

RESEARCH METRICS
COMMITTEE (RMC)



Inspiring Excellence

*Promoting
Research
Excellence*

QUALITY JOURNAL PUBLICATION AWARD

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Message of the Hon'ble Minister of Science and Technology

I am honored to be here today to celebrate the first-ever 'Quality Journal Publications Award' at BRAC University. This event marks a significant achievement in pursuing academic excellence and research innovation. On behalf of the Government of the People's Republic of Bangladesh, I extend my heartfelt congratulations to the deserving recipients of this prestigious award.

BRAC University's commitment to promoting excellence is evident in its significant research investment, which surpasses that of all other private universities in Bangladesh. This commitment underscores BRAC University's pivotal role as a leading academic institution dedicated to pushing the boundaries of knowledge and driving positive change in society.

Investing in research excellence is not a luxury but a necessity for the development and progress of our nation. By collaborating between academia, government, and industry, we can harness the power of research to create a brighter and more sustainable future for generations to come.

I am delighted that BRAC University has become one of the top 5 global universities in Sustainable Development Goal 1 (SDG 1). This recognition reaffirms the university's unwavering dedication to addressing pressing societal challenges such as poverty alleviation, healthcare, and environmental sustainability.

The university embodies the ethos of its illustrious founder, Sir Fazle Hasan Abed, who fervently believed in the transformative power of education for empowerment and social change. With its innovative green initiatives and sustainable practices, the state-of-the-art new campus is a beacon of environmental stewardship and responsible citizenship, reinforcing BRAC University's commitment to sustainability and ecological conservation.

In conclusion, I extend my warmest congratulations again to all the awardees, and I wish BRAC University continued success and prosperity in all its future endeavors.

Thank you,
Architect Yeafesh Osman,
Minister, Ministry of Science and Technology



Inspiring Excellence



Message of Pro Vice-Chancellor & Acting Vice-chancellor BRAC University

It brings me immense pleasure to share a significant milestone in our academic journey - the introduction of the 'Quality Journal Publication Award' at BRAC University. This achievement not only celebrates the outstanding contributions of our faculty but also underscores our commitment to academic excellence and groundbreaking research.

At BRAC University, our pursuit of knowledge is deeply rooted in a broader vision of serving humanity. Inspired by the visionary leadership and philosophy of Sir Fazle Hasan Abed, our founder, we are driven by a larger purpose - to leverage education and research as powerful tools for positive change in the world. Sir Fazle Hasan Abed believed in the power of education to empower communities and break the cycle of poverty. At BRAC University, we aim to bring his vision to life by fostering a culture of innovation, critical thinking, and social responsibility. Through our research, we strive to address pressing challenges such as public health, climate change, and social injustice.

Our commitment to excellence in research is reflected in the accolades we receive and in the tangible impact of our work on society. By incentivizing quality publications and investing in research infrastructure, we aim to create an environment where faculty and students can thrive intellectually and contribute meaningfully to the advancement of knowledge.

To enhance research quality, we incentivized faculty to publish in top journals. In 2023, 78 research papers achieved Q-1 classification in the Scopus Index, reflecting faculty diligence and the institution's commitment to excellence.

Congratulations to all the recipients of the 'Quality Journal Publications Award,' thank you to everyone who has contributed to this journey of excellence.

Professor Syed Mahfuzul Aziz
Pro Vice-Chancellor & Acting Vice-Chancellor
BRAC University



Inspiring Excellence

Message of the Chair Research Metrics Committee BRAC University



It is with great pleasure and honor that I extend warm greetings on behalf of the Research Metrics Committee. We are committed to fostering academic excellence and promoting research advancement at BRAC University. I sincerely congratulate the deserving awardees of our first 'Quality Journal Publication Award.'

Initiated in January 2023, this prestigious award serves to foster a vibrant research culture at our university. It focuses on recognizing and incentivizing contributions to top-tier Q1 journals, which reflect the pinnacle of research impact in each field. This program aligns with the Bangladesh Government's encouragement of research initiatives, and our emphasis on Q1 journals underscores our commitment to maintaining high standards and credibility in research output.

I am delighted that the initiative introduces financial incentives to inspire and motivate our academic and research staff. The selection process, meticulously carried out by the RMC, involves shortlisting, document verification, and thorough evaluation. This ensures funds are directed towards publications aligned with our university's research objectives, fostering a purposeful and impactful research culture.

We aim to elevate BRAC University's research profile by providing honorary incentives, implementing a transparent selection process, and accommodating diverse needs, ultimately contributing to institutional and national progress.

Your unwavering commitment is instrumental in shaping the future of research at our institution. We express our gratitude and look forward to continued collaboration and success on this journey towards academic excellence.

Best regards,
Professor A.K.M Abdul Malek Azad, PhD
Chair, Research Metrics Committee
BRAC University

ABOUT RMC AWARD

BRAC University's commitment to academic excellence and research advancement is exemplified through its "Rewarding Quality Journal Publications" initiative, a response to the Government of Bangladesh's encouragement for research initiatives. Among the four quartiles of journals i.e. Q1, Q2, Q3, and Q4, the top 25% of journals are designated as Q1 (Quartile 1). The prestige of Q1 journals is attributed to their wide recognition and significant impact on research. Hence, the objective for this award is to motivate the academic and research staff at BRAC University to contribute to the top-tier Q1 journals, representing the pinnacle of research impact in each field. The emphasis on Q1 journals underscores the University's dedication to maintaining high standards and credibility in research output.

To inspire researchers, the initiative introduces financial incentives, offering 100,000 BDT for articles published in the top 10% journals and 50,000 BDT for the rest of the Q1 publications. To be eligible, at least one author needs to be affiliated with BRAC University, and the topic researched will need to align with the University's research priorities. The program, initiated in January 2023, operates under the supervision of the Research Metrics Committee (RMC) which ensures fairness and integrity in the evaluation process.

The selection process is meticulous, involving shortlisting, document verification, and evaluation by the RMC. This process ensures that funds are directed towards publications aligning with the University's research objectives, fostering a purposeful and impactful research culture.

The "Rewarding Quality Journal Publications" initiative by BRAC University is a comprehensive approach to elevate the institution's research profile. By recognizing excellence in research through this award, the University is actively fostering a thriving research environment for the benefit of its academic and research community which ultimately contributes to the individual as well as the the institution's success.

SCHOLARLY
ARTICLES
PUBLISHED IN
PRESTIGIOUS
ACADEMIC
JOURNALS
Q1 (TOP 10%)

Title of the Article: 1

Neonatal mortality risk of vulnerable newborns: A descriptive analysis of subnational, population-based birth cohorts for 238 143 live births in low- and middle-income settings from 2000 to 2017.

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Abstract:

Objective: We aimed to understand the mortality risks of vulnerable newborns (defined as preterm and/or born weighing smaller or larger compared to a standard population), in low- and middle-income countries (LMICs).

Design: Descriptive multi-country, secondary analysis of individual-level study data of babies born since 2000.

Setting: Sixteen subnational, population-based studies from nine LMICs in sub-Saharan Africa, Southern and Eastern Asia, and Latin America.

Population: Live birth neonates.

Methods: We categorically defined five vulnerable newborn types based on size (large- or appropriate- or small-for-gestational age [LGA, AGA, SGA]), and term (T) and preterm (PT): T + LGA, T + SGA, PT + LGA, PT + AGA, and PT + SGA, with T + AGA (reference). A 10-type definition included low birthweight (LBW) and non-LBW, and a four-type definition collapsed AGA/LGA into one category. We performed imputation for missing birthweights in 13 of the studies.

Main outcome measures: Median and interquartile ranges by study for the prevalence, mortality rates and relative mortality risks for the four, six and ten type classification.

Results: There were 238 203 live births with known neonatal status. Four of the six types had higher mortality risk: T + SGA (median relative risk [RR] 2.6, interquartile range [IQR] 2.0-2.9), PT + LGA (median RR 7.3, IQR 2.3-10.4), PT + AGA (median RR 6.0, IQR 4.4-13.2) and PT + SGA (median RR 10.4, IQR 8.6-13.9). T + SGA, PT + LGA and PT + AGA babies who were LBW, had higher risk compared with non-LBW babies.

Conclusions: Small and/or preterm babies in LMICs have a considerably increased mortality risk compared with babies born at term and larger. This classification system may advance the understanding of the social determinants and biomedical risk factors along with improved treatment

that is critical for newborn health.

Keywords: *low-and middle-income countries, obstetrics and gynaecology; paediatrics: neonatal; preterm; small-for-gestational age.*

Title of the Article: 2

Vision Transformers, Ensemble Model, and Transfer Learning Leveraging Explainable AI for Brain Tumor Detection and Classification.

Author:

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Abstract:

The abnormal growth of malignant or nonmalignant tissues in the brain causes long-term damage to the brain. Magnetic resonance imaging (MRI) is one of the most common methods of detecting brain tumors. To determine whether a patient has a brain tumor, MRI filters are physically examined by experts after they are received. It is possible for MRI images examined by different specialists to produce inconsistent results since professionals formulate evaluations differently. Furthermore, merely identifying a tumor is not enough. To begin treatment as soon as possible, it is equally important to determine the type of tumor the patient has. In this paper, we consider the multiclass classification of brain tumors since significant work has been done on binary classification. In order to detect tumors faster, more unbiased, and reliably, we investigated the performance of several deep learning (DL) architectures including Visual Geometry Group 16 (VGG16), InceptionV3, VGG19, ResNet50, InceptionResNetV2, and Xception. Following this, we propose a transfer learning (TL) based multiclass classification model called IXV16 based on the three best-performing TL models. We use a dataset consisting of a total of 3264 images. Through extensive experiments, we achieve peak accuracy of 95.11%, 93.88%, 94.19%, 93.88%, 93.58%, 94.5%, and 96.94% for VGG16, InceptionV3, VGG19, ResNet50, InceptionResNetV2, Xception, and IXV16, respectively. Furthermore, we use Explainable AI to evaluate the performance and validity of each DL model and implement recently introduced Vision Transformer (ViT) models and compare their obtained output with the TL and ensemble model.

Keywords: Brain Tumor Classification, Deep Learning, Ensemble Learning, Multiclass Classification, Transfer Learning, VGG16, VGG19, InceptionV3, Xception, ResNet50, InceptionResNetV2, Explainable AI, LIME, Vision Transformers, SWIN, CCT, EANet.

Title of the Article: 3

Domestic Burdens Amid Covid-19 and Women's Mental Health in Middle-Income Africa.

Author:

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Abstract:

This article analyzes two longitudinal datasets (October – December 2020; April 2021) of 1,000 and 900 women in Kenya and Nigeria, respectively, alongside in-depth qualitative interviews with women at risk of changes to time use, to study two pandemic issues: women's substitution of paid for unpaid work and how these shifts compromise their mental health. Women devote more time to domestic care (30–38 percent), less time to employment (29–46 percent), and become unemployed (12–17 percent). A rise in domestic work is correlated with depressive (Nigeria) and anxiety symptoms (Kenya and Nigeria). Women with greater agency (Kenya) and fewer children (Nigeria) are less likely to report a domestic burden or loss in paid activities. Social protection programs may fill the void of assistance traditionally provided by informal networks in the short term, while campaigns shifting norms around household work may preserve women's economic participation in the long term.

Keywords: *Agency, domestic work, mental health, women, Kenya, Nigeria*

Title of the Article: 4

A Markov Switching Approach in Assessing Oil Price and Stock Market Nexus in the Last Decade: The Impact of the COVID-19 Pandemic

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Abstract:

We revisit the oil price and stock market nexus by considering the impact of major economic shocks in the post-global financial crisis (GFC) scenario. Our breakpoint unit root test and Markov switching regression (MRS) analyses using West Texas Intermediate (WTI) oil price and Standard & Poor's 500 (S&P 500) market index show that among the major economic events, the recent coronavirus (COVID-19) pandemic is the most significant contributor to market volatilities. Furthermore, our MRS results show that the relationship between oil price and the stock market is regime-dependent; the stock market experiences substantial and positive shocks in a volatile oil price regime. Our results provide valuable insights to investors and policymakers regarding risk management and financial market stability during economic crisis periods, specifically during the COVID-19 pandemic.

Keywords: COVID-19; Markov switching model; breakpoint unit root test; oil price; stock price.

Title of the Article: 5

Assessment of potential pathogenic bacterial load and multidrug resistance in locally manufactured cosmetics commonly used in Dhaka metropolis

Author:

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Abstract:

In Bangladesh cosmetics are being produced disregarding the Good Manufacturing Practices. So, this study aimed to test the level and nature of bacterial contamination of such cosmetics. A total of 27 cosmetics comprising eight lipsticks, nine powders, and ten creams were bought from New Market and Tejgaon areas of Dhaka city and tested. Bacteria was detected in 85.2% of samples. Majority of the samples (77.8%) exceeded the limit given by the Bangladesh Standards and Testing Institution (BSTI), Food and Drug Administration (FDA) and the International Organization for Standardization (ISO). Both Gram-negative (*Escherichia coli*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae* and *Salmonella* spp.) and Gram-positive bacteria (species of *Streptococcus*, *Staphylococcus*, *Bacillus* and *Listeria monocytogenes*) were identified. Hemolysis was observed in 66.7% Gram-positive and 25% Gram-negative bacteria. Multidrug resistance was tested in 165 randomly selected isolates. Every species of Gram-positive and Gram-negative bacteria exhibited varying levels of multidrug resistance. The highest levels of antibiotic resistance were in broad-spectrum antibiotics (ampicillin, azithromycin, cefepime, ciprofloxacin and meropenem) and narrow-spectrum Gram-negative antibiotics (aztreonam and colistin). Multidrug resistance was 12–78% in Gram-negative bacteria and 12–100% in Gram-positive bacteria. Coagulase and DNase were identified in 97.5% and 5.1% of *Staphylococcus aureus* isolates respectively. Our findings indicate that these cosmetics pose a risk to the public's health.

Title of the Article: 6

Transmission of risks between energy and agricultural commodities: Frequency time-varying VAR, asymmetry and portfolio management.

Author:

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Abstract:

This paper examines energy and agricultural commodities' short-run and long-run connectedness by using the Time-varying parameter vector autoregressions (TVP-VAR). It applies the frequency version of the TVP-VAR model, which is a modified version of the dynamic TVP-VAR model. The frequency decomposition definition also decomposes into short-run and long-run connectedness. We further the analysis by investigating the effect of asymmetry in returns on connectedness. It also examines how portfolio management strategies would lead to a maximization of profits with minimal risks. Empirical evidence indicates that only 32.52% and 31.38% of connectedness in oil and gas, respectively, are transmitted to agricultural commodities, which suggests their weak tendencies in influencing agricultural commodities; the total connectedness index hovers around 40–60% in the 2018–2019 period; however, it dropped below 40% in 2020–2021 when the COVID-19 pandemic contributed to disintegrate the connectedness between energy and agricultural commodities but increased further during the 2022 Russia-Ukraine saga. The findings also indicate that corn, wheat, and flour are net transmitters of risks to oil and natural gas in the long and short-run, and wheat-flour pairwise connectedness is the strongest in the connectedness. Asymmetry is also pronounced in the network of connectedness. Portfolio analyses indicate that investors require a low proportion of energy in a portfolio of energy-agricultural commodities to achieve an optimum profit. The findings will offer exciting insights into the connectedness of agricultural and energy commodities, particularly during periods of high price uncertainty.

