Organised by

2nd PHARMCARE SYMPOSIUM

6th - 8th March 2024

Deconstructing Conventional Practices to Revolutionise Clinical Pharmacy: Explore, Engage, Evolve

ABSTRACT BOOK

Sponsored by

TABLE OF CONTENT

TABLE OF CONTENT

KEYNOTE SPEECH 1

Dr. Tye Sok Cin
Postdoctoral Researcher
Section on Genetics and Epidemiology
Joslin Diabetes Center
Harvard Medical School

Dr. Tye Sok Cin is currently affiliated with the Joslin Diabetes Center at Harvard Medical School. She earned her master's in clinical pharmacy from Universiti Sains Malaysia and a Ph.D. from the University of Groningen in the Netherlands. She previously received the Young Asian Research Fellowship Award from Japan. In 2018, she was honoured with the European Union's Horizon 2020 research and innovation program under the Marie Skłodowska-Curie Grant. Last year, she was also awarded research grant support from the Hearst Foundation, USA. Dr. Tye Sok Cin is a dedicated member of the American Diabetes Association's Precision Medicine in Diabetes Initiatives and the European BEAt-DKD consortium.

Title: Beyond one size fits all: Towards precision medicine in diabetic kidney disease

The increased incidence of diabetes leads to the parallel increase in the prevalence of chronic kidney disease and premature cardiovascular complications. In the past, treatment guidelines for patients with diabetes have focused primarily on achieving target glycemic control via sequential addition of drug therapy. Clinical practice guidelines also recommended other risk factors control such as high blood pressure, cholesterol, and albuminuria. The guidelines recommended treatment approach were derived from clinical trials and population-based studies. It does not take into account individual variability or heterogeneity in treatment response to the drugs that were used to target specific risk factors. Studies have shown that, despite use of drug therapies, many patients with diabetes remain at high residual risk for developing micro- or macro-vascular complications. These data further suggest that the one-size-fits-all approach is not applicable or beneficial to diabetes management. There is a need to focus on tailor-made treatment approaches or healthcare decisions to improve long-term prognosis and treatment outcomes in each patient, i.e., Precision Medicine.

Integration of specific biomarkers (e.g., genetics, omics, and clinical), lifestyle data, holds the potential to accurately diagnose the disease, predict disease progression, and to decide treatment plan that would result in the highest efficacy and lowest side effects for a given individual. To successfully implement precision diabetes management, collaborative effort between multiple stakeholders is also crucial across local, national, and international levels.

KEYNOTE SPEECH 2

Professor Dr. Cate Whittlesea
Divisional Director
School of Pharmacy
Faculty of Life Sciences
University College London

Cate is Professor of Pharmacy Practice and Director of the UCL School of Pharmacy and a Fellow of the Royal Pharmaceutical Society. Cate has worked at Cardiff University, King's College London, Durham University before joining UCL. Cate's undergraduate and postgraduate teaching includes medication safety and public heath linked to her research in these areas. Cate as developed innovative undergraduate and postgraduate courses, included independent prescribing, to support the professional development of pharmacists and pharmacy students to meet changing healthcare needs.

Title: Clinical Pharmacy Education for the Future: The UK Perspective

In the UK the initial education and training of pharmacists is accredited by the General Pharmaceutical Council (GPhC). In 2021 this accreditation body published new standards for the initial education and training of pharmacists. These are a generation change because from 2026 in the UK all pharmacists will become independent prescribers at registration. Therefore, the foundations of prescribing will be taught and assessed in the undergraduate degree and 12 month foundation training period following graduation. The undergraduate degree now has an increased focus on experimental learning and assessment in the workplace throughout all 4 years of the programme. This presentation will outline the framework for pharmacist prescribing in the UK linked to the clinical role of the pharmacist in hospital, community and primary care. The new UK initial education and training standards will be explained. Information will be provided on how UK undergraduate pharmacy education has changed to meet these new requirements, including the incorporation of prescribing, clinical skills and student experiential placements within the 4 year undergraduate Master of Pharmacy degree.

INVITED TALK 1

Associate Professor Dr. Andi Hermansyah
Head Of Department
Department of Pharmacy Practice
Faculty of Pharmacy, Universitas Airlangga

Andi Hermansyah joined the Faculty of Pharmacy Universitas Airlangga Indonesia as a lecturer in 2008. Within almost the past two decades in academia, he has built a promising national and international reputation in pharmacy, pharmaceutical policy and health services research in pharmacy as evidenced through 4 books and book chapters, more than 80 refereed publications, 10 national and international projects, speakers at national and international events, adjunct lecturer positions in several reputable abroad universities and contributions to journal reviews. Andi is currently supervising 6 Master of Pharmacy students and 10 PhDs and has been appointed as Head of Department of Pharmacy Practice from 2020. Andi is also a registered pharmacist and a manager for quality education and business development at Apotek Farmasi Airlangga, a university teaching community pharmacy. He is responsible for maintaining the business of the pharmacy and at the same time ensure sustainable good pharmacy practice is achieved as a role model for student educational purposes. Apart from his work as academia and practitioner, he is also assigned as the Head of Scientific Department and Publication of Pharmacy Practice Evidence, a think tank division of the Indonesian Pharmacists Association. He recently joined the FIP Data and Intelligence Commission in 2023 allowing him to collaborate with global pharmacy experts and stakeholders.

Connecting Pharmacist Care: So Simple, (Yet) So Hard (Relearn the concept of pharmacist network of care)

The population of the world is ageing with pharmacists must bear to witness the complexity of care. Connected healthcare has been suggested to ease the strain of the complexities. Historically, however, community pharmacies have operated on a silo basis and have not shared information on their activities with or been able to access information from other healthcare providers. Despite the increasing emphasis on service provision, the burden of dispensing workload, increasing demand for pharmacy viability and the hypercompetitive market have contributed to marginalise the connection of care amongst pharmacists. Therefore, this study relearns the concept of pharmacist network of care and advocates the need for a concerted esprit de corps among pharmacists to foster a connected mission of care.

Three theories and evidence of practice were investigated for addressing the objective of this study: pharmacy hub and spoke model, pharmacy locally connected model and pharmacy integrated care model. These three models were used to evaluate the practice of pharmacist in Indonesia primarily during and after the Covid-19 pandemic situation.

INVITED TALK 1

Pharmacies can only use hub and spoke if the spoke pharmacy forms part of the same retail business as the hub pharmacy. The model offers pharmacists to "group together" to gain operational efficiencies and more interaction of spoke pharmacy with the customers. During pandemic, this model was used to facilitate telemedicine services for the Covid-19 patient.However, the service ceased after the pandemic was declared over. The locally connected pharmacy model allows local pharmacists to interact in a consultative forum for resolving local issues and work interdisciplinary with other health providers. This model was also introducedduring Covid-19 outbreak to discuss challenges when treating self-isolated patients. Finally, the concept of integrated care model brings pharmacists to an established medication therapy management agreement with the prescriber and other health professionals. This model was introduced under the national insurance scheme. It remains present, yet the operation is not easywith partnership issues occurring between the providers.

The three models demonstrate the untapped potential of pharmacist connection of care. Whilst the sustainability of all models is likely to dissolve over time, such connectivity would ensure that the community pharmacist's expertise in medicines is used fully and made more visible in the wider healthcare system.

INVITED TALK 2

Dr. Vijay Ivaturi
CEO, Principal Scientist
PumasAI

Vijay Ivaturi, Ph.D., the CEO of Pumas-AI and President of the International Society of Pharmacometrics (ISoP), is a key figure in pharmaceutical sciences and computational pharmacology. Dr. Ivaturi's professional journey is marked by his commitment to academia and industry. Before embarking on his entrepreneurial path, he served as an Assistant Professor at the University of Maryland's Centre for Translational Medicine. His expertise in pharmacometrics and clinical pharmacology is well-regarded, with substantial contributions in teaching, research, and practical applications. At Pumas-AI, Ivaturi focuses on integrating advanced technology and data science into pharmaceutical research. The company develops software and analytics tools to improve drug development and patient care, using machine learning and computational methods for more efficient processes. As President of ISoP, Ivaturi promotes global collaboration and knowledge sharing in pharmacometrics, enhancing the field's impact on healthcare. His leadership at both Pumas-AI and ISoP reflects his commitment to advancing drug development and bridging academia with industry. Ivaturi's work is recognized for its innovation and influence in reshaping how drugs are developed and brought to market.

Title : Model informed precision dosing: Past, Present and Future

Precision therapeutics offer the promise of tailored treatments that maximise efficacy and safety based on a patient's specific characteristics. Model-informed precision dosing (MIPD) is a critical cornerstone of this approach. MIPD integrates mathematical models of drug behaviour with patient data to optimise drug dosing regimens. However, traditional modelling methods may face limitations in handling the complexity and volume of data relevant to personalised medicine. Scientific machine learning (SciML) presents a new paradigm for addressing these challenges. SciML seamlessly merges mechanistic modelling principles with powerful machine learning algorithms. It can uncover patterns within vast datasets, identify novel biomarkers, and generate highly individualised therapeutic predictions.

INVITED TALK 2

This talk explores the potential of SciML to enhance MIPD for precision therapeutics. It will outline how SciML can:

- Integrate Diverse Data Sources SciML algorithms can process real-world data encompassing genomics, proteomics, imaging, and clinical variables to develop more comprehensive patient profiles.
- Capture Complex Biological Dynamics: SciML can build advanced models to reflect the intricate, non-linear interactions within biological systems, improving prediction accuracy.
- Drive Model Adaptation: SciML methods enable models to continuously learn and update, ensuring real-time adjustments to personalised treatments in response to new patient data.

Overall, the integration of SciML with MIPD promises to significantly bolster the potential of precision therapeutics, bringing tailored treatment closer to reality for a wide range of diseases.

TALK 1

Dr. Dzul Azri Mohamed Noor
Senior Lecturer
School of Pharmaceutical Sciences,
Universiti Sains Malaysia

Dr. Dzul Azri Mohamed Noor is a registered pharmacist and currently working as a senior lecturer in the School of Pharmaceutical Sciences, Universiti Sains Malaysia. His research interests are in precision medicine focusing on pharmacogenomics, epigenetics, and clinical pharmacy-related research.

Title: Pharmacogenetics of clopidogrel: Current evidence and way forward

Clopidogrel is a key antiplatelet agent used in preventing thrombotic events in patients with acute coronary syndrome and those undergoing percutaneous coronary interventions. Despite its efficacy, interindividual response variability, influenced by genetic factors, significantly impacts its therapeutic outcomes. This variability is primarily contributed by the polymorphisms in the CYP2C19 gene, which is crucial for clopidogrel's metabolic activation.

This presentation summarizes current evidence from studies on the impact of CYP2C19 polymorphisms on clopidogrel's effectiveness and safety. It will also discuss the clinical significance of genotyping in identifying patients at risk of poor outcomes and the treatment strategies in those affected patients.

Lastly, the presentation will also highlight future research strategies in South East Asian population, primarily Malaysia, to gain more insight into pharmacogenetics of clopidogrel and eventually towards its clinical implementation in this region.

TALK 2

Dr. Nur Aizati Athirah Daud
Senior Lecturer
School of Pharmaceutical Sciences,
Universiti Sains Malaysia

Aizati holds BPharm (Hons) and MPharm(ClinPharm) degrees from Universiti Sains Malaysia (USM) Penang, and a PhD in pharmacoepidemiology and pharmacogenomics from the University of Groningen, Netherlands. She serves as senior lecturer at USM's School of Pharmaceutical Sciences. Her expertise spans pharmacogenomics, precision medicine, women's health, sexual and reproductive and medication use during pregnancy. Her current projects explore the effects of genetic variations on statin efficacy and safety, adverse reactions of antiepileptic, genotype-guided antiplatelet therapy, and vitamin D deficiency during pregnancy.

