



28TH FEDERATION OF ASIAN PHARMACEUTICAL ASSOCIATIONS (FAPA) CONGRESS & NATIONAL PHARMACISTS CONVENTION *2022*

PHARMACISTS BUILDING BETTER HEALTH SYSTEMS

NOVEMBER 8 - 12, 2022

KUALA LUMPUR CONVENTION CENTRE
(KLCC)

CERTIFICATE OF APPRECIATION

presented to

Soraya Ismail

for invaluable sharing entitled

Oral Presenter

at the

28th Federation of Asian Pharmaceutical Associations (FAPA) Congress and
National Pharmacists Convention 2022 on 10-12th November 2022
organised by FAPA and Malaysian Pharmacists Society

CPD Points: A5-10



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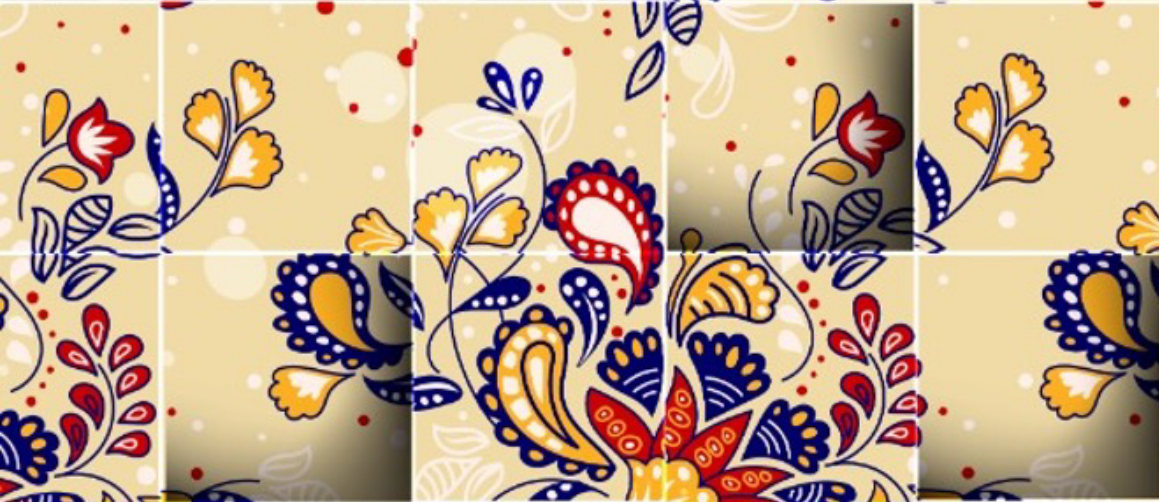
28TH FEDERATION OF ASIAN PHARMACEUTICAL ASSOCIATIONS (FAPA) CONGRESS

& MPS NATIONAL PHARMACISTS CONVENTION

PHARMACISTS BUILDING BETTER HEALTHCARE SYSTEMS

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ABSTRACTS BOOK



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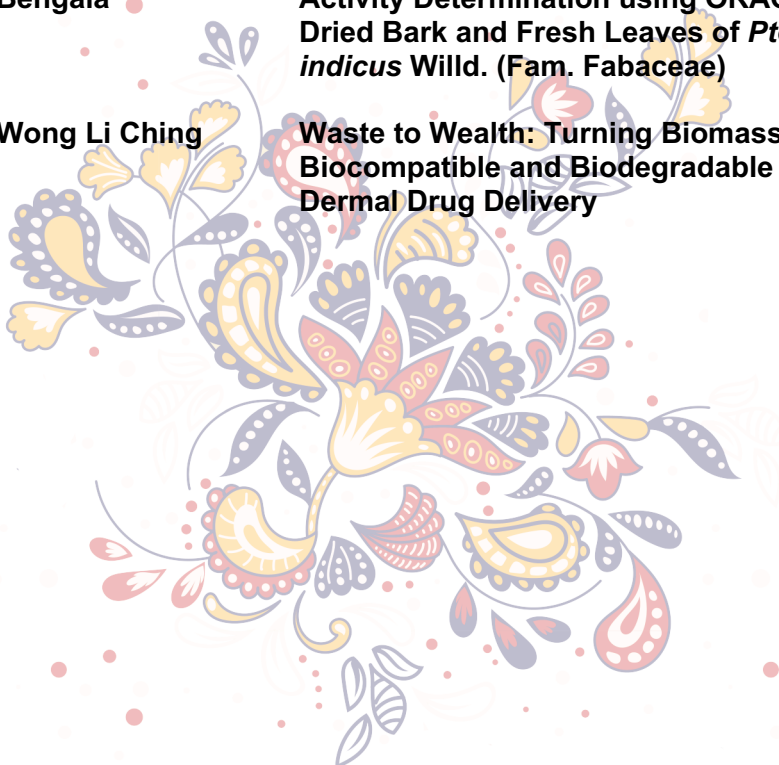
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CO1

Pharmacists' Perceptions on Future Implementation of A Medication Review Service Model in Community Settings: A Qualitative Study Utilising the Consolidated Framework for Implementation Research (CFIR) and the Expert Recommendations for Implementing Change (ERIC) strategy tool

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Background and Objectives: Pharmacists' roles have been evolving to include more patient-centred care services such as medication reviews that help patients receive the most benefits from their medications. In Malaysia, medication review service is yet to be widely implemented in the community pharmacy settings for several reasons, including the non-dispensing separation healthcare system. To implement a feasible medication review service model in Malaysia, it is important to gather community pharmacists' perspectives on such services. Therefore, the present study was conducted to explore community pharmacists' perceptions of barriers, facilitators, and strategies for the implementation of a medication review service model in Malaysia.

Methods: A focus group discussion followed by semi-structured interviews were conducted among purposively sampled community pharmacists with interest in medication review service. A deductive approach was used to generate and analyse the data according to the consolidated framework for implementation research (CFIR). After data mapping, the CFIR-ERIC matching tool was used to generate appropriate strategies according to the barriers identified.

Results and Discussion: Twenty community pharmacists participated in this study. Several barriers and facilitators to service implementation were identified based on the respondents' feedback. The CFIR-ERIC strategies matching tool analysis reported potential plans that can mitigate the barriers such as: identify and prepare champions, conduct local consensus discussions, conduct educational meetings, alter incentive/allowance structures, and develop a formal implementation blueprint.

Conclusion: The findings will guide the development of a medication review service model that is tailored for implementation in community pharmacy settings in Malaysia.





CO2

Role of Community Pharmacist in Cardiovascular Diseases-Related Health Promotion and Dyslipidemia Management in Malaysia: A Cross-Sectional Study

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Background and Objectives: In Europe, cardiovascular disease (CVD) is the primary cause of morbidity and mortality. It is connected to a heavy clinical and financial burden. Similarly in Malaysia, it is found that 64% of Malaysia adults had elevated total cholesterol (TC) and 56.7% with elevated low density lipoprotein cholesterol (LDL-C). Pharmacists in the community are well-positioned to assist patients who have CVD or who are at risk of developing this. Therefore, the purpose of this study was to investigate the current involvement of community pharmacists (CPs) in Malaysia specifically in dyslipidemia management. Their perceived barriers in providing CVD and dyslipidemia services are explored in depth.

Methods: A self-administered survey was sent to all CPs in Malaysia using convenience sampling. The survey was conducted online and being shared in relevant groups involving CPs in Facebook, Whatsapp and Telegram platforms. The data was analysed using descriptive and inferential statistics.

Results and Discussion: A total of 312 CPs took part in the study. Chinese population, CPs with premises located in the urban area, more than one pharmacist available at one shift and completion of dyslipidemia training show significantly higher practice. For CVD-related health promotional activities, more than 50% of the respondents opted for never or rarely in providing educational materials, conducting the risk assessment score and collaborating with other healthcare professionals. For dyslipidemia management, lack of practice was seen in counselling of antiplatelet therapy, referral of patients to dietitians and review of patients' drug history. Lack of access to medical records (71.2%) was the highest perceived barrier encountered by CPs, followed by lack of CVD-related educational materials (70.8%).

Conclusion: Current involvement of CPs in Malaysia is found to be satisfactory and can be improved. Support and strategies can be implemented effectively in the near future to increase the involvement of CPs in CVD prevention.





CO3

A Survey of the Adoption and Perception of Mobile Health Applications Among Community Pharmacists in Malaysia

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Background and Objectives: Mobile health applications are one of the most accessible health technologies that will play an integral role in the future of healthcare. Community pharmacists are key stakeholders in promoting mHealth applications among the general public, therefore understanding their adoption and perception of these applications is key in shaping the integration of these technologies into healthcare systems. In this study, we determine the adoption and perception towards mHealth applications of community pharmacists in Malaysia.

Methods: A cross-sectional survey was conducted with 300 community pharmacists practising in the Klang Valley, Malaysia using a stratified sampling approach and a self-administered questionnaire. The questionnaire included three sections: demographic characteristics, adoption of mHealth applications, and perception towards mHealth applications. Descriptive and inferential statistics together with factor analysis were utilised for data analysis.

Results and Discussion: The adoption of mHealth applications among respondents overall was high at 79.7%. However, among these mHealth application users only 65.7% recommended them to their patients. Respondents showed a higher usage of mHealth applications in the literature category, followed by patient monitoring and personal care. Respondents mainly recommended applications in the personal care and communication with healthcare professionals category to patients. Factor analysis revealed the most influential factor driving mHealth application adoption was positive perception towards mHealth applications aspects related to professional practice. This was significantly higher than perception towards other aspects of mHealth such as patient care, mHealth application features, and reliability of mHealth applications.

Conclusion: The overall adoption of mHealth applications is high among community pharmacists. However, community pharmacists are more likely to utilise mHealth applications for their own professional practice and less likely to recommend them to patients. Improving the perception of mHealth applications in aspects of patient care and reliability may help improve community pharmacists' promotion of mHealth applications among the general public.



A Scoping Review of Practices, Barriers and Facilitators in Providing Pre-travel Health Services by Community Pharmacists

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Background and Objectives: There is a growing involvement of community pharmacists (CPs) in the provision of pre-travel health services due to (i) rising number of international travellers; (ii) increased risk of travel-related illnesses; and (iii) expansion of pharmacists' scope of practice in certain countries. To enhance CPs' provision of quality and effective pre-travel health services, a better understanding of the practices and the relevant determinants (barriers and facilitators) is required. This scoping review aimed to identify and describe the practices, barriers and facilitators of pre-travel health services provided by CPs.

Methods: The PubMed, Science Direct, Scopus and Web of Science databases were searched for English language studies reporting CPs' practices, barriers, and/or facilitators to provide pre-travel health services that were published up to February 2022. A manual search of articles in prominent journals on travel medicine, Google Scholar and reference lists of included studies were also undertaken. The 14 domains of the Theoretical Domains Framework (TDF) were used to characterize the identified barriers and facilitators, and to guide the interpretation of the results.

Results and Discussion: Eleven studies were included in the review. The identified practices were related to pre-travel health advice (n=9), and pre-travel health services with interventions of prescribing and/or vaccination (n=2). Identified TDF domains for both the barriers and facilitators were "knowledge", "skills", "beliefs about capabilities", "environmental context and resources", and "social influences". The other identified barriers were "reinforcement" and "behavioural regulation". While other facilitators were "social/professional role and identity", "optimism", "beliefs about consequences", "intentions", and "emotions".

Conclusion: The pre-travel health services provided by CPs were diverse. The barriers and facilitators can be categorized into 12 TDF domains that are relevant at practitioner and organizational levels. Relevant bodies that are interested in promoting pre-travel health services by CPs may use the findings from this study to guide strategies in improving the scope of practice of travel medicine in the community pharmacy setting.

A Community Pharmacist-led Smoking Cessation Intervention using A Smartphone App (PharmQuit): A Randomized Controlled Trial

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Background and Objectives: WHO supports the harnessing of mobile technologies to improve access to smoking cessation services. As such, this study evaluated the effectiveness of smoking cessation services provided by community pharmacists using PharmQuit compared with standard care.

Methods: The study was a prospective, multicenter, randomized controlled trial that included 156 participants who were 18 years or older and smoked at least one cigarette daily for a month, were ready to quit, willing to participate, and had a smartphone. The study was performed at seven community pharmacies in three provinces in Thailand. Participants were allocated to the intervention (n=78) and control groups (n=78). Both groups received the usual smoking cessation services with pharmacotherapy and counseling from community pharmacists for 6 months. The intervention group received PharmQuit as an additional service. Both groups were scheduled for follow-up visits on days 7, 14, 30, 60, 120, and 180. The primary outcome was continuous abstinence rate on day 180. The secondary outcomes included 7- day point abstinence rate, number of cigarettes smoked per day, exhaled carbon monoxide levels, adherence rate to the program, and satisfaction with PharmQuit. An analysis using the intent-to-treat principle was performed.

Results and Discussion: Smoking cessation rates and the number of cigarettes smoked per day were significantly higher during the follow-up visits in both groups ($p < 0.05$). However, there were no statistically significant differences between the two groups. The adherence rate to the smoking cessation program was higher in the intervention group than in the control group (74 days vs. 60 days, $p > 0.05$).

Conclusion: The results showed the benefits of the contribution by community pharmacists. Although the inclusion of PharmQuit did not yield better results than pharmacists' counselling alone, it may help to obtain better adherence to smoking cessation programs.

Investigating Pharmacy Value-Added Services (PVAS) in Community Pharmacies: A Study in Urban and Suburban Areas of Perak, Malaysia

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Background and Objectives: Community pharmacies monitor and deliver health services to the community, apart from dispensing medications. PVAS are extended services provided to enhance pharmaceutical care. At present, digital technology is also needed as a platform for PVAS. This study was conducted to investigate the PVAS available in community pharmacies, to identify the practice differences in urban and suburban areas, and to identify the pharmacists' readiness to use digital technology.

Methods: This cross-sectional study was conducted face-to-face and via online. Validated-questionnaire consisted of three-parts, was distributed to community pharmacists (CPs) in urban and suburban areas of Perak. Survey-link was provided either via email or posted to social media. Paper-based survey was given to the CPs at the premise. Sample size was calculated using Raosoft Software. Data were analysed using SPSS V.20 descriptively.

Results and Discussion: Sixty-one (N=61) CPs responded; female (57%), age 36-40 years-old (29%), and Malays (44%). The most provided PVAS are health screening (100%), supplement-TCM consultation (79%), and diet-lifestyle counselling (77%). CPs also provide counselling for smoking cessation (36%) and weight management (44%). Eighty-five percent of CPs in urban areas used digital technology as a platform for PVAS. For readiness to use technology, only 49% of the CPs were ready. Home delivery (51%) and mobile pharmacy (40%) were chosen as the most appropriate PVAS.

Conclusion: No significant difference was found between PVAS provided by urban and suburban pharmacies. Although the CPs in urban areas prefer digital technology for certain PVAS, most of the CPs are already prepared with knowledge and budget for new future-PVAS.

Evaluation of Anticoagulation Control in Patients with Atrial Fibrillation

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Background and Objectives: Time in therapeutic range (TTR) measures the stability of the international normalized ratio (INR) in patients on warfarin therapy. Low values are associated with poor outcome. This study aims to evaluate the warfarin treatment for atrial fibrillation (AF) by determining the TTR and the significant predictors that affect the TTR control.