Keywords: *Agricultural commodity, Asymmetry, Frequency TVP-VAR, Optimal weight, Risk*

Title of the Article: 7

Unlocking the potential of women in a male dominated society: Key challenges and solutions in integrating women in digital economic activities.

Author:

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Abstract:

This study aimed to explore the challenges faced by women in participating in digital economic activities in Bangladesh and explore solutions to the challenges encountered by women while engaging in digital economic activities in Bangladesh. A qualitative approach was employed with 16 women directly involved in digital economic activities and research interviewed. These interviews provided rich qualitative data and outlined some challenges and possible solutions to promote women's engagement in the digital economy in Bangladesh. Key challenges identified were a lack of technological knowledge and interest, higher costs and inflation, higher interest rates on loans, a complicated loans process, male domination, lower government support, and few digital educational programs. Solutions proposed included: training and development programs, increased seminars and symposiums, more government funding, interest-free loans, a simple loan process, technological education, as well as the establishment of childcare centers. Henceforth, the current offers theoretical and practical implications.

Keywords: *Digital economy, Challenges, Solutions, Technologies, Development, Training and development*

Title of the Article: 8

Gender and leadership in public higher education in South Asia: examining the individual, socio-cultural and organizational barriers to female inclusion.

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Abstract:

The study examines the personal, social, and organizational barriers facing women in university leadership positions in South Asia, building on the cases of Malaysia and Bangladesh. We discussed the topic through the lens of interactionist feminist theory. Semi-structured interviews with 20 female deans from 12 public universities in Malaysia and Bangladesh were conducted, followed by two focus group discussions with eight female deans. The results reveal that personal barriers such as family duties, lack of technological knowledge, interest in taking leadership positions, spousal support and poor time management, and lack of spousal support represented the major barriers for female deans in Bangladesh. Lack of interest in deanship was found to compound the underrepresentation of women in dean roles. The participants identified fewer socio-cultural barriers faced by Malaysian female deans, while Bangladeshi participants met major issues. The organizational barriers for female deans in public universities were reported. The findings hold significant organizational and policy implications.

Keywords: *Personal barriers, social barriers, organizational barriers, female deans, public universities*

Title of the Article: 9

Green innovation in emerging economies: The role of managerial ties and market learning

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Abstract:

This study adopts the social capital and organizational learning perspectives to examine (i) how managerial business and political ties drive green product and process innovation, respectively, and (ii) the roles that explorative and exploitative market learning play in moderating the effects of managerial business and political ties on green product and process innovation. Findings from a survey of 283 Chinese firms show that managerial business and political ties distinctively drive green product and process innovation. Explorative and exploitative market learning strengthens the positive effects of managerial business and political ties on green product and process innovation for sustainable development. These findings advance the green innovation literature by clarifying how firms convert top-level managers' network ties and market-learning capabilities to strengthen corporate green innovation practices.

Keywords: *emerging economies, environmental management, green innovation, managerial ties, market learning*

Title of the Article: 10

Formulation design and optimization of sustained release tablet dosage form of Diacerein

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Abstract:

Diacerein is both an anti-inflammatory drug and an anti-arthritic agent. At present, no sustained release dosage form of Diacerein is commercially available. The aim of the study was to develop an optimized formulation of sustained release tablet dosage form of Diacerein that will be highly patient compliant. A three-level full factorial design was employed to develop nine different formulations of matrix tablets using a combination of Methocel K100M CR and Methocel K4M CR polymer at different ratios. The physical evaluation of both the drug-excipient powder mixtures and tablets of the nine formulations were performed and results were found to be within acceptable ranges for all tests. Dissolution profiles of tablets were obtained and the kinetics of drug release from the matrix tablets were determined by employing various mathematical models. The release data were simulated in Design Expert Software to carry out statistical analysis and the effect of both polymers on release patterns were observed after 1, 4 and 8 h in terms of contour plots and 3D surface plots, which were found to be statistically significant ($p < 0.05$). Finally, the overlay plot was obtained from which the optimized formulation of Diacerein was determined.

Keywords: *Diacerein, Factorial design, Kinetic models, Optimization, Polymer, Sustained release*

Title of the Article: 11

Unveiling the Potential of Polyphenols as Anti-Amyloid Molecules in Alzheimer's Disease

Author:

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Abstract:

Alzheimer's disease (AD) is a devastating neurodegenerative disease that mostly affects the elderly population. Mechanisms underlying AD pathogenesis are yet to be fully revealed, but there are several hypotheses regarding AD. Even though free radicals and inflammation are likely to be linked with AD pathogenesis, still amyloid-beta ($A\beta$) cascade is the dominant hypothesis. According to the $A\beta$ hypothesis, a progressive buildup of extracellular and intracellular $A\beta$ aggregates has a significant contribution to the AD-linked neurodegeneration process. Since $A\beta$ plays an important role in the etiology of AD, therefore $A\beta$ -linked pathways are mainly targeted in order to develop potential AD therapies. Accumulation of $A\beta$ plaques in the brains of AD individuals is an important hallmark of AD. These plaques are mainly composed of $A\beta$ (a peptide of 39-42 amino acids) aggregates produced via the proteolytic cleavage of the amyloid precursor protein. Numerous studies have demonstrated that various polyphenols (PPHs), including cyanidins, anthocyanins, curcumin, catechins and their gallate esters were found to markedly suppress $A\beta$ aggregation and prevent the formation of $A\beta$ oligomers and toxicity, which is further suggesting that these PPHs might be regarded as effective therapeutic agents for the AD treatment. This review summarizes the roles of $A\beta$ in AD pathogenesis, the $A\beta$ aggregation pathway, types of PPHs, and distribution of PPHs in dietary sources. Furthermore, we have predominantly focused on the potential of food-derived PPHs as putative anti-amyloid drugs.

Keywords: *Alzheimer's disease; $A\beta$; amyloid precursor protein; neurodegenerative disease; neuroprotection; polyphenols*

Title of the Article: 12

The Medium of Instruction in Bangladeshi Higher Education Institutions: Bangla, English, or Both?

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Abstract:

English as a medium of instruction (MOI) has become an important tool for universities to produce knowledgeable and skilled graduates. In Bangladesh, public and private universities remain distant in terms of policies related to MOI. The current study was undertaken to reach a tangible conclusion that would reflect “what should be the MOI in Higher Education Institutes (HEIs), Bangladesh.” This qualitative study involved seven senior university teachers with more than 15 years of teaching experience. Data were analyzed using discourse analysis. Findings show that the participants prefer the Bangla language as MOI to produce knowledgeable graduates, who would contribute to the growth of the nation. However, the authors strongly suggest the implementation of a bilingual curriculum in which instruction is delivered in both English and Bangla to impart knowledge to the students. It is also suggested that a national language-in-education policy be implemented, rather than the existing alien programs, to enrich students’ knowledge.

Keywords: *Bangladesh, English Medium Instruction (EMI), Higher Education Institutes (HEIs), language-in-education policy, medium of instruction policy*

Title of the Article: 13

Early diagnostic indicators of dengue versus other febrile illnesses in Asia and Latin America (IDAMS study): a multicentre, prospective, observational study

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Abstract:

Background: Improvements in the early diagnosis of dengue are urgently needed, especially in resource-limited settings where the distinction between dengue and other febrile illnesses is crucial for patient management.

Methods: In this prospective, observational study (IDAMS), we included patients aged 5 years and older with undifferentiated fever at presentation from 26 outpatient facilities in eight countries (Bangladesh, Brazil, Cambodia, El Salvador, Indonesia, Malaysia, Venezuela, and Viet Nam). We

used multivariable logistic regression to investigate the association between clinical symptoms and laboratory tests with dengue versus other febrile illnesses between day 2 and day 5 after onset of fever (ie, illness days). We built a set of candidate regression models including clinical and laboratory variables to reflect the need of a comprehensive versus parsimonious approach. We assessed performance of these models via standard measures of diagnostic values.

Findings: Between Oct 18, 2011, and Aug 4, 2016, we recruited 7428 patients, of whom 2694 (36%) were diagnosed with laboratory-confirmed dengue and 2495 (34%) with (non-dengue) other febrile illnesses and met inclusion criteria, and were included in the analysis. 2703 (52%) of 5189 included patients were younger than 15 years, 2486 (48%) were aged 15 years or older, 2179 (42%) were female and 3010 (58%) were male. Platelet count, white blood cell count, and the change in these variables from the previous day of illness had a strong association with dengue. Cough and rhinitis had strong associations with other febrile illnesses, whereas bleeding, anorexia, and skin flush were generally associated with dengue. Model performance increased between day 2 and 5 of illness. The comprehensive model (18 clinical and laboratory predictors) had sensitivities of 0.80 to 0.87 and specificities of 0.80 to 0.91, whereas the parsimonious model (eight clinical and laboratory predictors) had sensitivities of 0.80 to 0.88 and specificities of 0.81 to 0.89. A model that includes laboratory markers that are easy to measure (eg, platelet count or white blood cell count) outperformed the models based on clinical variables only.

Interpretation: Our results confirm the important role of platelet and white blood cell counts in diagnosing dengue, and the importance of serial measurements over subsequent days. We successfully quantified the performance of clinical and laboratory markers covering the early period of dengue. Resulting algorithms performed better than published schemes for distinction of dengue from other febrile illnesses, and take into account the dynamic changes over time. Our results provide crucial information needed for the update of guidelines, including the Integrated Management of Childhood Illness handbook.

Title of the Article: 14

Lancet Commission on synergies between universal health coverage, health security, and health promotion

Author:

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Abstract:

Executive summary

Since 2018, this Lancet Commission has sought to understand how to maximise synergies between the global health agendas of universal health coverage, health security, and health promotion, and what drives dis-synergies. By synergies the Commission is referring to an intervention, institutional capacity, or policy, that positively and substantially contributes to the achievement of two or more of these agendas in the areas where they intersect. We gathered data through desk reviews; case studies at the subnational, national, and global levels; consultation with two subregional bodies; and periodic Commissioner meetings both face to face and online to review, analyse, and synthesise data. Several key findings and implications for action arise from the analysis and the gathered data, particularly the in-depth country case studies, which provided several examples of these issues in action.

Fragmentation and dis-synergies between agendas is near universal and undesirable

Societies can and should pursue the agendas of universal health coverage, health security, and health promotion synergistically. We note that maximising synergies is important for both infectious and non-infectious diseases, and both endemic and epidemic diseases. However, we observed that, in countries at all income levels, counterproductive competition and fragmented investment are too often present in the implementation of these agendas, undermining the ability of health systems to achieve any of them—what we refer to as dis-synergies. For example, as highlighted by our in-depth country case studies, in some contexts, investments in health security detract from attempts to achieve universal health coverage, or efforts towards universal health coverage miss opportunities to promote healthy lives (ie, health promotion). Such dis-synergies weaken health systems, making them less able to cope with day-to-day and emergency demands, and render people more vulnerable to serious disease, as we saw with the COVID-19 pandemic.

COVID-19 has been our warning

The COVID-19 pandemic has shown that it makes good sense for all countries, regardless of their income level, to develop comprehensive health systems with synergies between health security, health promotion, and universal health coverage. We explored this in our COVID-19 case study and found that universal health coverage and healthier populations have helped some countries withstand the pandemic by accommodating the surge of patients from COVID-19, minimising stress on health-care facilities; and by minimising the burden and strain of serious COVID-19 disease on health systems because of fewer comorbidities.

Drivers of dis-synergies are diverse and multidimensional, including ill-considered national self interests and coloniality

Drivers of dis-synergies in subnational, national, and global health are diverse. Drivers include inappropriate laws and policies; imbalanced investments in specific areas of health systems; disregard for context; siloed programmes; inadequate capacities; politically driven interventions not based on evidence; ill-considered national self interests; and coloniality. Coloniality involves frameworks of thinking and doing that lead to misuse of power over others in decision making and implementation, with an assumption of inherent superiority without critical questioning of validity. Centralised decision making, exploitation of power disparities, disregard of context, and failure to critically question the validity of decisions are all manifestations of these drivers. An example of

coloniality potentially exacerbating dis-synergies in health systems is when nationally identified health priorities are unsupported by some powerful global-health actors if they are not consistent with their own priorities and concerns, as sometimes occurred in the early stages of Ghana's national health insurances reforms. The national health insurances reforms, which were an attempt to introduce universal health coverage into interventions and synergise with other health sector interventions, despite resource constraints, had to sometimes contend with opposition from some powerful global funders who saw the reform as inappropriate for a highly indebted poor country. Donor funding for health security investments in resource-constrained settings have been justified as serving the self interests of the donor country. We acknowledge that national self interest will take priority for governments of all countries as they prioritise and allocate funding and make decisions for national or international health objectives, regardless of country income level. However, supporting health security in a manner that is synergistic with universal health coverage and health promotion can help a country better control infectious disease. Thus, we argue that global solidarity in health can be consistent with enlightened self interest.

Changes in mindsets, decision making, and accountability are required to advance towards the comprehensive health systems we need to achieve universal health coverage, health security, and health promotion

We recognise that pulling together fragmented approaches that have evolved into entrenched systems requires long-term processes of change, which could sometimes take decades. We argue that constructing coherent comprehensive health systems is nevertheless necessary and will require three changes.

First is a change in mindset. We urgently need to reframe health in a comprehensive, holistic manner, and to develop shared values and principles to achieve this vision. We need to recognise that all health systems operate with constrained resources, and realizing synergies at the intersections between universal health coverage, health security, and health promotion is not only desirable but necessary, rather than promoting any one goal at the cost of the others.

Second is a change in decision-making. A decolonized approach would avoid top-down decision making that exploits power disparities within and between countries. We need to shift away from decisions that privilege global or donor priorities over those of implementing countries. We also need to end the wholesale uncritical transfer of interventions, policies, and programmes from the global to the national, or from one country to another. Instead, decisions should be based on evidence and understanding of how and why particular interventions work in context, valorising the knowledge required to make interventions work. Our country case studies show the importance, feasibility, and effect of national health leaders asserting their health priorities. Global health agencies should offer enough flexibility for countries to adapt investments, policies, and programmes to national priorities and contexts.

Third is a change in accountability. In our view, national governments retain primary responsibility for the health of their populations, and it is they who should be accountable for maximising synergies in their health systems. Holding governments accountable requires improved methods to measure and track synergies and dis-synergies, resilience, and performance of health systems over time. This change lies beyond the scope of this Commission but could be taken forward as a next step. That said, we recognise that, particularly in countries where development assistance for health has a substantial role, providers of development assistance for health (both funding and

technical advice and support) hold considerable power. These powerful countries therefore also bear responsibility and should be accountable for their contributions to dis-synergies or synergies in health systems. There is also ample space to improve synergies between global actors at the international level. Therefore, a monitoring and accountability framework should encompass both national and global actors and could make a small contribution to addressing power disparities between and within them.

Title of the Article: 15

Data Resource Profile: The Global School-based Student Health Survey-behavioural risk and protective factors among adolescents

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Abstract:

The World Health Organization (WHO) and the Centres for Disease Control and Prevention (CDC) developed the Global School-based Student Health Survey (GSHS) in collaboration with United Nations Children's Fund (UNICEF), United Nations Educational, Scientific and Cultural Organization (UNESCO) and Joint United Nations Programme on HIV/AIDS (UNAIDS). The aim of the GSHS was to generate comparable data from students aged 13 to 17 years which could inform school and youth health policies and programmes around the world. Whereas global paediatrics has generally focused on infancy and childhood, adolescence is increasingly recognized as a critical period for health outcomes during adulthood. Presently, there are approximately 1.86 billion individuals aged 10 to 24 years old worldwide (24% of the global population).