Title: Screening of HLA markers in the prevention of antiepileptic-induced severe cutaneous adverse drug reaction

Severe cutaneous adverse reactions (SCARs) are life-threatening adverse drug reactions (ADRs), which are commonly associated with the use of several drugs including antiepileptics. SCARs, such as Stevens–Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN), typically manifest 4–28 days after drug exposure, characterized by epidermal detachment, systemic fever, and haemorrhagic erosions. Advancements in pharmacogenomics have highlighted the role of the human leukocyte antigen (HLA) system, specifically alleles such as HLA-B15:02 and HLA-A31:01, in predisposing individuals to antiepileptic-induced SJS/TEN, particularly among Asian populations. Genetic testing for these alleles has been recommended by the Clinical Pharmacogenetics Implementation Consortium before initiating carbamazepine (CBZ) and oxcarbazepine therapy to mitigate the risk of SCARs in patients. In our recent findings among Malaysian patients receiving CBZ and phenytoin, HLA-B*15:02 has shown a significantly strong association with an increased risk of SJS/TEN. Patients with this genetic variation face multiple times higher risk of CBZ-induced SJS/TEN, emphasizing the importance of alternative therapy selection. Genetic screening in HLA genes before the initiation of CBZ holds promise in reducing the incidence of ADRs, and optimizing healthcare costs. However, challenges remain in integrating pharmacogenetics knowledge into routine clinical practice. Continued efforts are essential to ensure the widespread adoption of pharmacogenetic testing in optimising drug therapy.

TALK 3

Dr. Fatimatuzzahra' Abd Aziz
Senior Lecturer
School of Pharmaceutical Sciences,
Universiti Sains Malaysia

Dr. Fatimatuzzahra' holds the position of Senior lecturer at the School of Pharmaceutical Sciences, USM. She has been actively engaged in pharmacometabonomic and metabolomics research since 2018. Her primary focus revolves around the research of drugs efficacy and toxicity. Utilizing advanced techniques such as nuclear magnetic resonance, she endeavours to identify potential biomarkers that contribute to the broader understanding of pharmaceutical mechanisms.

Title: Integrating a pharmacometabonomics approach in precision medicine: Forecasting gentamicin-induced nephrotoxicity in Spargue Dawley rats

Since 2006, the field of pharmacometabonomics has emerged as a novel branch of science, defined by its utilization of mathematical models (chemometric analysis) of pre-dose metabolites to predict the effects of drugs. This research avenue has proven to be a powerful tool for anticipating drug metabolism, pharmacokinetics, and safety across various organisms, including animals and humans. Notably, ongoing studies in pharmacometabonomics have shown rapid growth, with investigations into drugs such as gentamicin, a widely used antibiotic known for its potential nephrotoxic effects. Currently, there are no reliable metabolites for early nephrotoxicity detection remains a significant challenge. To address this gap, a recent study aimed to establish a predictive model for gentamicin-induced nephrotoxicity based on pre-dose metabolites. Using Sprague-Dawley (SD) rats as subjects, gentamicin was administered subcutaneously to induce nephrotoxicity. Blood and urine samples were collected before and after treatment, and kidney histopathology was examined post-sacrifice. Employing nuclear magnetic resonance (NMR) spectroscopy and a pharmacometabonomic approach, metabolic variations in serum and urine samples pre-gentamicin administration was investigated and constructed a predictive model. Analysis revealed distinct metabolic patterns between toxic and non-toxic rat groups, with promising predictive accuracy (AUROC $\geq$ 0.7). Key metabolites of interest included lactate, trimethylamine-N-oxide, xylose, and various others in serum, along with 4-pyridoxic acid, citrate, and others in urine. These findings suggest that pharmacometabonomic models hold potential for predicting gentamicin-induced nephrotoxicity prior to dosing, thereby offering avenues for early intervention and enhanced drug safety.

TALK 4

Associate Professor Dr. Tan Mei Lan
Associate Professor
School of Pharmaceutical Sciences,
Universiti Sains Malaysia

Dr. Mei Lan Tan is an Associate Professor at the School of Pharmaceutical Sciences, Universiti Sains Malaysia. She is also a registered pharmacist with years of working experience in the industry. Her main research interests include drug-herb and drug-food interaction studies in various aspects such as the cytochromes P450, membrane drug transporters and hERG potassium channel. She aims to provide safety labeling and drug-herb-food interaction risk data to promote the appropriate use of supplements, functional foods and herbal or botanical medicine. Her other interests include molecular mechanisms of natural compounds, ER stress pathways and autophagy.

Title: ER stress sensors as potential biomarkers for disease development

The endoplasmic reticulum (ER) is the site where protein synthesis and folding of functional proteins occur in the mammalian cell. Perturbation in ER homeostasis results in a condition known as ER stress. To relieve ER stress, cells turn to a network of signaling and transcriptional pathways known as the unfolded protein response (UPR). The UPR pathway helps to reduce the translation and transcription of proteins and accelerates the ER protein folding and refolding ability to decrease the accumulation of misfolded proteins in the ER. As the chaperone proteins detect the presence of misfolded proteins, three sensory enzymes are activated to re-establish the cellular proteostasis, namely, protein kinase RNA-like endoplasmic reticulum kinase (PERK), inositol requiring protein-1 alpha (IRE1α) and activated transcription factor 6 (ATF6). These three important sensors activate a complex transcriptional cascade that leads to multiple adaptive responses or cell death. Mild or early ER stress is cytoprotective and activation of the UPR pathway and autophagy may be beneficial for the survival of cells. However, persistent and severe ER stress may be detrimental, as excessive ER stress responses trigger cell death processes such as apoptosis. It is now commonly acknowledged that various ER stress-related proteins and pathways are dysregulated during the development of certain pathological conditions. In this talk, the role of the ER stress pathway as anti-tumor targets and the ER sensors as potential biomarkers in substance abuse and COPD will be specifically discussed.

TALK 5

Dr. Chong Chee Ping
Senior Lecturer
School of Pharmaceutical Sciences,
Universiti Sains Malaysia

Dr. Chee Ping Chong is a senior lecturer specializing in clinical pharmacy. His expertise encompasses a diverse array of research interests, prominently focusing on community pharmacy practices, clinical pharmacokinetics, and critical care pharmacy.

Title: The distance between community pharmacies: a commentary on pharmacy zoning policy in Malaysia

Over the past decade, the community pharmacy sector in Malaysia has experienced remarkable growth, boasting approximately 7000 community pharmacists nationwide. These professionals play a crucial role in dispensing both prescription and non-prescription medications to the public, while also offering indispensable medication-related guidance. However, the burgeoning urban landscape, coupled with enhanced opportunities elsewhere, has led to a saturation of community pharmacies in urban hubs and a dearth in rural outskirts. Consequently, this imbalance fosters cutthroat competition and price conflicts in urban locales, while rural areas suffer from restricted access to essential medicines. Moreover, the rapid proliferation of chain pharmacies threatens to disrupt the equilibrium between independent and corporate entities. To mitigate these challenges, pharmacy zoning policies emerge as a potential remedy, entailing restrictions on new pharmacy establishments or branch expansions, capping the number of pharmacies in urban centers, and incentivizing ventures into rural regions. Nonetheless, the implementation of such policies warrants careful consideration, particularly regarding their compatibility with principles of free-market economics, the financial resources necessary for enforcement, and the evolving landscape of digital healthcare. Despite these complexities, pharmacy zoning policies remain the most pragmatic avenue for addressing the underlying disparities in Malaysia's community pharmacy landscape, meriting earnest exploration and consideration.

TALK 6

Dr. Ooi Guat See
Senior Lecturer
School of Pharmaceutical Sciences,
Universiti Sains Malaysia

Dr. Ooi Guat See is a registered pharmacist and currently working as a senior lecturer in the School of Pharmaceutical Sciences, Universiti Sains Malaysia. Her research interests are in pharmacy practice, public health, mental health, clinical pharmacy, community pharmacy and health system research. Her current work involves the development of mental health programs among the young people and the extended healthcare roles of community pharmacists.

Title: Malaysian community pharmacists' role in mental healthcare – are they ready?

Mental health has been a major concern globally for the past decade. With the emergence of the COVID-19 pandemic, the importance of mental health has been recognized more than before. However, the role and readiness of community pharmacists in providing mental health support and services remain scarce. This study aimed to explore the readiness and barriers of
Malaysian community pharmacists in dealing with mental health problems.:
A cross-sectional online survey was conducted from September 2021 until December 2021. The questionnaire was distributed via Google Form to the community pharmacists in Penang state, Malaysia. The data obtained were tabulated and analysed accordingly.
40 community pharmacists participated. The majority (70%) agreed that community pharmacists have a role in mental healthcare with 60% of them indicating it is necessary for community pharmacists to provide mental health services to the public and 55% showed interest in providing the service. However, 65% of the respondents were not confident in providing support to someone who experiences a mental health crisis and only 20% of them had prior training in mental health services. In terms of readiness, close to 90% of the respondents indicated that they need additional mental health training and the greatest barrier to providing the service is the lack of knowledge (75%) and training (80%), which is found similar to the previous studies. 80% of the respondent agreed upon the importance of mental health advocacy training and its integration into the pharmacy undergraduate syllabus as a preparedness plan.
Community pharmacists are generally positive about their role in mental healthcare and understand the importance of providing mental health services as primary healthcare providers. However, more training is needed by the implementation of programs and workshops, as well as to integrate the training into the undergraduate syllabus.

TALK 7

Dr. Sabariah Noor Harun
Senior Lecturer
School of Pharmaceutical Sciences,
Universiti Sains Malaysia

Dr Sabariah Noor Harun is a registered pharmacist (RPh 7366), senior lecturer, and clinical pharmacy researcher with expertise in pharmacometrics using a non-linear mixed-effect modelling approach. She received her bachelor's degree in pharmacy from Universiti Sains Malaysia (USM) in 2007 and completed her master's degree in clinical pharmacy from the same institution in 2010. In 2016, she earned her PhD in Pharmacy from the University of Queensland, Australia. Dr Sabariah's research interest lies in pharmacometrics and simulation, disease progression modelling, time-to-event modelling, and clinical pharmacy research. Her research mainly focusses on infectious diseases, stroke, and diabetes. She has recently expanded her research interest in applying AI/machine learning in clinical pharmacy education and clinical research. She has published several research papers and articles in international journals and conference proceedings. Dr Sabariah provides consultation on pharmacometrics modelling, clinical pharmacy research, and clinical pharmacy services. She has received several awards for her innovative research contributions, including the Gold Medal for SimPCare@USM, an online simulated clinical pharmacy clerkship platform, at the International University Carnival on E-Learning (IUCEL) 2022 & 2023 by the Ministry of Higher Education. She also received the Gold Award for Pitching (Educator) at the Virtual International e-Content Development Competition in 2021 and 2023. More about my publications and research can be found here https://experts.usm.my/cvitae/sabariahnoor

Title: Navigating Pharmacometrics in Clinical Practice: case studies from Stroke Research

Stroke poses a significant burden in Malaysia, necessitating innovative approaches to optimise treatment and management strategies. Personalised medicine emerges as a critical paradigm, acknowledging the inherent variability among patients. Pharmacometrics, as the quantitative backbone of personalised medicine, provides a systematic and evidence-based approach to understanding drug dynamics and individual patient responses. The primary objective of this presentation is to share insights from studies that have employed pharmacometric methodologies in stroke research within the Malaysian context. Through a comprehensive review of these studies, we aim to shed light on the evolving landscape of stroke management, emphasising pharmacometrics' relevance and potential impact in advancing personalised medicine for stroke patients in Malaysia.

TALK 8

Dr. Siti Maisharah Sheikh Ghadzi
Senior Lecturer
School of Pharmaceutical Sciences,
Universiti Sains Malaysia

Dr. Siti Maisharah Sheikh Ghadzi obtained her PhD from Pharmacometrics Research Group, Uppsala University, Sweden in 2017. Her current work involves the application of pharmacometrics in the clinical settings related to pharmacokinetics/pharmacodynamic modelling of drug for example clozapine, cyclosporine, vancomycin, as well as time-to-event modelling, and disease progression in diseases such as type 2 diabetes, tuberculosis, schizophrenia and others. Siti is also the current Secretary of the Population Approach Group of Malaysia (PAGMAS) since 2023, after serving as the President from 2021 to 2023.