Methods: In a retrospective observational study, all patients with AF attending follow-up in Warfarin Clinic, UKM Medical Centre from January 2020 until June 2021 were reviewed. The collected data includes patients' demographics and their clinical characteristics which were retrieved from INR's booklet and electronic medical record (C-HEtS, Medipro®).

Results and Discussion: Seventy-three patients who met the inclusion criteria were included in this study. Binary logistic regression was carried out to identify the significant predictors of TTR. The calculated mean TTR were 52%, (SD 24.97%). Of the included patients, 60.3% (n=44) were in the poor control category. The results of binary logistic regression revealed that the significant predictors of TTR control were age (OR 0.92; 95% CI: 0.86-0.99; p = 0.024) and number of medications (OR: 1.17; 95% CI: 1.02-1.35; p = 0.025). Younger age and increased number of medications leading to poor TTR values presumably due to poor adherence.

Conclusion: Since majority of patients under Warfarin Clinic follow-up had poor TTR control, it is necessary for patients to be well-educated and understand the importance of adherence through counselling in order to maintain good INR control.

Perceived Barriers to the Implementation of Pharmaceutical Care Before and During COVID-19 Pandemic among Pharmacists in Selected DOH Hospitals in Metro Manila, Philippines

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Background and Objectives: The coronavirus disease or COVID-19 continues to wreak havoc in the Philippines, making it one of the worst-affected countries in Asia. However, even before the world-wide health crisis, pharmacists already played an important role in patient care. A recent study concluded that pharmacists have stepped into new roles and played a key role during the COVID-19 pandemic. Thus, the study aims to enumerate the roles of hospital pharmacists and be able to compare these responsibilities before and during the COVID-19 pandemic. The study only focused on the two most relevant roles of hospital pharmacists in the Philippines - dispensing and patient and medication counseling.

Methods: The study was conducted within the fourteen (14) participating Level 3 Department of Health (DOH) hospitals in Metro Manila, Philippines using a quantitative, cross-sectional, non-experimental methodology. Participants were requested to answer a questionnaire using google application. Descriptive statistics, mean and standard deviation were used to present the data. In order to compare the perceived barriers to implementation of pharmaceutical care before and during COVID-19 pandemic, mean scores under each category of barriers were subjected to t-test and ranked accordingly.

Results and Discussion: It was found that before the COVID-19 pandemic, almost all barriers were disagreed by the respondents on both their patient counseling and dispensing roles. Meanwhile, during the pandemic all these barriers were found to be relevant on both roles. The most predominant barriers being lack of training and counseling as a time-consuming process for patient counseling; whereas, the tone and voice modulation and lack of recognition to pharmacists was found to be most relevant barriers in dispensing.

Conclusion: There is a significant difference in the perceived barriers in the implementation of pharmaceutical care before and during the COVID-19 pandemic, which only means that during the world-wide health crisis, the role of hospital pharmacists is significantly challenged.

Prediction of Aspirin Induced Gastric Toxicity and Resistance in Rats Using NMR-Based Pharmacometabonomics

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Background and Objectives: Low Dose Aspirin (LDA) is the cornerstone of secondary prevention in coronary artery disease (CAD). Despite its established efficacy, it suffers a major setback of causing gastrointestinal toxicity. In addition, some patients still experience atherothrombotic events while on aspirin secondary prophylaxis, a term known as aspirin resistance. The aim of this project was to evaluate the use of pharmacometabonomics, in finding metabolites that can predict aspirin-induced gastric toxicity and aspirin resistance in rats.

Methods: Pre-dose models were developed using H-NMR spectroscopic data from the biofluids of Sprague Dawley (SD) rats and the respective class identities of the rats. The class identities were either gastric toxic versus non-gastric toxic or aspirin resistant versus aspirin sensitive. Approximately, 300 μ l of rat serum and an equal volume of phosphate buffer were mixed and analysed using nuclear magnetic resonance (NMR) spectroscopy. The spectra were subjected to multivariate statistical analysis including principal component analysis and orthogonal-partial least square discriminant analysis and the discriminating metabolites were identified using metabolomics database.

Results and Discussion: The multivariate statistical analysis, from which the models were developed, showed a significant separation between the two classes in each case. Pre-dose pharmacometabonomic serum analysis identified valine, lactate, acetoacetate and pyruvate as biomarkers for aspirin-induced gastric toxicity. Meanwhile, lactate, trimethylamine N-oxide and 4-hydroxyphenylacetate were identified as biomarkers for aspirin resistance. The AUROC were 0.988 and 0.874 respectively for gastric toxicity and resistance discriminations.

Conclusion: NMR-based pharmacometabonomics has good potential to identify biomarkers to predict aspirin induced gastric toxicity and aspirin resistance. This technology known as precision medicine can be used to predict aspirin response on different individuals even before starting the therapy.





HO4

A Study on Adverse Effect Induced by Chemotherapy Drug Used For Colorectal Cancer and Their Management in Nepal Cancer Hospital and Research Center

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Background and Objectives: Colorectal Cancer (CRC) is the third most common malignancy and second most leading cause of death globally. The main objective of this study was to study various types of adverse drug reactions (ADRs) associated with chemotherapy administered in CRC in one of the cancer hospitals of Nepal.

Methods: A retrospective observational study was conducted at the Nepal Cancer Hospital and Research Centre in patients who visited from January 2020 to December 2021 for the treatment of colorectal cancer. Patient who met the study criteria were enrolled in the study and the data was collected from their case records. The ADRs reported were noted down and management of such ADRs were taken into account.

Results and Discussion: A total of 90 patient received chemotherapy, out of which ADRs were observed in 90% (n=81). There were in total 381 ADRs recorded among them. Common regimen administered for treatment of CRC were 5FU/LV, FOLFOX, CAPOX and Oral Capecitabine. Infection (55.6%) and diarrhea (51.9%) were the most prevalent ADRs in CRC patients receiving chemotherapy. Older population showed more ADRs compared to younger (P=0.05) and oral capecitabine reported less ADRs when compared to other chemotherapy regimen. Severe ADRs were seen in 38.3% (n=31) patients that included mainly diarrhea (n=14) and sepsis (n=9). Most of the severe ADRs led to prolonged hospitalization. Majority of the ADRs were managed symptomatically and only in severe or hypersensitivity cases the chemotherapy regimen was changed or stopped.

Conclusion: ADRs are inevitable with chemotherapy administered. Health care professionals including pharmacists can play an important role in detection and management of ADRs. Proper monitoring of patients on chemotherapy, timely detection and prevention of ADRs can be critical step in enhancing quality of life of CRC patients. Interventional studies aiming to improve detection and reporting of such ADRs is recommended.



Assessment of Patient Safety Culture among Healthcare Providers in A Tertiary Hospital at Johor Bahru, Malaysia

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Background and Objectives: Patient safety culture is the combination of attitudes and behaviors toward patient safety that are addressed when a patient walks into a healthcare institution. The objectives of the study were to identify the current status of patient safety culture and to evaluate and correlate the healthcare providers (HCPs) knowledge, attitude, and perception of patient safety culture in tertiary hospital settings.

Methods: A cross-sectional study was carried out among the HCPs of a tertiary hospital in Medini Johor. A structured validated questionnaire which includes Hospital Survey On Patient Safety Culture (HSOPSC) was used in this study to analyse the level of patient safety culture in the study settings.

Results and Discussion: A total of 100 HCPs were approached and only half of them (50%) responded to this online survey and the response rate was 50%. The overall patient safety grade was rated as very good or excellent by 31 (62%) respondents. Around 42% (n=21) of the respondents believed that the staff in the unit worked more hours than was ideal for patient care. The study revealed that feedback and communication about errors were good in this study setting, whereas staffing and non-punitive response to error require improvement in terms of patient safety culture.

Conclusion: HCPs in this study setting had favourable attitudes toward the culture of patient safety in their organization. Every healthcare organization should address the issue of safety culture holistically.

Insulin Needle Disposal Practices among Diabetes Patients from Health Clinics in Northern Peninsular Malaysia

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Background and Objectives: As type 2 diabetes mellitus (T2DM) progresses, uncontrolled blood glucose requires the use of insulin for better T2DM management. The risk of spreading diseases including hepatitis B, hepatitis C, HIV, and other blood-borne illnesses rises due to improper insulin needle disposal. The study aimed to assess the practices of insulin needle disposal among type 2 diabetes mellitus patients in Northern Peninsular Malaysia.

Methods: A validated Malay questionnaire was used to collect data from Penang, Kedah and Perlis health clinics. It was a cross-sectional study conducted from March 2021 to May 2021. T2DM patients using insulin were recruited for the study, and the subjects were required to fill in the questionnaire. According to United States Food & Drug Administration (USFDA), used insulin needles should be disposed of in a puncture-resistant container.

Results and Discussion: Three hundred and twelve subjects were recruited in this cross-sectional study. Insulin needle disposal practices among T2DM patients were poor since the majority of them disposed of the needles in improper sites.

Conclusion: The study showed that most subjects had poor insulin needle disposal practice. These findings reflect the bad insulin disposal practices among T2DM patients in Northern Peninsular Malaysia.

Herbal Medicine Tool: Identifying Herbal Users among Malaysian Women

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Background and Objectives: The use of herbal medicine is gaining popularity among women to prevent and manage diseases. Many believe herbal medicines are safe but are reluctant to disclose its use to their healthcare professionals. With the lack of disclosure, appropriate herbal counselling by healthcare professionals remains challenging. Therefore, the current work aims to develop and validate a tool to predict herbal users among adult Malaysian women.

Methods: The questionnaire-based study was performed among adult women who understood either Malay or English to assess sociodemographic data and characteristics of herbs used. Incomplete questionnaires were excluded. A simple and multiple logistic regression was performed on two-thirds of the data. Score-values were then assigned based on significant factors. Score-values were then compared with logistic regression-values in the remaining one-third of the data for validation.

Result and Discussion: A total of 1435 respondents were included. The most common herbal medicines used were raw herbs (n=439, 65.4%), followed by commercial herbs (n=220, 32.8%). The developed model based on two-thirds of the data (n=957, 66.7%) demonstrated that Malays, married women, employed and a monthly income of less than MYR3000 was associated with herbal use ($\chi^2=235.9$, $df=6$, $p<0.001$), in which beta-values were used to assign scores. The developed score-values of the significant factors demonstrated an area under the receiving operator curve (ROC) of 0.751. Validation of score-values on one-third of the data (n=478, 33.3%) demonstrated an area under the ROC of 0.765. It was demonstrated there was no significant difference between the two models ($p=0.302$), demonstrating that the model was acceptable.

Conclusion: The tool predicts high risk herbal users among Malaysian women. Healthcare professionals, in particular pharmacists, may find the tool easy to use and may facilitate appropriate education of herbal medicine, better coordination of care, reduce unwanted adverse effects and lead to better patient outcomes.



Post-prescription Review and Feedback: A Tertiary Hospital Experience

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Background and Objectives: Antimicrobial resistance (AMR) has proven to be a global health concern that threatens individual lives at mounting cost to the healthcare system and urgent AMR control measures must be taken to curb this growing crisis. To gate-keep antimicrobial usages in medical institutions, antimicrobial stewardships programs (AMS) have been introduced with proven positive impact on antibiotic utilization, improving patient outcomes and decreasing adverse effects. One of the important AMS strategies in controlling AMR is through post-prescription review and feedback (PPRF) that allows the attending clinicians to prescribe any empirical antibiotic regimen as they consider necessary for the patient. This study aims to describe how incorporating a PPRF strategy into a hospital AMS program impacts antibiotic consumption in a specialist centre.

Methods: This retrospective cross-sectional study was conducted at a tertiary hospital in Sabah, Malaysia from July 2019 to December 2019. Data collection forms were used to compile information such as patient's demographic characteristics, type and indication of antibiotic used as well as intervention provided by the AMS team.

Results and Discussion: 538 patients receiving the listed antibiotics were included in the study with a total of 847 reviews made throughout the 6-month intervention period. It took an average (SD) of 2.5 ± 2.3 days for the AMS team to conduct a PPRF review after an antibiotic was initiated by the respective primary team. The overall consumption of antibiotics in DDD/1000 patient days was remarkably reduced by 56.31% (316.23 vs 138.15 DDD/1000 patient days) between the intensified PPRF intervention period in July to December of 2019 as compared to before the intervention period in 2018 ($p < 0.001$).

Conclusion: An intensified PPRF strategy coupled with a dedicated AMS team was associated with reduction in antibiotic consumption and warranted further studies on the impact of PPRF on patient's outcome.

Health-related Quality of Life and Adjustments of Medications among Patients with Chronic Kidney Disease: A Multicentre, Retrospective Cohort Study

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Background and Objectives: Chronic kidney disease (CKD) is a major public health problem, which usually involves complex management, including inevitably complex medication regimens among CKD patients. The challenges of self-management, and adjustments to medications might possibly affect CKD patients' health-related quality of life (HRQoL). This study aims to investigate the association between medication adjustments with HRQoL in CKD patients.

Methods: This multi-centre retrospective cohort study recruited adult CKD patients in three Malaysian tertiary hospitals with specialist nephrology care. HRQoL data were collected using the KDQOL™-36 questionnaire. HRQoL was considered as poor if any of the 5 HRQoL measures scored below one standard deviation (SD) from the mean of the cohort. The clinical data, including adjustments to medications over the past 3 years, were collected via a combination of electronic and paper medical records. Association between adjustments to medications and HRQoL was further examined (by adjusting with possible confounders) using multiple logistic regression. Statistical analysis was performed using SPSS Version 23.

Results and Discussion: Of 90 participants recruited, most had baseline CKD Stages 3b and 4 (n=20, 22.2% respectively) and median age of 52.5 (23 to 82) years. The mean (SD) of medication adjustments over the study period was 13.8 (13.3). Poor HRQoL was found in 46 patients (51.1%). While no association was found with the number of medications, poor HRQoL was significantly associated with number of medication adjustments (adjusted odds ratio [aOR] 1.072, 95% confidence interval [CI]: 1.030, 1.116) and diabetes (aOR 3.177, 95% CI: 1.193, 8.457), after adjustment for potential confounders.

Conclusion: Poor HRQoL was found to be associated with adjustments of medications in CKD patients, in addition to diabetes morbidity. Therefore, additional multidisciplinary support pertaining to medication management might be beneficial to these CKD patients to reduce the negative disease outcomes associated with poor HRQoL.

Pharmacists' Virtual Consultations for Diabetes Patients in Malaysia: Impact on Medication Adherence and Glycaemic Control

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Background and Objectives: Virtual consultation is an alternative platform for providing pharmaceutical care for chronic disease patients mainly during the COVID-19 pandemic where physical visits to hospitals and health clinics were restricted. This study investigated the outcomes of virtual consultations by pharmacists on diabetes patients undergoing the Diabetes Medication Therapy Adherence Clinic (DMTAC) follow-up.

Methods: This was a prospective study involving 17 hospitals from all the states in Malaysia from April to September 2020. Type 2 diabetes patients attending the DMTAC clinic for more than one year and having either a telephone or mobile phone were included. Those with poor phone line connectivity, language barrier, and unconducive environment for virtual consultation were excluded. Pharmacists provided virtual consultations at least two times between physical visits at baseline and six months. Data were analyzed descriptively and statistically using SPSS Version 26.0.