Although the adolescents' right to health has been established in the United Nations Convention on the Rights of the Child, adolescent health, development and wellbeing have received little attention in global health and social policies. Adolescence, in particular, offers a window of opportunity to influence or prevent behaviours that contribute to diseases in adulthood and which commonly emerge and manifest between the ages of 11 and 24 years. In addition, adolescent mortality accounts for an increasing number of premature deaths, as a result of the epidemiological transition and a decline in infant mortality.

Besides cardiovascular diseases and communicable diseases, health risk behaviour (such as road injury, interpersonal violence or suicide) is the leading cause of adolescent mortality. Many modifiable multiple risk behaviours, which imply an engagement in two or more risk behaviours (smoking, excessive alcohol use, poor diet), begin in adolescence but can become habits in adulthood, thereby increasing the risk of comorbidities and early mortality. Adolescents who engage in one risky behaviour are more likely to engage in others. This holds true for both substance use—for example tobacco, alcohol and illicit drugs and behaviours, such as sexual risk, self-harm and antisocial behaviour.

The GSHS aims to provide comprehensive data on adolescent health-related behaviours to support countries in developing effective youth health programmes, facilitate international comparisons and establish health trends to evaluate health promotion programmes. WHO and CDC provide technical support and training workshops to countries throughout the planning and the implementation of the survey, to ensure high data quality. The official country-level agency conducting or funding the survey (e.g. Ministry of Health) owns the GSHS data. Key health risk factors that the GSHS includes are alcohol use, dietary behaviours, drug use, hygiene, mental health, physical activity, protective factors (including data on school attendance, perceived social support at school and parental regulation and monitoring), sexual behaviours and tobacco use, as well as violence and unintended injuries, which reflect key risk factors as reported in the literature.

Machine learning to analyse omic-data for COVID-19 diagnosis and prognosis

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Abstract:

Background

With the global spread of COVID-19, the world has seen many patients, including many severe cases. The rapid development of machine learning (ML) has made significant disease diagnosis and prediction achievements. Current studies have confirmed that omics data at the host level can reflect the development process and prognosis of the disease. Since early diagnosis and effective treatment of severe COVID-19 patients remains challenging, this research aims to use omics data in different ML models for COVID-19 diagnosis and prognosis. We used several ML models on omics data of a large number of individuals to first predict whether patients are COVID-19 positive or negative, followed by the severity of the disease.

Results

On the COVID-19 diagnosis task, we got the best AUC of 0.99 with our multilayer perceptron model and the highest F1-score of 0.95 with our logistic regression (LR) model. For the severity prediction task, we achieved the highest accuracy of 0.76 with an LR model. Beyond classification and predictive modeling, our study finds ML models performed better on integrated multi-omics data, rather than single omics. By comparing top features from different omics dataset, we also found the robustness of our model, with a wider range of applicability in diverse dataset related to COVID-19. Additionally, we have found that omics-based models performed better than image or physiological feature-based models, proving the importance of the omics-based dataset for future model development.

Conclusions

This study diagnoses COVID-19 positive cases and predicts accurate severity levels. It lowers the dependence on clinical data and professional judgment, by leveraging the utilization of state-of-the-art models. Our model showed wider applicability across different omics dataset, which is highly transferable in other respiratory or similar diseases. Hospital and public health care mechanisms can optimize the distribution of medical resources and improve the robustness of the medical system.

Keywords: COVID-19 diagnosis, Severity, Multi-omics, Machine learning, Autoencoder

Feature Cloning and Feature Fusion Based Transportation Mode Detection Using Convolutional Neural Network

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Abstract:

The smartphone-based sensors (including accelerometer, proximity, and gyroscope sensors) are ubiquitous and emerging mobility data sources that could be used for transportation modes (i.e. bus, train, car, walking, and stationary) detection. One of the important challenges in transportation modes detection is to build an appropriate model that can extract useful data from the sensor outputs and that can reduce misclassifications. Several factors make the feature modeling difficult including inappropriate sampling frequency of input signals, wavering behavior of devices (e.g. the changing orientation of a device relative to the human body), and continuous base vibration causing similar sensor outputs for both stationary and non-stationary states and related threshold values of velocity. This paper proposes novel approaches to address these challenges by developing a robust transportation mode detector based on a convolution neural network (CNN). The proposed robust detector develops a feature modeling technique by novel feature fusion and cloning techniques. Pre-trained features are constructed using a separate vanilla neural network (VNN) framework to extract the distinguishing components from the original features that are combined with the original and cloned features. The proposed feature fusion technique is successfully able to overcome the noise from the base vibration and the minimal informative outputs from the lower sampling frequency. This enables the CNN to be trained with more efficient and discriminative features that result in a better classification model. The proposed approaches have been validated using a large volume of mobile sensor data based on the movements of travelers. Different types of mobile sensors have been used to collect data including accelerometer, proximity, and gyroscope. Experimental results demonstrate that the proposed approaches can improve the performance of the detection engine significantly over conventional techniques and reduces the misclassification rate.

Keywords: *Transportation mode, feature cloning, feature fusion, convolutional neural network, data augmentation.*

Title of the Article: 18

Explainable indoor localization of BLE devices through RSSI using recursive continuous wavelet transformation and XGBoost classifier

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Abstract:

Indoor localization systems with higher precision and integrity are being highly demanded because of their numerous applications in superstores, smart homes, smart cities, elderly care, and disaster management. Although there are many technologies for indoor positioning e.g., Wireless Fidelity (Wi-Fi), Bluetooth Low Energy (BLE), and Radio-Frequency Identification (RFID), the high precision localization is still challenging because of the multipath effect and non-line of sight propagation of radio waves in complex indoor environment. This research proposes an explainable indoor localization (EIL) method for higher precision and integrity in IPS. The proposed localization method considered received signal strength indicator (RSSI) from BLE devices for predicting their precise locations. A recursive continuous Wavelet transform (R-CWT) method is proposed to extract discriminative features from the beacon signals for efficient localization. The extracted features are then fed to the extreme gradient boosting machine for the accurate classification of indoor positions. Moreover, to ensure integrity in indoor position classification, the Shapley additive explanations (SHAP) method is introduced to interpret the results obtained from the gradient boosting machine. The proposed method (EIL) precisely localize BLE devices within 1.5 m in a superstore environment with an accuracy of 98.04% which is much higher than the reported accuracies in existing studies.

Keywords: *Explainable Indoor Localization, Recursive Continuous Wavelet Transform, XGBoost, Shapley Additive Explanation, Bluetooth Low Energy*

Title of the Article: 19

Detection and Analysis of Fake News Users' Communities in Social Media

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Abstract:

The widespread use of social media platforms has led to an increase in the dissemination of fake news with the intention of manipulating public opinion and causing chaos and panic among the population. To address this issue, we focus on detecting the organized groups that participate together in fake news campaigns without prior knowledge of the news content or the profiles of social accounts. To this end, we propose a spatial-temporal similarity graph, a novel graph structure that connects social accounts that participate in the early stage of similar fake news campaigns. A community detection algorithm is applied on the similarity graph to cluster the users into communities. We propose a community labeling algorithm to label the communities as benign or malicious based on the output of a fake news classifier. Evaluation results show that the community labeling algorithm can correctly label the communities with an accuracy of 99.61%. In addition, we perform a statistical comparison analysis to identify the structural community features that are statistically significant between benign and malicious communities.

Keywords: *Fake news, Social networking (online), Labeling, Feature extraction, Detection algorithms, Chatbots, Manuals*

Title of the Article: 20

Deep Learning Based Fusion Model for Multivariate LTE Traffic Forecasting and Optimized Radio Parameter Estimation

Author:

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Abstract:

With the evaluation of cellular network internet data traffic, forecasting and understanding traffic patterns become the critical objectives for managing the network-designed Quality of Service (QoS) benchmark. For this purpose, cellular network planners often use different methodologies for predicting data traffic. However, traditional traffic forecasting approaches are erroneous. As well as most of the time, traditional traffic forecasts are high-level or a generously large regional cluster level. Also, eNodeB-level utilization with concerning traffic forecasting is not readily available. As a result, user experience degradation or unnecessary network expansion is triggered based on the traditional method. This research deals with extensive 6.2 million real network time series Long-Term Evolution (LTE) data traffic and other associate parameters, including eNodeB-wise Physical Resource Block (PRB) utilization, which focuses on building a traffic forecasting model with the help of multivariate feature inputs and deep learning algorithms. A state-of-the-art Deep Learning algorithm-based fusion model is proposed. The combination of different deep learning algorithms, namely Long Short-Term Memory (LSTM), Bidirectional LSTM (BiLSTM) and Gated Recurrent Unit (GRU), enables traffic forecasting at a granular eNodeB-level and also provides eNodeB-wise forecasted PRB utilization. In this research R2 score value for the proposed fusion model is 0.8034, which outperforms traditional models. Apart from the PRB utilization, QoS threshold was devised as 70% from a real network experience to trigger soft parameter tuning decisions. Based on the forecasted PRB utilization, this research proposed a unique algorithm that estimates eNodeB-level soft capacity parameter optimization for a short-term step-up solution or long-term network expansion to ensure a guaranteed QoS benchmark.

Keywords: *LTE networks, machine learning in networking, traffic prediction, deep learning, mobile network capacity, physical resource block, resource management.*

Title of the Article: 21

EMPOLITICON: NLP and ML Based Approach for Context and Emotion Classification of Political Speeches From Transcripts

Author:

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Abstract:

Political speeches have played one of the most influential roles in shaping the world. Speeches of the written variety have been etched into history. These sorts of speeches have a great effect on the general people and their actions in the coming few days. Moreover, if left unchecked, political personnel or parties may cause major problems. In many cases, there may be a warning sign that the government needs to change its policies and also listen to the people. Understanding the emotion and context of a political speech is important, as they can be early indicators or warning

signs for impending international crises, alignments, wars and future conflicts. In our research, we have focused on the presidents/prime ministers of China, Russia, the United Kingdom and the United States which are the permanent members of the United Nations Security Council and classified the speeches given by them based on the context and emotion of the speeches. The speeches were categorized into optimism, neutral, joy or upset in terms of emotion and five context categories, which are international affairs, nationalism, development, extremism and others. Here, optimism is a secondary emotion, whereas joy and upset are primary emotions. Apart from classifying the speeches based on context and emotion, one of the major works of our research is that we are introducing a dataset of political speeches that contains 2010 speeches labelled with emotion and context of the speech. The speeches we have worked on are large in word count. We propose EMPOLITICON-Context, a soft voting classifier ensemble learning model for context classification and EMPOLITICON-Emotion, a soft voting classifier ensemble learning model for emotion classification of political speeches. The proposed EMPOLITICON-Context model has achieved 73.13% accuracy in terms of context classification and the EMPOLITICON-Emotion model has achieved 53.07% accuracy in classifying the emotion of the political speeches.

Keywords: *Context modeling, Bit error rate, Voting, Support vector machines, Social networking (online), Security, Emotion recognition, Oral communication*

Title of the Article: 22

UAV Assisted Cooperative Caching on Network Edge Using Multi-Agent Actor-Critic Reinforcement Learning

Author:

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Abstract:

In recent times, caching at edge nodes is a well-known technique to overcome the limitation of strict latency, which simultaneously improves users' Quality of Experience (QoE). However, choosing an appropriate caching policy and content placement poses another significant issue that has been acknowledged in this research. Conventional caching policies that are experimented with at the edge do not consider the dynamic and stochastic characteristics of edge caching. As a result, we have proposed a cooperative deep reinforcement learning algorithm that deals with the dynamic nature of content demand. It also ensures efficient use of storage through the cooperation between nodes. In addition, previous works on cooperative caching have assumed the users to be static and didn't consider the mobile nature of users. Therefore, we have proposed UAVs as

aerial Base Stations (UAV-BS) to assist in peak hours where a ground base station is insufficient to support the surge in user requests. In this novel research, we have demonstrated the cooperation between aerial and Ground Base Stations (GBS) and aimed at maximizing the global cache hit ratio. Simulations have shown that our proposed Cooperative Multi-Agent Actor-Critic algorithm outperforms conventional and reinforcement learning based caching methods and achieves a state-of-the-art global cache hit ratio when there is a surge in user requests. Thus, it opens the door for further research on cooperative caching in joint air and ground architecture.

Keywords: *Base stations, Servers, Reinforcement learning, Cooperative caching, Vehicle dynamics, Computational modeling, Cloud computing*

Title of the Article: 23

Combatting antifungal resistance: Paradigm shift in the diagnosis and management of onychomycosis and dermatomycosis

Author:

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Abstract:

Antifungal resistance has become prevalent worldwide. Understanding the factors involved in spread of resistance allows the formulation of strategies to slow resistance development and likewise identify solutions for the treatment of highly recalcitrant fungal infections. To investigate the recent explosion of resistant strains, a literature review was performed focusing on four main areas: mechanisms of resistance to antifungal agents, diagnosis of superficial fungal infections, management, and stewardship. The use of traditional diagnostic tools such as culture, KOH analysis and minimum inhibitory concentration values on treatment were investigated and compared to the newer techniques such as molecular methods including whole genome sequencing, and polymerase chain reaction. The management of terbinafine-resistant strains is discussed. We have emphasized the need for antifungal stewardship including increasing surveillance for resistant infection.

Title of the Article: 24

Diferential Diagnosis, Prevention, and Treatment of mpox (Monkeypox): A Review for Dermatologists

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Abstract:

The current 2022 mpox (monkeypox) outbreak has been officially recognized as a public health emergency. The mpox clinical symptoms include high fever, fatigue, chills, headache, swollen lymph nodes, muscle aches, and a disseminated painful rash. However, recent cases of mpox have shown a shift in clinical symptoms, with anogenital skin lesions emerging as the predominant feature. Due to the predominant skin manifestations of mpox, dermatologists could be crucial in detecting new mpox cases and educating frontline healthcare professionals about mpox. The mpox virus is continuously evolving and has several variants. Genome sequencing has revealed that the Clade IIb variant is responsible for the 2022 mpox outbreak. Mpox spread may occur through animal-to-human and human-to-human transmission; however, unlike coronavirus disease 2019 (COVID-19), long-range airborne transmission has not been reported. Healthcare professionals are at higher risk of becoming infected since they are usually in close contact with both the patients and potentially contaminated fomites (e.g., examination table, gowns, gloves). Both public and healthcare professionals should take preventive and avoidance measures to limit the spread. Mpox is usually self-limiting and may require only symptomatic treatment; however, it may cause severe complications in special populations such as immunocompromised individuals. For severe infection, clinicians may consider antiviral drugs (off-label), tecovirimat and brincidofovir, originally approved for smallpox treatment. Two smallpox vaccines, ACAM2000® and JYNNEOSTM, can be used as pre-exposure prophylaxis against mpox. JYNNEOSTM, which carries approval for mpox use, has less adverse effect potential than ACAM2000®, and may also be used as post-exposure prophylaxis, preferably within 4 days of exposure.