Title: Mastering Pharmacometrics Modelling: Insights from Clozapine Case Studies in Clinical Practice

Pharmacometrics, the quantitative analysis of pharmacology, plays a pivotal role in optimizing drug therapy by integrating mathematical models with clinical data. The case studies presented herein showcase the potential of pharmacometrics modelling to enhance therapeutic outcomes and guide clinical decision-making, focuses on clozapine. Clozapine, vital yet complex, poses challenges in metabolism, exposure-response dynamics, and adverse reactions. The implementation of pharmacometrics-based models addresses these complexities in healthy volunteers and schizophrenia patients. A semi-physiological pharmacokinetic model, based on a single 12.5 mg clozapine dose in 33 healthy volunteers, incorporates pre-systemic metabolism. Clinical data from 116 schizophrenia patients, with a mean follow-up of 306 weeks, utilize parametric survival models for time-to-positive symptom improvement and a mixture model for adverse drug reactions (ADRs). The optimal pharmacokinetic model features two compartments for clozapine and norclozapine, with first-order absorption and elimination. Race-based differences show African Black individuals with lower clozapine clearance and Caucasians with higher clearance. Correlations emerge between bodyweight, volume of distribution, and the impact of pantoprazole on drug concentrations. Weibull hazard function characterizes time-to-event analysis, revealing associations with age, atypical antipsychotic co-treatment, and higher clozapine cumulative doses. Unique modelling approaches capture clozapine-induced adverse reactions, which are tachycardia, weight gain, and neutropenia, highlighting diverse response patterns among patients. This study introduces innovative pharmacometrics models addressing clozapine's complex metabolism, interactions with pantoprazole, predictive factors for therapeutic response, and diverse adverse reaction profiles. Deepening our understanding of clozapine pharmacology, these findings open avenues for novel approaches in new drug development and personalized treatment strategies in the clinical practice.

TALK 9

Dr. Amer Hayat Khan
Senior Lecturer
School of Pharmaceutical Sciences,
Universiti Sains Malaysia

Dr. Amer is a quality-focused professional and educator with over 20 years of experience in elevating pharmaceutical elegance, improving patient access to biologic therapies, conducting comprehensive research into new therapies and grooming pharmacy leadership. He constantly identifies strategic opportunities for enhancement in patient care via continuing research that is on the cusp of biologic therapy breakthroughs in Infectious Diseases, Antibiotic Stewardship, Nephrology, Epidemiology, Clinical Pharmacy & Public Health. Besides, he is also a collaborative leader skilled in mentoring, mobilising and directing teams in line with aggressive performance metrics. He promotes a focus on continued curriculum improvement to close knowledge and skills gaps and strengthen academic cultures and experiences within all instructional programs. He is also involved in evaluating student and program feedback, identifying and mitigating gaps in learning and aligning research projects with defined goals.

Title: Seeking Adherence Through Adherence

In 2019, tuberculosis (TB) remained the leading cause of death due to a single infectious pathogen. An estimated 10 million people had TB worldwide, with 1.2 million TB fatalities among Human Immunodeficiency Virus (HIV)-negative people and 208,000 deaths among HIV-positive people. Literature indicates that treatment adherence for tuberculosis diseases is difficult due to the complexity, low tolerability, and extended duration of current treatment regimens, especially for both drug-susceptible and drug-resistant TB. There is a need to continue the quest for low-cost, reliable, and acceptable adherence measures for the treatment of TB and HIV co-infection. A qualitative approach and pharmacist-led intervention are needed to improve medication adherence levels for TB/HIV-AIDS patients. The study aims to investigate the degree of adherence and evaluate its impacts on clinical outcomes in TB patients. The qualitative research approach will figure out the specific societal issues, while a longitudinal study based on evidence will draw a real picture of the weaknesses. By adopting the World Health Organization Five-Dimensional adherence approach, the system development will facilitate overcoming the existing research gap.

To determine the uptake and usage of the intervention, the study will include theoretical and conceptual models and theories. The study will conclude with targeted efforts of the healthcare team to improve and sustain excellent adherence in the real-world clinical setting, which is critical for maximizing the effectiveness of each medication and treatment. These innovative technologies can thereby be harnessed to improve adherence to infectious diseases specifically, but to numerous conditions in general.

TALK 10

Ms. Nur Hafzan Md Hanafiah
Pharmacy Lecturer
School of Pharmaceutical Sciences,
Universiti Sains Malaysia

Graduated with BPharm (Hons) from International Islamic Unversity Malaysia and completed her Master's in Clinical Pharmacy from Universiti Sains Malaysia. She is currently the Chairperson of the Malaysian Pharmacist Society (MPS) Immunisation Advocacy Chapter (2022-2024) and also the Coordinator for the development of the Certified Training Programme on Immunisation for Pharmacists (CTPIP). Her research interest revolves around personalized medicine in oncology (Solid and Hematology) and aseptic dispensing in pharmacy practice. Current work involves pharmacy education development and health promotion focusing on cancer, vaccination and immunization, and other clinical pharmacy-related studies.

Title: Leveraging Microcredentials for Advancing Pharmacists' Professional Development

Continuous professional development (CPD) is important for the pharmacist to update their knowledge and skills. The COVID-19 pandemic has highlighted the importance of adaptive and innovative approaches, leading to the integration of microcredentials as a flexible and easily accessible format for learning, thus enables pharmacists to participate in CPD programs remotely. An initiative is the Certified Training Programme in Immunisation for Pharmacists (CTPIP), hosted on the OpenLearning platform. Consisting of eight microcredential modules culminating in hands-on workshops, CTPIP is aligned with Sustainable Development Goals 3 and 4, emphasizing continuous professional development and updated immunization practices. Through interactive methods like discussions, case studies, forums, and group activities, CTPIP enhances critical thinking, problem-solving, and decision-making skills specific to immunization services. The impact of the CTPIP course on pharmacist competency and patient care is evaluated through post-course assessments and feedback surveys from participants. The course has been well-received, with 387 participants enrolled by 2022 and increasing numbers thereafter. Initial results indicate significant improvements in pharmacists' knowledge of immunization guidelines, confidence in managing adverse events, proficiency in administering vaccines safely and efficiently, and the quality of immunization counseling provided to vaccinees. The generated income from the program is approximately RM 13,500.00, with an expected annual income projection of RM 92,800 based on an estimated enrollment of 232 provisionally registered pharmacists per year. In conclusion, microcredential-based CPD offers pharmacists adaptable, accessible, and personalized learning opportunities, enabling them to navigate evolving healthcare landscapes effectively and continually enhance patient care. Embracing such innovative approaches not only ensures professional development for pharmacists but also contributes significantly to the advancement of pharmaceutical practice.

TALK 11

Dr. Hadzliana Zainal
Senior Lecturer & MPharm Coordinator
School of Pharmaceutical Sciences,
Universiti Sains Malaysia

Hadzliana Zainal is a Senior Lecturer in the School of Pharmaceutical Sciences, Universiti Sains Malaysia where she has been a member since 2008. She is the Coordinator for the MPharm Program for the School of Pharmaceutical Sciences. Her research interests are mainly in clinical pharmacy, pharmacokinetic and pharmacodynamic modelling and translational medicine. Her current work involves the application of pharmacometrics in human and animal clinical trial, stroke related studies, medication safety in paediatrics, pharmacovigilance and clinical pharmacy related studies. She is also one of the trainers for OECD-GLP training for study directors.

Title: Neurological Nostradamus: Predicting Mortality and Functional Disability Following First-ever Acute Ischaemic Stroke

Stroke is a leading cause of mortality, disability and imposes a heavy socio-economic burden worldwide. In Malaysia, stroke is ranked as the third cause of death after ischemic heart disease and pneumonia, as well as a leading cause of hospitalization. Stroke is also among the top diseases with the greatest burden of disease, based on disability adjusted life years. Evidence have demonstrated effective treatments for stroke, however, most patients who survived the stroke still have medical complications and/or disabilities that require continuous monitoring and management. Guidelines for stroke management recommends several interventions for optimal outcomes, but the implementation and impact on patient outcomes including mortality and morbidity are rarely monitored and evaluated. Details from a single predictor is often inadequate to provide reliable estimates of prognostic probabilities or risks, particularly in complex patients. There are several models in the prognostic/risk research literature, but implementation in routine clinical practice is limited, particularly in a long-term care setting. Development and validation prediction models of stroke outcome may change the current narrative of stroke burden among Malaysian population. In addition, the total stroke-associated cost is mainly determined by the length of hospital stay, however factors such as gender, age, co-morbid conditions, severity of stroke and family support might have significant contribution to the overall costs of stroke care in any institution. We sought to understand the factors that predict high risked patients with poor prognosis post- stroke, which can be translated as probabilities of mortality/ functional disability when patient details are entered into an online calculator to help inform clinicians on which patients would need extra attention following first-ever acute ischaemic stroke.

ONLINE
ORAL PRESENTATION
ABSTRACT

ORAL ONLINE PRESENTATION

PCS2024-0017

RELAPSE PATTERNS AS A KEY INDICATOR OF STEROID-SPARING REQUIREMENTS IN PEDIATRIC NEPHROTIC SYNDROME

Khairunnisa Mohamad[1*], Hadzliana Zainal[2], Nur Arzuar Abdul Rahim[3], Tengku Hasnita Tengku Hussain[4]

[1] School of Pharmaceutical Sciences, Universiti Sains Malaysia, Pulau Pinang, Malaysia,

[2] Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, Pulau Pinang, Malaysia,

[3] Department of Clinical Medicine, Advanced Medical and Dental Institute, Universiti Sains Malaysia, Pulau Pinang, Malaysia,

[4] Department of Paediatric, Hospital Sultanah Nur Zahirah, Ministry of Health Malaysia, Terengganu, Malaysia

*Correspondence email: khai2nisa@gmail.com

Background: Approximately half of the frequent relapses or steroid-dependent nephrotic syndrome (FR/SDNS) children require additional steroid-sparing agents (SSA). This study assesses prednisolone outcomes and identifies factors for the timely requirement of SSA use. **Methods:** A retrospective cohort multicentre study analysed treatment outcomes and prognostic factors for SSA requirements in children with FR/SDNS. The time-to-event analysis utilising the Kaplan-Meier estimate examined the proportion of children needing early initiation of SSA. **Results:** A total of 121 children (85 males) diagnosed with nephrotic syndrome at a median age of 4.5 years (range 1.3-12.8) were followed up for a median of 3.7 years (range 1.0-15.0). Prednisolone successfully controlled relapse in 42% of children, while adding SSA improved overall control to 78%. Time to subsequent relapse post-FR/SDNS diagnosis (at a 3-month threshold) was the only significant predictor of SSA requirement and steroid dependency, odds ratio (OR)=2.93, 95% confidence interval (CI) 1.33-6.02 and OR=9.0, 95% CI 3.31-24.45, respectively. The Kaplan-Meier analysis showed that those with an earlier first relapse (those with an earlier first relapse (<3 months) required SSA sooner than those relapsing at three months or later (log-rank p<0.01). Most children experiencing relapse within three months initiated SSA within 6 and 12 months from the FR/SDNS diagnosis. **Conclusions:** Prednisolone monotherapy may be insufficient to manage relapses among FR/SDNS children, particularly for those experiencing relapse within less than three months post-diagnosis, indicating an early requirement for SSA within 6 and 12 months of FR/SDNS diagnosis.

Keywords: idiopathic nephrotic syndrome, frequent relapses, steroid dependency, steroid-sparing agents, predictors

ORAL ONLINE PRESENTATION

PCS2024-0022

PERCEPTION OF PHARMACIST'S ROLE AND PRACTICE ON ATORVASTATIN-RELATED DRUG INTERACTIONS AMONG COMMUNITY PHARMACISTS IN EGYPT

Mohammed Gamal Mohammed Maslub[1,2,3,*], Mahasen Ali Radwan[2], Abubakar Sha'aban[4], Marwa Adham El-Mohamdy[5], and Nur Aizati Athirah Daud[1]

[1] School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800, Malaysia

[2] Department of Clinical Pharmacy/Pharmacy Practice, Faculty of Pharmacy, Egyptian Russian University, 11829, Egypt

[3] International Society of Pharmacovigilance (ISoP), Egypt Chapter, Cairo, Egypt

[4] Division of Population Medicine, Cardiff University, CF14 4YS, United Kingdom

[5] Department of Clinical Pathology, Faculty of Medicine, Ain Shams University, 11591, Egypt

*Correspondence email: mohammed_gamal_bcps@student.usm.my

Backgrounds: Atorvastatin (ATV)-related drug interactions (DIs) have been attributed to the adverse effects of ATV. The community pharmacist's (CP) responsibility in the management of drug-related problems (DRPs) is essential for the detection and prevention of potential drug-drug interactions. This survey describes CPs' perceptions regarding managing ATV-related DIs and their experience encountering major- and moderate-severity ATV-related DIs. **Methods:** The survey link was sent in Google Forms to CPs throughout Egypt's governorates via social media, email, or text. It comprised three sections: 1) demographics, 2) whether respondents conduct CP's roles for management of ATV-related DIs, and 3) perceived occurrence of encountering major or moderate ATV-related DIs. The study included only licensed CPs and excluded pharmacists in settings other than community pharmacies. **Results:** A total of 973 respondents completed the survey (73% males and 27% females). Reliability analysis showed acceptable internal consistency of the items used in the questionnaires (**α** =0.843). The mean cumulative role fulfilment score was 7.2 (± 1.91 SD). Most of the respondents provided patient education on the consequences of ATV-related DIs (n=828, (85.1%)), recommended monotherapy regimens, if possible (n=800, (82.2%)), and gave special care for polypharmacy patients (n=779, (80.1%)). About half of the CPs recognised that both clarithromycin (n=446, (45.8%)) and cyclosporine (n=480, (49.3%)) caused major interactions with ATV in high frequency. For moderate DDIs, digoxin (n=411, (42.2%)), phenytoin (n=399, (41%)), and azithromycin (n=394, (40.5%)) were the most reported to occur in high frequency. **Conclusions:** This study identified the high mean cumulative score for pharmacist-led interventions to manage ATV-related DIs. A high rate of ATV-related DIs was encountered. Consequently, continuous education and pharmacy stewardship programs can be planned to improve CPs' competencies in detecting and managing ATV-related DIs.

