnostic challenge and raising the risk of severe intraoperative hemorrhage. This case series highlights its varied clinical presentations, diagnostic pitfalls, radiological features, and management approaches.

Methodology: Clinical case series based on the presentation, diagnostic evaluation, management, and documented outcome described by the authors.

Results: Case 1: 32-year-old female presenting with a 6-month history of right-sided pulsatile tinnitus, progressive conductive hearing loss, and intermittent positional vertigo. Otoscopy revealed a reddish retrotympanic mass. HRCT misdirected toward ASOM, while MRI confirmed Glomus Tympanicum. Case 2: 30-year-old female presenting with an aural polyp and otorrhea, without pulsatile tinnitus or hemorrhage. Intraoperative mastoid exploration revealed a highly vascularized mass, and histopathology confirmed a paraganglioma masquerading as inflammatory disease. Case 3: 27-year-old female with a 2-year history of progressive hearing loss, pulsatile tinnitus, and otalgia, previously misdiagnosed and treated for CSOM with recurrent aural polyp. Contrast MRI/MRA confirmed an enhancing middle-ear mass extending to EAC. Histopathology showed characteristic Zellballen pattern and neuroendocrine positivity. Patient underwent canal wall-down mastoidectomy and tumor excision. Case 4: 35-year-old female presenting with ear blockage, pulsatile tinnitus, and an aural polyp in the EAC. Audiometry showed conductive hearing loss, tympanometry revealed a bifid/double-peaked curve, and MRI confirmed middle-ear glomus tumor. Reluctant for surgery, she was referred for CyberKnife stereotactic radiosurgery.

Conclusion: Diagnostic Vigilance: Aural polyps that are recurrent, friable, atypical, or accompanied by pulsatile tinnitus must raise strong clinical suspicion for middle-ear vascular neoplasms prior to biopsy or excision. Radiological Imaging: Cross-sectional imaging (CT, MRI, MRA) is mandatory to map tumor extension, characterize vascularity, and prevent catastrophic surgical bleeding. Individualized Management: Treatment must be tailored to symptoms, tumor spread, patient preference, and surgical fitness. Stereotactic radiosurgery (CyberKnife) serves as an effective alternative for patients seeking non-surgical options.

Keywords: Glomus Tympanicum; middle-ear paraganglioma; aural polyp; pulsatile tinnitus; conductive hearing loss; temporal bone; stereotactic radiosurgery

ABSTRACT 21

AI-Enabled Continuity of Care: Transforming Patient Follow-Up from Episodic Encounters to Continuous, Clinician-Supervised Care

Dr Anum Ashfaq, Dr Hasnat Akhtar, Dr Muhammad Faiq Ali

NUST School of Health Sciences; PAF Hospital Islamabad

Introduction: Healthcare delivery in many emerging health systems remains centred on episodic consultations, with limited infrastructure for structured follow-up between visits. This creates a critical “care gap” in patients who require ongoing monitoring. High-risk pregnancy is a particularly important example, where changes in symptoms, treatment adherence, or maternal wellbeing may occur between scheduled appointments and require timely clinical attention.

Methodology: We present an AI-enabled digital health ecosystem developed by Synapse Health Technology, incubated at the LUMS Centre for Entrepreneurship, Lahore, Pakistan, designed to extend clinician-led care beyond the hospital or clinic. The system combines ARIA, a patient-facing conversational AI agent, with Synapse Workspace, a clinician-facing treatment and monitoring platform. ARIA conducts scheduled, structured conversations with patients, capturing symptoms, treatment adherence, progress, and patient-reported concerns. For high-risk pregnancy, these interactions can be configured around clinically relevant monitoring parameters and predefined escalation criteria. Synapse Workspace allows clinicians to create individualized care pathways, determine what should be monitored, define thresholds for clinical review, and receive structured longitudinal updates. Rather than replacing clinical decision-making, the system is designed to create a continuous feedback loop between patients and clinicians, keeping the treating team at the centre of care.

Results: The innovation addresses a fundamental challenge in resource-constrained settings: how to provide meaningful continuity of care without proportionally increasing clinical workload. By automating routine follow-up while preserving clinician oversight, the platform has the potential to improve follow-up completion, treatment tracking, patient engagement, and timely identification of patients requiring review. Its adaptable architecture could support applications beyond obstetrics, including chronic disease management and other longitudinal care pathways.

Conclusion: ARIA and Synapse Workspace are currently in prototype development and early pilot planning. The next phase will evaluate feasibility, patient engagement, follow-up completion, clinician usability, adherence, escalation appropriateness, and care coordination in high-risk pregnancy. Patient-sovereign and federated data principles are incorporated into the proposed architecture to support responsible deployment across healthcare institutions. Synapse aims to move digital health beyond reminders and disconnected teleconsultations toward continuous, intelligent, clinician-supervised care. By transforming everyday patient experiences into structured clinical feedback, this model offers a scalable pathway for bringing proactive follow-up into healthcare systems where clinical resources are limited but the need for continuity is greatest.