Results and Discussion: The 65 subjects included had a median age of 58.0 [48.0 – 65.5] years. Poor medication adherence (21.2%), poor understanding of medication instructions (18.2%), and inability to adjust insulin doses (16.7%) were the main pharmaceutical care issues that warranted pharmacists' interventions during the virtual consultations. Subjects' Malaysia Medication Adherence Assessment Tool (MyMAAT) score improved significantly from 51.0 [45.5 – 57.8] at baseline to 54.0 [52.0 – 57.0] after six months ($p < 0.05$). This translated into significant improvements in glycaemic control indicated by an HbA1c reduction of 1.3% from 9.2% [7.8 – 10.4] at baseline to 7.9% [7.5 – 9.6] after six months ($p < 0.05$). Hypoglycemia present at baseline resolved in the majority (83.7%) of the patients in the sixth month.

Conclusion: The virtual consultations by DMTAC pharmacists resulted in improved medication adherence and glycaemic control for type 2 diabetes patients. This approach should be adopted to complement physical pharmacist follow-ups and would ensure a sustained pharmaceutical care delivery.



HO11

A Systematic Review and Meta-analysis of Dabigatran Peak and Trough Concentration in Adults

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Background and Objectives: Dabigatran etexilate is an oral direct thrombin inhibitor used in preventing thromboembolism in patients with atrial fibrillation and several other conditions. Routine dabigatran concentration monitoring is not recommended in clinical practice; however, measurement of dabigatran concentration may be required in several conditions. This study aims to pool the peak and trough dabigatran concentration from real world studies. A systematic review was performed to identify studies that measured the peak and trough dabigatran concentrations.

Methods: Observational studies reporting dabigatran peak or trough concentrations and patients' clinical characteristics of either gender, age or weight were included. Random-effect meta-analyses and meta-regression were conducted to pool dabigatran concentrations and to identify the correlation between factors affecting dabigatran concentrations.

Results and Discussion: Fifteen studies with a total of 1,226 patients were included. The pooled peak dabigatran concentration was 133 ng/mL (95% CI: 113-154, $I^2 = 86%$, $n=655$), while the pooled dabigatran trough concentration was 80 ng/mL (95% CI: 69-91, $I^2 = 93%$, $n=1,010$). Meta-regression analyses suggested that age is significantly correlated to trough concentration, while body weight and creatinine clearance significantly correlated to peak concentration. Subgroup results revealed that dabigatran concentration when measured with LC-MS/MS was higher than Hemoclot Thrombin Inhibitor (HTI) assay.

Conclusion: Several guidelines have proposed dabigatran concentrations target range and the pooled dabigatran concentrations were in line with the suggested range. Further studies to correlate dabigatran concentrations and clinical outcomes is warranted to improve the safety and efficacy monitoring of dabigatran therapy.



The Impact of Pharmacist-Managed Titration Clinic (PMTTC): A Pilot Study

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Background and Objectives: The key to reduce morbidity and mortality of cardiovascular disease is by having an ACE inhibitor (ACE-I) or Angiotensin Receptor Blocker (ARB) and beta-blockers commenced promptly in the treatment management. Nonetheless, these drugs are often not prescribed, or doses are not optimized. One strategy to improve this is by involving the pharmacist to optimize the medication management. The aim of this study was to evaluate the impact by determining the proportion of patients on target or maximum tolerated ACE-I (perindopril) and beta-blocker (bisoprolol) doses, their blood pressure and heart rate in the Pharmacist-Managed Titration Clinic (PMTTC) versus General Medical Clinic (GMC) managed by the physician.

Methods: This was a prospective study involving patients who attended the clinic from May 2019 until March 2020. 16 patients are screened in the ward during their admission due to cardiovascular disease by the pharmacist. Patients must at least be on 2 doses of perindopril and bisoprolol and doses are not yet maximized. They are compared to 16 patients who attended the GMC through simple random sampling.

Results and Discussion: At baseline, mean blood pressure systolic, diastolic, heart rate, doses of beta-blocker and ACE-I/ARB in both groups were similar. In PMTTC, mean blood pressure systolic was 118 ± 17.4 mmHg compared to 135 ± 15.3 mmHg for GMC ($p < 0.05$). Mean diastolic blood pressure for PMTTC was 74 ± 12.6 mmHg compared 81 ± 11.6 mmHg ($p > 0.05$). Mean heart rate was 69 ± 10.5 bpm in PMTTC versus 78 ± 5.9 bpm in GMC ($p < 0.05$). Mean dose for bisoprolol was 5 ± 3.3 mg in PMTTC versus 2.7 ± 1.72 mg in GMC ($p < 0.05$). Mean dose for perindopril was 4 ± 2.7 mg in PMTTC versus 2.8 ± 2.1 mg in GMC ($p > 0.05$).

Conclusion: This study demonstrates the beneficial impact of PMTTC in terms of improvement of blood pressure, heart rate and optimisation doses of ACE-I/ARB and beta-blocker for cardiovascular disease medication management.



HO13

An Intervention in Reducing Inhaled Corticosteroid- Induced Local Adverse Events among Asthmatic Patients – A Pilot Study.

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Background and Objectives: Since 2019, GINA has recommended inhaled corticosteroid (ICS) as first-line therapy for all asthmatic patients. Regular use of ICS leads to local adverse events (LAEs) in oropharyngeal areas that may compromise asthma control. Current practice to remove deposited ICS fraction is using the standard mouth rinsing (SMR) method after using an ICS inhaler. This study introduced “immediate diet in addition to standard mouth rinsing (ID-SMR).” The objective is to compare the use of the ID-SMR method with the SMR method in reducing the occurrence of ICS-induced LAEs and improving asthma control.

Methods: Participants were randomly assigned to the control arm (SMR) and interventional arm (ID-SMR) with a 1:1 ratio to complete four visits at the one-month interval. The participant was instructed to apply the SMR method in the control arm. For the interventional arm, the participant was instructed to have food within 5 minutes after applying the SMR method. During each visit, participants were interviewed on incidences of LAEs and asthma control levels were assessed.

Results and Discussion: 12 participants per arm completed this study. At the last visit, participants with ≥ 1 LAEs in the control arm were significantly higher ($p < 0.05$) than in the interventional arm. Similar improvement was observed in participants with well asthma control from the baseline visit to the last visit, with a non-significant difference between the two arms.

Conclusion: As compared to the SMR method, the ID-SMR method can effectively minimize the occurrence of LAEs, but does not show better improvement in asthma control.





HO14

Comparison of Eight Methods for Estimation of Creatinine Clearance in Patients with Unstable Kidney Function – A Multi-center, Prospective, Observational Study from Malaysia.

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Background and Objectives: Estimation of creatinine clearance (Clcr) has long been a problem in critically ill patients with unstable kidney function. The commonly used methods like Cockcroft-Gault method requires a stable kidney function. A reliable and more accurate tool is needed in the estimation of Clcr to guide drug dosage adjustment. The study aimed to compare the eight methods to estimate Clcr with measured Clcr. In addition, the study also aimed to determine the agreement between estimated Clcr with measured Clcr.

Methods: This was a multicentre, prospective, observational study. Three intensive care units in Malaysia tertiary public hospitals. Two serum creatinine samples over 24 hours apart and simultaneously 24 hours urine collection. This study was approved by the Malaysian medical research ethical committee (MREC) – NMRR-16-736-29621 (IIR).

Results and Discussion: A total of 43 patients were recruited. During the early phase of unstable kidney functions (regardless of acute deteriorating or acute improving), only the modified Cockcroft-Gault method showed non-significant different with the measured Clcr ($p = 0.741$). A sub-set analysis on 23 patients with acute deteriorating kidney functions was performed. Only the modified Cockcroft-Gault revealed non-significant different with the measured Clcr ($p = 0.843$). Sub-set analysis performed on 20 patients with rapid improving kidney functions, the Chiou method greatly underestimated the Clcr by approximately 34%, $p < 0.001$. Bland-Altman analysis revealed that Clcr estimated with modified Cockcroft-Gault method showed agreement to measured Clcr, $p > 0.05$.

Conclusion: Owing to the precision of estimation and the consistency (reproducibility) as well as the simplicity of modified Cockcroft-Gault method, it should be the reliable method to assess renal function in critically ill patients with unstable kidney function



Exposure to Potentially Harmful Excipients in Medications among Neonates at A State Hospital in Malaysia

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Background and Objectives: Medicines may contain potentially harmful excipients (PHE) which are toxic to neonates. The extent of PHE exposure among neonates in Malaysia remains unknown. This study aimed to determine the incidence, types and predictors of PHE exposure among hospitalized neonates.

Methods: A prospective observational study was conducted from March to April 2022 in neonatal wards at Hospital Melaka. All neonates receiving at least one medication were randomly selected. Medical and medication related data were retrieved from patients' medical records. The PHEs of interest were aspartame, benzalkonium chloride, benzyl alcohol, benzoic acid or benzoates, ethanol, parabens, polysorbate 80, propylene glycol, saccharin sodium, sorbitol and sulphites. Product information leaflets (PILs) and summaries of product characteristics (SPCs) were referred to obtain information on active pharmaceutical ingredient, strength, trade name as well as type and amount of the excipients.

Results and Discussion: A total of 108 neonates were recruited and 97.2% of them were exposed to at least one PHE. The high incidence of PHE exposure in neonates is similarly seen in other countries worldwide. Parabens (47.2%) and sulphites (27.5%) were the two most commonly administered PHEs. Benzyl alcohol is contraindicated in neonates but was administered to 8% of neonates in this study. The median daily dose of ethanol (24.11 mg/kg/day, IQR 19.73, 28.49) exceeded the acceptable daily intake (ADI) by four times. However, the dose was not available for all PHEs as this information is not always available in the PIL or SPC. Administration of cardiovascular drugs was associated with a higher risk of exposure to any PHE (OR 6.38, CI 2.75, 14.79, p-value < 0.001).

Conclusion: The exposure of PHE among neonates in this study is high with certain PHEs exceeding the ADI. It highlights the need for certain strategies to be implemented to reduce such exposure in neonates.



HO16

Antiseizure Medication Prescribing: A Glimpse of Current Practice in A Ministry of Health Tertiary Care Centre

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Background and Objectives: Antiseizure medication (ASM) is the mainstay of treatment for epilepsy patients. Throughout the years, new ASMs were approved to be registered by Ministry of Health, Malaysia. This study aims to determine the current prescribing practice of ASM in a tertiary care centre.

Methods: All prescriptions containing at least one ASM from 1 January 2019 to 31 December 2021 were preliminary screened for eligibility. Samples were randomised using stratified sampling method according to the portion of ASM usage. Each of the subject's follow up card was retrospectively review and all relevant data was recorded.

Result and Discussion: A total number of 260 patients were included for analysis. The commonly prescribed ASM monotherapy for initial management of epilepsy was sodium valproate (50.4%), followed by carbamazepine (8.1%), phenytoin (8.1%) and levetiracetam (4.6%) across all seizure types. For initial management, sodium valproate and phenytoin (7.7%) was the most common ASM combination followed by sodium valproate and carbamazepine (4.2%). At maintenance, polytherapy (54.6%) was prescribed more often compared to monotherapy (45.6%) with the combination of sodium valproate and levetiracetam tops the polytherapy prescribing (10%). Majority (95.4%) have at least one concurrent medications with 38.5% of the patients have only folic acid tablet being co-prescribed. Half of the patients (50.6%) have their ASM being monitored for serum concentration within the recent period.

Conclusion: Sodium valproate remains the drug of choice as initial as well as maintenance therapy for most seizure types. The role of levetiracetam in the treatment of epilepsy whether as mono- or polytherapy has become more prominent in line with its approval by Ministry of Health over the last decade. Newer agent such as zonisamide is still being sparingly prescribed. A nationwide study is warranted for better insights into overall ASM prescribing in government healthcare centres.



Assessment of Anticoagulation Control, Bleeding, and Thromboembolic Complications in Anticoagulation Medication Therapy Adherence Clinic (ACMTAC) Service in Malaysia

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Background and Objectives: The risk of thromboembolic events must be balanced against the risk of bleeding while using warfarin as an anticoagulant. Time in therapeutic range (TTR) is an important assessment for evaluating the quality of anticoagulation treatment because it has been proven to be associated with bleeding and thromboembolic events. In Malaysia, the pharmacist-managed Anticoagulation Medication Therapy Adherence Clinic (ACMTAC) service is used for follow-up and dosage control of warfarin. To evaluate degree of anticoagulation control, bleeding complications and thromboembolic events from the year 2019 to 2021 under ACMTAC service.

Methods: This multicentre and cross-sectional study included patients treated with warfarin from 1st Jan 2019 to 31st December 2021 under ACMTAC in Malaysia. A multistage sampling was used to select facilities with ACMTAC and systematic sampling was used to select patients from each facility. The TTR value was calculated using Rosendaal's method and TTR $\geq 65\%$ was defined as a good control.

Results and Discussion: Of 1464 patients from 49 facilities, the mean age was 60.3 (13.1) years and 732 (50%) were female. The main indications for warfarin treatment were atrial fibrillation (65.7%) and valve replacement (23.1%). The annual mean TTR for all patients in 2019, 2020 and 2021 were 63.1(24.5)%, 64.0(25.0)% and 64.1(26.3)% respectively. The percentage of ACMTACs with good anticoagulant control over three consecutive years was 49.5, 55.1 and 53.4. Thromboembolic events occurred in 15 (1.0%) and majority of events were stroke and TIA (n=12, 0.8%). Bleeding events occurred in 227 (15.5%) and majority had bruises (n=87, 5.9%) followed by gum bleeding (n=40, 2.7%).

Conclusion: Overall, there was a moderate quality of anticoagulation control in warfarin-treated patients under ACMTAC management. Nearly half of patients achieved the minimally recommended TTR of 65%. Bleeding and thromboembolic events in this study were low.

Assessment of Psychological Health among PLWH during COVID-19 and Its Association with Antiretroviral Therapy Adherence

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Background and Objectives: COVID-19 not only affects physiological health but also impairs psychological health of the global population. This includes individuals on chronic treatment such as people living with HIV (PLWH) infection. The impact can cause non-adherence towards highly active antiretroviral therapy, which will lead to unsuccessful treatment outcomes leading to progression to AIDS and death. However, investigations on this issue are still limited among local HIV infected population. This study aims to determine the impact of COVID-19 on PLWH related to psychological health and adherence towards antiretroviral therapy.

Methods: A cross-sectional survey was conducted in two hospital-based Infectious Disease (ID) clinics in Pahang state. PLWH who met inclusion and exclusion criteria were conveniently recruited in this study. Data was collected between 1st April 2022 until 31st July 2022. Psychological health was assessed by using Impact of Event Scale-Revised (IES-R Malay version) and antiretroviral therapy adherence level was assessed by using the Malaysia Medication Adherence Assessment Tool (MyMAAT). Spearman's rank correlation test was utilised to analyse correlation between psychological health and antiretroviral therapy adherence level.

Results and Discussion: Of 59 participants, mean age was 38.02 (± 11.02) years old. One-fourth ($n=15$, 25.4%) of the patients had psychological stress of median (IQR) score of, 6 (1 - 14.5) and more than one-third ($n=21$, 35.6%) had behavioural stress with a median (IQR) score of 4 (0 to 10) during the COVID-19 phase in Malaysia. For antiretroviral therapy adherence, majority of patients had good adherence towards antiretroviral therapy ($n=49$, 83.1%). A significant negative correlation was associated between psychological and behaviour domain with adherence ($r = -0.359$, $p < 0.05$ and $r = -0.344$, $p < 0.05$ respectively).