Keywords: Community pharmacists, Atorvastatin, Drug interactions, Drug-related problems (DRPs), Egypt

ORAL ONLINE PRESENTATION

PCS2024-0023

COMBINED ORAL CONTRACEPTIVE PILLS: KNOWLEDGE, ATTITUDE AND PRACTICE AMONG USERS IN PERAK

Nurul Nasrah binti Mohd Ariffin[1]

[1] School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 Malaysia

Correspondence email: nurulnasrah @gmail.com

Background: The perfect use failure rate of hormonal contraceptives is less than 1%. The typical use failure rate among inconsistent and incorrect users is 7%. The study aims to determine the level of knowledge, attitude and practice, and adherence to combined oral contraceptive pills (COCP) use among the participants. **Methods:** A cross-sectional study using self-administered questionnaires was performed among COCP users attending 12 government health clinics in Perak state. Subjects were recruited via convenience sampling from 1st April 2023 until 30th June 2023. Inclusion criteria include women prescribed with COCP indicated for contraception for at least three months and able to read and write in either Malay or English. The questionnaire used was developed and content validated. Reliability analysis and a pilot test were performed among 30 COCP users, and Cronbach alpha obtained was 0.845. The questionnaires consist of 60 questions divided into five sections, including demographic data, information related to COCP, knowledge, attitude, and practice towards COCP. **Results:** A total of 588 respondents completed the questionnaires (98% response rate). 53.2% of the respondents were between the ages of 30 and 39, 72.8% had studied in secondary school before, 61.1% were housewives, and 77.7% were from low-income groups. 73.3% were multigravidas, and 53.6% were on the pills for a year and above. 57.7% of the respondents had a moderate level of knowledge, 57.1% had a moderate level of attitude, and 86.4% had a good practice level. There was a statistically moderate positive correlation between adherence and practice. **Conclusions:** This study showed that the majority had moderate knowledge, attitude, and good practice towards COCP. Participants showed a good adherence towards pill taking.

Keywords: COCP, contraceptive, hormonal, pills

ORAL ONLINE PRESENTATION

PCS2024-0032

RELATIONSHIP ADHERENCE OF TREATMENT AND CLINICAL OUTCOMES IN OUTPATIENT TYPE 2 DIABETES MELLITUS PATIENTS AT PB SELAYANG II HEALTH CENTER MEDAN

Embun Suci Nasution[1], Hari Ronaldo Tanjung[1], Erida Novriani[2], Nur Azizah[3]*

[1] Department of Pharmacology and Clinical Pharmacy/Community Pharmacy, Faculty of Pharmacy, Universitas Sumatera Utara, 20155, Indonesia

[2] Department of Clinical Pharmacy, Faculty of Pharmacy, Universitas Prima Indonesia, 20118, Indonesia

[3] Undergraduate Program, Faculty of Pharmacy, Universitas Sumatera Utara, 20155, Indonesia

*Correspondence email: nurazh1002@gmail.com

Background: Diabetes mellitus is a chronic disease that requires long-term treatment which adherence will result in good clinical outcomes. This study aimed to determine the relationship between adherence and clinical outcomes in outpatients with type 2 diabetes mellitus (T2DM). **Methods:** This was a descriptive cross-sectional with a simple random sampling. The sample is a population who met the inclusion criteria. The inclusion criteria for this study were T2DM outpatients at Padang Bulan Selayang II Health Centre in Medan aged ≥ 18 years and who have taken diabetes medication for at least one month. The research was conducted between August and December 2023. Data on patient adherence were collected using MARS-5 questionnaire, clinical outcome data were based on fasting blood glucose and body mass index (BMI) from direct examination, and sociodemographic data obtained from interview. **Results:** A total of 90 respondents, constituting a 72% response rate from a population of approximately 220, were included in the study. The majority of participants were women (55.6%), aged between 56 and 65 years (41.1%), holding a bachelor's degree (46.7%), unemployed (65.6%), experiencing diabetes for more than 5 years (48.9%), and having comorbidities (54.4%). Adherence levels were assessed in both adherence categories (41.1%) and non-adherence categories (58.9%). Fasting blood glucose was categorised as either controlled (43.3%) or uncontrolled (56.7%). Furthermore, BMI outcomes were segmented into normal (51.1%), mildly obese (16.7%), and obese (32.2%). Among these variables, only age exhibited a significant difference with fasting blood glucose ($p=0.046$). The Spearman's rho test indicated no significant relationship between adherence and clinical outcomes, with a very low correlation. **Conclusions:** The adherence level among T2DM outpatients predominantly leaned towards non-adherence, characterized by uncontrolled fasting blood glucose levels and a normal BMI. A noteworthy finding was the absence of a significant relationship between adherence and clinical outcomes. This deviation challenges the theoretical expectation that adherence to medication should correlate with favourable clinical outcomes. Such discrepancies are likely attributed to the influence of general, individual, or other unpredictable factors on clinical outcomes.

Keywords: adherence, clinical outcome, health centre, type 2 diabetes mellitus

ORAL ONLINE PRESENTATION

PCS2024-0034

KNOWLEDGE AND ATTITUDE LEVEL OF MOTHERS FOR STUNTING PREVENTION AT MEDAN LABUHAN SUBDISTRICT

Embun Suci Nasution[1], Hari Ronaldo Tanjung[1], Firman Maulana[2]*

[1] Department of Pharmacology and Clinical/Community Pharmacy, Faculty of Pharmacy, Universitas Sumatera Utara, Medan 20155, Indonesia.

[2] Bachelor of Pharmacy Program, Faculty of Pharmacy, Universitas Sumatera Utara, Medan 20155, Indonesia.

*Correspondence email: firmanmaulana0004@gmail.com

Background: Stunting is a nutritional problem worldwide, especially in developing and poor countries. The study aimed to determine mothers' level of knowledge and attitudes for preventing stunting. **Method:** This was a descriptive cross-sectional study using questionnaires. This research was conducted from October to December 2023 at Medan Labuhan Subdistrict. **Results:** A total of 316 mothers participated in this study, resulting in a 100% response rate. The majority of participants fell within the age range of 17-60 years, with a mean age of 29.9 years. Educational backgrounds varied, with a significant proportion having completed senior high school (78.16%), followed by bachelor's degree holders (6.33%). A substantial number identified as housewives (92.41%), and the majority reported an income exceeding 1,500,000 IDR (38.61%). The distribution of knowledge levels among mothers was categorized as low (15.8%), medium (43%), and high (41.1%). In terms of attitude, percentages for bad, enough, and good were 9%, 49.7%, and 49.4%, respectively. The Kruskal-Walli's test revealed a significant relationship between knowledge and attitude ($p<0.05$). **Conclusion:** The knowledge and attitude of mothers in preventing stunting in the Medan Labuhan Subdistrict are categorized as moderate. Implementing effective parenting programs and disseminating information about proper nutrition for mothers with children under two years old can be considered viable solutions to reduce the prevalence of stunting.

Keywords: attitude, knowledge, mothers, questionnaires, stunting

ORAL ONLINE PRESENTATION

PCS2024-0043

THE IMPACT OF PHARMACIST SELF-MANAGEMENT INTERVENTIONS ON HEALTH-RELATED QUALITY OF LIFE (HRQOL) AND UNPLANNED HEALTHCARE UTILISATIONS IN PATIENTS WITH COPD: A SYSTEMATIC REVIEW AND META-ANALYSIS

Nurdiana Jamil[1*], Nor Hafizah Abdul Manan[2], Chong Li Yin[3], Leong Siew Lian[4], Zainol Akbar Zainal[5]

[1]Faculty of Pharmacy, University of Cyberjaya

[2]Faculty of Medicine, University of Cyberjaya

[3]Pharmacy Department, Serdang Hospital

[4]School of Pharmacy, Monash University Malaysia

[5]Faculty of Pharmacy, University Kebangsaan Malaysia

*Correspondence email: nurdiana@cyberjaya.edu.my

Background: As chronic obstructive pulmonary disease (COPD) progresses, patients may experience more frequent exacerbations and a heavier burden of symptoms. Self-management interventions boost the daily skills required for COPD patients to control their disease. These include using inhaler devices correctly, avoiding triggers of exacerbation, including smoking cessation, and recognising worsening symptoms. Pharmacists, who are extensively trained in counselling, are well-suited to providing self-management intervention programs to COPD patients. As self-management involves behavioural change, effective interventions should be grounded on behaviour change techniques (BCT). **Objective:** The systematic review examined the components of BCT utilised in pharmacist-delivered self-management interventions and its impact on health-related quality of life (HRQoL) and healthcare utilisation in COPD patients. **Methods:** A systematic search of PubMed, OVID, EBSCOhost, and Google Scholar was conducted to identify eligible studies that reported the outcomes of interest. Characteristics of interventions that aimed to produce behaviour change in patients were identified. BCTs were classified according to a BCT taxonomy. HRQoL and healthcare use measures following interventions were extracted, pooled, and visualised using forest plots. **Results and discussion:** Fourteen studies of intervention were included in the study. Frequently used BCTs included "Information on the health consequence" and "Instructions on how to perform a behaviour". Patients who received interventions had higher HRQoL than patients who did not (standardised mean difference = -0.73, 95% CI = -1.31 to -0.14, $X^2(10) = 263.01$, $p < 0.001$, $I^2 = 97.8\%$) and had reduced unplanned healthcare utilisations when compared to patients who did not (OR = 0.40, 95% CI = 0.29 – 0.56, p = 0.178, $I^2 = 25.5\%$). **Conclusions:** Pharmacist-delivered self-management interventions positively impacted healthcare utilisations and HRQoL of COPD patients. These findings support a greater need for pharmacist involvement in self-management interventions.

Keywords: COPD, self-management, behaviour change techniques

ORAL ONLINE PRESENTATION

PCS2024-0015

DEVELOPMENT AND VALIDATION OF THE QUESTIONNAIRE TO ASSESS THE KNOWLEDGE, ATTITUDES, AND PRACTICES OF HERBAL PRODUCT USE AMONG THE GENERAL POPULATION

Nazmi Liana Azmi[1]*, Wan Fatin Alya Alisya Wan Musa[1], Tengku Norshaherah Tengku Mohd Nordin[1], Nurul Nabilah Husna Zunaidi[1]

[1]Department of Pharmacy, Hospital Raja Perempuan Zainab II, 15586 Kota Bharu, Kelantan, Malaysia

*Correspondence email: nazmiliana@moh.gov.my

Backgrounds: In Malaysia, there has been a developing trend in the usage of herbal products. Therefore, this study aimed to develop and validate a questionnaire to assess the general population's knowledge, attitudes, and practices (KAP) of herbal product use. **Methods:** Based on the available literature and expert opinion, a self-administered questionnaire on herbal product use was developed in Bahasa Melayu and English. It comprised three domains, which were knowledge, attitudes, and practices. Six experts assessed the content validity, while ten respondents determined the face validity. Then, Cronbach's alpha was used to test the reliability in a pilot study conducted on 56 respondents. All data were analysed using Statistical Package for Social Sciences (SPSS) version 20.0. **Results:** Initially, the questionnaire was developed with 30 items: knowledge (10 items), attitudes (10 items), and practices (10 items). All domains scored content validity indexes of more than 0.83 during content validation. However, after the harmonization session with the experts, a few questions were included to produce 39 items: knowledge (12 items), attitudes (13 items), and practices (14 items). Some sentences were rephrased and restructured based on the experts' comments. As for the face validity indexes, all of them were within 0.96 to 1.00, indicating that the respondents could easily understand the questions. However, the definition of prescription medicine was added to enhance the understanding further. In the pilot study, all domains achieved Cronbach's alpha values of 0.60 after removing two items from the knowledge domain. **Conclusions:** A self-administered questionnaire on KAP of herbal product use was successfully developed with a total of 37 items: knowledge (10 items), attitudes (13 items), and practices (14 items). It was found valid and reliable to use among the general population.