Title of the Article: 25

Time and frequency domain connectedness and spillover among categorical and regional financial stress, gold and bitcoin market

Author:

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Abstract:

Fragility of the financial system has been a matter of global concern. This study examines connectedness and spillovers among financial stress index (FSI) categories, regional FSI, gold, and Bitcoin. We employed time-varying and frequency domain approach of Chatziantoniou et al. (2021) using weekly data. We confirmed the interdependencies and connectedness of gold and Bitcoin with global categorical and regional financial stress. We find that credit FSI category is the largest transmitters in every model, implying that credit risk is an important driver of financial stress. United States is the largest stress contributor within the regional category. Additionally, connectedness among FSI categories, regional FSI, gold and Bitcoin has intensified during COVID-19 pandemic. In the short run, while gold and Bitcoin are net shocks receivers of categorical and regional financial stress, they are net shocks transmitters in the long run. Hence, gold and Bitcoin lost their safe-haven properties in the short-run but retained their values in the long-run. The findings expand understanding on the role of gold and Bitcoin for investors seeking protection from global financial stress.

Keywords: *Financial stress index, Gold, Bitcoin, Spillover, COVID-19*

Title of the Article: 26

The role of solar energy usage in environmental sustainability: Fresh evidence through time-frequency analyses

Author:

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Abstract:

The most important challenge for both developed and developing countries is to ensure sustainability while struggling with environmental degradation. CO2 emissions as a proxy for environ-

mental degradation can be considered an obstacle to sustainability. There exist several significant works in the literature on the effects of solar energy use on environmental degradation/sustainability. In this study, the effects of the use of solar energy within different time and frequency dimensions on CO₂ emissions were examined with the methodology of the continuous wavelet transform. The paper investigated the association between solar energy consumption and total energy-related CO₂ emissions in the USA through Morlet wavelet analysis, which is one of the most advanced time-frequency analysis methods for the period 1990:1–2022:6. In the wavelet coherency computations, geothermal energy consumption, hydroelectric energy consumption, industrial production, and manufacturing industry production variables were also included as control variables. Empirical findings demonstrate that solar energy consumption can have reducing effects on CO₂ emissions at lower frequencies (longer-term cycles) and sub-time periods (2014:1–2022:1) in the USA. The findings can guide the energy and environmental policies of developed and developing countries that aim to struggle with global warming and/or climate change through the increase in solar energy usage.

Keywords: *Solar energy, Carbon dioxide emissions, Sustainability, Time-frequency analysis, Wavelet transform, The United States*

Title of the Article: 27

Socially responsible HRM and hotel employees' environmental performance: the mediating roles of green knowledge sharing and environmental commitment

Author:

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Abstract:

Purpose

This study aims to investigate how employee environmental performance (EP) is affected by socially responsible human resource management (SRHRM) via green knowledge sharing (GKS) and environmental commitment (EC).

Design/methodology/approach

Partial least squares-structural equation modeling was used to analyze data from 494 frontline employees of hotels.

Findings

The findings reveal that SRHRM influences employee EP, GKS and EC. SRHRM indirectly predicts individual EP through GKS and EC mediation. GKS and EC also have significant relationships with employee EP.

Practical implications

Hotels can use the findings of this study to develop effective strategies to promote employees' positive responses to the environment and improve their organizational identification. Moreover, the current research enables the organization to recognize the importance of employees' GKS and EC and capitalize on them.

Originality/value

This study links SRHRM to the individual EP level in the hotel industry. This study reveals the importance of EC and GKS as psychological mechanisms linking SRHRM and EP.

Keywords: *Socially responsible HRM, Environmental performance, Environmental commitment, Green knowledge sharing and corporate social responsibility, Employee environmental performance*

Title of the Article: 28

Promoting technology innovation performance through high involvement HRM, technology adaptation and innovativeness

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Abstract:

Purpose – This paper aims to examine how high involvement HRM (HIHRM), technology adaptation and innovativeness influence employees to respond to technology innovation performance – that is, radical innovation performance and incremental innovation performance – in distinct ways.

Design/methodology/approach – The purposive judgmental sample technique is used to assess the perceptions of 545 IT employees in Bangladesh's ready-made garment (RMG) industry. The partial least square-structural equation modeling (SEM-PLS) method is applied to analyze and interpret the data.

Findings – Findings of the analysis show that HIHRM, technology adaptation and innovativeness influence employees to exhibit technology innovation performance. Furthermore, both technology adaptation and innovativeness show the significant mediating effects between HIHRM and technology innovation performance.

Practical implications – First, this study’s findings contribute to HIHRM and technology innovation performance within the context of the resource-based theory. Second, the RMG organizations would acknowledge the role of HIHRM on employee technology adaptability and innovation capability in this regard. A future study might point to the models’ ability to create the best work environments, which can help organizations to boost employee productivity through adaptation and innovation.

Originality/value – The study would offer a distinctive perspective on higher-order HIHRM and how they affect IT employees in RMG organizations in Bangladesh that could be approached in other labor-intensive and developing nations. This study also expands the research on technology adaptation and innovativeness by exploring the mediating roles between HIHRM and employee technology innovation performance in the organization.

Keywords: *High involvement HRM, Technology innovation performance, Technology adaptation, Innovativeness, Resource-based theory*

Title of the Article: 29

Asymmetric relationship between climate policy uncertainty and energy metals: Evidence from cross-quantilogram

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Abstract:

Climate policy uncertainty is a widely used measure of climate risk based on policy fronts. On the other hand, energy metals offer avenues for the use of clean, green, and sustainable energy to combat the environmental hazards and reduce carbon footprint. Following this, the current study aims to investigate the relationship between climate policy uncertainty and energy metals through a novel technique of cross-quantilogram. The study finds a pronounced relationship between climate policy uncertainty and energy metals in terms of reducing carbon emissions. We

also report diversification benefits of energy metals given the larger lags. We deduced useful insights for practitioners, investors, and scholars.

Keywords: *Carbon footprint, Climate policy uncertainty, Cross-quantilogram, Energy metals*

Title of the Article: 30

Effects of in-store live stream on consumers' offline purchase intention

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Abstract:

Live stream marketing through social media has attracted the attention of digital retailing marketers in recent years. However, there is a lack of evidence in understanding the influence of in-store live stream on offline purchase intentions. This study aimed to investigate the influence patterns of environmental stimuli on consumers' intention to purchase offline/in-store after watching an in-store live stream session. The Stimuli-Organism-Response (SOR) model was employed as the theoretical framework, and a structured questionnaire was used to collect data from individuals who had previous experience with in-store live stream marketing. Structural equation modelling was then applied for data analysis, with a total of 234 valid responses. The findings revealed that environmental stimuli have a significant positive effect on consumers' intentions to make in-store purchases, and the attitudes towards influencers and products substantially mediate the relationship between stimuli and purchase intention. More specifically, consumer attitude towards products has a pronounced effect on whether they will make an in-store purchase. The novelty of this research lies in its investigation of the impact that live stream marketing has on offline or in-store shopping experiences. This contrasts with the majority of existing live stream studies, which focus on consumers' online shopping experiences. In addition, this study broadens the scope of the application of the SOR model to contribute to the growing body of literature on live stream marketing.

Keywords: *Live stream influencer marketing, Stimuli-organism-response (SOR), Consumer attitude, In-store purchase intention*

Title of the Article: 31

Scaling social impact in women-led social enterprises in developing countries: a knowledge-based perspective

Author:

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Abstract:

Purpose – Although scaling is considered a “hot topic”, very little is known about how knowledge management (KM) assists in scaling social impact. To fill this gap, the authors draw on knowledge-based and social capital theories and investigate how various KM practices and external networks (e.g. bridging social capital) affect scaling social impact in developing countries.

Design/methodology/approach – Applying structural equation modeling (SEM) with AMOS version 23, the authors conducted a survey with 354 women leaders who are working in women-led social enterprises in Dhaka, Bangladesh.

Findings – The authors found that knowledge codification, training and mentoring, and bridging social capital are positively and significantly associated with scaling social impact.

Originality/value – This is one of the pioneering study that explore how KM impacts scaling social impact for women-led social enterprises in the context of a developing country. The authors also extend knowledge-based theory by applying it at the individual level. Finally, the authors enhance the understanding of women entrepreneurship by showing that women entrepreneurs in developing countries are also utilizing bridging social capital to overcome challenges associated with scaling social impact.

Keywords: *Scaling social impact, Knowledge management, Social capital, Developing country, Women-led social enterprise*

Title of the Article: 32

Demystifying evidential Dempster Shafer-based CNN architecture for fetal plane detection from 2D ultrasound images leveraging fuzzy-contrast enhancement and explainable AI

Author:

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Abstract:

Ultrasound imaging is a valuable tool for assessing the development of the fetal during pregnancy. However, interpreting ultrasound images manually can be time-consuming and subject to variability. Automated image categorization using machine learning algorithms can streamline the interpretation process by identifying stages of fetal development present in ultrasound images. In particular, deep learning architectures have shown promise in medical image analysis, enabling accurate automated diagnosis. The objective of this research is to identify fetal planes from ultrasound images with higher precision. To achieve this, we trained several convolutional neural network (CNN) architectures on a dataset of 12400 images. Our study focuses on the impact of enhanced image quality by adopting Histogram Equalization and Fuzzy Logic-based contrast enhancement on fetal plane detection using the Evidential Dempster–Shafer Based CNN Architecture, PReLU-Net, SqueezeNET, and Swin Transformer. The results of each classifier were noteworthy, with PreLUNet achieving an accuracy of 91.03%, SqueezeNET reaching 91.03% accuracy, Swin Transformer reaching an accuracy of 88.90%, and the Evidential classifier achieving an accuracy of 83.54%. We evaluated the results in terms of both training and testing accuracies. Additionally, we used LIME and GradCam to examine the decision-making process of the classifiers, providing explainability for their outputs. Our findings demonstrate the potential for automated image categorization in large-scale retrospective assessments of fetal development using ultrasound imaging.

Keywords: *PreLUNet, Evidential Dempster–Shafer CNN, Swin Transformer, Histogram Equalization, Fuzzy Logic Contrast*

Title of the Article: 33

A study on road accident prediction and contributing factors using explainable machine learning models: analysis and performance

Author:

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Abstract:

Road accidents are increasing worldwide and are causing millions of deaths each year. They impose significant financial and economic expenses on society. Existing research has mostly studied road accident prediction as a classification problem, which aims to predict whether a traffic accident may happen in the future or not without exploring the underneath relationships between the complicated factors contributing to road accidents. A number of research have been done to date to explore the importance of road accident contributing factors in relation to road accidents and their severity, however, only a few of those research have explored a subset of ensemble ML models and the New Zealand (NZ) road accident dataset. Therefore, in this paper, we have evaluated a set of machine learning (ML) models to predict road accident severity based on the most recent NZ road accident dataset. We have also analysed the predicted results and applied an explainable ML (XML) technique to evaluate the importance of road accident contributing factors. To predict road accidents with different injury severity, this work has considered different ensembles of ML models, like Random Forest (RF), Decision Jungle (DJ), Adaptive Boosting (AdaBoost), Extreme Gradient Boosting (XGBoost), Light Gradient Boosting Machine (L-GBM), and Categorical Boosting (CatBoost). New Zealand road accident data from 2016 through 2020 obtained from the New Zealand Ministry of Transport is used to perform this study. The comparison results show that RF is the best classifier with 81.45% accuracy, 81.68% precision, 81.42% recall, and 81.04% of F1-Score. Next, we have employed the Shapley value analysis as an XML technique to interpret the RF model performance at global and local levels. While the global level explanation provides the rank of the features' contribution to severity classification, the local one is for exploring the use of features in the model. Furthermore, the Shapley Additive exPlanation (SHAP) dependence plot is used to investigate the relationship and interaction of the features towards the target variable prediction. Based on the findings, it can be said that the road category and number of vehicles involved in an accident significantly impact injury severity. The identified high-ranked features through SHAP analysis are used to retrain the ML models and measure their performance. The result shows 6%, 5%, and 8%, increase, respectively, in the performances of DJ, AdaBoost, and CatBoost models.

Keywords: Road accident, Explainable machine learning, SHAP, Feature, Injury severity

Title of the Article: 34

A novel approach for optimal energy resources mixing in nuclear-renewable microgrids using probabilistic energy modelling method

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Abstract:

Zero-carbon energy infrastructure design has become one of the most consequential pivotal toward sustainable development. This article introduces a novel approach to energy infrastructure innovation that incorporates carbon-free energy generation resources- renewables and Micro Nuclear Reactors (MNRs). The integrated Nuclear-Renewable Microgrid (NRM) has minimal greenhouse gas emissions and the utmost reliability. However, the planning and modeling of NRMs may face challenges due to the variability and uncertainty of renewable resources. Therefore, the study proposes a probabilistic energy modeling approach for NRMs, which provides an outstanding estimation for energy system planning in terms of economics and resiliency. Multiple load-generation scenarios have been formulated based on the probability distribution functions. A recent nature-based optimization technique, Slime Mould Algorithm (SMA), is employed to minimize the total annual cost of the probabilistic model with reliability constraints. The statistical analyses reveal that the probabilistic energy modeling method perfectly evaluates how energy generation resources should be mixed to fulfill energy demand in an optimal manner. The key findings also demonstrate observations on finance, system resiliency, and system components before the commencement of the project. The results are validated by another recent metaheuristic optimization algorithm called Aquila Optimizer (AO).

Keywords: *Sustainable Energy System, Probabilistic Energy Modeling, Nuclear-Renewable Microgrids, Optimization*

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Title of the Article: 1

Dietary vitamin A intake and its major food sources among rural pregnant women of South-West Bangladesh

Author:

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Abstract:

The study aimed to estimate the dietary intake of vitamin A and its major food sources among rural pregnant women from the southwest region of Bangladesh. A multi-stage random cluster sampling method was used to select the respondents (N = 1012). A semi-structured questionnaire was used to collect the data, and statistical analysis was conducted using IBM SPSS 20.0. The mean age of the respondents was 23.27 ± 5.23 years, and the majority were in their second (48%) and third trimester (49%). The mean dietary intake of vitamin A was 392 ± 566 μg Retinol Activity Equivalent (RAE)/day (51% of Recommended Dietary Allowance). The contribution of β -carotene (plant source) and retinol (animal source) in vitamin A intake was about 60% and 40%, respectively. The major β -carotene contributing food groups were vegetables (dark and light) and tubers, and food items were colocasia, potato, beans, brinjal, and ripe tomatoes. On the other hand, the major retinol-contributing food groups were fish, eggs, and milk, and food items were small fish, Rui (carp) fish, and cow's milk. It was also observed that the consumption of food items from β -carotene and retinol-contributing food groups did not differ significantly among the three groups of respondents, but the variations in the amount of the different food items consumed were significant. Dietary vitamin A intake is low among pregnant women in the South-West region of Bangladesh. Hence, they are at a greater risk of adverse materno-fetal health outcomes associated with vitamin A deficiency.

Keywords: Dietary intake, Vitamin A, Pregnant women, Bangladesh

Title of the Article: 2

Efficiency improvement of thin film solar cell using silver pyramids array and antireflective layer

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Abstract:

In recent years, plasmonics has been widely employed to improve light trapping in solar cells. Silver nanospheres have been used in several research works to improve the capability of solar absorption. In this paper, we use silver pyramid-shaped nanoparticles, a noble plasmonic nanoparticle, inside thin-film silicon and InP solar cells to increase light absorption compared to previously published topologies. The proposed structure consists of a TiO₂ pyramid structure placed at the top of the surface working as an anti-reflective layer, silicon/indium phosphate as an absorption layer, silver pyramid-shaped nanoparticles incorporated inside the absorption layer, and an aluminum reflecting layer at the bottom. In this research, we used finite difference time domain (FDTD) simulation to model the thin-film solar cell (TFSC). Optimizing the shape and placement of the silver pyramids, we have achieved an efficiency of 17.08% and 18.58% using silicon and InP as the absorbing layers respectively, which is significantly better than previously reported studies. The open-circuit voltages are 0.58 V and 0.92 V respectively, which is the highest among other configurations. To conclude, the findings of this study laid the foundation to create an efficient thin-film solar cell utilizing the light-trapping mechanism of noble plasmonic nanoparticles.