Conclusion: Despite the fact that the nation is entering a 'transition to endemic' COVID-19 phase, psychological health impairment was still reported among PLWH. Our findings found a negative correlation between poor psychological health and antiretroviral therapy adherence level.



HO19

Role of Pharmacist in Providing Pharmaceutical Care to Tuberculosis Patients in Tertiary Care Paediatric Hospital

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Background and Objectives: Pharmacist's role shifts from dispensing to bedside care, resulting better patient health outcomes. Pharmacists in developed countries ensure rational drug use, improve clinical outcomes, and promote health status by working as part of a multidisciplinary team of healthcare professionals. However, clinical pharmacist services on healthcare utilization in low-and middle-income countries (LMICs) like Pakistan are unclear. Pharmacists can improve the implementation of critical pathways by documenting processes and out-comes, ensuring proper patient selection and medication use, monitoring patients for drug efficacy and adverse effects, and providing for continuity of care. Objective of this study is to assess the role of a clinical pharmacist-directed patient education on the therapy adherence of paediatric TB patients and to identify the major pharmaceutical care needs.

Methods: Data was collected by using questionnaire designed to collect demographic variables as well as knowledge, attitude, and adherence to the treatment. This study includes all patients who enrolled from Jan 2019 to June 2019.

Results and Discussion: In this study, 58.47% of the respondents were male and 41.53% were female. It was found that 64.98% of the respondents appreciated the role of pharmacist in TB clinic and agreed that their medication outcome and satisfaction has increased with pharmacist interaction. Results showed that 23.88% patients needed extra pharmaceutical care, and all agreed to receive the guidance from the Pharmacist. Approximately 11.14% patients/attendants refused to receive pharmaceutical care and guidance from the pharmacist and did not show consent for follow-up. Many patients faced side effects of drugs. Among them, 64.13% patients were satisfied with the guidance provided by the Pharmacist to manage and understand side effects.

Conclusions: Patients' adherence to TB treatment improved when a pharmacist provided patient education on medication use and addressed patients' pharmaceutical care issues.



Impact of a Communication Skills Training Program on Malaysian Hospital Pharmacists' Patient-Centred Communication Attitudes and Behaviours

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Background and Objectives: Effective communication is integral in the process of providing patient-centred care in health encounters. Communication skills training (CST) programs have been proposed as a way to improve patient-centred communication among pharmacists. However, there is a paucity of studies on the impact of CST among Malaysian hospital pharmacists. This study aimed to evaluate the effects of a CST program on patient-centred communication scores, communication self-efficacy, and attitudes toward concordance among pharmacists providing medication therapy adherence clinic (MTAC) services in public hospitals.

Methods: A CST program for pharmacists based on a patient-centred communication framework (the Four Habits Model) and motivational interviewing techniques was developed and implemented. A pre-test/post-test quasi-experimental design was used to evaluate the effects of this CST program. Pharmacists underwent pre-test/post-test audiotaped simulated consultations and completed questionnaires, including the Revised United States–Leeds Attitudes toward Concordance scale and communication self-efficacy scale. The Four Habits Coding Scheme (FHCS) was used to evaluate patient-centred communication scores from the audiotapes.

Results and Discussion: A total of 38 pharmacists from four tertiary hospitals participated in the training program. However, only 23 pharmacists completed both pre- and post-intervention simulated consultations. Among those who completed both simulated consultations, improvements were noted in the FHCS scores, including exploring patients' concerns (pre-test median = 3, post-test median = 4, $Z = -2.73$; $p < 0.05$), acceptability (pre-test median = 3, post-test median = 4, $Z = -2.58$; $p < 0.05$), and barriers to treatment (pre-test median = 3, post-test median = 4, $Z = -2.86$; $p < 0.05$). However, there were no significant improvements in scores regarding involving patients in decision-making. Based on the questionnaire responses, there was an improvement in recognising patients' needs and potential medication uncertainty.

Conclusion: CST may help increase the adoption of patient-centred communication behaviours in pharmacists' consultations with patients and improve pharmacists' attitudes towards concordance and communication self-efficacy. Future CST studies among pharmacists may consider incorporating training on decision support tools to enhance patient involvement in decision-making.



Rapid Quantitative Estimation of Favipiravir in Rat Plasma by Liquid Chromatography-Tandem Mass Spectroscopy and its Application to Pharmacokinetic Studies

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Background and Objectives: To validate bio-analytical LCMS/MS method for the estimation of favipiravir in bulk and pharmaceutical drugs in rat plasma. To develop a simple, rapid and specific LCMS/MS bio-analytical method for the estimation of Favipiravir in bulk and combined pharmaceutical dosage forms. To validate the proposed methods in accordance with the analytical parameters mentioned in the ICH guidelines, such as system suitability, accuracy, precision, specificity, linearity, recovery, matrix factor, stability, LOD and LOQ.

Methods: Chromatographic separation of favipiravir was achieved on Waters Alliance-e2695, by using X-bridge phenyl, 150x4.6mm, 3.5 μ m column and the mobile phase containing 0.1% formic acid & ACN in the ratio of 40:60% v/v. The flow rate was 1.0 mL/min; detection was carried out by using a photodiode array detector at ambient temperature.

Results and Discussion: The number of theoretical plates and tailing factor for favipiravir were NLT 2000 and should not more than 2 respectively. Percentage relative standard deviation of peak areas of all measurements always less than 2.0. The proposed method was bio-analytical validated according to USFDA guidelines.

Conclusion: The method was found to be simple, economical, suitable, precise, accurate & stable method for pharmacokinetics analysis of favipiravir and study of its stability.

Treatment Burden, Medication Adherence and Health Literacy in Elderly with Multimorbidity

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Background and Objectives: Many chronic health conditions occur outside healthcare institutions in the form of self-management routines that the elderly perform on their own at home. Elderly people who have poor health literacy and are burdened with their treatment regimen may struggle with adhering to their medication plans. The prospective study aims to explore quantitatively how treatment burden and health literacy affect medication adherence in elderly living with multimorbidity.

Methods: Face-to-face structured interviews were conducted in 10 general practitioners (GP) clinics in Selangor among elderly aged >60 years to collect the data comprising of (1) demographic details, (2) treatment burden assessed using the Burden of Treatment Questionnaire (TBQ-15), (3) health literacy of participants assessed using the Short Form Health Literacy Questionnaire (HLS-SF12) and (4) medication adherence level of participants assessed using the Malaysia Medication Adherence Assessment Tool (MyMAAT).

Results and Discussion: The preliminary data collected for this study included 36 elderly aged 60 years and above with 2 or more chronic conditions. The mean score for treatment burden, health literacy, and medication adherence for the participants was 53.9 (SD = 29.7), 20.6 (SD = 9.0), and 36.0 (SD = 18.9). All the participants (100%) in this study had a high treatment burden and showed low medication adherence ($p < 0.05$) and 72.4% of participants with limited health literacy had low medication adherence ($p < 0.05$). The findings of this study indicate that elderly with multimorbidity who have a high treatment burden and low health literacy significantly are less adherent to their medications.

Conclusion: Low health literacy and high treatment burden significantly affected the elderly with multimorbidity and hurt their health outcomes.



IMO4

PrEP Talk: A Multivariate Analysis Exploring the Awareness, Attitude, and Preference of Filipino University Students in Metro Manila toward Human Immunodeficiency Virus (HIV) Pre-Exposure Prophylaxis (PrEP)

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Background and Objectives: Pre-Exposure Prophylaxis (PrEP) acts as an additional preventive choice in the sexual transmission of the virus has been emerging in popularity in the Philippines. To date, the country's implementation of PrEP is still under pilot testing, thus there are no available detailed-reports. The purpose of the study is to assess the use of PrEP among Filipino university students by identifying their awareness, attitude, and preference.

Methods: Primary data was obtained from an anonymous online survey conducted among 300 Filipino university students in Metro Manila. Multivariate analysis of the survey data was employed to identify the factors that affect their attitude and preference, and to establish their knowledge and awareness to the medication.

Results and Discussion: Three factors that explain preference over an HIV prevention were identified using factor analysis, namely, familiarity, social impact, and sexual lifestyle. Consequently, the study explored the effects of these factors on different clusters that resulted from cluster analysis. These clusters were sexually active, sexually informed, and sexually inactive. Considerably low knowledge and awareness scores were recorded across all clusters, with an overall 51.4% average correct response. In spite of that, respondents demonstrated favorable attitudes and high interest in PrEP, with 67% (201) saying that they would use the medication.

Conclusion: The positive response and high levels of interest recorded, despite their low knowledge and awareness, highlights its importance in promoting PrEP uptake to the key populations. Moreover, the three identified factors could serve as instrumental figures in influencing strategies that the public and private sectors may take on for advancing PrEP in the country. These sectors can tailor fit their actions based on the characteristics of different groups of people as described by the cluster analysis. Overall, the key insights from the study may serve as guides in improving awareness, preference, and utilization of PrEP in the Philippines.



Risk of Haemorrhagic Stroke due to Methamphetamine Abuse - A Case Series

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Background and Objectives: Drug abuse is the biggest issue in the western world and even a major part of the world is facing. Irrespective of age groups, everyone is being victims to that. Methamphetamine is one among those which is a common form of abuses seen in the western world. Cerebrovascular complications show a worse effect on the victim's quality of life. Hence, the present study is concentrated on the adverse cerebrovascular outcomes due to methamphetamine abuse.

Methods: A systematic review is done by taking case reports and case series between a timeline of 2000-2019. The collection of studies was done from EMBASE, MEDLINE and PUBMED. The quality of each study is assessed by using the new castle-Ottawa scale. The inclusion criteria were Case reports, Case series with patients having a history of methamphetamine use. Patients who stopped use of methamphetamine one year back and studies which involve abuse of other illegal drugs were excluded from the study. We evaluated for the stroke which show an absolute involvement of methamphetamine as risk factor.

Results: Following the exclusion and inclusion criteria, articles were collected from 25 case reports and being assessed for the occurrence of stroke in subjects who were consuming methamphetamine. Of the 25 cases being collected, hemorrhagic stroke comprises of 13 (52%) cases, ischemic stroke comprises of 9 (36%) cases, cardiogenic shock 1(4%), hypovolemic shock 1(4%) and anterograde amnesia 1(4%). All the cases show that chronic use of methamphetamine led to stroke. All the cases were strongly evidenced by the confirmatory diagnosis as methamphetamine being the cause for the cerebrovascular events. CT scan was the diagnostic technique used as the confirmatory diagnosis. Thereby, the study strongly interprets that methamphetamine use can cause stroke even in healthy individuals.

Conclusion: There data can be interpreted as methamphetamine abuse may lead to stroke. Based on this study, it can be interpreted that chronic abuse of methamphetamine may lead to cerebrovascular complications of which stroke is the most common complications. The risk of hemorrhagic stroke is more than ischemic stroke.

Knowledge, Attitude, and Practices among Filipinos towards Vitamin D Supplementation amidst the Pandemic

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Background and Objectives: Vitamin D has been recently studied to have immune enhancing effects, especially towards respiratory illness prevention and recovery. However, it is not commonly viewed as a preventive measure for Covid19 and other respiratory tract infections such as asthma, TB, and COPD. The aim of this study is to determine the knowledge, attitude, and practice of Filipinos aged 20-50 years old residing in Quezon City towards vitamin D supplementation during the pandemic.

Methods: The survey tool was developed using statements from other references and was validated to ensure credible data gathering. It was posted on social media platforms accompanied by a poster indicating the inclusion criteria for eligible participants.

Results and Discussion: The questionnaire garnered results stating that the Filipino consumers in Quezon City have high levels of knowledge, attitude, and practice proper vitamin D intake wherein females (60.69%) were the more common participants in the age group of 20-29 years' old (86%). It was also noted that the prevalence of Covid-19 symptoms contributed to the increase in vitamin D supplementation based on supplement sale increase in 2020. The study also found out that knowledge, attitude, and practices have positive correlations with each other when it comes to vitamin D supplementation amidst the pandemic.

Conclusion: The relationship exists between the knowledge and attitude, knowledge and practice, and attitude and practice of Filipinos towards vitamin D supplementation amidst the pandemic. It shows positive significant correlations with each other. This means that higher levels of knowledge are associated with a higher level of attitude and frequent proper practice of vitamin D supplement intake. A higher level of attitude implies a high level of knowledge and frequent proper practice of vitamin D supplement intake. It is recommended for pharmacist to continue proper education and information regarding vitamin D supplementation.

Therapeutic Effects and Possibilities of *Citrus maxima* (Pomelo) Leaves Aqueous Extract of a Commercial Product

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Background and Objectives: For thousands of years, population in rural and tribal areas has relied primarily on *Citrus maxima* leaves as a natural traditional medicine. In order to find natural items that can be utilised in addition to conventional medicine, our study would want to gain a greater understanding of the therapeutic characteristics of *Citrus maxima* leaves of a commercial product.

Methods: Phytochemical analysis was performed to identify and screen for bioactive chemical elements in medicinal plant. The neutralisation effect and capacity of fresh and dry leaves of young and old leaves were experimentally evaluated. To measure the anti-inflammatory efficacy and antioxidant activity of all four-leaf extracts, egg albumin denaturation assay and DPPH radical scavenging assay were carried out.

Results and Discussion: Screening assays for phytochemicals identified the classes of active phytochemicals as flavonoids, steroids, tannins, and cardiac glycoside. The outcome demonstrated that the dried old leaf extract had an excellent neutralizing effect by raising the pH of the artificial gastric juice from its initial pH of 1.2 to 4.16 ± 0.04 with the preeminent consumption of 89.85 ± 0.08 mL of artificial gastric juice and 5.669 ± 0.005 moles of H⁺ ions, respectively. Fresh old leaf extract displayed appreciable activity preventing the denaturation of egg albumin with $71.10 \pm 0.62\%$ inhibition. The maximum potential of anti-oxidant was seen in fresh young leaf extract with $76.91 \pm 1.197\%$ inhibition.

Conclusion: All the assays evidenced the neutralising, anti-inflammatory and anti-oxidant effect of *Citrus maxima* leaves, with dried old leaves, fresh old leaves and fresh young leaves being the most prominent. Our study's pertinent findings will pave the way for the discovery of natural remedies that may be utilised in conjunction with conventional medicine.

Knowledge, Attitude, and Practice of the Medical Practitioners towards Adverse Drug Reactions Reporting

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Background and Objectives: In Malaysia, the rate of adverse drug reaction (ADR) reporting among private practitioners is exceptionally low, with only 5.26% reporting. The failure to report ADRs increases the likelihood of ADR cases significantly and reduces the quality of life of patients. This study was aimed to analyse medical practitioners' knowledge, attitudes, and practices (KAP) on pharmacovigilance and the ADR reporting system and to identify the factors that influence ADR underreporting.

Methods: A cross-sectional survey of 600 private and public medical practitioners in Kuala Lumpur and Selangor was undertaken. A structured validated questionnaire was used to collect demographic data, medical practitioners' KAP of ADRs and reporting system.