Keywords: Validation, knowledge, attitudes, practice, herbal products

ORAL ONLINE PRESENTATION

PCS2024-0016

BARRIERS TO MENTAL ILLNESS TREATMENT IN SAUDI ARABIA: A POPULATION-BASED CROSS-SECTIONAL STUDY

Ahmed Adel Mohammed[1,2*], Sufyan Mohammed Alomair[1], Abdulrahman A. Alnijadi[1], Abdulazia S Almulhim[1], Fatimatuzzahra' Abd Aziz[2], Mohamed Anwar Hammad[3], Promise Madu Emeka[4]

[1]Department of Pharmacy Practice, College of Clinical Pharmacy, King Faisal University, 36363 Al Ahsa, Saudi Arabia,

[2] School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 Pulau Pinang, Malaysia

[3]Department of Clinical Pharmacy, Faculty of Clinical Pharmacy, Albaha University, 257 689 Albaha, Saudi Arabia

[4]Department of Pharmaceutical Sciences, College of Clinical Pharmacy, King Faisal University, 36363 Al Ahsa, Saudi Arabia,

*Correspondence: ahmedadelm@student.usm.my

Background: Mental illness is a disorder that can cause impairment and disability, affecting mood, thinking, and behaviour; therefore, early intervention will reduce morbidity. In Saudi Arabia, no population-based assessment has been done before to assess the potential barriers that may prevent those who need professional mental illness counselling from seeking help. This study evaluates the general population's opinions regarding personal, family, societal, and medical barriers preventing mental health patients from seeking consultation and treatment. **Methods**: In Saudi Arabia, a cross-sectional study was conducted on 463 individuals aged 18 and above. Data were collected from public places by face-to-face interviews using a validated questionnaire consisting of two parts. The first part included sociodemographic data, while the second part contained subsections of society/family, personal, and medical barriers. **Results**: The results showed that 379 (81.9%) indicated that society and family barriers impacted them, whereas 325 (70.3%) believed personal barriers hindered seeking help. However, 294 (63.5%) opted for medical barriers as a hindrance. Regarding the highest barriers, 120 of the total respondents (25.9%) saw psychiatric illness as a source of shame and stigma, 166 respondents (35.9%) said that the psychiatric patient is seen as crazy, 159 of them (34.3%) believed it is tough for anyone to talk about their feelings and emotions and 183 respondent (39.5%) feared that psychiatric illness would decrease the chance of marriage to the appropriate person. Our findings also indicated a low trust in in-hospital treatment, hence a loss of confidence in using medications. **Conclusion:** The findings of this study indicate that societal stigma is the most common barrier preventing people from seeking mental health consultation. Many barriers differ significantly between males and females. The results of this study can direct health care management towards changing the profile of mental health care services explicitly presented to females and providing a service that focuses on the emotional and psychological aspects of the patient.

Keywords: obstacles, consultation, stigma, barriers, mental illness

ORAL ONLINE PRESENTATION

PCS2024-0019

DEVELOPMENT AND VALIDATION OF USABILITY AND SATISFACTION OF MOBILE HEALTH APPS QUESTIONNAIRE

Phei Ching Lim[1,2*], Yen Hoe Ooi[2], Celine Symons[2], Yen Li Lim[3], Nurul Nazihah Zamri[2], Shirley Wen Wen Ting[2], Hadzliana Zainal[1].

[1]School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 Penang, Malaysia

[2]Department of Pharmacy, Hospital Pulau Pinang, 10990 Penang, Malaysia.

[3]Clinical Research Centre, Hospital Pulau Pinang, 10990 Penang, Malaysia

*Correspondence email: pheiching@gmail.com

Background: In this digital era, various mobile health (mHealth) apps were developed, thus making education and health information more accessible for health monitoring. Assessment of the usability and satisfaction of mHealth apps will ensure the efficiency and optimal use of the apps. Nevertheless, questionnaires currently revolve around the usability of the computerised system which are not utilisable to gauge the benefit of mHealth apps. We aimed to develop and validate the usability and satisfaction of the mobile health apps (USHA) questionnaire. **Methods:** The development and validation of the USHA questionnaire consisted of three phases: item development, content validation and reliability test. During item development phase, the first draft of the USHA questionnaire in English consisted of Likert-scale items and patients' demographic items was designed. The questionnaire was forward and backward translated to Malay and Chinese versions. Content validation phase was conducted with eight experts followed by face validation by five patients. Reliability test was conducted among patients who had experienced using Rightest CARE® apps using test-retest method. **Results:** The first draft of the tri-language USHA questionnaire consisted of 18 Likert-scale items and eight patients' demographic items. During expert validation, five Likert-scale items and one patient's demographic item were eliminated as not relevant, not important or not clear while four Likert-scale items were rephrased as lack of clarity. One item on patients' demographic was removed as content validity index was 0.60 during face validation process. Thirty patients consented for reliability test. USHA questionnaire demonstrated good reliability with Cronbach's alpha 0.956 and intraclass correlation coefficient of 0.845. **Conclusion:** Tri-language USHA questionnaire is a valid and reliable 13 Likert-scale items and six patients' demographic questionnaire to assess the usability and satisfaction of patients towards mobile health apps in Malaysia. It is a validated tool to access the efficiency of mHealth apps.

Keywords: usability, satisfaction, mobile health apps, questionnaire, development and validation

ORAL ONLINE PRESENTATION

PCS2024-0020

IMPROVED TIMELINESS IN ANTIBIOTIC OPTIMIZATION: IMPACT OF PHARMACISTS IN BACTERAEMIA STEWARDSHIP

CheeLan Lau[1,3*], Petrick Periyasamy [2], Kiew Bing Pau [3], Shue Hong Kong [3], Farah Waheeda Tajurudin [3], Sheah Lin Ghan [3], Nur Jannah Azman [3], Stephanie Wai Yee Tan [3], Muhammad Nazrin Ibrahim, Xiong Khee Cheong[2], Ummu Afeera Zainulabid[2], Fara Rahidah Hussin[2], Toh Leong Tan [4], Hui-min Neoh[5], Zainina Zainal Abidin[6], Noranati Zulkifli Chia[6], Mohd Syazwan Mohd Said[6], Munirah Abdul Aziz[6], Ramliza Ramli [6], and Isa Naina-Mohamed

[1] Pharmacoepidemiology and Drug Safety Unit, Department of Pharmacology, Faculty of Medicine, Universiti Kebangsaan Malaysia, Cheras, Kuala Lumpur 56000, Malaysia

[2] Medical Department, Faculty of Medicine, Universiti Kebangsaan Malaysia, Cheras, Kuala Lumpur 56000, Malaysia

[3] Pharmacy Department, Hospital Canselor Tuanku Muhriz, Cheras, Kuala Lumpur 56000, Malaysia

[4] Department of Emergency Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia, Cheras, Kuala Lumpur 56000, Malaysia

[5] UKM Medical Molecular Biology Research Institute (UMBI), Universiti Kebangsaan Malaysia, Kuala Lumpur 56000, Malaysia; hui-min@ppukm.ukm.edu.my

[6] Department of Medical Microbiology and Immunology, Faculty of Medicine, Universiti Kebangsaan Malaysia, Cheras, Kuala Lumpur 56000, Malaysia

*Corresponding email: cllau@ppukm.ukm.edu.my

Backgrounds: Delayed appropriate antibiotics in bacteraemia are associated with higher mortality, yet each day of broad-spectrum antibiotics increases resistance risk. Direct antibiotic susceptibility testing (dAST) enables faster antibiotic streamlining before conventional AST report (cAST) is available. We aimed to study the impact of pharmacists in optimising antibiotic choice and timeliness in bacteraemia, utilising dAST information. **Methods:** This was a prospective cross-sectional study in a teaching hospital. dAST was performed on positive blood culture broth, as per recommendation by the Clinical and Laboratory Standards Institute (CLSI). Patients > 18 years old admitted to medical wards were included. Cultures with no growth, yeast, gram-positive rod, coagulase-negative staphylococci, and mixed growth were excluded. During the control phase (pre) (November 2022 - February 2023), dAST was reported verbally to the ward by a microbiologist and noted in the electronic laboratory system. During the intervention phase (post) (June - September 2023), dAST information was also relayed to antimicrobial stewardship (AMS) pharmacist, who collaborated with ward pharmacists to evaluate case and discuss with prescribers on antibiotics adjustment. Infectious disease physicians were consulted in complicated cases. Optimal antibiotics refer to the narrowest spectrum susceptible option in the cAST report. **Results:** A total of 56 and 78 medical patients with bacteraemia were included in pre and post-phases, respectively. Both phases were comparable in patients' demographics, comorbidities, and infection severity. Healthcare-associated infections with the respiratory site and gram-negative bacteria predominated in each phase. One-third of bacteraemia had resistant organisms isolated. With pharmacist involvement, the receipt of optimal antibiotics since dAST and before cAST was almost doubled (25 (44.6%) vs 64 (82.1%), P<0.001). Furthermore, the fraction of unnecessary broad-spectrum antibiotics was significantly lower (22 (39.3%) vs 12 (15.4%), P =0.002), and fewer

patients remained on inadequate antibiotics (6 (10.7%) vs 1 (1.3%), P = 0.02). No difference in mortality was observed (12 (15.6%) vs 12 (21.8%), P=0.49). **Conclusions:** Pharmacists enhance the dAST utility in achieving faster and greater antibiotic optimisation.

Keywords: Antimicrobial stewardship, direct antibiotic susceptibility testing, bacteraemia, rapid diagnostic, pharmacist.

ORAL ONLINE PRESENTATION

PCS2024-0025

THE ASSOCIATION BETWEEN MRNA EXPRESSION OF PI3K/AKT/MTOR SIGNALING PATHWAY AND DEMOGRAPHIC AND CLINICAL FACTORS IN ASTHMATIC AND HEALTHY PATIENTS: A CASE-CONTROL STUDY IN PENANG GENERAL HOSPITAL

Azlinah Matawali[1,2]*, Irfhan Ali Hyder Ali[3], Eugene Ong Boon Beng[4], Habibah A. Wahab[1], Tan Mei Lan[1]

[1] School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 Malaysia

[2] Preparatory Centre for Science and Technology, Universiti Malaysia Sabah, 88400 Malaysia

[3] Respiratory Department, Penang General Hospital, 10990 Malaysia

[4] Institute for Research in Molecular Medicine (INFORMM), Universiti Sains Malaysia, 11800 Malaysia

*Corresponding Author Email: azlinahm@student.usm.my

Backgrounds: Asthma is a chronic respiratory disease characterised by airway inflammation, airway hyperreactivity, and airway remodelling. Deregulation of the PI3K/AKT/mTOR pathway has been associated with the progression of asthma. However, clinical investigations of this pathway in adult asthma are still lacking. This study investigated the phosphorylation status of PI3K, AKT, mTOR, p70S6K, and 4EBP1 genes in adult asthma and healthy controls. Secondly, to evaluate the association between PI3K/AKT/mTOR expression levels and patient's demographic and clinical factors. **Methods:** In this case-control study, a purposive sampling method was used to recruit 44 asthma participants from the Respiratory Department, Penang General Hospital. A total of 84 participants from the asthma and healthy group were interviewed using Quality of Life (QoL) and Asthma Control Test (ACT) questionnaires, while clinical data were obtained from the patient's file record. About 10 ml of blood was withdrawn, whereby peripheral blood mononuclear cells were extracted, followed by mRNA isolation and quantification. Expressions of target genes were evaluated using qRT-PCR, and normalised gene expression was calculated according to the Pffafl method. All results were statistically determined using Statistical Package for Social Science v.26 software. **Results:** The study revealed the p70S6K gene is highly expressed in asthma patients as there are significant differences between p70S6K expression level in asthma (0.844 [0.705]) and healthy group (0.683 [0.357]) (median [IQR]), $p<0.05$ using Mann-Whitney test. The p70S6K expression in asthma is significantly associated with the presence of irritants ($p=0.002<0.05$), weather changes ($p=0.012<0.05$), and patients' allergy status ($p=0.035<0.05$). Spearman correlation showed a positive low correlation between p70S6K expression with sensitivity to irritants ($r=0.479$, $p=0.001<0.05$), weather changes ($r=0.388$, $p=0.010<0.05$), and allergy status ($r=0.326$, $p=0.033<0.05$). **Conclusions:** Downstream protein p70S6K was significantly upregulated in asthma patients, which related to patients' demographic and clinical factors. We envisaged this study to identify new candidate genes associated with asthma progression, hence improving our understanding of asthma pathophysiology.