Keywords: *Silver pyramid array, Thin-film solar cell, Light trapping, Nanoparticle array, Antireflective layer, Absorption efficiency*

Title of the Article: 3

Aggregating Different Scales of Attention on Feature Variants for Tomato Leaf Disease Diagnosis from Image Data: A Transformer Driven Study

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Abstract:

Tomato leaf diseases can incur significant financial damage by having adverse impacts on crops and, consequently, they are a major concern for tomato growers all over the world. The diseases may come in a variety of forms, caused by environmental stress and various pathogens. An auto-mated approach to detect leaf disease from images would assist farmers to take effective control measures quickly and affordably. Therefore, the proposed study aims to analyze the effects of transformer-based approaches that aggregate different scales of attention on variants of features for the classification of tomato leaf diseases from image data. Four state-of-the-art transformer-based models, namely, External Attention Transformer (EANet), Multi-Axis Vision Transformer (MaxViT), Compact Convolutional Transformers (CCT), and Pyramid Vision Transformer (PVT), are trained and tested on a multiclass tomato disease dataset. The result analysis showcases that MaxViT comfortably outperforms the other three transformer models with 97% overall accuracy, as opposed to the 89% accuracy achieved by EANet, 91% by CCT, and 93% by PVT. MaxViT also achieves a smoother learning curve compared to the other transformers. Afterwards, we further verified the legitimacy of the results on another relatively smaller dataset. Overall, the exhaustive empirical analysis presented in the paper proves that the MaxViT architecture is the most effective transformer model to classify tomato leaf disease, providing the availability of powerful hardware to incorporate the model.

Keywords: *transformers, EANet, MaxViT, CCT, PVT, tomato leaf disease, attention*

Title of the Article: 4

Shariah audit of Islamic Banks in Bangladesh: the present practice and the way forward

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Abstract:

Purpose- The study explores the existing Shariah audit practice of Islamic banks (IBs) in Bangladesh aiming at providing suggestions for improvements on the detected shortfalls in the relevant areas.

Design/methodology/approach- This research applied a qualitative method, and data were collected through conducting semi-structured interviews in Bangladesh. A total of 17 interviews were conducted for accomplishing the research objectives.

Findings- The study finds that there is no comprehensive Shariah audit manual in the current operation for IBs in Bangladesh, and as such, the requirements of their Shariah compliance remain

a big question. Although the Shariah audit is conducted within IBs, and the Shariah audit officers or Shariah officers inspect necessary documents while conducting the Shariah audit, they only cover 10–20% of total investments and transactions. Based on the findings of this study, it is recommended that the Shariah auditing tasks should broadly cover at least 80% of the investment portfolios, documents and financial contracts and activities.

Research limitations/implications- The findings of this research are expected to significantly contribute to the regulatory authorities concerned in Bangladesh and beyond, which include the suggestions that IBs can adopt to strengthen their Shariah governance system. The study also pinpoints that in the current system, Shariah auditors' roles are somehow limited in examining and checking the investment sides with a minimal portion (10–20%), for which they are unable to perform their responsibilities in a befitting manner to provide assurance services and overall, Shariah compliance of IBs activities.

Practical implications- This study explores the current Shariah audit systems and provides recommendations to improve the existing systems which will be beneficial for Islamic banks of Bangladesh.

Originality/value- To the researchers' knowledge, perhaps this is the first research of its kind which seeks to explore the current Shariah audit practice in Bangladesh qualitatively, and it provides some practical suggestions for making the necessary developments of the current audit process of IBs. In addition, there are no empirical studies in the entire Emerald insight publishers and Scopus database regarding Shariah audit practices. The study contributes to the agency, stakeholder and legitimacy theories by exploring the Shariah audit of IBs.

Keywords: *Shariah governance, Shariah audit, Islamic banks, Bangladesh*

Title of the Article: 5

The Paddy Procurement System for Sustainability: Evidence from Bangladesh Agriculture Sector

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Abstract:

Bangladesh derives one-half of its agricultural GDP and one-sixth of its national income from paddy. It is crucial to the farmers' ability to survive. This paper aims to investigate current paddy procurement system and farmer awareness in the Bangladeshi agricultural sector to ensure business sustainability. This paper utilised a quantitative approach to research. The research investigated farmers' consciousness through perception and contentment. For the measurement, a survey of 210 farmers from three Upazilas was conducted using a closed-ended, pre-tested questionnaire. Version 20 of the SPSS programme was used for data analysis. Approximately 67.6% of respondents were unhappy with the current paddy procurement system, according to the study. Approximately 69.10% of respondents believe there is a middleman in the current paddy procurement system, approximately 94.30% of respondents believe the current system needs improvement, and 99.0% believe a new paddy procurement system could be beneficial. Furthermore, these findings led to the conclusion that there is room for improvement in the current paddy procurement system, which will increase the transparency and sustainability of paddy procurement activities for everyone, including farmers.

Keywords: *paddy, sustainable paddy procurement system, farmer's consciousness, farmer's perception, farmer's satisfaction*

Title of the Article: 6

The Promise of Nanoparticles-Based Radiotherapy in Cancer Treatment

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Abstract:

Radiation has been utilized for a long time for the treatment of cancer patients. However, radiotherapy (RT) has many constraints, among which non-selectivity is the primary one. The implementation of nanoparticles (NPs) with RT not only localizes radiation in targeted tissue but also provides significant tumoricidal effect(s) compared to radiation alone. NPs can be functionalized with both biomolecules and therapeutic agents, and their combination significantly reduces the side effects of RT. NP-based RT destroys cancer cells through multiple mechanisms, including ROS generation, which in turn damages DNA and other cellular organelles, inhibiting of the DNA double-strand damage-repair system, obstructing of the cell cycle, regulating of the tumor micro-environment, and killing of cancer stem cells. Furthermore, such combined treatments overcome radioresistance and drug resistance to chemotherapy. Additionally, NP-based RT in combined treatments have shown synergistic therapeutic benefit(s) and enhanced the therapeutic window. Furthermore, a combination of phototherapy, i.e., photodynamic therapy and photothermal

therapy with NP-based RT, not only reduces phototoxicity but also offers excellent therapeutic benefits. Moreover, using NPs with RT has shown promise in cancer treatment and shown excellent therapeutic outcomes in clinical trials. Therefore, extensive research in this field will pave the way toward improved RT in cancer treatment.

Keywords: cancer treatment, radiotherapy, radiation treatment, nanoparticles, nanoparticle-based radiotherapy, combination therapy, phototherapy, mechanism

Title of the Article: 7

Plausibility of natural immunomodulators in the treatment of COVID-19—A comprehensive analysis and future recommendations

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Abstract:

The COVID-19 pandemic has inflicted millions of deaths worldwide. Despite the availability of several vaccines and some special drugs approved for emergency use to prevent or treat this disease still, there is a huge concern regarding their effectiveness, adverse effects, and most importantly, their efficacy against the new variants. A cascade of immune-inflammatory responses is involved with the pathogenesis and severe complications with COVID-19. People with dysfunctional and compromised immune systems display severe complications, including acute respiratory distress syndrome, sepsis, multiple organ failure etc., when they get infected with the SARS-CoV-2 virus. Plant-derived natural immune-suppressant compounds, such as resveratrol, quercetin, curcumin, berberine, luteolin, etc., have been reported to inhibit pro-inflammatory cytokines and chemokines. Therefore, natural products with immunomodulatory and anti-inflammatory potential could be plausible targets to treat this contagious disease. This review aims to delineate the clinical trials status and outcomes of natural compounds with immunomodulatory potential in COVID-19 patients along with the outcomes of their in-vivo studies. In clinical trials several natural immunomodulators resulted in significant improvement of COVID-19 patients by diminishing COVID-19 symptoms such as fever, cough, sore throat, and breathlessness. Most importantly, they reduced the duration of hospitalization and the need for supplemental oxygen therapy, improved clinical outcomes in patients with COVID-19, especially weakness, and eliminated acute lung injury and acute respiratory distress syndrome. This paper also discusses many potent natural immunomodulators yet to undergo clinical trials. In-vivo studies with natural immunomodulators demonstrated reduction of a wide range of proinflammatory cytokines. Natural immunomodulators that were found effective, safe, and well tolerated in small-scale clinical trials are warranted to undergo large-scale trials to be used as drugs to treat COVID-19 infections. Alongside, compounds yet to test clinically must undergo clinical trials to find their

effectiveness and safety in the treatment of COVID-19 patients.

Keywords: COVID-19, SARS-CoV-2, Pandemic, Natural compounds, Immunomodulators, Cytokines

Title of the Article: 8

Relationship between greenfield investment and economic growth: Evidence from Bangladesh

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Abstract:

The key purpose of the study is to investigate the relationship between Greenfield investment and economic growth of Bangladesh using annual time series data during the period 2003–2020. The study employs Toda-Yamamoto (T-Y) tests of Granger causality method that performs Modified Wald Test (MWALD) in order to establish causal relation among different variables. There are three steps in implementing the T-Y procedure. The first step involves using different tests (ADF, PP, and KPSS test) to identify the maximum order of integration of the variable. The second step requires selecting the optimal lag length (p) based on several lag length selection criteria. In the third step, MWALD approach is used for testing the vector auto regression model for causality. The results of the tests (ADF, PP, and KPSS) concluded that the maximum order of integration of the variables is two. Then, the optimal lag length of two ($p = 2$) has been selected based on several lag length selection criteria. Finally, the findings reveal the evidence of unidirectional causality from Real Greenfield Foreign Direct Investment (RGFDI) to Real Gross Domestic Product (RGDP). The key contribution of this study is to investigate the Greenfield investments-growth relationship for a country like Bangladesh.

Keywords: Greenfield investment, Economic growth, Toda-yamamoto (T-Y) tests of granger causality, Bangladesh

Title of the Article: 9

GHRM and employer branding: empirical study in developing and developed economies

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Abstract:

Purpose – The purpose of this study was to compare the effect of GHRM practices on employer branding among firms in developed and developing economies.

Design/methodology/approach – This study applied a cross-sectional survey for 234 respondents. The sample was derived from multiple databases consisting of firms in developed and developing countries.

Findings – The analysis indicates that green competence building practices and green performance management practices are positively related to environmental reputation and hence employer brand. Green employee involvement is exceptional because it has a more positive influence on environmental reputation in developed economies.

Originality/value – This study is cross-national in nature and compares GHRM practices in developed and developing economies

Keywords: *Employer branding, Green human resource management, Environmental reputation, Human resource management, Developing economies, Developed economies, Green abilities, Green motivation, Green opportunities*

Title of the Article: 10

Relationship between FDI Inflows and Export Performance: An Empirical Investigation by Considering Structural Breaks

Author:

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Abstract:

The present study examines the relationship between FDI inflows and export performance in

Bangladesh by considering the issue of structural breaks utilizing annual time-series data from 1972 to 2019. In the study, unit root tests were conducted without (ADF test and PP test) and with (ZA test and LP test) the presence of probable structural breaks in the dataset. A Johansen test of co-integration was employed to determine whether the variables were co-integrated. The VECM was used for determining the sources of causation and the directions of the causal relationships between the variables. Since all the variables were integrated of order one, $I(1)$, with breaks (confirmed by ZA and LP unit root tests), a Johansen test of co-integration was applied to identify whether the variables were co-integrated. The results of the Johansen co-integration test confirmed that three variables (LRGDPGR, LRFDI, and LREX) have a long-run equilibrium relationship or cointegrating relation. Finally, the VECM suggests the evidence of a positive and unidirectional causal relation from REX to RFDI in Bangladesh. An important uniqueness of this study lies in its application of the methodological issues of incorporating structural breaks, which could have significant implications for investigating the said relationship.

Keywords: FDI, export performance, structural break, VECM, Bangladesh

Title of the Article: 11

Anxiety and Stress Related to COVID-19 Among the Community Dwelling Older Adults Residing in the Largest Refugee Camp of the World

Author:

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Abstract:

The current cross-sectional study was conducted among 864 older adults aged ≥ 60 years residing in Rohingya refugee camp through face-to-face interviews during November–December 2021. COVID-19-related anxiety was measured using the five-point Coronavirus Anxiety Scale (CAS) and perceived stress using the 10-point Perceived Stress Scale (PSS). The linear regression model identified the factors associated with COVID-19-related anxiety and perceived stress. The prevalence of COVID-19-related anxiety and perceived stress was 68% and 93%, respectively. The average COVID-19-related anxiety score expected to be significantly higher among those who were physically inactive, concerned about COVID-19, had a close friend/family member diagnosed with COVID-19, and had some difficulty in getting food and routine medical care during the COVID-19 pandemic. Meanwhile, the average perceived stress score was expected to be significantly higher among those without partners, who were feeling overwhelmed by COVID-19, and who experienced COVID-19-related anxiety during the pandemic. The findings suggest providing immediate psychosocial support to older Rohingya adults.

Keywords: *Rohingya, Older adults, COVID-19, COVID-19-related anxiety, Perceived stress*

Title of the Article: 12

Reflecting on Reflections Concerning Critical Incidents in Developing Pre-Service Teachers' Professional Identity: Evidence from a TESOL Education Project

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Abstract:

Due to the limited capacity enacted to supervision and the absence of a comprehensive framework leading to the professional identity of the pre-service teachers, the researchers initiate the Growing as a TESOL teacher project that involves the pre-service teachers in a teaching practicum course, engages them in reflecting on reflections concerning critical incidents for conceptualizing their identity as TESOL (Teaching English to Speakers of Other Languages) teachers. The study reports the impact of the project on developing the PSTs' identity as TESOL teachers. The dialogical approach suggested by Akkerman and Meijer (Teaching and Teacher Education, 27(2), 308-319, 2011) lays the theoretical foundation of the study. A phenomenological study is undertaken involving 10 pre-service teachers specializing in TESOL at a university in Malaysia. Using multiple instruments, we document the responses pertaining to their perceived identity as future

TESOL teachers prior to the project and perceived identities as TESOL teachers after the project. Since the study enjoins the pre-service teachers to share their reflections initially, then receive reflections from others, and finally reflect on self-reflections and reflections of others, the processes induct them into a dialogic activity within the self. With the knowledge gained from reflecting on reflections of critical incidents, the pre-service teachers continue the dialogues to negotiate prior identities with the demanding identities to deal with the classroom realities. The dialogue paves an avenue to read-just and realign their identities as TESOL teachers.

Keywords: *Pre-service teachers, Teacher identity, Teacher education, TESOL, ESL, Reflective practice*

Title of the Article: 13

Is There a Link between Bilingualism and Intelligence?

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Introduction

From the beginning of the 20th century, the area of psycholinguistics has been investigating whether being proficient in dual languages or being bilingual has an advantage on cognitive benefits (Barac et al., 2014). Researchers have fallen into two schools of thought in answering this question. Some researchers claim that bilingualism positively impacts creativity and intelligence (Bialystok et al., 2004; Costa et al., 2008). On the other hand, some researchers claim that bilingualism is a negative phenomenon that has deleterious effects on intelligence (Morton & Harper, 2007; Paap & Greenberg, 2013). It is assumed that language plays a vital role in the development of cognitive processes, at least from the time the child has achieved some language competence as stated by Vygotsky (1962). Language also develops the communication system but becomes an essential device for forming the processes which allow the child to organize thought. Also, the capability of using two languages might reflect the features or processes in the brain underlying the language skills that studying only one language may not disclose. So, it can be resumed that bilingualism affects cognitive strategies or intelligence. However, the controversy in the literature on the effect of bilingualism on intelligence has remained unanswered till now. Therefore, this article discusses bilingualism and intelligence along with historical accounts of various trends concerning them to see whether there is a relation between them or not.