Results and Discussion: This survey included 600 private and public medical practitioners. Around 78.3% of respondents believed that reporting ADRs helped to discover safe pharmaceuticals, and 82% said that it helped to gauge the occurrence of ADRs. In terms of practice, 68.9% of respondents said they would only report an event if they were certain the reaction was an ADR. In terms of attitudes, 84%, 62.4%, and 26.5% of people were complacent, ignorant, or indifferent.

Conclusion: Half of the participants in this survey showed medium to moderate understanding, attitudes, beliefs, and practice of ADR reporting. ADRs were underreported at all levels of practice, academic, and professional experience. A well-structured periodic intervention programme is required to address the fundamental cause and raise the rate of ADR reporting.

Adoption of Machine Learning Algorithms in Predicting Vaccine Hesitancy: A Narrative Review

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Background and Objectives: The alarming increase of vaccine hesitancy (VH) cases among Malaysian parents has led to a resurgence of vaccine preventable diseases (VPD) and mortalities among children in the last 10 years. Numerous studies have assessed various factors of vaccine hesitancy. However, less research has been conducted on how well these factors perform in predicting vaccine hesitancy. Recently, machine learning algorithms (MLA) have been used to predict vaccine hesitancy accurately. Therefore, the objective of this study is to review the use of machine learning algorithms to predict vaccine hesitancy.

Methods: A narrative review of existing literature using a non-systematic search for original articles was conducted through online search databases, namely Pubmed, DOAJ Open Access, and Google Scholar from 2018 to 2022, on machine learning algorithms to predict vaccine hesitancy (VH). Fifteen (15) articles were then included in this review. Key words used to conduct the search were “machine learning algorithms”, “vaccine hesitancy”, “refusal”, “immunisation”, “artificial intelligence”, “adopting”, and “predicting”.

Results and Discussion: The findings highlighted the increasing roles played by machine learning algorithms in predicting vaccine hesitancy, across various socioeconomic and demographic profiles in low-, middle- and high-income countries. The phases of development, validation, and performance analysis of a battery of machine learning models predicting vaccine hesitancy was also documented. Strategies to develop parsimonious models to provide health workers and policymakers with interpretable model that can be easily explained was also provided.

Conclusion: This review has found that MLA is an objective method to predict VH and can be used by policy makers to increase vaccination uptake among the population.

Parents' Knowledge and Willingness for COVID-19 Vaccination in Young Children in Malaysia

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Background and Objectives: Parents' understanding of the benefits of COVID-19 vaccines may influence willingness to vaccinate their children. Data on the interface between knowledge about COVID-19 vaccines and willingness to vaccinate young children among Malaysian parents is scarce.

Methods: A public web-based cross-sectional survey was conducted from March to June 2022 among parents with children aged between 5 and 11 years. Target sample size was 381 using Krejcie & Morgan calculation with estimated population of 6.52 million and 0.05 accuracy. A validated questionnaire of 36 items was distributed via social media using convenient, non-probability sampling to collect information on: demographic details, parents' knowledge of COVID-19 vaccines, and their willingness to vaccinate children against COVID-19. Knowledge score of 6 and above is considered good. The association between independent variables with having good knowledge and high willingness were analysed using logistic regression (odd ratio (OR), confidence interval (CI) 95%) with significance value $p < 0.05$.

Results and Discussion: The analysis included data from 386 respondents, of which, 53.4% scored good knowledge and 81.3% showed high willingness. Higher knowledge score was positively associated with higher willingness ($p < 0.001$). Lower knowledge score was associated with working outside health-related field (OR 0.247, 95% CI 0.142 – 0.430, $p < 0.001$), have not received (OR 0.159, 95% CI 0.053- 0.486, $p < 0.004$) or refused (OR 0.042, 95% CI 0.009 – 0.184, $P < 0.001$) booster doses. The least correct answers were about vaccine effectiveness (correct: 35.2%) and side effects (correct: 20.5% - 26.7%). High willingness was predominant in children with complete childhood immunization record (OR 2.660, 95% CI 1.315 - 5.382, $p = 0.006$).

Conclusion: Parents who are well-informed about the effectiveness and safety profile of COVID-19 vaccines are more willing to vaccinate their children. It is utmost important to comprehend parents' understanding on this topic to minimize hesitancy towards COVID-19 vaccination for this subpopulation.



IMO11

Knowledge, Attitude, and Acceptance on Coronavirus Disease (COVID-19) Vaccination Among Non-allied Health Individuals in the Greater Manila Area (Metro Manila, Bulacan, Cavite, Laguna, and Rizal), Philippines

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Background and Objectives: The Coronavirus Disease 2019 (COVID-19) pandemic wreaked havoc on healthcare systems, posing novel problems. It is a condition manifesting as cough to severe respiratory distress syndrome. The elderly and with comorbidities like hypertension and diabetes are highly susceptible. Vaccination is considered the best hope for a long-term solution. This; however, has to be accepted by a majority of the population to achieve herd immunity. The aim of the study is to assess the knowledge, attitude, and acceptance (KAA) on COVID-19 vaccination among non-allied health individuals and determine their relationship to demographic profiles.

Methods: The online self-administered questionnaire was developed through literature review and modified, undergone expert evaluation/validation, translation and back translation, and pre-testing. The instrument was distributed to respondents residing in the Greater Manila Area: GMA (Metro Manila, Bulacan, Cavite, Laguna, and Rizal), Philippines. Data collection was conducted in a month period (June 2022); after which descriptive and inferential statistics using Microsoft Excel 2020 and R/Python version 4.2.0 2022 were utilized to evaluate the KAA profiles.

Results and Discussion: Most of the respondents were Young Adults (54%), Male (50%), Single (67%), With Tertiary Education (54%), and belonging to the Middle Class (39%). Age (0.02546), Educational Background (0.0002017), Monthly Household Income (0.002824), and Internet Signal (0.02266) were found to significantly influence Knowledge. Those greatly affected Attitude were: Age (0.01767), Educational Background (0.0003589), Monthly Household Income (0.0006069), Internet Signal (0.0359), Time Spent on Social Media (0.01968), and Political Stance (0.001231). Lastly, those that showed significance with Acceptance were Educational Background (0.02556), Monthly Household Income (0.00002606), and Internet Signal (0.005458).

Conclusion. This study offers insight into the KAA of the COVID-19 vaccination among non-allied health individuals in the GMA. Demographics such as Educational Background, Monthly Household Income, Internet Signal, and Time Spent on Social Media influence the KAA.



The Interaction between Herbal Extract and Eudragit Polymer Blend on Physicochemical and Mechanical Characteristics of Core/shell Composite Orodispersible Films

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Background and Objectives: Orodispersible fibre film with core/shell composite is a promising drug dosage form to overcome the bitter taste drawback of herbal extracts using coaxial electrospun technology. However, the interaction between the core and the shell layer are not fully comprehended. This research aims to reveal the interaction effects of different ratios of Eudragit polymer blends (shell) and *Carica papaya* leaf extract (core) on the physicochemical and mechanical characteristics of core/shell composite orodispersible fibre films.

Methods: The orodispersible fibre films were formulated using the coaxial electrospinning method with Eudragit L100-55 and Eudragit L100 polymer blends in the ratio of 1:0, 1:1, 1:3, 1:5, and 0:1 respectively. Blank formulations were prepared to compare with those loaded with the *Carica papaya* leaf extract. The developed formulations were characterised for their film thickness, moisture content, swelling properties, mechanical strength, and film disintegration (wetting time). ATR-FTIR analysis was conducted to study the drug-excipient compatibility.

Results and Discussion: The employed polymers in coaxial electrospun manner successfully produced homogenous and adequate flexibility fibre films, with a uniform green color from the inside and off-white color from the outside. The developed orodispersible films offered an immediate disintegration profile in simulated human saliva (pH 6.8), showing the potential production of oral formulation. ATR-FTIR analysis showed the compatibility between the shell and core layer.

Conclusion: The coaxial electrospinning was successfully used in developing orodispersible films as a pharmaceutical dosage form for the oral delivery of *Carica papaya* leaf extract with the abilities to overcome the bitter taste. This study elucidates the relationship between polymer carrier and herbal extract in affecting the physicochemical and mechanical behaviours of the orodispersible films at different ratios of polymer blends.

Removing Communication Barrier between Pharmacy and Deaf Patients

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Background and Objectives: Deaf community in Malaysia uses Malaysian Sign Language in communication. In the University of Malaya Medical Centre (UMMC), however, the Pharmacy Department uses either Malay or English for medication instruction on the labels as well as when dispensing medication to patients. This communication barrier can compromise deaf patient's safety when using medications.

Methods: A survey was conducted in 2020 across the hospital to assess the current practice in delivering care towards deaf patients. Following the survey, an improvement was initiated in 2021 in collaboration with the Malaysia Federation of the Deaf (MFD) to create 75 medication instruction videos in Malaysian Sign Language. Each video is linked to a QR code that is printed and stuck on the medication upon dispensing to deaf patients. Patients will scan the QR codes to access the videos.

Results and Discussion: Pre-improvement survey (N=275) which includes 64 pharmacy staff found that most (97%) staff are not equipped to cater to deaf patients given the existing communication barrier. Engagement with the deaf community via MFD creates a library of medication instructions in Malaysian Sign Language that is verified for deaf community use. A post-improvement survey among Pharmacy frontliners (N=111) showed that 96.3% feels that this standardized approach eases communication with deaf patients.

Conclusion: Providing QR code labels with embedded medication instructions in sign language removes communication barriers in the dispensing process and creates an inclusive system for ensuring safe and correct medication use by deaf patients.

Digital Health Perception among the Pharmacy Students of Asian Countries

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Background and Objectives: In the recent decade, there has been a gradual uptake and adoption of digital health in the healthcare industry. The utilisation of digital health tools at healthcare facilities has greatly improved patient-related outcomes, supported healthcare staff by reducing their workload and improved care coordination. Hence, it is imperative for healthcare professionals to be well-acquainted with digital health literacy and are competent-level digital skills. Therefore, institutions/universities must implement digital health literacy competencies in the curriculum to prepare future healthcare professionals to leverage the potential of digital technologies to improve patient health. The study aimed to evaluate the perceptions of Asian pharmacy students on digital health.

Methods: It was a mixed-methods study conducted online through an anonymous and self-administered survey targeted toward pharmacy students in Asian countries. The online survey questionnaire has both qualitative and quantitative items. The pharmacy students from approved universities in Asian countries willing to participate in this survey were included. A total of 44 approved universities were included from India (22), Malaysia (6), Thailand (3), Indonesia (4), Bangladesh (3), Philippines (3), Pakistan (1), Sri Lanka (1), and South Korea (1).

Results and Discussions: The study survey received 304 responses. More than three-fourths of the respondents understood and were familiar with eHealth (n=226, 74.34%). In addition to that, the majority of the respondents saw the advantage of the use of "Big data", "Telehealth", and "mHealth" in the future. In terms of the implementation of eHealth in the pharmacy curriculum, 80.59% (n=245) of the respondents were in favour since nearly 80% of respondents had received less than 5 hours of eHealth training.

Conclusion: The findings in this study have demonstrated that digital health-related components in the pharmacy curriculum and perceived digital health literacy among Asian pharmacy students ranged from acceptable to reasonable levels. Furthermore, the majority of students favour and anticipate the implementation of eHealth education in the pharmacy curriculum.

Targeted Primary and Secondary Preventive Strategies for Depression among Malaysian Pharmacy Students

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Background and Objectives: The global depression burden has remained a challenge throughout the pre- and post-pandemic era. The pandemic effect has led to the spiralling of mental disorders among young people who will be the next generation of leaders. This study aims to identify university students' sociodemographic, psychosocial and academic backgrounds and performance associated with depression symptoms for the development of primary and secondary preventive strategies for mental health.

Methods: A cross-sectional study was conducted using an online questionnaire distributed to 19 institutions in Malaysia offering a Bachelor of Pharmacy degree program. The self-rated Depression Anxiety Stress Scale (DASS-42) was used to assess depression symptoms. Pearson's chi-square test and Fisher's exact test were used to assess the investigated variables with depression symptoms. Independent T-test and one-way ANOVA were used to compare means of depression score across variables. Binary logistic regression was employed to examine the relationship between the investigated variables and depression symptoms.

Results and Discussion: A total of 610 pharmacy students participated, of which 47% (n = 289/610) were having depression symptoms. Students who smoke nicotine and those who have separated parents, family history of mental illness, and poor academic performance were associated with depression symptoms ($p < 0.05$). Differences in geographical areas, race and religion also showed significant associations with depression symptoms. Parental marital status, poor academic performance, history of mental illness and comorbidities were statistically predicting depression symptoms ($p < 0.05$).

Conclusion: Primary preventive strategies allowing students to harness healthy coping skills for stress, nicotine-free campaigns and a holistic curriculum are warranted. Secondary measures on mindfulness and compassion skills activities to benefit students who experienced early life crises are highly recommended. Enforcing these targeted strategies in collaboration with health and social sectors should be the primary agenda of universities to ensure their uptake.

Academic Restructuring towards Flexible Learning in Philippine Pharmacy Education

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Background and Objectives: Due to Covid-19, schools physically shut down in 2020, which led to the implementation of flexible learning in pharmacy education. The first phase of this study sought to determine the stage where schools are from the continuum of pre-emerging to empowering, forming the basis of the creation of the ACTS (Assess, Cope, Transition, Synergize) framework; Philippine Association of Colleges of Pharmacy [PACOP] Recommending Guidelines on Academic Restructuring towards Flexible Learning and action plan in serving all schools of pharmacy during the height of the pandemic. The second phase determined the stage two years after integrated action plan implementation, with the adopted 2021 framework, AAT (Absorptive Adaptive Transformative)-Resilience Capacities or ARTS (Adaptation Resilience Transformative Synergy).

Methods: Survey research using an adapted tool was employed. Eighty-seven and fifty-three schools, represented by the deans or heads, participated in the first and second phase, respectively, out of 124 schools. Qualitative inputs were used to supplement the discussion of findings. Data were analysed using descriptive statistics and thematic analysis.

Results and Discussion: Along areas of course plan modification, lecture, laboratory, research, experiential pharmacy practice (EPP) and health and wellness; and specific domains like mode of delivery, gradable assessments, and grading system, results in 2020 showed that schools were mostly on the pre-emerging (42.35%) to emerging phase (34.12%). Now in 2022, schools have migrated to engaging (37.74%), extending (35.8%) and empowering (18.9%) stages. Best practices' themes were borderless integration of industry experts and practitioners in the [FLO] delivery; resilience of schools and industry/ organization partners 3) stronger collaboration with all stakeholders; hybrid/ hyflex mode as main recovery plan strategy.

Conclusion: Moving forward, there is still a need for recovery interventions, revision of existing recommending guidelines, measures of sustainability and CQI, and official guidelines for EPP delivery.

A Shared Culture of Caring in the Time of the COVID-19 Pandemic: The Essence of Interprofessional Collaboration as Perceived by Pharmacy and Medical Technology/Medical Laboratory Science Students

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Background and Objectives: The COVID-19 pandemic has affected an unimaginable number of lives, focusing on the healthcare providers who play an essential role in battling the pandemic; strategy makes the healthcare system organized in a way that will help reduce the current issues or challenges faced in the field. This study sought to assess the perception, attitude, and perceived view of medical laboratory science and pharmacy students on interprofessional collaboration during the COVID-19 pandemic.