Keywords: PI3K/AKT/mTOR, p70S6K, asthma, Penang General Hospital

ORAL ONLINE PRESENTATION

PCS2024-0033

EFFECTS OF SINGLE NUCLEOTIDE POLYMORPHISM (SNP) IN PHARMACOKINETIC (PK) OF ALLOPURINOL AND OXYPURINOL: A SCOPING REVIEW

Teo Yi Ying[1], Farah Aida A. Zairol Azwan[1], Shamin Saffian[1], Mohd Makmor-Bakry[1], Mohd Shahrir Mohamed Said[2], Nor Asyikin Mohd Tahir[1]*

[1]Centre for Quality Management of Medicines, Faculty of Pharmacy, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

[2]Department of Medicine, Hospital Canselor Tuanku Muhriz, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

*Corresponding email: syikin.tahir@ukm.edu.my

Backgrounds: Pharmacogenomics, studying genetic variation in patient responses to treatment, has gained prominence in drug development and clinical decisions, particularly in treating diseases like gout. Allopurinol, the first line for gout and hyperuricemia, exhibits variable doses in achieving the therapeutic target outcome, necessitating personalised approaches. Genetic factors, such as single nucleotide polymorphisms (SNP), can influence allopurinol and oxypurinol pharmacokinetics (PK), impacting drug effectiveness. This study aimed to document various SNPs and their effects on the PK of allopurinol and oxypurinol, determine the common SNPs associated with the altered PK, and investigate its effects on potential clinical outcomes. **Methods:** Advanced search on three electronic databases, PubMed, Scopus and Ovid Medline(R) were conducted for articles that involve SNP and PK of allopurinol and oxypurinol, published in English up to 16 December 2023. Quality assessment on the retrieved studies was done using the Quality Assessment Tool for Studies with Diverse Designs (QATSDD). **Results:** 13 studies were included, with eight non-randomised trials (clinical, cohort and pilot study), two randomised controlled trials (RCTs), two genome-wide association study (GWAS) and one genomic sequencing studies. 11 SNPs in eight genes from relevant articles were discussed for their effect on allopurinol and oxypurinol PK and its potential clinical outcome. The most frequently discussed SNP associated with altered allopurinol and oxypurinol PK is ABCG2 rs2231142. **Conclusion:** Future research on less-explored genetic variants is needed to fill existing knowledge gaps and refine our understanding of this topic. This scoping review serves as a foundation for future studies exploring the association between genetic factors and PK of allopurinol and oxypurinol, enhancing the potential of precision medicine approaches in managing gout and hyperuricemia.

Keywords: single nucleotide polymorphism, SNP, pharmacokinetic, allopurinol, oxypurinol

ORAL ONLINE PRESENTATION

PCS2024-0024

A TIME-TO-EVENT MODELLING OF SPUTUM CONVERSION WITHIN TWO MONTHS AFTER ANTITUBERCULOSIS INITIATION AMONG DRUG-SUSCEPTIBLE SMEAR POSITIVE PULMONARY TUBERCULOSIS PATIENTS: IMPLEMENTATION OF INTERNAL AND EXTERNAL VALIDATION.

Mohd Rahimi Muda[1,2], Orwa Albitar[1], Sabariah Noor Harun[1], Syed Azhar Syed Sulaiman[1], Irfhan Ali Hyder Ali[3], Siti Maisharah Sheikh Ghadzi[1*]

[1]School of Pharmaceutical Sciences, Universiti Sains Malaysia, Gelugor 11800, Penang, Malaysia

[2]Faculty of Pharmacy, Universiti Teknologi MARA Puncak Alam Campus, 42300 Bandar Puncak Alam, Selangor, Malaysia

[3]Respiratory Department, Hospital Pulau Pinang, Ministry of Health Malaysia, Jalan Residensi, George Town 10460, Penang, Malaysia

*Corresponding email: maisharah@usm.my

Background: Delayed sputum conversion has been associated with a higher risk of treatment failure or relapse among drugs susceptible smear-positive pulmonary tuberculosis patients. Many studies have identified several contributing factors, but the results varied across regions and countries. Therefore, the current study aimed to develop a predictive model that explained the factors affecting time to sputum conversion within two months after initiating antituberculosis agents among Malaysians with drug-susceptible smear-positive pulmonary tuberculosis patients. **Methods:** Retrospective data of pulmonary tuberculosis patients followed up at a tertiary hospital in the Northern region of Malaysia from 2013 until 2018 were collected and analysed. Nonlinear mixed-effect modelling software (NONMEM 7.3.0) was used to develop parametric survival models. The final model was further validated using the Kaplan-Meier-visual predictive check (KM-VPC) approach and sampling-importance resampling (SIR) method. **Results:** A total of 224 patients were included in the study, with 34.4% (77/224) of the patients remained positive at the end of two months of the intensive phase. Gompertz hazard function best described the data. The hazard of sputum conversion decreased by 39% and 33% for moderate and advanced lesions as compared to minimal baseline of chest X-ray severity, respectively (adjusted hazard ratio (aHR), 0.61; 95% confidence intervals (95% CI), (0.44 – 0.84) and 0.67, 95% CI (0.53-0.84)). Meanwhile, the hazard also decreased by 59% (aHR, 0.41; 95% CI, (0.23 – 0.73)) and 48% (aHR, 0.52; 95% CI, (0.35 – 0.79)) between active and former drug abusers as compared to the non-drug abuser, respectively. **Conclusions:** The successful development of the internally and externally validated final model allows a better estimation of the time to sputum conversion and provides a better understanding of the relationship with its predictors.

Keywords: time to event, sputum conversion, hazard, NONMEM, pulmonary tuberculosis

ORAL ONLINE PRESENTATION

PCS2024-0026

A POPULATION PHARMACOKINETIC MODEL OF SUBCUTANEOUS INSULIN FOR HYPERGLYCEMIA DURING ACUTE ISCHEMIC STROKE AMONG PATIENTS WITH PRE-EXISTING DIABETES

Karam Alali[1], Orwa Albitar[9], Siti Fatimah Ismail[3], Kamarul Aryffin Baharuddin[3], Sanihah Abdul Halim[4], Wan Mohd Izani Wan Mohamed[4], Chee Toong Chow[5], Neoh Kar Keong[6], Tuan Salwani Tuan Ismail[7], Farisyah Syakirah Mohd Zain[8], Mohd Jamsani Mat Salleh[8], Irene Looi[2], Purnima devi Suppiah[2], Siti Maisharah Sheikh Ghadzi[1], Sabariah Noor Harun[1*]

[1] Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11700 Penang.

[2] Clinical Research Center, Hospital Seberang Jaya, 13700 Penang, Ministry of Health Malaysia.

[3] Department of Emergency Medicine, School of Medical Sciences, Universiti Sains Malaysia, 15200 Kota Bharu, Malaysia

[4] Department of Internal Medicine, School of Medical Sciences, Universiti Sains Malaysia, 15200 Kota Bharu, Malaysia

[5] Department of Emergency & Trauma, Hospital Seberang Jaya, 13700 Penang

[6] Medical Department, Kek Lok Si Charitable Hospital, 11500 Penang

[7] Endocrinology Unit, Hospital Universiti Sains Malaysia, 16150 Kota Bharu, Malaysia

[8] Pathology Department, Hospital Seberang Jaya, 13700 Penang

[9] Roche Pharma Research and Early Development, 4070 Basel, Switzerland

*Corresponding email: sabariahnoor@usm.my

Background: No conclusive evidence suggests normalising serum glucose during hyperglycemia after acute ischemic stroke improves outcomes. The failure to categorise patients according to the distinct pathophysiological mechanisms underlying insulin regulation in pre-stroke diabetic and non-diabetic individuals might account for the limitation in observing the anticipated benefits. Different treatment approaches are needed. Thus, we aimed to develop a pharmacokinetic model of subcutaneous (SC) insulin in acute ischemic stroke patients with pre-existing diabetes. **Methods**: This prospective study was conducted in two stroke centers in Malaysia. Data from acute ischemic stroke patients with pre-existing diabetes who developed hyperglycemia within 72 hours of admission were collected. At least three blood samples were collected sparsely at 0, 0.5, 1.5, 3, 4, 6, and 8 hours of the SC insulin therapy. One and two-compartment models with additive, exponential, and combined additive and exponential error models and the lag absorption model were investigated, and potential covariates were added. Sampling importance resampling (SIR) was used to estimate the parameter uncertainty. **Results**: One compartment model with first-order absorption and elimination and a combined additive and exponential error model for 53 diabetic patients was selected as the baseline model for SC insulin. The absorption rate increased by 12% every year after age 60. Patients with concomitant hypertension had approximately 22% lower apparent clearance than those without hypertension. Full model retained with Ka: 1.54 h^{-1}, CL/F 72.2 L/h, V/F 243 L, endogenous insulin concentration: 7.76 µIU/mL, additive error: 9.5 µIU/mL, proportional error: 0.189. Inter-individual variability effects

were 99% for Cl/F and 53.2% for V/F. Relative standard errors were below 30% for both THETAs and ETAs. **Conclusions**: Diabetic patients older than 60 years old and those with concomitant hypertension may need a lower dose of SC insulin for hyperglycaemia during acute ischemic stroke.

Keywords: Hyperglycaemia, Insulin, diabetes, ischemic stroke

ORAL ONLINE PRESENTATION

PCS2024-0028

SYSTEMATIC REVIEW ON ONLINE AND DIGITAL INTERVENTIONS TO IMPROVE MENTAL HEALTH LITERACY AMONG YOUTH

Felicia Xian Wei Law[1], Yuet Yen Wong[2,3] *, Yue Yin Soo[1], Shu June Low[1], Guat See Ooi[1]

[1] School of Pharmaceutical Sciences, Universiti Sains Malaysia, Pulau Pinang, Malaysia

[2] Faculty of Pharmacy, Universiti Teknologi MARA Cawangan Pulau Pinang, Bertam Campus, Malaysia

[3] Collaborative Drug Discovery Research (CDDR) Group, Faculty of Pharmacy, University Teknologi MARA (UiTM) Cawangan Selangor, Kampus Puncak Alam, 42300 Bandar Puncak Alam, Selangor Darul Ehsan, Malaysia

*Corresponding email: yuetyen@uitm.edu.my

Background: High prevalence of mental health issues among the youth has become a pressing public concern. Given the widespread use of internet among the youth, online mental health services and digital interventions could be accessible platforms for the young people to seek help. **Methods**: A systematic review was performed to determine the effective components of online and digital mental health interventions in improving mental health literacy, knowledge, belief and well-being among the youth. We comprehensively searched four databases (PubMed, Scopus, Science Direct, and Web of Science) from 2012 to 2023. Results were narratively synthesised and organised based on sample characteristics, location or setting, delivery methods, and outcome measurements. **Results**: Fifteen studies were included in the systematic review. Most studies were conducted in developed countries (n=13), whilst one each from Malaysia and Ethiopia. The common intervention methods include online educational approaches (n = 10), online mental health triage service (n = 3), gamification (n =1) and electronic diary (n = 1). Help-seeking behaviour and symptoms related to depression, anxiety, and stress were the most examined outcomes in these studies. Despite diverse outcome measurements, a relatively higher number of studies (n=5) reported an improvement in depression symptoms. Findings on mental health literacy and knowledge were inconsistent due to measurement tool variations, hindering the ability to draw a conclusive statement. There remains no conclusive finding on the most effective components of online and digital mental health interventions due to the diversity in programme content and delivery methods, disparities in gender distribution, a lack of control group and absence of long-term follow-up. **Conclusion:** More research with robust study design and standardisation of outcome assessments would facilitate comparisons across studies in determining the effectiveness of online and digital interventions among the youth.