Title of the Article: 14

A Facile Fluorometric Assay of Orotate Phosphoribosyltransferase Activity Using a Selective Fluorogenic Reaction for Orotic Acid

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Abstract:

Orotate phosphoribosyltransferase (OPRT) exists as a bifunctional enzyme, uridine 50- monophosphate synthase, in mammalian cells and plays an important role in pyrimidine biosynthesis. Measuring OPRT activity has been considered important for understanding biological events and development of molecular-targeting drugs. In this study, we demonstrate a novel fluorescence method for measuring OPRT activity in living cells. The technique utilizes 4-trifluoromethylbenzamidoxime (4-TFMBAO) as a fluorogenic reagent, which produces selective fluorescence for orotic acid. To perform the OPRT reaction, orotic acid was added to HeLa cell lysate, and a portion of the enzyme reaction mixture was heated at 80 °C for 4 min in the presence of 4-TFMBAO under basic conditions. The resulting fluorescence was measured using a spectrofluorometer, which reflects the consumption of orotic acid by the OPRT. After optimization of the reaction conditions, the OPRT activity was successfully determined in 15 min of enzyme reaction time without further procedures such as purification of OPRT or deproteination for the analysis. The activity obtained was compatible with the value measured by the radiometric method with [3H]-5-FU as the substrate. The present method provides a reliable and facile measurement of OPRT activity and could be useful for a variety of research fields targeting pyrimidine metabolism.

Keywords: *orotic acid; fluorogenic reaction; orotate phosphoribosyltransferase; enzyme activity; laboratory test*

Title of the Article: 15

Re-naturing cities through water-centric development: evaluating a canal restoration project in Narayanganj City, Bangladesh

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Abstract:

The concept of 're-naturing cities' promotes nature-based solutions for sustainable urban design; one of those being water-centric development with networks of blue (water bodies) and green (vegetation areas) aims to generate urban areas that support economic growth, strengthen social cohesion, and restore degraded ecosystems. Projects get implemented for revitalizing urban water bodies with multifunctional areas. This context demands to study water-centric development projects for evaluating the success of 're-naturing cities' in terms of achieving sustainable goals. This research analyzes a part of a canal restoration project of Narayanganj City, Bangladesh, for investigating the development process and understanding its effectiveness in achieving sustainable goals. The study employs multiple qualitative tools for capturing users' views (emic analysis) and researchers' views (etic analysis). The combined understanding identifies that the project focuses primarily on adding an aesthetically pleasing element to the urban fabric, overlooking multiple socioeconomic and ecological possibilities of living with water.

Keywords: *blue-green network, canal restoration, nature-based solution, re-naturing cities, sustainable urban design, water-centric development*

Title of the Article: 16

Towards associating negative experiences and recommendations reported by Hajj pilgrims in a mass-scale survey

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Abstract:

The annual Hajj presents diversified negative experiences to millions of pilgrims worldwide. The negative experiences and recommendations to overcome them as per pilgrims' feedback are yet to be analyzed from an aggregated perspective in the literature, which we do in this paper. To do so, first, we perform a large-scale survey (n=988) using our comprehensive questionnaire. Then, we perform both quantitative (e.g., clustering) and qualitative (e.g., thematic) analyses on the

survey data. Our quantitative analysis reveals up to seven clusters of negative experiences. Further, going beyond the quantitative analysis, our qualitative analysis reveals 21 types of negative experiences, 20 types of recommendations, and nine themes connecting the negative experiences and recommendations. Accordingly, we reveal associations among the negative experiences and recommendations based on the themes in thematic analysis and present the associations through a tripartite graph. However, we have some limitations in this study, such as fewer female and young participants. In future, we plan to collect more responses from female and young participants and extend our work by analyzing linkages in the tripartite graph by augmenting the edges within the graph with appropriate weights. Overall, the findings of this study are expected to facilitate the prioritization of tasks for the management personnel in charge of the Hajj pilgrimage.

Keywords: *Religious tourism, Pilgrimage, Islamic pilgrimage, Satisfaction Negative experiences, Suggestions for management*

Title of the Article: 17

Supplementing recurrent neural networks with annealing to solve combinatorial optimization problems

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Abstract:

Combinatorial optimization problems can be solved by heuristic algorithms such as simulated annealing (SA) which aims to find the optimal solution within a large search space through thermal fluctuations. This algorithm generates new solutions through Markov-chain Monte Carlo techniques which can result in severe limitations, such as slow convergence and a tendency to stay within the same local search space at small temperatures. To overcome these shortcomings, we use the variational classical annealing (VCA) framework that combines autoregressive recurrent neural networks (RNNs) with traditional annealing to sample solutions that are uncorrelated. In this paper, we demonstrate the potential of using VCA as an approach to solving real-world optimization problems. We explore VCA's performance in comparison with SA at solving three popular optimization problems: the maximum cut problem (Max-Cut), the nurse scheduling problem (NSP), and the traveling salesman problem (TSP). For all three problems, we find that VCA outperforms SA on average in the asymptotic limit by one or more orders of magnitude in terms of relative error. Interestingly, we reach large system sizes of up to 256 cities for the TSP. We also conclude that in the best-case scenario, VCA can serve as a great alternative when SA fails to find the optimal solution.

Keywords: optimization problems, annealing, recurrent neural networks, RNNs, machine learning, statistical physics

Title of the Article: 18

Risk perception of sun exposure and knowledge of vitamin D among the healthcare providers in a high-risk country: a cross-sectional study

Author:

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Abstract:

Background: High levels of vitamin D deficiency are commonly reported even in regions with abundant sunshine. This necessitates a comprehensive understanding of the determinants that influence sun exposure practices. As the primary source of health-related knowledge for the general public, the attitude of the healthcare professionals towards sunlight and their awareness related to vitamin D deficiency can be critical in this regard.

Methods: A cross-sectional survey was conducted among 2,242 physicians, intern doctors, and senior medical students in Bangladesh from October 2019 to February 2020. A pre-tested structured questionnaire (containing twelve close-ended questions) was used. The perceptions of health risks due to sun exposure, and basic knowledge of the physiological and epidemiological aspects of vitamin D deficiency were tested.

Results: An overall negative attitude towards sunlight in the context of Bangladesh was highlighted – 68% participants thought regular sun exposure would be harmful or very harmful; 26% thought the level of UV radiation was very high; 44% recommended using sunscreen always; skin burns, heat stroke, and cancer were selected as potential consequences of regular sun exposure by 45%, 21%, and 30% respondents respectively. Overall knowledge regarding vitamin D deficiency appeared to be biased towards bone health; other symptoms and associated illnesses not

having obvious link to Calcium-metabolism were identified much lesser frequently. Furthermore, 'sunrise to 10 am' was identified as the best time to get vitamin D by 69% participants; 60% believed <30 min of weekly sun exposure would be sufficient for the Bangladeshi population; an only 33% identified that prevalence of vitamin D insufficiency in Bangladesh would be 50% or more. Taking vitamin D-rich food was suggested by more respondents over regular sun exposure (43% vs. 33%) as more effective remedial strategy to curb vitamin D deficiency in Bangladesh.

Conclusion: In addition to highlighting some crucial knowledge gaps, results from this study provides a comprehensive baseline dataset for knowledge and attitude regarding the public health aspects of vitamin D deficiency among the healthcare providers in Bangladesh, which would be generalizable to other countries with similar socio-demo-graphic context, and will facilitate taking more effective policies worldwide.

Keywords: *Vitamin D, Sunlight, Knowledge, Attitude, Practice, KAP, Physicians, Medical students*

Title of the Article: 19

A systematic review on predicting PV system parameters using machine learning

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Abstract:

Due to the growing demand, assessing performance has become obligatory for photovoltaic (PV) energy harvesting systems. Performance assessment involves estimating different PV system parameters. Traditional ways, such as calculating solar radiation using satellite data and the IV characteristics approach as assessment methods, are no longer reliable enough to provide a reasonable projection of PV system parameters. Estimating system parameters using machine learning (ML) approaches has become a reliable and popular method because of its speed and accuracy. This paper systematically reviewed ML-based PV parameter estimation studies published in the last three years (2020 – 2022). Studies were analyzed using several criteria, including ML algorithm, outcome, experimental setup, sample data size, and error metric. The analysis revealed several interesting factors. The neural network was the most popular ML method (32.55%), followed by random vector functional link (13.95%) and support vector machine (9.30%). Dataset was sourced from hardware tests and computer-based simulations: 66% of the studies used data from only computer simulation, 18% used data from only hardware setup, and the 16% experiments used data from both hardware and simulations to evaluate different system parameters. The top three most commonly used error metrics were root mean square error (29.1%), mean absolute error (17.5%), and coefficient of determination (15.9%). Our systematic review will help researchers assess ML algorithms' projection in PV system parameters estimation. Consequently, scopes shall be created to establish more robust governmental frameworks, expand private financing in the PV industry, and optimize PV system parameters.

Keywords: *Photovoltaics, System parameter estimation, Machine learning, Systematic review*

Cobalt Ferrite Nanoparticle's Safety in Biomedical and Agricultural Applications: A Review of Recent Progress

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Abstract:

Cobalt ferrite nanoparticles (CFN) have drawn attention as a theranostic agent. Unique physico-chemical features of CFN and magnetic properties make CFN an outstanding candidate for biomedical, agricultural, and environmental applications. The extensive use of CFN may result in intentional inoculation of humans for disease diagnosis and therapeutic purposes or unintentional penetration of CFN via inhalation, ingestion, adsorption, or other means. Therefore, understanding the potential cytotoxicity of CFN may pave the way for their future biomedical and agricultural applications. This review scrutinized CFN biocompatibility, possible effects, and cytotoxic mechanisms in different biological systems. Literature indicates CFN toxicity is linked with their size, synthesizing methods, coating materials, exposure time, route of administration, and test concentrations. Some in vitro cytotoxicity tests showed misleading results of CFN potency; this might be due to the interaction of CFN with cytotoxicity assay reagents. To date, published research indicates that the biocompatibility of CFN outweighed its cytotoxic effects in plant or animal models, but the opposite outcomes were observed in aquatic Zebrafish.

Keywords: Cobalt ferrite nanoparticles, theranostic agent, biological systems, biocompatibility, toxicological outcomes, cytotoxicity

Title of the Article: 21

Infant and young child feeding practices and associated socioeconomic and demographic factors among children aged 6–23 months in Ghana: Findings from Ghana Multiple Indicator Cluster Survey, 2017–2018

Author:

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Abstract:

Background: Association between poor infant and young child feeding (IYCF) practices and malnutrition in infants and young children (IYC) is well established. Furthermore, appropriate IYCF practices are important during the first 1,000 days of life to ensure optimal health and development. Understanding IYCF practices and associated socioeconomic and demographic factors will inform interventions to achieve the UN 2030 Sustainable Development Goal (SDG) target to end malnutrition in all forms.

Objective: This study estimates the prevalence of Minimum Dietary Diversity (MDD), Minimum Meal Frequency (MMF), and Minimum Acceptable Diet (MAD), and examines their association with socioeconomic and demographic characteristics among children aged 6–23 months in Ghana.

Method: We used data from the Ghana Multiple Indicator Cluster Survey 6 (GMICS6) conducted in 2017–18. Participants were recruited through multi-stage stratified cluster sampling. Information on caregiver's self-reported breastfeeding status and 24-hour dietary recall of foods IYC were fed with were collected through face-to-face interviews. We estimated the prevalence of MDD, MMF and MAD with a 95% confidence interval (CI). We investigated the socioeconomic and demographic determinants of MDD, MMF and MAD using univariate and multivariable logistic regression analyses.

Findings: Among 2,585 IYC aged 6–23 months, MDD, MMF and MAD were estimated as 25.46%, 32.82% and 11.72% respectively. Age of the IYC, educational status of the mothers/primary caregivers, and resident regions were found to have positive associations with MDD, MMF and MAD. In addition, the richest household wealth index and urban area of residence were found to have significant positive associations with MDD.

Conclusion: We report a low prevalence of MDD, MMF and MAD. Efforts to improve IYCF practices

among children aged 6–23 months in Ghana should focus on multi-sectorial approaches including increasing access to formal education, income-generating activities and addressing regional and rural-urban inequity.

Keywords: *Minimum dietary diversity, Minimum meal frequency, Minimum acceptable diet, Ghana.*

Title of the Article: 22

Early childhood development in Ghana: assessing the status and determinants of the literacy numeracy, physical, social-emotional and learning domains

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Abstract:

Despite initiatives by key actors in the last two decades, Early Childhood Development in Ghana, measured by physical, cognitive, linguistic, and social–emotional development of children up to 8 years of age, remains poor. This study aimed to assess Ghana’s Early Childhood Development (ECD) status and determinants by analyzing the Ghana Multiple Indicator Cluster Survey 2017/18 data. Among the 3801 Ghanaian children (35–59 months; 1880 males), 42.7% were developmentally on track in literacy–numeracy, 93.6% in physical, 68.2% in social–emotional, 82.3% in learning, and about 67% in at least 3 of the 4 domains. Multiple logistic regression analyses suggest a positive association between ECD and female sex of children, their age, mothers’ attendance in any ECD programs, mothers’ educational qualification, and household wealth. On the other hand, evidence of a negative association was observed between ECD and child disability, stunting status of children, maternal disability, the number of days children were left alone for more than an hour, and residence in a rural area. The level of maternal education may be implicated in ECD policies as it affected several ECD domains.

Keywords: *Early Childhood Development (ECD), Early Childhood Development Index (ECDI), Literacy–numeracy, Physical, Social–emotional, Learning*

Title of the Article: 23

Residential area greenness and hypertension: a national assessment on urban adults in Bangladesh

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Abstract:

This study investigated the associations between greenness and blood pressure (BP) metrics (systolic BP [SBP], diastolic BP [DBP], hypertension) among urban adults in Bangladesh and the potential mediation effects of body mass index (BMI) using 2011 Bangladesh Demographic and Health Survey data for 2360 urban adults (aged ≥ 35 years). The Enhanced Vegetation Index was used as a measure of residential area greenness. Associations between greenness and BP metrics were estimated using linear and binary logistic regression models. We also conducted mediation analyses. Greater area-level greenness was inversely associated with SBP ($\beta -1.33$, 95%CI: -2.46 , $-.20$), DBP ($\beta -.83$, 95%CI: -1.64 , $-.02$), and hypertension (adjusted odds ratio .87, 95%CI: .77, .98). BMI substantially mediated associations between greenness and BP metrics. Adopting urban greening policies could reduce the risk of hypertension, thus can contribute to reduction of non-communicable disease burden in Bangladesh. Longitudinal studies are required to further investigate the causal pathways.