Methods: A 30-item questionnaire was distributed randomly using google forms to the Third and Fourth-Year students taking either BS Pharmacy (BSPHarm) or BS Medical Laboratory Science (BSMLS) at a private university in Northern Philippines. A total of 198 respondents returned the questionnaire. Descriptive statistics were utilized to determine the perceptions and practices of the participants. A t-test and chi-square were used to compare the mean values of dependent and independent variables to determine their statistical relationship.

Results and Discussion: Results showed that interaction between BSPHarm and BSMLS students was observed to be a high percentage ("Regularly"= 35.90%; "Quite a lot"= 18.70%; "Somewhat"= 35.90%; "Not at all"= 9.60%), but collaboration shows the opposite ("Regularly"= 27.60%; "Quite a lot"= 26.00%; "Somewhat"= 22.40%; "Not at all"= 24.00%). There is a lack of collaboration of student-professionals with the student-medical technologists in general. Nevertheless, they still understand the responsibilities of their own department and see interprofessional collaboration as an important factor in providing quality service in patient care.

Conclusion: Based on the results, it can be inferred that interprofessional education and collaborative experience is an essential tool in honing the students' patient-centeredness, teamwork and collaboration, especially in times of pandemic. Hence, in interprofessional collaboration, more effort should be made in interacting and collaborating with other student professionals.

Knowledge, Awareness, Acceptability, and Perceived Research Misconduct among the Schools of Pharmacy in Malaysia

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Background and Objectives: Research misconduct is a growing issue which needs more attention. The higher prevalence of research misconduct in health-related research as compared to research in other fields negatively influences the healthcare sector. The factors which might influence research practice of researchers include their level of knowledge and awareness regarding research misconduct, as well as their acceptability to unethical practices in research. In this study, we aimed to investigate the relationship among research misconduct, its knowledge, awareness, and acceptability which focuses on Malaysia pharmacy education community, i.e., the educators and students.

Methods: An institutional ethics committee approval was obtained from the Universiti Malaya Ethics Committee (UMREC). A cross-sectional study using an online questionnaire was conducted. A total of 393 pharmacy students and pharmacy academicians in Malaysia were involved. The data was analysed using PLS-SEM to assess the proposed hypotheses.

Results and Discussion: The findings show that there is a statistically significant positive relationship between awareness of terminologies regarding research misconduct and perceived research misconduct in the workplace of respondents. However, the acceptability to unethical practices in research demonstrates a negative correlation with perceived research misconduct. Knowledge and awareness regarding research misconduct have no statistically significant relationship with perceived research misconduct in this study. Both awareness on terminologies and acceptability to unethical practices explained 10.8% variance in perceived research misconduct.

Conclusion: To conclude, our study indicates that the awareness, knowledge, and acceptability of research misconduct might not be the main predictors to questionable conduct of research among the pharmacy academicians and students. Future study on the relationship between other factors which might contribute to research misconduct is highly recommended to investigate the significant contributing factors of irresponsible conduct of research.

Smoking Cessation Problem-based Learning: Virtual Experience

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Background and Objectives: Problem-based learning (PBL) is a student-centred teaching and learning methodology where students collaboratively address specific issues. Tobacco use is a major health issue globally. Health professions and students need to have knowledge and skills to facilitate smoking cessation. The objective of this study is to assess feasibility of PBL during a virtual attachment involving institutions from Malaysia and the USA.

Methods: A 4-week smoking cessation virtual attachment was conducted for three third-year University of Pittsburgh, USA pharmacy students. Malaysian smoking cessation experts designed and facilitated a PBL smoking cessation module. It was split into two 2-hour sessions with 3 triggers; Trigger 1: 'Chief Presentation', Trigger 2: 'History & Motivational Interview', and Trigger 3: 'Brief 5A's Intervention'. Students received Trigger 1 a day earlier and discussed amongst themselves. In session 1, Triggers 1-3 were given sequentially and discussed after completing all tasks from each trigger. In session 2 one-week later, facilitators gave formative assessment and students provided reflection regarding the PBL session. Upon completing the four-week virtual attachment, students provided feedback and facilitators graded the students.

Result and Discussion: A comprehensive and interactive PBL session was successfully conducted virtually. Based on the clinical practice guidelines of both countries, there were differences in terms of availability and use of cessation medications, but the general principles of smoking cessation consultation and interventions were similar. Students were able to discuss the case openly, putting forth ideas and questions in both sessions. All students provided positive feedbacks regarding the PBL.

Conclusions: With the extensive development of online platforms connecting the world over, student virtual attachment and mobility programmes can be easily conducted with minimal cost. A suitable module embedding PBL can be designed and conducted to best suit the online platform and the intended students.

Continuing Professional Development: A Need Assessment among Pharmacists in Malaysia

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Background and Objectives: Continuing Professional Development (CPD) is a lifelong learning model to maintain and enhance pharmacists' competencies. As the practice of pharmacy is advancing, it is essential to keep pharmacists updated and ultimately improve patient care. In view of compulsory CPD points for Malaysian pharmacists, this study aimed to assess the needs of pharmacists to fulfil the CPD requirements.

Methods: A cross-sectional survey was carried out using an online, validated semi-structured questionnaire. The questionnaire was shared with pharmacists on social media and through pharmacists' WhatsApp groups.

Results and Discussion: A total of 557 responses were obtained, of which 57% were from hospital pharmacy background. Continuing pharmacy education (CPE) sessions (93.2%), structured activities such as seminar (91.4%) and workshops (87.6%) were the most preferred CPD activities. This finding is consistent with other studies that showed most of the respondents preferred directed learning more than non-directed learning. Nutrition and diet (95.4%) and pharmacotherapy of geriatric population (90.8%) were the most preferred CPD topic and area of specialisation among respondents with community pharmacy background whilst infectious diseases (85.5%) and pain management (83.9%) for respondents with hospital pharmacy background as these are common areas encountered by them during their practice. The main barriers to CPD participation were cost of participation (83.5%), time constraints (83.1%) and accessibility to CPD venue (81.1%). Out-of-pocket payment and high workload could be the main reasons for these barriers. Improved range of CPD topics (94.8%) and more frequent CPD activities (92.3%) were the top two motivators to CPD involvement. Thus, reduced cost, better timing of CPD activities, improved relevance of topics and increased accessibility would lead to increase CPD participation.

Conclusion: These findings have also enabled CPD providers to develop modalities to improve CPD programmes to meet the needs of pharmacists.



SAO1

Potential Roles of Pharmacists in HIV/AIDS Care Delivery in Nepal: A Qualitative Study

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Background and Objectives: Nepal is facing escalating infection rates of HIV/AIDS, a major global public health threat. Continuum of services is an identified strategic component of the Joint United Nations Programme on HIV/AIDS (UNAIDS) commitment to end this public health crisis by 2030 and achieve the Sustainable Development Goal 6. Pharmacists are integral members of the continuum of care in HIV/AIDS but the idea is novel to Nepal. Realizing the need to explore and identify potential roles of pharmacists in HIV/AIDS care delivery, this study aimed to gain an insight into the views of stakeholders on the roles of pharmacists in this arena.

Methods: A qualitative approach was used where 15 key informants were interviewed using a semi-structured interview protocol. Participants were selected through a sequence of purposive sampling and snowball sampling technique. The interviews were conducted, transcribed verbatim and analyzed using thematic analysis.

Results and Discussion: Potential roles of pharmacists reside in adherence monitoring, pharmacovigilance, provincial and district level ART centers. Pharmacists and other stakeholders held divergent views on the pharmacist's role in dispensing and counseling antiretroviral medications. Barriers to the pharmacists' involvement were lack of workforce, advocacy and government support, frailty of professional organizations, self-limited scope, policy constraints, structural limitations, biasedness, and societal unawareness. Pharmacists themselves and organizations such as National Government Organizations (NGOs) and International Government Organizations (INGOs) were identified as the facilitators.

Conclusion: Stakeholders are willing to expand the role of pharmacists in HIV/AIDS care in Nepal. Nevertheless, some crucial impediments exist. Primarily, an aggressive and assertive advocacy is needed from pharmacists themselves and their professional organizations to establish their roles in HIV/AIDS care delivery. Additionally, unearthing potential of pharmacists as contributors in HIV/AIDS care delivery or any other chronic disease management equally demands a strong support from the government officials as well as the other health care professionals.



Assessing Health Literacy among The Newly Diagnosed Type 2 Diabetes and Pre-diabetes Patients in Malaysia

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Background and objectives: Health literacy refers to the ability of an individual to access, understand, appraise, and apply health information and services. In Malaysia, one in three adults have low health literacy. Low health literacy is associated with poorer diabetes knowledge and self-care management. We aimed to assess the health literacy of newly diagnosed type 2 diabetes and pre-diabetes patients to identify their strengths and limitations in health literacy.

Methods: The Health Literacy Questionnaire (HLQ) which examines the 9 scales of health literacy was used. 28 participants who were recruited from online platforms and two public clinics for qualitative interview were invited to fill in the questionnaire. Data were collected using self-administered questionnaires which were available online and paper based. Descriptive statistics was used to summarise the responses to the questionnaire questions. Data from the semi-structured interviews were coded and categorised into themes using thematic analysis.

Results and discussion: The HLQ provided 9 separate scores to indicate a person's strengths and limitations in their health literacy and the strengths and limitations of the sample population can be explained in terms of the number of participants with a lower or higher level of health literacy for each scale. In this study, among the 9 scales of the HLQ, the lowest score was found for scale 7 'Navigating the healthcare system' and the highest score was scale 5 'Appraisal of health information'.

Conclusion: The limitations in health literacy among the newly diagnosed type 2 diabetes and pre-diabetes patients were identified. The results were consistent with the themes identified from the interview data. Improving accessibility of health information and services for diabetes patients are needed to increase patients' knowledge and empower self-care behaviours.

Perspectives and Challenges Managing Older Adults: A Qualitative Study with Primary Health General Practitioners and Pharmacists In Penang, Malaysia

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Background and Objectives: There has been an increase in the older adult demographic, and there is a need to prioritize healthy ageing to suit their needs. Primary care facilities, due to their accessibility and use, seem to be the first choice for healthcare services for older adults. This study aims to understand the health care providers' perspectives on older adults' medication use problems at the primary care level.

Methods: The study used a qualitative methodology comprising 30 in-depth interviews among general practitioners and pharmacists in Penang, Malaysia, in public and private primary care settings. Participants were recruited based on purposive sampling. Interviews were transcribed verbatim, and data were coded based on the principles of thematic analysis in NVivo.

Results and Discussion: Findings reported on the perspectives of professional healthcare providers in providing healthcare services to older adults. Three themes emerged from the study. Theme one highlighted aligning health systems with the needs of older populations. Theme two explored feedback on shared decision-making among health care providers. The final theme delineated the challenges of medication use and facilities among older adults.

Conclusion: This study identified various challenges faced by primary care providers in responding to older adults' medication-related problems at the primary care level. Inputs from the primary health care system frontier are essential to reduce the challenges and uplift the quality of ageing populations' healthcare in Malaysia.



SAO4

Knowledge, Attitude and Practice of Filipinos on Sunscreen Utilisation

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Background and Objectives: Non-melanoma skin cancer is a type of cancer that is mainly caused by overexposure to ultraviolet (UV) light and recent study shows the increasing number of people at risk of this cancer were Filipinos. This study aims to identify the knowledge, attitude, and practices of Filipinos in Brgy. Catmon, Malabon City on sunscreen utilization.

Methods: By using the snowball sampling technique, the researchers were able to gather 100 respondents online. Pearson-R was used to determine if there is a significant relationship between the knowledge, attitudes, and practices on sunscreen utilisation. T-test and Analysis of Variance was used to determine if there was a difference between the respondent's knowledge, attitudes, and practices on sunscreen utilization when grouped according to their profile.

Results and Discussion: The study revealed that respondents' knowledge, attitude, and practices on sunscreen utilization have a moderately high positive relationship. The study also revealed that the respondents' knowledge, attitude, and practices on sunscreen utilisation have a significant difference when grouped according to their socio-demographic profile, specifically the respondents' gender. This indicates that other demographic profiles such as age, economic status, field of work, and their skin type does not differ in their knowledge, attitude, and practices on sunscreen utilization.

Conclusion: The results of this study can be used to encourage health professionals on better education and counselling on the harmful effects of sun exposure, necessitating the daily use of sunscreen to aid in preventing skin cancer, for better skin care, and better health.



A Strategy to Strengthen Halal Pharmamedlog Initiatives by Malaysian Armed Forces - First Government Agency in the World

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Background and Objectives: Malaysian government aims to be the most competitive country in the global halal industry. Halal Pharmamedlog refers to management of pharmaceuticals and medical logistics (Pharmamedlog) items under circumstances of Islamic Law. Previously, there was no JAKIM halal certified Pharmamedlog warehouse in Malaysia. 93 Medical and Dental Depot Malaysian Armed Forces (93 MDDMAF) took the challenge to obtain halal recognition in order to support MAF Health Services Action Plan 2030 which contains Syariah Compliance Pharmacy Practice (SCPP) of Pharmamedlog activities.

Methods: A descriptive study was carried out from November 2020 to March 2022 in 7 stores of 93 MDDMAF which handled Pharmamedlog items. Halal Pharmaceutical Decision Tree (HPDT) was a novel halal assessment tool and was developed with the consensus of Halal Subject Matter Experts. HPDT analysed sources of active ingredients and excipients that potentially originated from animals and substances forbidden to Muslims. Colour coding of green (permissible), grey (doubtful) and red (forbidden) were used to describe product halal category. Halal Critical Points (HCPs) were then identified and controlled to guarantee halal integrity of products and processes.

Results and Discussion: Assessment of 1465 Pharmamedlog items showed that 94% of the health products were categorized as green items, 4% as grey, and 2% as red. Clear process of segregations needed to be shown to preserve halal integrity during the management of Pharmamedlog. 13 HCPs were identified and strictly monitored through Halalan Thoyyiban Risk Management Plan. After thorough audit, 7 stores of the 93 MDDMAF have been certified halal by JAKIM on 16th April 2022. This recognition is the first in the world received by a government agency.

Conclusions: MAF is committed to ensure all health facilities and supply chain partners adapt and cultivate Halal Supply Chain Management System through SCPP Plan-Do-Check-Act cycles to ensure safety, quality and efficacy of Pharmamedlog items in MAF.



SA06

The Stress, Satisfaction, and Fulfilment of Early Career Pharmacists – A Qualitative Study of their Professional and Personal Lives

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Background and Objectives: Early career pharmacists are reportedly highly stressed and burnt out. Developing interventions to support their well-being requires an understanding of the factors that affect their stress, satisfaction, and fulfilment. This study aims to examine and develop a better understanding of: 1) the factors that affect the stress of both their professional and personal lives, 2) the aspects of professional and personal life that affect their satisfaction and fulfilment, and 3) what they need to achieve satisfaction and fulfilment in their professional and personal lives.

Methods: A cross-sectional study using a questionnaire was developed. The questionnaire contained 8 questions designed to collect qualitative data on the factors affecting the stress, satisfaction, and fulfilment in the professional and personal lives of early career pharmacists. Questionnaire responses were analysed using a qualitative content analysis approach and themes describing influential factors were developed.