Keywords: Mental health literacy, mental illness, youth, online, digital interventions

ORAL ONLINE PRESENTATION

PCS2024-0039

THE PREVALENCE AND THE IMPACT OF CLINICAL PHARMACIST'S INTERVENTION ON DRUG-RELATED PROBLEMS IN PATIENTS WITH CHRONIC KIDNEY DISEASE

Khurshid Alam[1*], Amer Hayat Khan[1], Syed Azhar Syed Sulaiman[1], Ooi Guat See[1], Waqas Ahmad[1], Amir Ullah[3]

[1] School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 Malaysia

[2] Nephrology UNIT District Headquarters Teaching Hospital, Medical Teaching Institution Bannu,, 28100, Pakistan

*Corresponding email: muhdkhurshid79@gmail.com

Backgrounds: Chronic kidney disease (CKD) is a global health issue of growing concern. According to projections from the Worldwide Health Observatory, it is one of the rapidly increasing contributors to global mortality. The prevalence of CKD and end-stage renal disease (ESRD) is increasing globally. The objective was to evaluate the prevalence and impact of clinical pharmacist intervention in resolving drug-related problems among patients with chronic kidney disease. **Methods:** A single-arm, pre and post-intervention study design was used, which was assessed to be suitable in testing for the feasibility of implementing an intervention in clinical practice by a clinical pharmacist as a researcher. Descriptive and chi-square tests were used to examine the frequency of different types of DRPs and the difference in DRPs between pre and post-intervention. This study measured pre- and post-intervention variables of interest before and after an intervention in the same patients, from February 2022 to June 2022, and then March 2022 to July 2022. **Results:** The findings of this study indicate a high prevalence of drug-related problems, with every patient experiencing at least one drug-related problem. The mean drug-related problem (DRP) per patient was found to be 2.903 with STD ± 1.148. The study assessed the considerable influence of clinical pharmacist intervention on drug-related problems. The predominant form of drug-related problem (DRP) was drug interaction 167 (45.1%), which was reduced to 76 (20.5%) after intervention carried out by clinical pharmacists statistically significant (P= 0.032). Another common DRP was found to have poor compliance issues in pre-interventions (n = 144 (38.9%) and was significantly reduced to 80 (21.6%) post-intervention (P = 0.042). Untreated indications were noticed in 137 cases (37.0%); after pharmacist intervention, this number was significantly reduced to 27 cases (7.3%), with a statistically significant difference (P = 0.004). However, it is noteworthy that medication compliance among patients in our study was unsatisfactory and fell below expectations. **Conclusion:** The findings demonstrate a high prevalence of drug-related problems among CKD patients, with every patient experiencing at least one drug-related problem. Clinical pharmacist intervention effectively reduced the prevalence of drug interactions, poor compliance issues, and untreated indications, leading to improved medication management in these CKD outpatients. This research emphasises the vital role of clinical pharmacists in mitigating drug-related problems among CKD patients, resulting in improved medication management and potentially better health outcomes.

Keywords: Chronic kidney disease, prevalence, drugs related problems, poor adherence, failure to receive drugs

ORAL ONLINE PRESENTATION

PCS2024-0041

SCREENING HLA-A, HLA-B, AND HLA-DRB1 ALLELE FREQUENCIES IN THE IRAQI POPULATION: IMPLICATIONS FOR PRECISION THERAPY IN EPILEPSY

Ali Fadhel Ahmed[1*], Nur Aizati Athirah Daud[1,2] , Dzul Azri Mohamed Noor[1] , Majeed Arsheed Sabbah[3]

[1] Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 USM Pulau Pinang, Malaysia

[2] Human Genome Center, School of Medical Sciences, Universiti Sains Malaysia Health Campus, 16150 Kubang Kerian, Kelantan, Malaysia

[3] Forensic DNA for Research and Training Centre, Alnahrain University, Baghdad 64074, Iraq

*Corresponding email: alifadhel1131990@student.usm.my or alifadhel1131990@gmail.com

Background: Understanding HLA diversity is crucial for personalised epilepsy therapy, optimising drug selection and dosage while minimising adverse effects. This study explores HLA allele frequencies in Iraq, enhancing precision medicine and improving epilepsy treatment. **Method:** This study involved 440 individuals: 300 healthy volunteers and 140 epilepsy patients from Dr. Saad al-Witry Neuroscience Hospital and Medical City Hospital in Baghdad. The selection criteria for healthy volunteers included the absence of any known chronic diseases or medical conditions. For the epilepsy group, patients were diagnosed based on clinical assessments and medical records. Peripheral blood samples were collected for genotyping analysis. Genomic DNA was isolated using the ReliaPrepTM Blood gDNA Miniprep System Kit (Promega-USA) and stored at -20°C until further processing. Genotyping for HLA class I alleles (HLA-A and HLA-B) and class II alleles (HLA-DRB1) was performed using the polymerase chain reaction-sequence-specific oligonucleotide (PCR-SSO) method. **Results:** The study identified significant frequencies, with the highest observed for HLA class I alleles: A 02:01 (24.09%), A 03:01 (11.2%), A 01:01 (10.1%); B 35:01 (8.9%), B 50:01 (6.4%), and B 07:02 (5.2%). Regarding HLA class II alleles, the three most common are DRB1 07:01 (17.2%), DRB1 03:01 (16.1%), and DRB1 11:01 (10.9%). Certain HLA alleles have been linked to susceptibility or protection against epilepsy. Understanding the distribution of these alleles in the context of epilepsy illuminates' population dynamics and genetic ancestry and directly informs disease prognosis and personalised treatment strategies. Comparing our findings with studies on neighbouring or genetically similar populations offers insights into the wider genetic makeup of the region and its relevance for precision medicine. **Conclusion:** This study provides insights into the distribution of HLA alleles in the Iraqi population, serving as a benchmark for exploring the relationship between HLA alleles and epilepsy therapy.

Keywords: Human Leukocyte Antigens (HLA) - Allele frequency- Iraqi population

ORAL ONLINE PRESENTATION

PCS2024-0042

FACTORS ASSOCIATED WITH INCREASED LENGTH OF HOSPITAL STAY IN PAEDIATRIC ASTHMA EXACERBATIONS: A RETROSPECTIVE ANALYSIS OF SINGLE-CENTRE DATABASE

Zainol Johari[1]*, Felicia Cheong Wei En[1], Nurdiana Jamil[1],

[1] Faculty of Pharmacy, University of Cyberjaya, 63000 Malaysia

*Corresponding Author

Email: zainoljohari@cyberjaya.edu.my

Background: Asthma exacerbation is a common but potentially life-threatening event that can occur even in asthmatic children receiving optimal medical management. Exacerbations have been shown to cause adverse outcomes such as increased length of hospital stay. Thus, it is useful to identify factors associated with increased length of stay (LOS) to vigilantly monitor those at risk. Additionally, guideline adherence in managing asthma exacerbations in the pediatric population is vital in delivering safe, effective, and evidence-based care. This study aimed to identify the factors associated with increased LOS in children admitted with asthma exacerbation and assess how well paediatric asthma exacerbation management had adhered to the international guidelines. **Methods:** A retrospective clerking of the patient medical record database was conducted to identify eligible cases for analysis. Cases of children aged five years to 18 years old with physician diagnosed asthma who were admitted between 1 January to 31 December 2022 to a tertiary hospital in Selangor was included into the study. Patients' sociodemographic data, relevant histories, clinical parameters, and management were retrieved from the electronic Health Information System (e-HIS). **Results:** A total of 130 patient cases were included in this study. Asthmatic boys had a shorter LOS (AOR: 0.423 95% CI 0.197 – 0.907, p = 0.027), whereas children with longer duration of asthma had longer LOS (AOR: 2.50 95% CI 1.075 – 5.813, p = 0.033. All patients (100%) were administered short-acting beta-agonist for exacerbation management and were prescribed it for as-needed use upon discharge. However, only 65.4% received systemic steroids, and 86.2% of patients were prescribed inhaled steroids as part of their discharge medication regimen. **Conclusion:** More attention should be paid to children with factors associated with increased LOS and the prescribing of steroids as part of acute exacerbation management and long-term exacerbation prevention.

Keywords: paediatric, asthma exacerbation, guideline adherence

ORAL ONLINE PRESENTATION

PCS2024-0044

RISK FACTORS FOR HOSPITAL READMISSIONS AMONG CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS IN MALAYSIA

Kader Muhammad Kader Ridzwan[1]*, Nurdiana Jamil[1],

[1] Faculty of Pharmacy, University of Cyberjaya, 63000 Malaysia

*Corresponding email: kader@cyberjaya.edu.my

Backgrounds: Chronic obstructive pulmonary disease (COPD) is a leading cause of death in Malaysia. Patients with frequent exacerbation have a faster decline in lung function, limited daily functionality, and increased mortality. Risk factors associated with frequent exacerbation and hospital readmissions should be identified to decrease future risk. **Method:** A retrospective analysis of the electronic medical database was conducted. Cases were selected if patients had repeated hospital admissions for COPD exacerbation within 12 months. Patient demographics, length of stay, interval days between hospitalisations, co-morbidity, smoking status, and medication non-adherence were documented at index admission. Associations of risk factors with the frequency of hospital readmission for COPD exacerbation were evaluated using regression analysis. **Results:** Patients had a mean age of 66.84 years (±11.10), had a history of chronic smoking (73.1%), and had at least one other medical co-morbidity. The majority of the study population (57.7%) had infective exacerbation and had a duration of admission of < 7 days, an interval of 1-6 months from previous admission, and at least one readmission within the past 12 months. Smoking status (OR = 2.75; 95% CI: 1.02 – 7.39; p = 0.045), poor adherence to inhalers (OR = 3.45; 95% CI: 1.39 – 8.58; p = 0.008) and having less than 30 days between previous hospitalisation (OR = 5.8; 95% CI: 1.12 – 31.02; p = 0.036) were associated with increased number of hospital readmission. **Conclusion:** Modifiable risk factors such as smoking and non-adherence to medications should be managed to reduce exacerbations that contribute to increased hospitalisations.

Keywords: Chronic Obstructive Pulmonary Disease, hospital readmission, risk factors

ORAL ONLINE PRESENTATION

PCS2024-0018

ENHANCING THERAPEUTIC APPROPRIATENESS IN COMMUNITY-ACQUIRED PNEUMONIA MANAGEMENT OF HOSPITALISED PATIENTS: A QUASI-EXPERIMENTAL STUDY PROTOCOL

Sahar Elnajjar[1]*, Sabariah Noor[1], Semira Beshir[2]

[1] School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 Malaysia

[2] Department of Clinical Pharmacy, Dubai Pharmacy College, UAE [1]

*Corresponding email: saharelnajjar@student.usm.my

Background: Community-acquired pneumonia (CAP), one of the most significant public health concerns, requires precise and effective management. To optimise therapeutic approaches, this study explores the potential impact of post-prescription review intervention. Since clinical pharmacists play an increasingly important role in healthcare, specifically in infectious diseases, our study will evaluate the influence of their integration into multidisciplinary team and antimicrobial stewardship program on therapeutic appropriateness. The primary objective of this study is to assess the impact of ID clinical pharmacist-led post-prescription review intervention on therapeutic appropriateness in the management of CAP. **Methods:** A single-centre quasi-experimental design utilising interrupted time series analysis will be implemented. Participants will be divided into a control group (receiving standard care without ID clinical pharmacist involvement: pre-phase) and an intervention group (benefiting from ID clinical pharmacist expertise). ID clinical pharmacists will be integrated into the healthcare team, actively participating in post-prescription reviews and contributing to antimicrobial stewardship efforts. Data will be collected prospectively, and outcomes will be compared between the two groups using appropriate statistical analyses. **Expected Results:** Within the intervention group, therapeutic appropriateness is expected to improve significantly. We expect higher rates of adherence to treatment guidelines, increased medication appropriateness, a potential reduction in hospital LOS, lower 30-day all-cause or pneumonia readmission rates, and a decrease in in-hospital mortality. **Conclusion:** These findings would emphasise the positive impact of ID clinical pharmacist-led interventions on CAP management. There are several implications from the expected promising results of this study. It first underlines the critical role of pharmacy professionals in ensuring therapeutic appropriateness, especially those who specialise in Infectious Diseases. The findings can be used to inform healthcare policy and recommend the integration of clinical pharmacists in multidisciplinary teams dealing with infectious diseases. Furthermore, this study builds on development of a new model of collaborative healthcare, emphasising need for further research to validate and generalise these results across diverse healthcare settings. Ultimately, the study's implications extend beyond CAP management, influencing broader strategies for optimising infectious disease treatment protocols.