Keywords: *Community greenness, blood pressure, hypertension, urbanization, adult health*

Title of the Article: 24

Affective social anthropomorphic intelligent system

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Abstract:

Human conversational styles are measured by the sense of humor, personality, and tone of voice. These characteristics have become essential for conversational intelligent virtual assistants. However, most of the state-of-the-art intelligent virtual assistants (IVAs) are failed to interpret the affective semantics of human voices. This research proposes an anthropomorphic intelligent system that can hold a proper human-like conversation with emotion and personality. A voice style transfer method is also proposed to map the attributes of a specific emotion. Initially, the frequency domain data (Mel-Spectrogram) is created by converting the temporal audio wave data, which comprises discrete patterns for audio features such as notes, pitch, rhythm, and melody. A collateral CNN-Transformer-Encoder is used to predict seven different affective states from voice. The voice is also fed parallelly to the deep-speech, an RNN model that generates the text transcription from the spectrogram. Then the transcribed text is transferred to the multi-domain conversation agent using blended skill talk, transformer-based retrieve-and-generate generation strategy, and beam-search decoding, and an appropriate textual response is generated. The system learns an invertible mapping of data to a latent space that can be manipulated and generates a Mel-spectrogram frame based on previous Mel-spectrogram frames to voice synthesize and style transfer. Finally, the waveform is generated using WaveGlow from the spectrogram. The outcomes of the studies we conducted on individual models were auspicious. Furthermore, users who interacted with the system provided positive feedback, demonstrating the system's effectiveness.

Keywords: IVA, NLP, SER, Emotion, Audio-emotion, Personal-assistant

Title of the Article: 25

Ejection Fraction estimation using deep semantic segmentation neural network

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Abstract:

The Ejection Fraction value denotes how much blood is pumped out of the heart to different parts of the body. It is a routine clinical procedure in heart function assessment, where the left ventricle of the heart has to be manually outlined by doctors in clinical settings to measure the Ejection Fraction value which is time-consuming and highly varies by the observer. Most of the state-of-the-art automated Ejection Fraction estimation methods applied statistical or neural network models to generic and expensive clinical procedures like 3D ultrasound, MRI, and CT imaging. However, 2D echocardiography is a specialized diagnosis method that is inexpensive and routinely used in clinical settings to diagnose heart diseases. This paper proposed an automated Ejection Fraction estimation system from 2D echocardiography images using deep semantic segmentation neural networks. Two parallel pipelines of deep semantic segmentation neural network models have been proposed for efficient left ventricle (LV) segmentation in its systolic (contracted) and diastolic (expanded) states. The three different semantic segmentation neural networks, namely UNet, ResUNet, and Deep ResUNet, have been implemented in those parallel pipelines, and the performance of the proposed model has been studied on a standard 2D echo-cardiography data set. The most accurate model among the three achieved a Dicescore of 82.1% and 86.5% in LV segmentation on end systole and end diastole states, respectively. The Ejection Fraction value is then determined by applying the volume measurement formula to the output of the left ventricle segmentation network. Therefore, the proposed automated Ejection Fraction system can be used in clinical settings to remove the eyeball estimation practice and reduce the inter-observer variability problem.

Keywords: AI in network, Deep learning, Big data network, Ejection Fraction, Convolutional neural network, Left ventricle, End systole, End diastole

Title of the Article: 26

Systematic review of mesotherapy: a novel avenue for the treatment of hair loss

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Abstract:

Mesotherapy is a technique by which lower doses of therapeutic agents and bioactive substances are administered by intradermal injections to the skin. Through intradermal injections, mesothera-

py can increase the residence time of therapeutic agents in the affected area, thus allowing for the use of lower doses and longer intervals between sessions which may in turn improve the treatment outcome and patient compliance. This systematic review aims to summarize the current literature that evaluates the efficacy of this technique for the treatment of hair loss and provides an overview of the results observed. Of the 416 records identified, 27 articles met the inclusion criteria. To date, mesotherapy using 6 classes of agents and their combinations have been studied; this includes dutasteride, minoxidil, growth factors or autologous suspension, botulinum toxin A, stem cells, and mesh solutions/ multivitamins. While several studies report statistically significant improvements in hair growth after treatment, there is currently a lack of standardized regimens. The emergence of adverse effects after mesotherapy has been reported. Further large-scale and controlled clinical trials are warranted to evaluate the utility of mesotherapy for hair loss disorders.

Keywords: *Mesotherapy, local intradermal therapy, pattern hair loss, alopecia, physical therapy*

Title of the Article: 27

Entrepreneurial orientation and performance of SMEs: the roles of marketing capabilities and social media usage

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Abstract:

Purpose: Small and medium-sized enterprises (SMEs) are an important contributor to emerging countries' economic growth. However, SMEs have been struggling to sustain their performance in a highly competitive environment. Thus, this study aims to re-examine the effect of SMEs' entrepreneurial orientation (EO) on firms' performance during the COVID-19. This study has also studied the moderating role of social media usage and the mediating role of marketing capabilities and social media usage.

Design/methodology/approach: This study used a structured questionnaire for data collection, where the unit of analysis was the manager or owner of SMEs. The data were analyzed using partial least square-structural equation modeling.

Findings: The findings show that an EO has a significant and positive effect on an SME's perfor-

mance, but the outcomes are conditional on the role of social media and marketing capabilities. The empirical results reveal that marketing capabilities significantly mediate the relationship between EO and SME performance. In addition, social media usage moderates the relationship between EO and SME performance and it also partially mediates the EO-performance nexus of SMEs. Finally, this study discovers that the EO-Performance nexus of SMEs is serially mediated by social media usage and marketing capabilities.

Research limitations/implications: This study has important implications for SMEs that are seeking to gain a competitive advantage. For example, an SME should deploy market activities through social media channels. In situations such as a pandemic and uncertainty, this could be the most effective tool.

Originality/value: This study builds a theory-based mediation-moderation model to explain the link between EO and SME performance. In explaining mediation-moderation effects, the current study provides insight into EO-performance relationships. Moreover, the current model facilitates exploring whether serial mediation passes through social media usage and market capabilities. Therefore, with new findings, the study extends the literature on serial mediation in the EO-performance of SMEs. Additionally, this study extends the literature on the moderating role of social media on SMEs in Indonesia, which has not been investigated. Besides, the current study adds new insight into the EO-performance of SME in COVID-19 condition.

Keywords: *Entrepreneurial orientation, Marketing capabilities, Social media, Performance*

Title of the Article: 28

International trade policy uncertainty spillover on stock market: Evidence from fragile five economies

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Abstract:

Trade policy uncertainty (TPU) and its impact on the global economy have captured much attention of the policymakers in the last decade. This paper contributes to building an emerging literature strand by investigating TPU spillovers of United States, China, and Japan on stock returns and volatilities of fragile economies, namely, Colombia, Indonesia, Mexico South Africa, and Turkey. This study confirms the existence of spillover effects employing Diebold and Yilmaz's (2012) methodology. The results show that USA and China are net shock transmitter of TPU, while Japan is a net receiver. Chinese TPU has the largest influence among the three countries followed by USA and Japan. This study also employs vector autoregression (VAR)-DCC-GARCH and VAR-ADCC-GARCH to capture the spillover effects on stock returns and volatility. We find that TPU of USA, China, and

Japan transmits shocks that drive stock market returns of fragile economies. However, the sign of the spillover effects is country specific and depends on a country's TPU. Similar evidence was found for volatility spillover. In few cases, TPU of USA, China, and Japan stabilizes the stock market returns volatility. Hence, TPU has heterogeneous effects on stock market in Colombia, Indonesia, Mexico South Africa, and Turkey.

Keywords: *Trade policy uncertainty, fragile economies, returns, volatilities, spillover*

Title of the Article: 29

Work design, employee well-being, and retention intention: A case study of China's young workforce

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Abstract:

China's growing workforce of young employees has propelled its economy towards becoming a global power. However, with evolving workplace difficulties and uncertainties, the rate of employee turnover is also rising, which affects every department in companies, in addition to impacting costs and finances. This study explored the influences of five core job characteristics, work relationships, and work conditions on young Chinese employees' retention intentions, mediated by employee well-being. Using a quantitative cross-sectional approach, 804 responses were obtained from young Chinese workers. We also employed partial least squares structural equation modeling to analyze and forecast the extent of the impact of this study's independent variables. The empirical findings revealed that job autonomy, skill variety, task significance, feedback, work relationships, and work conditions indirectly influenced the retention intentions of young workers in China, with employee well-being acting as a mediator. However, the impact of task identity on employee well-being and retention intentions was insignificant. Our study contributes to the literature on employee retention intentions by demonstrating the importance of young employees' perceptions of work design-related aspects and extending the application of the job characteristics model.

Keywords: *Work design, Retention intention, Job characteristics, Work relationship, Work condition*

Title of the Article: 30

Connectedness and spillover effects of US climate policy uncertainty on energy stock, alternative energy stock, and carbon future

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Abstract:

Global warming is pressuring policymakers to change climate policies in shifting the global economy onto a net-zero pathway. While financial assets are responsive to policy changes and development, climate change policies are becoming increasingly unpredictable, making policy decision less certain. This study investigates connectedness and spillover effects of US climate policy uncertainty on energy stocks, alternative energy stocks, and carbon emissions futures. We analyzed spillover and connectedness before and after the Paris Agreement. We employed monthly frequency data from August 2005 to March 2021 and applied DY (2012) method and MGARCH approach. We found that world energy stocks and carbon emissions futures are connected to US climate policy uncertainty. Uncertainty in climate policy and world energy stocks act as information transmitters in return spillover, while global alternative energy and carbon market are shock receivers. On volatility spillover, climate policy uncertainty, energy stocks, and carbon emissions future are shocks transmitters, while alternative energy stocks are receivers. We observe increase in connectedness following the Paris Agreement suggesting strengthened global efforts in tackling climate change. DCC and ADCC estimations revealed spillover effects of climate policy on futures returns and volatilities of world energy stocks and carbon emissions futures and the shocks could be transmitted through to the energy sector. During period of uncertainty in US climate policy, carbon allowances can potentially serve as a safe haven for energy stocks and provide downside protection for alternative energy stocks, hence hedging against climate transition risks.

Keywords: *Alternative energy stock, Climate policy, Energy stock, Carbon future*

Title of the Article: 31

Does perceived behavioral control mediate customers' innovativeness and continuance intention of e-money? The moderating role of perceived risk and e-security

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Abstract:

Purpose – With the emergence of coronavirus disease 2019 (COVID-19), the usage of e-money has been reinforced to reach the next level. Therefore, this study aims to examine the mediating role of perceived behavioral control (PBC) on the nexus of customers' innovativeness and continuance intention of electronic money (e-money). This study also explores the moderating roles of perceived risk (PR) and electronic security (e-security) in relationships.

Design/methodology/approach – The authors employed a structured questionnaire for data collection and the partial least squares structural equation modeling (PLS-SEM) for empirical estimations.

Findings – The authors' findings reveal that customers' innovativeness promotes continuance intention of using e-money and demonstrate that PBC partially mediates the relation between customers' innovativeness and continuance intention of using e-money. The empirical findings also reveal that PR negatively moderates the relationship between customers' innovativeness and continuance intention and the relationship between customers' innovativeness and PBC. The empirical findings also exhibit that perceived e-security enhances the degree of the relationship between customers' innovativeness and continuance intention and the relationship between customers' innovativeness and PBC.

Practical implications – The findings shed light on an important factor that increases the likelihood of repeat e-money usage and has direct managerial implications for customer experience and risk concerns. Hence, the findings imply that e-money service providers should run a promotional advertisement highlighting what additional features are included or offered and how these could be beneficial for the customers. Furthermore, e-money service providers should provide some tutorial videos in order to increase innovative customers' control over e-money services as well as highlight how risk and security are protected.

Originality/value – This paper integrates three key theories: the diffusion of innovation (DOI) theory, the theory of planned behavior (TPB) and the PR theory in post-adoption behavior of e-money usage. The current study also attempts to fill a literature gap by examining the moderating role of PR and e-security, which could be useful within the relationship between customers' innovativeness, PBC and customers' continued intentions of e-money usage.

Keywords: *Customer intentions, Customer innovation, e-security, Risk perception, Behavioral control, e-money*

Title of the Article: 32

Transcriptomic analysis of esophageal cancer reveals hub genes and networks involved in cancer progression.

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Abstract:

Esophageal carcinoma (ESCA) has a 5-year survival rate of fewer than 20%. The study aimed to identify new predictive biomarkers for ESCA through transcriptomics meta-analysis to address the problems of ineffective cancer therapy, lack of efficient diagnostic tools, and costly screening and contribute to developing more efficient cancer screening and treatments by identifying new marker genes. Nine GEO datasets of three kinds of esophageal carcinoma were analyzed, and 20 differentially expressed genes were detected in carcinogenic pathways. Network analysis revealed four hub genes, namely RAR Related Orphan Receptor A (RORA), lysine acetyl-transferase 2B (KAT2B), Cell Division Cycle 25B (CDC25B), and Epithelial Cell Transforming 2 (ECT2). Over-expression of RORA, KAT2B, and ECT2 was identified with a bad prognosis. These hub genes modulate immune cell infiltration. These hub genes modulate immune cell infiltration. Although this research needs lab confirmation, we found interesting biomarkers in ESCA that may aid in diagnosis and treatment.

Keywords: *Esophageal carcinoma, Biomarkers, Differentially expressed genes, Protein-protein interaction, Hub genes, Gene ontology*

Title of the Article: 33

Environmental and Social Performance of the Banking Industry in Bangladesh: Effect of Stakeholders' Pressure and Green Practice Adoption

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Abstract:

The concepts of Stakeholders' Pressure (SP), Environmental Performance (EP), and Corporate Social Performance (CSP) are well established in the business of progressive firms. However, firms are yet to examine the effects of Stakeholders' Pressure (SP) on environmental performance (EP) and Corporate Social Performance (CSP) by connecting the missing linkage of Green Practice Adoption (GPA). The present study explored the association between Stakeholders' Pressure (SP), Environmental Performance (EP), and Corporate Social Performance (CSP) through the mediating effect of Green Practice Adoption (GPA). The study's objective was to determine the factors to propose a model for the environmental and social performance of the banking industry in the Bangladesh context. The study assessed the hypotheses using partial least squares-based structural equation modeling with data from 540-line managers from 30 private commercial banks. The results indicate that SP significantly improves EP, CSP, and GPA. On the other hand, GPA showed a substantial accepted effect on EP and CSP. Furthermore, mediation analysis showed that GPA mediates the relationship between SP with EP and CSP. This research fills the gap in the domain of the Environmental and Social Performance of the Banking Industry in Bangladesh. From this study, the academicians may get fresh antecedents of the environmental performance management approach. Thus, the study's outcomes may give valuable insights to policymakers and managers and provide them with practical evidence to proactively implement SP in firms because such practices positively impact EP and CSP through the mediation of GPA. This result may improve operational efficiency and provide firms with a superior reputation.

Keywords: *environmental performance, stakeholders' pressure, corporate social performance, green practice adoption*

Title of the Article: 34

The economic growth–travel frequency nexus in China: Importance of the transport Kuznets curve

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Abstract:

This study pioneers the analysis of transport Kuznets curve (TKC) for passengers in 31 Chinese provinces using data from 1980 to 2018 and a comprehensive non-parametric econometric analysis approach. The empirical analysis finds convergence among most of the provinces in terms of travel frequency and economic growth, as well as the nexus between the variables. There is a non-linear positive effect of economic growth on travel frequency in all 31 provinces, and evidence for the existence of TKC – in full or in part – in 30 provinces. The study provides the initial motivation for policymakers to undertake policies and projects commensurate with each province's transport growth nexus.