Results and Discussion: Some of the factors that contribute to the stress, satisfaction and fulfilment of early career pharmacists were identified. The stressors identified include the workplace environment and relationships with colleagues, the demands of a pharmacist career, the lack of career advancement pathways, job insecurity, relationships, and their weaknesses. Factors contributing to satisfaction and fulfilment included supportive work environments and relationships, being appreciated and making a difference, growth, supportive relationships, and self-care.

Conclusion: Supporting the well-being of early career pharmacists is important for a resilient, engaged, and effective pharmacy workforce. Key interventions include eliminating job insecurity, establishing clear career pathways, improving work environments and relationships, and investing in skills development.



Health Care Team Patterns through Perception of Interprofessional Interaction Between Pharmacists and Medical Technologists in a City in Northern Philippines

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Background and objectives: Interprofessional collaboration in healthcare is a crucial factor in delivering quality health and patient care. The aim of this study was to investigate healthcare team patterns involving interprofessional collaboration between medical technologists and pharmacists.

Methods: The researchers utilized a quantitative, descriptive cross-sectional design wherein, a 30-item questionnaire was distributed through physical questionnaires and Google Forms. It was administered to pharmacists and medical technologists working at four tertiary hospitals in a city in Northern Philippines. A total of 105 respondents were recruited, with a response rate of 64.7%. This study utilized simple random sampling using Microsoft Excel random number generator. All consenting medical technologists and pharmacists with at least six-month hospital experience were included in the study.

Results and Discussion: The findings are divided into two sections: (1) correlation and comparison on the levels of interaction and collaboration of medical technologists and pharmacists with other healthcare professionals, and (2) comparison on the readiness of interprofessional learning among medical technologists and pharmacists in the city. Interprofessional interactions between medical technologists and pharmacists is infrequently observed, compared to interprofessional interactions between other healthcare professionals. The ranking of interaction with pharmacists is significantly negatively correlated with the ranking of interaction with medical technologists ($r_s = -0.895$; $P\text{-value} = 0.001$) indicating that those who interact more with pharmacists interact less with medical technologists. Evidence suggests a significant difference between the mean index on "Teamwork and Collaboration", and "Patient-Centeredness" of the two professions ($P\text{-value} = 0.001$; $P\text{-value} = 0.014$). This indicates that pharmacists exhibit greater positive attitude towards "Teamwork and Collaboration" and "Patient-Centeredness" than medical technologists. However, both professions showed readiness for interprofessional learning.

Conclusion: There is a lack of established interprofessional interactions and collaboration between pharmacists and medical technologists despite existence calls for the creation of interactive and collaborative opportunities.

Foundation and Advanced Competencies of Community and Hospital Pharmacists in Northern Philippines

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Background and objectives: In most developed countries, a competency framework specific to the practice of pharmacy in the community is well-established and recognized as a means to facilitate individual continuing professional development and assist with performance review, thus progress could be seen in the provision of pharmaceutical care. However, such is not yet in place in certain developing countries including the Philippines. This study aimed to determine the awareness and preparedness of pharmacists to career progression and specialization through assessing their actual and perceived level of practice and to determine the correlation between the current level of practice of community and hospital pharmacists to the length of experience in their current practice areas.

Methods: A questionnaire was developed using the Philippine Practice Standards for Pharmacists. Seventy community and hospital pharmacists were selected via non-probability convenience sampling. Microsoft Office Excel 2010[®] and statistical tool tests like Kolmogorov-Smirnov, Shapiro-Wilks, Wilcoxon Signed-Rank, and Spearman's Rho Correlation were used.

Results and Discussion: Perceived level of practice of community and hospital pharmacists showed an advanced level on all standards. The actual level of hospital pharmacist under Business Sustainability Assurance resulted as advanced and the rest were expert. For community pharmacists, all were advanced except for Providing Quality Medicines and Patient Needs which was expert. The correlation of actual level vs. perceived level demonstrated significant positive correlation for both pharmacists in all competency standards except for Business Sustainability Assurance which only showed significant correlation. The length of practice in hospital pharmacy was correlated with Providing Quality Medicines and Patient Needs and the rest were not correlated.

Conclusion: There is a current recognition of the pharmacy practice, particularly the role of each pharmacist to ensure patient safety. The advancement of competencies proves the strong sense of responsibility among Filipino Pharmacists to continually improve, and thus provide better quality services to the clients and patients.

Obstacles in Asthma Management: Perspectives from Bangladeshi patients

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Background and Objectives: Data from a cross-sectional study puts the number of asthmatic patients in Bangladesh close to 7 million. However, the challenges faced by Bangladeshi asthma patients have not yet been explored. This study aims to find out the hurdles being faced by asthma patients in Bangladesh.

Methods: This qualitative study involved interviewing 16 Bangladeshi asthma patients who were purposively sampled and recruited from a government-run hospital which specialized in asthma patients. The interviews were audio recorded, transcribed, translated and analyzed using Quirkos™ (Edinburgh, UK) to identify major themes and subthemes.

Results and Discussion: Six barriers to asthma management were identified. 1) Asthmatics found their diagnosis to be inadequate and unconvincing. 2) Women found greater difficulty in managing asthma. 3) High medication cost. 4) Getting free medications required complicated paper-work 5) Patients relied on traditional medicines (TMs) to unsuccessfully manage asthma 6) Asthma exacerbated during winter.

Patients unconvinced by their asthma diagnosis, are unlikely to follow through with their treatment plans. Likewise, patients who are unable to meet the cost of their treatment are at risk of discontinuing their therapy. This necessitates a more streamlined method of providing financial assistance to patients in need. Gender stereotypes regarding household chores need to be overcome with thorough counselling from healthcare providers (HCPs). Likewise adequate patient education programs need to be carried out to sway patients away from using CAMs to treat their asthma. Finally, HCPs need to make patients aware of exposing themselves to the elements during winter and to make necessary lifestyle adjustments.

Conclusion: Results from this study can be used for additional qualitative studies or intervention trials to improve asthma management.



SAO10

The Pharmacist's Contribution During the COVID 19 Pandemic: Medicine Delivery Services

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Background and Objectives: SARS-CoV-2 (COVID 19) was a global pandemic which changed the socioeconomic of every nation. Malaysia also was not excluded and implemented various strategies to counter the pandemic such as the execution of Movement Control Order (MCO) that restricted the movement of people, which affected and limited access to healthcare services. Pharmacists as the medication expert and one of the frontliners in the healthcare sector play roles, in many aspects of its profession, to cater the needs of society and ensure the accessibility to medicines throughout the pandemic. The objective of this research was to assess the pharmacists' roles in medicine delivery during the Movement Control Order (MCO) during the COVID-19 pandemic and in particular to ensure the access to medicines and promotion of quality use of medicines.

Methods: The participants were chosen from an online form offered during medicine delivery service during MCO and involved repeat prescriptions from the nearby government healthcare facilities. Participants were interviewed through phone calls after the medicines were delivered. The responses were recorded and analysed.

Results: A total of 80 participants were involved in this study. All participants agreed that pharmacy delivery medicines services helped them to collect the medications. Majority of the participants preferred the pharmacists to deliver the medicine as the pharmacist could also provide counselling on the usage of medication. Furthermore, the majority of the participants were willing to continue the services after the MCO.

Conclusion: Pharmacists help access to medicines and quality use of medicines. The medicines delivery services should be expanded as pharmacy value-added services that involve both government and private sectors.





SAO11

A Narrative Review of Vaccine Hesitancy in Childhood Immunisation in Malaysia.

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Background and Objectives: Vaccination has been known to be the most effective strategy in the prevention of many communicable diseases. In Malaysia, since 2013 there has been a resurgence in vaccine preventable diseases in children. The aim of this study was to examine the prevalence of vaccine hesitancy (VH) in Malaysia and the factors that contribute towards vaccine hesitancy.

Methods: Relevant articles on vaccine hesitancy in childhood immunisation in Malaysia were searched using Google Scholar, PubMed and Mendeley databases. The search was restricted for articles published in the English language from 2015 – 2022. Studies giving insight into vaccine hesitancy, refusal, defaulters, and highlighted factors contributing to these parameters were included.

Results and Discussion: VH includes those who refuse or delayed getting their child immunised. A total of 10 papers were included in the review which varied in terms of methodology, vaccine hesitancy measurement methods, settings and participants. The prevalence of vaccine hesitancy from 3 studies was in the range of 6.8% to 11.6%. The range of defaulters is much wider whereby the percentage of mothers or parents who defaulted is between 0.03% - 20.7%. Parents or mothers who refused childhood vaccination accounted for a very small percentage (0.08% - 0.47%). Common reasons for VH are low education level, doubts about vaccine content and religion. Interestingly, VH is more common among non-Muslims in the urban areas, but more Muslims mothers are vaccine-hesitant in rural states.

Conclusion: Vaccine hesitancy (VH) is complex and depends on various settings that include time, place and vaccines. Factors that are associated with VH are also wide ranging.



Electronic Prescription Services Trends across Community Pharmacies in Malaysia

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Background and Objectives: Telehealth services have increased exponentially, particularly during Covid-19 pandemic. E-prescribing is the direct transmission of electronic prescriptions (e-prescriptions) from prescribers to community pharmacies via digital devices. To date, there is a lack of studies investigating e-prescription services in Malaysia. Thus, the study aims to investigate usage of e-prescription services in community pharmacies and determine trends of most common medication classes prescribed.

Methods: A retrospective observational study was conducted by retrieving records from a telemedicine database used among community pharmacies in Malaysia. The e-prescribing records from January 2019 to December 2021 were extracted using a designated data collection form. Data cleaning, standardization and data analysis were performed using Python v3.9. The diagnoses and medicines were classified according to the International Classification of Disease (ICD-11) and Anatomical Therapeutic Chemical (ATC) system, respectively. The usage of the service across time, demographic profile of users and the most common medication classes prescribed were identified.

Results and Discussion: A total of 743,542 records were included, including 109,664 (14.7%), 206,262 (27.7%) and 427,616 (57.5%) records, respectively for 2019, 2020 and 2021. There were 207,024 (27.8%) unique users and 536,548 (72.2%) repeated users over the 3 years. The user population comprised of 59.7% female and 40.3% male, with a mean age of 51 ± 21 years and primarily Malaysians (97.3%). The most commonly prescribed medication classes were for cardiovascular system (52.7%), alimentary tract and metabolism (21.1%), musculoskeletal system (7.2%), blood and blood-forming organs (5.2%) and nervous system (2.9%).

Conclusion: This study concludes that the increase in usage of e-prescription services and its potential to remain as a feature of the health care system in community pharmacies. Further investigation on its role in prescribing and dispensing practices and impact on medication safety, quality and health care delivery are warranted.

Improving Knowledge, Attitude, and Perception of Falls among the Geriatric Population through Educational Intervention

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Background and Objectives: As the global elderly population grows, especially in Southeast Asia, fall incidences are predicted to increase dramatically in the future. Elderly people who experience falls suffer from lower quality of life and incur more medical expenses as a result of treatment for their injuries. As one of the main factors in increasing the risk of falls, numerous research has been conducted in recent years to determine the relationship between drugs and falls. This study was aimed to assess the knowledge, attitude, and perception (KAP) of falls among the geriatric population in a primary care Malaysian clinic setting, review the fall risk-increasing drugs (FRIDs) and provide educational intervention to improve the awareness of falls and FRIDs and analyse the effectiveness of the educational intervention.

Methods: This interventional study was carried out in a primary care setting using a validated structured questionnaire to assess the KAP of falls. Elderly patients who were 65 years and above, seeking medical treatment in the primary care setting, and able to read, understand, and respond to the study questionnaire and educational interventional materials were included in the study.

Results and Discussion: In a total of 310 respondents, 74% of them had obtained primary level education, and 46% of them were living alone or with their partner/caregiver. The percentage of elderly patients who experienced falls after the age of 65 years was 31%. The study showed that the participants' KAP of falls and FRIDs improved significantly ($p < 0.05$) after the pharmacist-led educational intervention.

Conclusion: The educational intervention provided to the elderly population in the rural region improved the knowledge of the elderly population in the primary care clinical settings. Health policy focusing on prevention measures needs to be curated in the future to meet the demands of the ageing population

Accuracy of Diagnosis Codes in Identifying COVID-19 Cases in Secondary Databases: A Systematic Review and Multi-institutional Study in Taiwan

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Background and Objectives: Secondary data (e.g., administrative data, electronic medical records (EMR) or claims data) provide an essential understanding of the clinical features and treatment outcomes of COVID-19. However, the validity of ICD-10-CM codes for identifying COVID-19 remains unclear. This study aimed to investigate the accuracy of diagnosis codes for COVID-19 cases in secondary databases.

Methods: We searched PubMed and Embase on August 18, 2022 to identify articles reporting validity indicators of ICD-10-CM COVID-19 codes from secondary data sources. Two reviewers independently performed the study selection and data extraction. The major exclusion criteria included records not related to validation studies of secondary data sources (i.e., irrelevant records). We also analyzed the EMR database from 9 Chang Gung Memorial Hospitals covering over 10% of Taiwan's population to evaluate the accuracy of ICD-10-CM codes in identifying COVID-19 cases during 2020-2021 in Taiwan. We calculated sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) for each COVID-19 hospitalization recorded with ICD-10-CM code at hospital discharge, and we used the COVID-19 PCR results as a reference standard.

Results and Discussions: We included 9 publications (Canada: 1, USA: 8) reporting at least one validity indicator of ICD-10-CM COVID-19 codes. Including our multi-institutional study in Taiwan, these 10 studies varied considerably in sample size (ranging from 1,590 to 180,426) and were clinically heterogeneous in regard to study cohort. The sensitivity ranged from 49.0% to 100.0%; the specificity ranged from 5.0% to 100.0%. The positive predictive values (PPV) ranged from 44.9% to 98.0%; negative predictive values (NPV) ranged from 32.0% to 100.0%.

Conclusions: Our findings could serve as an important reference to confirm the accuracy of the COVID-19 cohort from the secondary data in pharmacoepidemiological studies, since the PPV, sensitivity, NPV, and specificity were over 80% in the majority of included studies. Further validation studies from other data sources are suggested to confirm the validity of ICD-10-CM COVID-19 codes.

Mussel-inspired Mucoadhesive Gelatine Film Loaded with Cetylpyridinium Chloride

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Background and Objectives: Mouthwashes containing antiseptic agents are commonly used to prevent or treat oral cavity health issues. Recently their use has been suggested to reduce the severity and transmission rate of COVID-19 disease. However, mouthwashes have low retention times in the oral cavity. This study aimed to formulate buccal films containing an antiseptic agent with enhanced retention time in the oral cavity.

Methods: A series of films made of bovine gelatine cross-linked by tannic acid (GelTA) were prepared by solvent evaporation and loaded with cetylpyridinium chloride (CPC), followed by physical and functional characterisation.

Results and Discussion: The GelTA films mass and thickness were in the range of 16.4–23.0 mg and 89.9–103.3 μm , respectively. The cross-linking of gelatine using tannic acid notably increased the films' dissolution times. The miscibility of CPC in BG-TA5-GLY20-7 was higher by 3-fold than in the control film. Reduced film solubility, swelling ratio, pH and contact angle were observed in CPC-loaded films compared to blank film. Moreover, the release of CPC from the GelTA film prepared at pH 7 was significantly extended (6 h) compared with the control film (1 h). There was a positive correlation ($R=0.865$, $p=0.00$) between the erosion of GelTA films and CPC release. Furthermore, the BG-TA5-GLY20-7 film demonstrated antimicrobial activities against *S. aureus* in agar disc diffusion studies with the ZOI of 6.8 ± 0.8 and 11.0 ± 0.9 for the blank and CPC loaded films (20% CPC), respectively.