Keywords: community-acquired pneumonia, infectious diseases, antimicrobial stewardship, clinical pharmacist, therapeutic appropriateness.

E-POSTER PRESENTATION ABSTRACT

E-POSTER PRESENTATION

PCS2024-0014

PREVALENCE AND SUSCEPTIBILITY OF BACTERIAL ISOLATES AT ICU IN A PUBLIC HOSPITAL IN SANA'A YEMEN

Egbal Abdulrahman[1], Amer Hayat Khan[1*], Abdulelah Thabet[2,3], Mohammed Al-tam[2,3], Assel Aldwdahi[2,3], Mohammed Alsana'ani[2,3]

[1]Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences, University Sains Malaysia, 11800 Penang, Malaysia

[2]21 of September University of Medical and Applied Sciences, Sana'a, Yemen

[3]Faculty of Medicine and Medical Sciences, Sana'a University, Sana'a, Yemen

* Corresponding email: dramer@usm.my

Background: In intensive care unit (ICU) patients are more vulnerable to infections, resulting in increasing increased morbidity and mortality. Providing adequate empirical antibiotics for these infections may improve patients' survival outcomes. However, only with a comprehensive knowledge of the local bacterial distribution and resistance pattern can the ensure adequate empirical antibiotics prescription be achieved. So, this study aimed to determine the prevalence and antibiotic resistance of the bacteria isolated from ICU patients in Hospital Sana'a, Yemen. **Methods**: A single-centre, retrospective observational study based on collecting the reports on cultures' reports of ICU patients over one year from January 1 until December 31, 2022. Specimens were collected from blood, urine, sputum, cerebrospinal fluid (CSF), pus and swab. Other sociodemographic and clinical data was gathered from patients' medical records. Statistical Package for the Social Sciences (SPSS) version 28.0 was used for data descriptive analysis. **Results:** The collected sample included 77 growth cultures. Gram-negative bacteria (77.9%) were more predominant than Gram-positive bacteria. The most common pathogen was *Klebsiella spp.* (50.6%) followed by *Pseudomonas aeruginosa* (24.7%) and Staphylococcus aureus (19.5%). Among the isolated bacteria, *S. aureus* showed a high antibiotic sensitivity rate (82.1%). Vancomycin and Levofloxacin showed the highest antibiotic sensitivity to *Staphylococcus aureus* with (as (100%)) and ((90%),) respectively. While, the highest antimicrobial resistance was observed among *Klebsiella Spp.*, that was resistance to cephalosporines, ertapenem and ciprofloxacin. **Conclusion:** Antibiotic resistance bacteria is highly prevalent, especially with gram-negative bacteria, contributing to the overall increase in ICU morbidity and mortality. Further studies may focus on the impact of this resistance on the morbidity and mortality resistance leading to unnecessary and inappropriate use of antibiotics.

Keywords: ICU, Antibiotic susceptibility, Antibiotic resistance

E-POSTER PRESENTATION

PCS2024-0035

PSYCHIATRIC PATIENT'S PERSPECTIVES ON MENTAL HEALTH SERVICES IN A MALAYSIAN TEACHING HOSPITAL: A QUALITATIVE STUDY

Muhammad Afiq bin Sanep[1], Muhammad Ikhwan bin Bkhari@ Bukhari[1], Nurul Aziera binti A Rahim[1], Norny Syafinaz Binti Ab Rahman[1], Nathratul Ayeshah binti Zulkifli[2], Nora binti Mat Zain[3], Mohamad Haniki bin Nik Mohamed[1], Syahrir bin Zaini[1,4]*

[1]Department of Pharmacy Practice, Kulliyyah of Pharmacy, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, 25200 Kuantan, Pahang, Malaysia

[2] Department of Psychiatry, Faculty of Medicine, University Sciences Islam Malaysia, 71800 Nilai, Negeri Sembilan, Malaysia

[3] Department of Psychiatry, Kulliyyah of Medicine, International Islamic University Malaysia, 25200 Kuantan, Jalan Sultan Ahmad Shah, 25200 Kuantan, Pahang, Malaysia

[4] Qualitative Research Group, Kulliyyah of Pharmacy, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, 25200 Kuantan, Pahang, Malaysia

*Corresponding email: syahrirz@iium.edu.my

Backgrounds: Understanding patients' perspectives on the mental health care services they receive is important in improving patient-centred mental health services. Currently, there is still a lack of studies focusing on the qualitative exploration of the topic. This study aims to understand the psychiatric patients' perspectives of the mental health services in a Malaysian teaching hospital, specifically Sultan Ahmad Shah Medical Centre @IIUM (SASMEC @IIUM) through interviews. **Methods:** The study employs a qualitative approach, gathering patient data through individual, in-depth interviews, which are recorded and transcribed verbatim. Face-to-face interviews were conducted using a semi-structured interview guide to collect comprehensive insights of the patients. Data analysis was conducted inductively using Microsoft Word Macros and Microsoft Excel. **Results:** Ten patients of SASMEC @IIUM in Kuantan, Pahang, were recruited by using purposive sampling method, based on the inclusion and exclusion criteria of this study. The patients were recruited because they were above 18 years old, can communicate in Malay or English, has either depression, anxiety, bipolar disorder or stable schizophrenia and currently under treatment of this hospital. Through interviews, three themes emerged from participants' reflections on their experiences, which are: 1) Positive experiences (friendly and understanding staff, improved quality of life, appointments are convenient and sufficient) 2) Negative experiences (long waiting time at the pharmacy, pharmacy closes during lunch hour, lack of drug counselling given by the doctor) and 3) Suggestions for improvement (add more counselling sessions, implement the telemedicine, establish a dedicated pharmacy for psychiatric patients). **Conclusion:** A comprehensive understanding of the perspectives of psychiatric patients regarding mental health services in a teaching hospital had been obtained. By exploring these insights, proper actions can be initiated. In the future, more improvements of these services can be planned to satisfy both service users and providers as well as to ensure the treatment efficacy.

Keywords: patients, perspectives, mental health services

E-POSTER PRESENTATION

PCS2024-0010

INNOVATIVE APPROACHES TO EVALUATE THE EFFICACY OF VARIOUS BIOLOGIC AND TARGETED SYNTHETIC DMARDS IN RHEUMATOID ARTHRITIS PATIENTS IN MALAYSIA: LEVERAGING PREDICTORS FOR LOW DISEASE ACTIVITY.

Nasreh Shamsi Poor Gheshmi[1]*, Amer Hayat Khan[1], Syed Sulaiman Syed Azhar[1]

[1] School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 Malaysia

*Corresponding email: nasreh@student.usm.my

Backgrounds: Rheumatoid arthritis (RA) is a chronic inflammatory disorder characterised by progressive joint deterioration and potential disability in the absence of suitable therapeutic interventions. The goal of RA treatment is the achievement of remission; however, in situations where remission is not possible, pursuing low disease activity (LDA) is a viable option. This study aimed to assess the effectiveness of biologic and targeted synthetic DMARDs in reducing disease severity (DAS28), achieving LDA, and identifying predictor factors influencing the outcomes. **Methods:** A longitudinal observational study was conducted on 270 RA patients who underwent biologic and targeted synthetic DMARDs therapy. Treatment outcomes, defined by reduced disease severity and achieving LDA, were assessed using DAS28 ESR scores. The logistic regression model was used in the study to determine the probability of achieving LDA according to the European League Against Rheumatism (EULAR) response criteria within 12 months of therapy. **Results:** Female predominance (70.7%), Malay ethnicity (51.1%), and a mean age of 54.10 years were noted. DAS28-ESR significantly improved over 12 months; F (2.97, 701.48) =255.91, $p < 0.001$, and 16.7% of patients achieved LDA. Age OR: 0.97, (95% CI: 0.15, 0.89, p=0.01), administration of targeted synthetic DMARDs OR: 0.26, (95% CI: 0.08 to 0.81, p=0.02), concurrent methotrexate use OR: 0.39, (95% CI: 0.16 to 0.95, p=0.03), concurrent other conventional synthetic DMARDs including sulfasalazine, leflunomide, and hydroxychloroquine OR: 0.40, (95% CI: 0.18 to 0.91, p=0.02), erythrocyte sedimentation rate OR: 0.98, (95% CI: 0.97 to 0.99, p=0.04), and pain based on visual analogue scale OR: 1.19, (95% CI: 0.04 to 1.37, p=0.01) were significantly associated with LDA achievement. **Conclusion:** This study highlighted significant improvements in disease severity and achieving LDA among RA patients treated with biologic and targeted synthetic DMARDs. Factors such as younger age, administration of targeted synthetic DMARDs, concurrent use of methotrexate and other conventional synthetic DMARDs, lower erythrocyte sedimentation rate, and pain score significantly influence the likelihood of achieving LDA. These findings highlight the significance of considering various factors in treatment decision-making and emphasise the importance of personalised treatment strategies for optimal outcomes.

Keywords: Rheumatoid arthritis, low disease activity, DMARDs, DAS28 ESR, biologics

E-POSTER PRESENTATION

PCS2024-0021

DEVELOPMENT AND EVALUATION OF MDRO RISK ASSESSMENT TOOL IN ICU SETTING IN THE UNITED ARAB EMIRATES HOSPITALS: A STUDY PROTOCOL

Jumana Mohamed Fouad Al-Salloum[1,2], Sabariah Noor Harun[3*], Subish Palaian[4].

[1] Discipline of Clinical Pharmacy, School of Pharmaceutical, Universiti Sains Malaysia

[2] University of Sharjah, College of Pharmacy. University Hospital Sharjah, UAE

[3] College of Pharmacy and Health Sciences, Ajman University, UAE (0000)

*Corresponding email: sabariahnoor@usm.my

Background: The overuse of antibiotics in healthcare has increased due to the high rate of multi-drug resistant organisms (MDRO) related infections. Identifying the causative organism at the earliest can be achieved using a predictive tool to identify patients at high risk of developing MDRO infection, hence; initiating an appropriate antimicrobial therapy while waiting culture results. This study aims to develop a tool to determine the predictors for developing an MDRO infection in patients admitted to the intensive care unit (ICU), in UAE based population, and validate this tool for its accuracy. **Methods** A total of 384 patients' data will be collected retrospectively in this observational cohort study from two tertiary hospitals in UAE using simple random sampling. Data includes patient demographics, infection type, culture results, history of antibiotics, etc. Univariate analysis will be used to identify the independent predictors of MDRO infection, those variables with a *P* value less than 0.05 will be included in a logistic regression model, and a backward stepwise approach will be used to identify independent predictors of MDRO infection. Then the final regression model will transform into a point-based rule, and each variable will be assigned a weighted score, this score will be obtained by dividing each regression coefficient by half of the smallest coefficient and rounding to the nearest integer. The developed tool will then be tested retrospectively on another sample of patient data for a validation process. **Expected Results:** The prevalence of gram-negative MDRO in the ICU is expected to be approximately 40%, of which ESBL *E.coli* and *Klebsiella pneumonia* will have a higher percentage among other bacteria. The most commonly identified predictors for developing MDRO infection would be a history of antibiotic use in the last three months, recent hospitalisation, and invasive procedures such as mechanical ventilation or haemodialysis. The accuracy of the developed model is expected to be more than 80% to identify high-risk patients. **Conclusion:** Identifying patients with high-risk of developing MDRO infection at the early stage of disease helps select the appropriate antibiotic. Since the tool is built using local epidemiology data, it will accurately detect those patients in the UAE population.

Keywords: MDRO, Predictive tool, Risk Assessment, ICU

2nd PHARMCARE SYMPOSIUM

6th - 8th March 2024

Organised by

USM UNIVERSITI SAINS MALAYSIA

APEX™

UNIVERSITI SAINS MALAYSIA
SCHOOL OF PHARMACEUTICAL SCIENCES

USM PCRG