Keywords: *China, economic growth, transport, travel frequency*

Title of the Article: 35

Data-Driven Diabetes Risk Factor Prediction Using Machine Learning Algorithms with Feature Selection Technique

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Abstract:

As type 2 diabetes becomes more prevalent across the globe, predicting its sources becomes more important. However, there is a big void in predicting the risk factors of this disease. Thus, the purpose of this study is to predict diabetes risk factors by applying machine learning (ML) algorithms. Two-fold feature selection techniques (i.e., principal component analysis, PCA, and information gain, IG) have been applied to boost the prediction accuracy. Then, the optimal features are fed into five ML algorithms, namely decision tree, random forest, support vector machine, logistic regression, and KNN. The primary data used to train the ML model were collected based on the safety procedure described in the Helsinki Declaration, 2013, and 738 records were included in the final analysis. The result has shown an accuracy level of over 82.2%, with an AUC (area under the ROC curve) value of 87.2%. This research not only identified the most important clinical and nonclinical factors in diabetes prediction, but it also found that the clinical risk factor (glucose) is the most relevant for diabetes prediction, followed by dietary factors. The noteworthy contribution of this research is the identification of previously unclassified factors left over from the previous study that considered both clinical and non-clinical aspects.

Keywords: *diabetes, feature selection, risk factors, machine learning*

SentiTAM: Sentiments centered integrated framework for mobile learning adaptability in higher education

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Abstract:

Online communities provide facilities to share public opinions and or sentiments on a wide range of subjects, from routine topics to vital issues of critical interest. Nowadays, many higher education institutions (HEIs) recognize the value of students' sentiments and evaluate users' concerns for the successful adaptation of mobile learning applications (MLAs). While digital learning has been extensively studied previously, little has been known about why MLA is underutilized. Therefore, this study extends the literature by proposing the SentiTAM model underlying technology acceptance model (TAM), and students' sentiments on MLA platforms. A self-administered cross-sectional survey of 350 MLA users' data was analyzed through structural equation modeling (SEM) using the AMOS package program. In addition, we have performed sentiment analysis on students' opinions gathered through Google discussion forums and Twitter. The results show that MLA use intention is strongly influenced by sentiments and self-motivation, while perceived usefulness and perceived ease of use directly influence MLA usage. To the best of our knowledge, this study is the first attempt in MLA that investigates several vital factors, including sentiments as a multi-perspective tool and motivational factors with core constructs of TAM. The findings assist developing countries make smart decisions about how to use MLA with emerging technology.

Keywords: *Sentiment analysis, Technology acceptance model (TAM), SentiTAM, Higher education, Mobile learning applications (MLAs)*

Blockchain in Online Learning: A Systematic Review and Bibliographic Visualization

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Abstract:

In the contemporary era of global and sustainable information management, blockchain has made a cutting-edge transformation in online learning. To apprehend this new trajectory, this current systematic review with bibliographic visualization aims to identify the thematic clusters of underlying aspects concerning the sustainable nexus of blockchain and online learning. Using the updated guidelines of the PRISMA flowchart, a total of 434 scholarly research papers from the mainstream research databases, i.e., Web of Science, Scopus, IEEE Xplore, and ScienceDirect, were inspected to be categorized into 15 relevant publications. Bibliographic data were assembled and analyzed accordingly to construct network visualization maps, such as co-authorship, citation, co-citation, bibliographic coupling, and term co-occurrence using VOSviewer 1.6.18. Significant terms were reported and later cross-mapped with those identified by critically reviewing the applicable 15 papers. Standardized scholarship, behavior pattern, and digital badging have been found and derived as themes from the connected clusters. Therefore, current research findings reveal these three broad clutches of themes concerning the sustainable nexus of blockchain and online learning.

Keywords: Blockchain, online learning, qualitative systematic review, bibliographic, PRISMA, VOSviewer

Title of the Article: 38

Multiple CUAV-Enabled mMTC and URLLC Services: Review of Energy Efficiency and Latency Performance

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Abstract:

Cognitive unmanned aerial vehicles (CUAVs) play a vital role in next-generation wireless networks as they assist in massive machine-type communication (mMTC) and ultra-reliable low-latency communication (URLLC) services. This study focuses on multiple CUAV-enabled networks wherein CUAVs are paired with each other. We analyze the data rate, energy efficiency, and latency of such networks by applying the finite information block length theory, wherein mMTC and URLLC information use a non-orthogonal multiple access technique. Furthermore, we formulate an optimization problem to maximize the energy efficiency of paired CUAV devices by jointly optimizing the transmission power of the mMTC and URLLC information to satisfy the latency requirement. The numerical results indicate that our proposed multiple-CUAV-enabled scheme enhances the network performance of CUAV devices in terms of energy efficiency and latency better than the existing scheme.

Keywords: *Cognitive radio network, finite information block length theory, massive machine-type communications, non-orthogonal multiple access, unmanned aerial vehicles, ultra-reliable low-latency communications.*

Title of the Article: 39

A Social Cure for COVID-19: Importance of Networks in Combatting Socio-Economic and Emotional Health Challenges in Informal Settlements in Dhaka, Bangladesh

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Abstract:

The Bangladesh government issued a lockdown throughout the country from March–May 2020 in response to the COVID-19. The sudden lockdown caused economic ruptures across the country due to job loss. We conducted a comprehensive analysis of the outbreak through 40 in-depth interviews with men and women living in three Dhaka informal settlements from January to November 2021 to identify gaps to mitigate negative downstream effects of global pandemic policies. In this paper, we explore the critical importance of social networks as coping mechanisms for those who lost livelihood due to COVID-19 lockdown. Due to the congested living conditions in informal settlements, many established residents foster close, trusting relationships, and a strong sense of community. Formal and informal networks in urban slums, whether reciprocal or strategic, played an integral role as a way of coping during times of scarcity. We found limited analysis in public health literature on the resilience of these social networks and its impact on health and wellbeing. Our paper attempts to unpack the ways our respondents drew on their own social networks to combat the socio-economic and emotional health challenges brought on by a lack of adequate formalized support as part of the pandemic response.

Keywords: *COVID-19, gender, social networks, financial insecurity, food insecurity, stress buffering, social capital*

Title of the Article: 40

Chemical analysis of calabash chalk and its effect on locomotor activities and behavior in Swiss albino mice

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Abstract:

Continuous exposure of young women to calabash chalk, especially at child-bearing age, necessitated this study to analyze the chemical constituents of calabash chalk and to evaluate its effect on locomotor activities and behavior in Swiss albino mice. Dried cubes of calabash chalk were purchased and analyzed by atomic and flame atomic absorption spectrophotometer. Twenty-four Swiss-albino mice were taken and divided into four groups: control (1 ml distilled water) and three treated groups with the doses of 200 mg/kg, 400 mg/kg, and 600 mg/kg of calabash chalk suspension, respectively, by oral gavage. Hole Cross, Hole Board, and Open Field tests were performed to evaluate the locomotor activities, behavior, and anxiety along with measurement of body weight. The data were analyzed by SPSS-software. Chemical analysis of calabash chalk showed the presence of trace elements along with some heavy metals such as lead (19.26 ppm), Chromium

(34.73 ppm), and arsenic (4.57 ppm). After 21 days of oral administration of calabash chalk, the study showed a significant decrease in body weight in the treated groups of mice ($p < 0.01$). Decreased locomotor activities were also observed in all three experiments. Significantly decreased locomotion and behaviors were also observed in the hole crossing, line crossing, head dipping, grooming, rearing, stretch attend, central square entry, central square duration, defecation, and urination, in a dose-dependent manner ($p < 0.01$). These effects also prove the axiogenic behavior of calabash chalk in albino mice. Heavy metals are believed to be harmful to the brain and responsible for cognitive dysfunction and elevated anxiety. In this study, decreased body weight in mice may occur due to disorders in hunger and thirst centers of the brain by heavy metals. Therefore, heavy metals may be responsible for muscle weakness, decreased locomotor activities, and axiogenic effects of mice.

Keywords: Calabash chalk, Heavy metals, Locomotor activity, Behavioral tests, Anxiogenic effect

Title of the Article: 41

A patient-specific functional module and path identification technique from RNA-seq data

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Abstract:

With the advancement of new technologies, a huge amount of high dimensional data is being generated which is opening new opportunities and challenges to the study of cancer and diseases. In particular, distinguishing the patient-specific key components and modules which drive tumorigenesis is necessary to analyze. A complex disease generally does not initiate from the dysregulation of a single component but it is the result of the dysfunction of a group of components and networks which differs from patient to patient. However, a patient-specific network is required to understand the disease and its molecular mechanism. We address this requirement by constructing a patient-specific network by sample-specific network theory with integrating cancer-specific differentially expressed genes and elite genes. By elucidating patient-specific networks, it can identify the regulatory modules, driver genes as well as personalized disease networks which can lead to personalized drug design. This method can provide insight into how genes are associating with each other and characterized the patient-specific disease subtypes. The

results show that this method can be beneficial for the detection of patient-specific differential modules and interaction between genes. Extensive analysis using existing literature, gene enrichment and survival analysis for three cancer types STAD, PAAD and LUAD shows the effectiveness of this method over other existing methods. In addition, this method can be useful for personalized therapeutics and drug design. This methodology is implemented in the R language and is available at <https://github.com/riasatazim/PatientSpecificRNANetwork>.

Keywords: *RNA-seq, Patient-specific network, Cancer; Perturbation network, Survival analysis, Functional analysis*

Title of the Article: 42

Frequency of watching television, owning a mobile phone and risk of being overweight/obese among reproductive-aged women in low- and lower-middle-income countries: A pooled analysis from Demographic and Health Survey data

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Abstract:

People who are overweight and obese suffer from significant health impacts that have increased globally. Concurrently, usage of information and communication devices such as television and mobile phones have also been growing, affecting people's weight. This study examined the association between watching television and owning a mobile phone with overweight and obesity among reproductive-aged women in low- and lower-middle-income countries (LLMICs). Data of 21 LLMICs reported between 2015 and 2020 were collected from the Demographic and Health Surveys. Multivariate logistic regression was performed to determine the association into three pooled segments: a group of 21 countries, the World Bank income classification and the regional categorisation of the countries. The all-inclusive prevalence of overweight or obesity was found at 27.1% among 175,370 reproductive-aged women, and this prevalence varied among countries. Overall, the odds of being overweight or obese were 1.20 (adjusted odds ratio [AOR]=1.20, 95% confidence interval [CI]: 1.15–1.24), 1.40 (AOR=1.40, 95% CI: 1.35–1.44) and 1.18 (AOR=1.18, 95% CI: 1.03–1.35) times higher among those who watched television less than once a

week, at least once a week and almost every day, respectively, compared with those who did not watch television. Besides, women's mobile phone ownership is more likely to experience overweight or obesity (AOR=1.72, 95% CI: 1.67–1.77). Consistent results were found for the countries categorised according to the World Bank income and regional classification. Focus on sedentary behavior, such as television watching and mobile phone use, of women and regional or country-specific innovative strategies and programs are of great immediate importance to decrease the prevalence of overweight and obesity.

Keywords: *overweight, obesity, television, mobile, women*

Title of the Article: 43

Assessment of the impact of good pharmacy practices training among drug dispensers in Bangladesh

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Abstract:

Background: Training improves dispensing behavior of drug dispensers in low-and middle-income countries. Between 2018 and 2020, a total of 5,059 Grade C pharmacists, who completed a 3-month training course for availing a “Grade C pharmacist certificate” were trained on Good Pharmacy Practice (GPP) in 11 districts in Bangladesh by Management Sciences for Health (MSH) under Better Health in Bangladesh (BHB) project. We assessed the impact of GPP among trained Grade C pharmacists under the BHB project compared to those who did not receive GPP training under the BHB project (non-trained), and explored the major challenges towards achieving GPP.

Methods: We created a database of trained Grade C pharmacists provided by MSH and randomly selected the trained Grade C pharmacists for recruitment following consent. We created another database of the non-trained Grade C pharmacist who were deployed within a 1-km radius of a trained Grade C pharmacist, and randomly recruited one non-trained against one trained Grade C pharmacist. A semi structured questionnaire was administered to obtain information about knowledge of GPP, including guidelines of dispensing medicines, temperature maintenance, medicine storage, counseling customers and labeling medicines. Dispensing behavior was directly observed following a structured tool. Chi-square test (for categorical variables) and

independent sample t-tests (for continuous variables) were applied for comparison between the trained and the non-trained Grade C pharmacists. A logistic regression model was applied to explore an association between knowledge and practice between the two groups.

Results: Between February and March 2021, 220 trained and 220 non-trained Grade C pharmacists were recruited. Mean age (SD) of the participants was 41 years (10.5) and 98.4% were male. Compared to the non-trained, the trained Grade C pharmacists had better knowledge about the guidelines of dispensing medicines (97.7% vs 89.5%, $p < 0.001$), temperature maintenance (91.8% vs 45.5%, $p = 0.001$), medicine storage (92.3% vs 40.5%, $p = 0.001$) counseling customers (99.5% vs 92.3%, $p < .001$) and labeling medicines (91.0% vs 80%, $p < 0.001$). General dispensing behavior was observed to be better among the trained than the non-trained with labeling of medicines (63.2% vs 53.4%, $p = 0.038$), counseling customers (39.1% vs 28.6%, $p = 0.021$) and using a room thermometer for maintaining ambient temperature in the medicine shops (56.8% vs 26.8%, $p < 0.001$). Bad behavior of the customers (39.5%) and lack of GPP knowledge among Grade C pharmacists (28.6%) were recognized to be challenges towards achieving GPP in Bangladesh.

Conclusion: Training led to better knowledge and practices about dispensing medicines among Grade C pharmacists in Bangladesh. Periodic training may promote achieving GPP in Bangladesh.

Keywords: *drug dispensers, good pharmacy practice, grade C pharmacists, knowledge, practice, dispensing behavior*

Title of the Article: 44

Perceptions of and Attitudes toward COVID-19 Vaccination among Urban Slum Dwellers in Dhaka, Bangladesh

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Abstract:

Vaccine hesitancy or low uptake was identified as a major threat to global health by the World Health Organization (WHO) in 2019. Vaccine hesitancy is context-specific and varies across time, place, and socioeconomic groups. In this study, we aimed to understand the perceptions of and attitudes toward COVID-19 vaccination through time among urban slum dwellers in Dhaka, Bangladesh. In-depth telephone interviews were conducted between October 2020 and January 2021 with 36 adults (25 females and 11 males) living in three urban slums of Dhaka City, Bangladesh. Follow-up interviews were undertaken in April and August 2021 to capture any shift in the participants' perceptions. Our findings show that for many there was an initial fear and

confusion regarding the COVID-19 vaccine among people living in urban informal settlements; this confusion was soon reduced by the awareness efforts of government and non-government organizations. Women and young people were more interested in being vaccinated as they had had more exposure to the awareness sessions conducted by non-governmental organizations (NGOs) and on social media. However, people living in the slums still faced systemic barriers, such as complicated online vaccine registration and long queues, which led to low uptake of the vaccine despite their increased willingness to be vaccinated. This study highlights the importance of using sources such as NGO workers and television news to debunk myths, disseminate COVID-19 vaccine information, and support adherence to vaccination among urban slum dwellers. Our study underscores the importance of addressing systemic barriers blocking access and understanding community perceptions in order to develop effective communication strategies for vulnerable groups that will then improve the COVID-19 vaccine uptake.

Keywords: *covid, covid-19 vaccines, urban slums, informal settlements, vaccine hesitancy, contextual factors*