Association between Out-of-pocket Health Expenditures and Low Birthweight in Eastern Ethiopia: GSEM

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Background : The introduction of free maternity services in many developing countries has led to a significant reduction in maternal and neonatal deaths. However, persistent out-of-pocket (OOP) payment and a poor healthcare financing system significantly affects the maternal service utilisation of pregnant women, leading to adverse birth outcomes. This study aimed to investigate the association between OOP payments and low birthweight (LBW) in Eastern Ethiopia.

Method : A prospective cohort study followed pregnant women for ten months to examine the incidence of LBW. Direct medical and non-medical costs were summed up to give OOP expenditures. Poisson regression with robust variance estimate was used to assess the independent predictors of LBW. Adjusted risk ratios (RR) with 95% confidence intervals were computed. The direct, indirect, and total effects of OOP and pre-specified potential mediators on LBW were estimated using a Generalized Structural Equation Modeling (GSEM).

Result : The study found that 10.9% of women had LBW neonates. After controlling for confounding factors, OOP expenditure (aRR = 3.23, 95% CI: 1.19, 8.73), prenatal depression (aRR=2.93, 95%CI: 1.67, 5.15), and lack of birth preparedness and complication readiness (BPCR) (aRR=4.26, 95%CI: 1.59, 11.41) increased the risk of LBW. In GSEM, prenatal depression (β=1.22, CI:0.18, 2.38) and lack of BPCR (β=1.16, CI: 0.01, 2.16) mediated the association between LBW and OOP expenditures. Prenatal depression mediated the association by 25.7% and lack of BPCR mediated by 18.5%.

Conclusion : There was a significant positive association between OOP payment and LBW, which was partly mediated by prenatal depression and lack of BPCR. Therefore, policies aimed at reducing LBW should prioritize reducing financial stress during pregnancy and integrating mental health counselling, early screening, and treatment programs within prenatal care services, particularly among financially disadvantaged women.

Safety of Robot Gastrectomy for Gastric Cancer Performed by Junior Surgeons: A Multicenter Study

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Background : The safety of robot-assisted gastrectomy (RG) for gastric cancer performed by junior surgeons has not yet been reported.

Objective : To clarify the safety of RG performed by junior surgeons by comparing outcomes with those of senior surgeons.

Methods : We retrospectively analyzed patients with stage I–III gastric cancer who underwent RG between 2018 and 2024 at 18 institutions of the Kyoto Esophagogastric Surgery Study Group, using clinical data registered in our web-based database. Surgeons within 10 years after graduation were defined as junior, and those beyond 10 years as senior.

Results : A total of 12 junior surgeons and 46 senior surgeons performed 46 and 1,350 RGs, respectively. The proportion of junior surgeons among those performing RG increased from 0.3% in 2018–2022 to 10.4% in 2023–2024 ($P < 0.001$). Senior surgeons more frequently treated upper-third tumors and performed proximal or total gastrectomy. Median operative time was 383 minutes for juniors and 371 minutes for seniors ($P = 0.71$). Postoperative complications of Clavien-Dindo grade ≥II occurred in 15% vs. 14% of patients ($P = 0.87$). In multivariate analysis adjusting for tumor and surgical factors, junior surgeons had an estimated increase in operative time of +28 minutes (95% CI: 0.1 to +55, $P = 0.049$) and an odds ratio for complications of 1.35 (95% CI: 0.54–3.39, $P = 0.52$).

Conclusions : The proportion of junior surgeons among those performing RG has been increasing. Although operative time tended to be longer, RG performed by junior surgeons was carried out safely with outcomes