Keywords: Artificial intelligence; conversational AI; digital health; continuity of care; high-risk pregnancy; remote patient monitoring; treatment adherence; clinical decision support; healthcare innovation

ABSTRACT 22

AI-Based Dental Triage for Community Dental Camps

Ayesha Abdullah, Hifza Imran, Prof Dr Usman Hadi

Islamabad Medical And Dental College; Centre of Digital Healthcare Technologies, Ulster University, Belfast, United Kingdom

Introduction: Community dental camps often involve large numbers of patients presenting within a limited time, with varying levels of urgency. In such conditions, dental physicians face difficulty in consistently prioritising these patients efficiently and effectively. Artificial intelligence (AI) may offer a practical way to support rapid and structured triage while keeping clinical decision-making in the hands of dental professionals. This study aimed to develop a proof-of-concept machine-learning model to classify patients attending community dental camps into three triage categories: P1 (emergency), P2 (urgent), and P3 (routine).

Methodology: A synthetic educational dataset of 1,000 patient records was developed using dental triage information, including age, pain severity and duration, facial swelling, fever, airway symptoms, uncontrolled bleeding, trauma, oral lesions, lesion duration, and relevant medical risk. Data was stratified into training, validation, and test sets, with preprocessing performed through a modelling pipeline to reduce information leakage. Logistic Regression was used as an interpretable baseline, while Random Forest was evaluated as a comparison model. Additionally, hyperparameter optimisation was performed using cross-validation, with Macro F1 as the primary optimisation metric. Logistic Regression tuning included regularisation strength, solver, and class weighting, while Random Forest tuning included the number of trees, maximum depth, minimum samples per split and leaf, maximum features, and class weighting.

Results: Both models achieved an accuracy of 82.67% on the test set and identified all P1 emergency cases, resulting in 100% P1 recall. After Hyperparameter Tuning, Logistic Regression performed best at 0.05 regularization and Random Forest performed best at a maximum depth of 2.5. In conclusion, Logistic Regression performed better overall across precision, recall, and F1-score and was chosen as our final model.

Conclusion: These findings suggest that AI could potentially support more rapid and consistent prioritisation at community dental camps, particularly by helping identify emergency presentations. However, the model is based on synthetic, rule-derived data and therefore does not establish clinical validity. Future work should incorporate real-world, diverse datasets, additional severity features, external validation, and prospective clinical evaluation. The system should remain a decision-support tool, with final triage decisions made by qualified dental professionals.

Keywords: Artificial Intelligence; Machine Learning; Community Dentistry; Triage

ABSTRACT 23

Three Years of Traumatic Brain Injury Care: Who Is Affected, How They Present, and How They Fare

Abdul Wassay, Muhammad Usman

PAF Hospital, Fazaia Medical College, Islamabad – Pakistan

Introduction: Traumatic brain injury (TBI) is a major cause of morbidity and mortality, particularly in low- and middle-income countries. Understanding local injury patterns and outcomes can inform prevention and improve neurosurgical care. To evaluate the demographic profile, mechanisms, severity, radiological patterns, management, and early outcomes of TBI patients managed at a tertiary neurosurgical center.

Methodology: A descriptive cross-sectional study was conducted at PAF Hospital, Islamabad, from January 2023 to December 2025. Patients of all ages with TBI were included. Demographics, mechanism, GCS-based severity, CT findings, treatment, and hospital outcomes were recorded. Glasgow Outcome Scale (GOS) at discharge was the primary outcome measure. Descriptive statistics were used.

Results: Among 316 patients, 234 (74.1%) were male and 82 (25.9%) female. Road traffic accidents (168; 53.2%) and falls (104; 32.9%) were the predominant mechanisms. Nearly half (156; 49.4%) were younger than 20 years. TBI was mild in 155 (49.1%), moderate in 95 (30.1%), and severe in 66 (20.9%). Common CT findings included cerebral edema (41; 13.0%), contusions (40; 12.7%), and extradural hematoma (32; 10.1%). Conservative treatment was undertaken in 227 (71.8%), while 89 (28.2%) underwent surgery. Good recovery at discharge occurred in 240 (75.9%); mortality was 13 (4.1%).

Conclusion: TBI predominantly affected young males, with road traffic accidents and falls as major causes. Despite substantial injury severity, three-quarters achieved good early recovery, highlighting the importance of prevention, early triage, and timely individualized and specialized care.

Keywords: Traumatic Brain Injuries; Craniocerebral Trauma; Glasgow Outcome Scale; Road Traffic Accidents

COMPILED BY

Dr Iffat Noreen & Dr Saleha Afridi

Community Medicine Department

Fazaia Medical College, Air University

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