Health Risk Assessment of Inorganic Arsenic: An Umbrella Review

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Inorganic arsenic (iAs) is a toxic environmental pollutant linked to serious health risks, prompting global regulatory efforts. This study identifies major health conditions associated with iAs exposure using text network analysis (TNA), and assesses health risk assessments (HRA) through an umbrella review and dose–response analysis. It synthesizes previous systematic reviews (SRs) to offer a broader perspective on iAs-related health effects. An optimized TNA-based search strategy was applied across multiple databases to identify relevant SRs. An umbrella review framework was employed to synthesize and reinterpret findings across SRs. The methodological quality of included SRs was assessed using the AMSTAR2 tool. Extracted data on study characteristics, exposure levels, and risk estimates were analyzed to evaluate the dose-response relationship between iAs exposure and health outcomes. From 922 SRs, 36 were included and categorized into 10 health condition groups. For example, seven SRs found a significant dose-response relationship between iAs and bladder cancer (BC), with one SR reporting relative risks of 2.70, 4.20, and 5.80 at 10, 50, and 150 μg/L, respectively. Individual study analysis further showed that each 10 μg/L increase in iAs raised BC risk by 3.11% (P = 0.003). iAs exposure is associated with hypertension, diabetes, cardiovascular disease, and adverse fetal outcomes. Dose-dependent increases in BC, lung cancer, and hypertension risks were observed. These findings support more precise HRA and regulatory strategies.

A Prospective Cohort Study on Maternal Mental Health Following Twin Deliveries at NCCHD

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Objective : Raising twin places substantial demands on parents, reading to raising concerns about maternal mental health and bonding; however, longitudinal evidence remains limited. This study aimed to prospectively investigate trajectories of maternal mental health and mother–infant bonding among mothers of twins.

Methods : A prospective cohort study of women who delivered twins at National Center for Child Health and Development (NCCHD) between 2020 and 2024 was conducted. The study was approved by the Institutional Review Board of the NCCHD (No, 2020-140), and written informed consent was obtained from all participants. At one month postpartum, we assessed postpartum depression using the Edinburgh Postnatal Depression Scale (EPDS) and mother–infant bonding using the Mother-to-Infant Bonding Scale (MIBS). Mothers with high scores were followed up. When the twins reached 18 months of age, maternal psychological distress was evaluated using the Japanese version of the Kessler Psychological Distress Scale (K6), and bonding was re-assessed with MIBS. We defined EPDS ≥9 as postpartum depression, MIBS ≥5 as bonding disorder, and K6 ≥10 as psychological distress.

Results : A total of 105 mother–twin dyads were included. The dropout rate at 18 months was 9.2%. At one month postpartum, 16 mothers (15.2%) had EPDS scores ≥ 9, and 9 mothers (8.6%) had MIBS scores ≥ 5. At 18 months postpartum, 12 mothers (11.4%) had K6 scores ≥10, and 17 (16.2%) had MIBS scores ≥5. Among mothers with EPDS ≥9 at one month, 3 (18.8%) showed K6 ≥10 and 3 (18.8%) had MIBS ≥5 at 18 months. In contrast, among those with MIBS ≥5 at one month, 6 (66.7%) showed K6 ≥10 and 4 (44.4%) had MIBS ≥5 at 18 months.

Conclusion : In this twin cohort, mothers with high MIBS scores at one month postpartum had a higher risk of mental distress and impaired bonding when their twins reach 18 months of age, compared to those with high EPDS scores.

Classifying bipolar disorder cases by machine learning models using a Japanese web-based survey

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Objective : Bipolar disorder (BD) is defined by recurrent mania or hypomania and depression episodes that significantly impact physical health, psychological well-being, and social functioning. Although clinical assessment by healthcare professionals plays a primary role in classifying patients with BD, to enhance the classification when clinical data are insufficient, the affected factors might serve as potential features for BD classification using machine learning approaches. As a preliminary step toward developing more sophisticated classification models, this study investigated key distinguishing features of BD by comparing individuals with BD to individuals without mental disorders. Specifically, we examined differences in physical, psychiatric, and social comorbidities between these groups using large-scale Japanese web-based survey data and developed machine learning models to classify BD cases accurately.

Method : We conducted a large-scale online survey of the general Japanese population, collecting responses from 1,776 individuals without mental disorders and 250 individuals with BD. Demographic characteristics and physical, psychiatric, and social comorbidities were compared between groups and used as input features, with self-reported BD status as the target variable for model development. We applied Extreme Gradient Boosting (XGBoost) and Artificial Neural Network (ANN) for constructing classification models. Model performance was evaluated using the area under the receiver operating characteristic curve (AUC).

Results : The individuals with BD experienced a significantly higher comorbidity burden compared to those without mental disorders. XGBoost and ANN demonstrated excellent discrimination (AUC > 0.80) compared to the classical logistic regression model.

Conclusion : Machine learning models demonstrate potential for BD classification using web-based survey data.