Conclusion: GelTA film prepared at pH 7 has potential applications as a buccal film matrix considering its functional properties and extended dissolution and release of CPC.

Design of Degenerate, Universal Primers for Multiplex PCR Determination of Biofilm-Formation in *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, and *Escherichia coli*

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Background and Objectives: Biofilm-forming pathogens *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, and *Escherichia coli* are responsible for a significant proportion of nosocomial infections. Classical techniques for bacterial detection are time-consuming and labor-intensive. Multiplex polymerase chain reaction (PCR) using degenerate primers has potential for simultaneous detection of multiple bacterial species. This study aimed to design degenerate, universal primers for multiplex PCR determination of biofilm formation in *S. aureus*, *P. aeruginosa*, *K. pneumoniae*, and *E. coli*.

Methods: FASTA gene sequences of clinically significant biofilm-forming bacterial strains were collected from NCBI Nucleotide database. Consensus sequences were generated from chosen genes using multiple sequence alignment (MSA). These sequences were used to generate primers, which were characterized, validated, and subjected to principal component analysis (PCA) to determine significant degenerate primer sequences. Primer selection followed by post-validation was performed to all collected genes to determine hallmark nucleotide bands. Finally, a touchdown multiplex PCR method was proposed.

Results and Discussion: From the six clinically significant biofilm-forming bacterial strains, 96 genes were associated with biofilm-forming activity. There were three MSA profiles generated: first, for the *S. aureus* rqcH gene producing fibrinogen-binding protein (SAOUHSC_01175) and *P. aeruginosa* psIE gene; and second, for enterococcal Hha toxicity modulator, tomB gene; and third, for hemolysin expression-modulating hha gene. From these, two degenerate consensus sequences were used to generate 60 primers. A total of 13 primers for the first consensus sequence, and ten primers for the second consensus sequence were determined as significant degenerate primers. Two primer pairs having satisfactory characteristics were selected for design of a touchdown multiplex PCR.

Conclusion: Degenerate universal primers were designed to produce hallmark bands for clinically significant biofilm-forming strains of chosen bacterial species. Actual PCR using the proposed method will be performed to determine effectiveness of these degenerate primers in detecting these biofilm-forming strains.

***In vitro* Anticancer Activity of *Myriostachya wightiana* Whole Plant Methanolic Extract on Breast, Hepatocellular and Colorectal Cancer Cell Lines**

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Background and Objectives: Cancer is an evil spirit that causes alarming symptoms of death owing to the disease's global growth and is estimated to have caused 9.6 deaths globally in 2018. *Myriostachya wightiana*, (Poaceae) a grass plant of mangroves are of tremendous ecological importance since they are rich in potential bioactive chemicals. The objective of the study was to evaluate the Anti-cancer activity of methanolic extract of *Myriostachya wightiana* whole plant. The extract was subjected to preliminary phytochemical screening with aim to study in-vitro cytotoxic activity in different cell lines followed by docking studies and *in-vivo* animal studies.

Methods: The crude flour from the entire plant was extracted in succession of polar solvents with increasing polarity. The extract was dried and weighed after being evaporated to dryness. The extract was screened for flavonoids, alkaloids, carbohydrates, tannins, and other phytochemicals. In-vitro cytotoxic study was performed on the human breast cancer cell-line MCF-7, human colorectal cancer cell line CACO-2 and hepatocellular cancer cell line HEPG-2 using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay.

Results and Discussion: *Myriostachya wightiana* Methanolic extract was found to be effective with IC₅₀ values 103.47 µg/ml, 110.22 µg/ml, 110.85 µg/ml on MCF-7, HEPG-2, CaCO 2 with the standard drug Vinblastine sulphate respectively.

Conclusion: The study indicated that methanolic extract of *Myriostachya wightiana* was active with IC₅₀ against human breast cancer cell line MCF 7, colorectal cancer cell line CACO 2 & hepatocellular cancer cell line HEPG 2. There is an urgent need for more research into this plant in order to uncover and isolate its active anticancer components.

***In vitro* Inhibition of α -Glucosidase by *Rubus rosifolius* Leaf and Fruit Extracts**

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Background and Objectives: Diabetes mellitus (DM) remains one of the leading causes of mortality in the Philippines. It is the fifth-leading cause of death among Filipinos (January to December 2021), with a 6.3% share and a 21% increase from 2020. One drug class commonly employed in DM management is alpha-glucosidase inhibitors (e.g., acarbose); however, their use is linked to hepatitis and adverse GIT effects, which led to exploring effective and safe herbal alternatives for DM management with fewer side effects. *Rubus rosifolius*, commonly known as *sampinit*, was investigated for the α -glucosidase inhibitory activity of its methanolic leaf and fruit extracts.

Methods: *R. rosifolius* leaves and fruits were macerated using 80% ethanol to extract their phytoconstituents. Phytochemical screening was carried out to identify the presence of glycosides, alkaloids, saponins, tannins, flavonoids, triterpenoids, and steroids in leaf and fruit extracts. *In-vitro* alpha-glucosidase inhibition assay was performed, and the IC₅₀ values were computed using a dose-response curve with linear regression interpolation expressed as percent inhibition.

Result and Discussion: *R. rosifolius* leaf and fruit extracts yielded 11.95% and 25.13%, respectively. Glycosides, alkaloids, saponins, tannins, flavonoids, triterpenoids, and steroids appear in leaf and fruit extracts; anthraquinone glycosides only appear in the latter. Alpha-glucosidase inhibition at 405 nm determined that at 1,000 $\mu\text{g/mL}$, the fruit extract had the highest activity (98.42%), followed by the leaf extract (93.33%) and acarbose (76.18%). However, one-way ANOVA showed that % inhibitions at various concentrations among treatment groups were significantly different (p -value <0.05); and that the leaf extract had higher hypoglycemic activity (22.24 $\mu\text{g/mL}$) than the fruit extract (195.32 $\mu\text{g/mL}$) and acarbose (367.96 $\mu\text{g/mL}$).

Conclusions: Among treatment groups at various concentrations, the leaf extract is more potent than the fruit extract in inhibiting alpha-glucosidase. Both *R. rosifolius* methanolic extracts are good alternative supplements to acarbose in lowering plasma glucose levels.

Investigation of *Pittosporum molucannum* Plant Extracts as Potential Source of Natural Biopesticides

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Background and Objectives: Unintentional pesticide poisoning (UPP) in humans has been an inherent public health problem most developing and agricultural countries, faces since the 1960's. Pesticides are substances that are used to kill or repel plants and animals considered to be pests. However, despite its benefits, pesticides poses health risks. *Pittosporum molucannum* locally known as "buyo-buyo" was traditionally used as herbal pesticides although no further scientific findings support this claim. Thus, this study aims to provide initial findings on the plant's potential as a source of natural biopesticides.

Methods: In this study, extracts were obtained through maceration of the plant's leaves, fruits, and barks in ethanol, followed by filtration, and finally concentration using rotary evaporator. The extracts were chemically profiled through thin-layer chromatographic principles and toxicity was screened using brine shrimp lethality assay and MTT cytotoxicity assay. Herbicidal activity was determined using phototoxicity assay and activity was compared to glyphosate (positive control) and water (growth control).

Results and Discussion: TLC experiment results suggest that the leaves, fruits and barks contain semipolar compounds that are UV active at 365nm and 254nm wavelengths. Alkaloids and flavonoids were found on the three plant extracts, phenolics were found in leaves and fruits, and tannins was found only on leaves. Furthermore, toxicity profiling suggests an LC50 of 0.098 mg/mL for leaves extract and 3.125 mg/mL for barks and fruits extracts. In addition, the fruits extract was found to be cytotoxic (CC50) at 0.39 ug/mL while both the leaves and barks at 0.2 ug/mL. Herbicidal assay suggests that the extracts totally inhibit seed germination (100 % + SD 0.00) at 2 ug/mL while the positive control (13.5 ug/mL glyphosate) only exhibited 92.34 % + 0.47) inhibition.

Conclusion: Findings of this study suggests that *P.molucannum* plant contains UV active compounds that could be a potential source of biopesticides specifically against weeds.

Docking Study Using Vina for Phytochemicals from *Mangifera zeylanica* to Treat Dengue

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Background and Objectives: Dengue has emerged as a global public health challenge which unmet specific drug treatment or vector control has become a threat to the world due to increased morbidity rate. The current unavailability of drugs has urged the need for novel antiviral drugs. NS3 protease (PDB ID: 2FOM) is known for its viral replication of the dengue virus type II is used in this study. This study explores the possibility of phytochemical compounds as NS3 protease antagonists by detecting the common amino acid residues in the binding pocket.

Methods: 2OFM, which is a primary target protein to treat dengue, was retrieved from RCSB PDB. In this study, docking of phytochemicals which were downloaded from NCBI PubChem from the source, *Mangifera zeylanica* was carried out in a single config.txt file using AutoDock vina 1.2.6 with FDA-approved drug as control ligand to find the antagonist candidate of NS3. All the ligands were docked at a time by generating and executing the *.BAT file through vina.exe and ligands (*.pdbqt files) folder pathways. BIOVIA discovery studio was utilized to visualize the interactions between protein and ligand. Potential drug candidates against dengue were assessed using Swiss-ADME webtool based on Lipinski's rule of five, blood-brain barrier permeability and GI absorption for oral administration.

Results and Discussion: Phytochemical, lupeol showed the lowest binding energy (-8.9 kcal/mol) while it does not obey Lipinski's rule. Epicatechin showed -8.5 kcal/mol and acceptance for Lipinski's rule. Other phytochemicals' binding affinities range from -5.1 to -8.6 kcal/mol.

Conclusion: Epicatechin can be selected as a potential drug candidate. LEU149 was detected as a common amino acid with respect to hydrogen bond and LEU76 and ILE165 were identified as the common amino acid residue corresponding to hydrophobic interaction. Further, in-vitro and in-vivo experiments can be persuaded.

Synergistic Killing of Polymyxin B Combinations with Chloramphenicol Derivatives against Multidrug Resistant (MDR) *Klebsiella pneumoniae*

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Background and Objectives: Combination antibiotics is a treatment strategy to achieve synergistic killing against multidrug resistant (MDR) *Klebsiella pneumoniae*. Combination interactions can be classified into synergy ($\geq 2 \log_{10}$ CFU/mL), additive ($1-2 \log_{10}$ CFU/mL), and indifferent activity ($< 2 \log_{10}$ CFU/mL) of bacterial killing when compared to the most active monotherapy. This study aimed to determine the antimicrobial pharmacodynamics of polymyxin B combination with chloramphenicol and its less cytotoxic derivatives (thiamphenicol and florfenicol) against MDR *K. pneumoniae*.

Methods: Broth microdilution was used to determine the minimum inhibitory concentration (MIC) against *Acinetobacter baumannii* 19606 and MDR *K. pneumoniae*, ATCC 700603, BAA-2146, and 700721 isolates. Time kill assay was used to assess the bacterial killing of polymyxin B (20mg/L) in combination with chloramphenicol (160mg/L), thiamphenicol (64mg/L) and florfenicol (64mg/L) against MDR *K. pneumoniae* isolates. Viable cell count was done to determine the antimicrobial pharmacodynamic effect of antibiotics alone and in combination expressed as bacterial burden (\log_{10} CFU/mL) at 1, 4 and 24h.

Results and Discussion: All isolates were susceptible to polymyxin B and resistant to chloramphenicol, thiamphenicol and florfenicol. Monotherapy polymyxin B showed a regrowth of bacteria after 24h for all isolates. Chloramphenicol, thiamphenicol and florfenicol were ineffective against all isolates when treated alone. The combination of polymyxin B with chloramphenicol exhibited synergistic activity against all isolates. Treatment of polymyxin B and florfenicol demonstrated synergistic and additive killing of all isolates and combination of polymyxin B with thiamphenicol showed indifferent and additive killing of bacteria. The synergistic activity combination of polymyxin B with chloramphenicol against MDR *K. pneumoniae* were similar as previous study.

Conclusion: The combination of polymyxin B with florfenicol and thiamphenicol demonstrated synergistic and additive killing against MDR *K. pneumoniae* isolates. Further investigation assessing the cytotoxic effect of polymyxin B combination with thiamphenicol and florfenicol at clinically relevant concentrations are warranted.

Effect of *B. hispida* Seed Extract towards Protein Expression of AHR, OVOL-1 and CYP1A1

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Background and Objective: Atopic dermatitis (AD) is skin disease which can be characterized by pruritic and eczematous dermatitis that can be chronically varied through remissions and relapses. Primarily, AD is caused by the skin barrier dysfunction while the skin sensitization to allergens could also contributed to the severity of the skin disease. This study aims to discover the skin barrier repair functions of the *Benincasa hispida* seed extract (BHSE) which mainly consists of polyunsaturated fatty acids (PUFAs) towards the skin barrier proteins which usually were downregulated in AD.

Methods: The methods that were implemented in this study were the immunoblotting including Sodium Dodecyl Sulphate Polyacrylamide Gel Electrophoresis (SDS-PAGE) to study the upregulations of three main skin barrier proteins which are Filaggrin, Loricrin and Involucrin and the receptors and other proteins (Aryl Hydrocarbon Receptors, Ovo Like Transcriptional Repressor 1 and Cytochrome P450 Family 1 Subfamily A Member 1) which were involved in the upregulations of the mentioned skin barrier proteins. The procedures started with the SDS-PAGE to separate the protein mixture of HaCaT lysate according to their respective molecular weight, followed by protein transfer or blotting towards the polyvinylidene fluoride membrane and lastly, the blocking steps of primary and secondary antibody before chemiluminiscent visualization.

Results and Discussion: This study found that the BHSE was able to upregulate all of the proteins involved in the skin barrier restoration in dose dependent manner of the selected concentrations of 250 µg/mL, 125 µg/mL and 62.5 µg/mL.

Conclusion: Based on this finding, it can concluded that there were upregulations on the protein expressions in most of the interested proteins which each one of them plays a crucial role in restoring the skin barrier dysfunction and therefore, suggesting the ability of the BHSE in the treatment for AD through the restoration of skin barrier dysfunction.

Effect of Retinoic Acid Loaded Nanosponge Gel-cream Formulation vs Commercial Formulation in Animal Model

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Background & Objectives: Acne is a common inflammatory skin disorder affecting 9.4% of the global population making it the eight most prevalent disease worldwide. Retinoic acid (RA) is effective in treating acne but may cause side effects. RA can be encapsulated in a cyclodextrin based nanosponge which is known to improve delivery through sustained release which helps reduce side effects. The objective of this study is to compare the effect of commercial RA cream with RA loaded nanosponge gel-cream with the same strength (0.05%) on animal model.

Methods: Rats (n=12) were divided into four groups which are the control group, commercial formulation group, placebo gel-cream group and finally the test group with retinoic acid loaded nanosponge gel cream formulation. Formulation was applied once daily for 21 days. The rats were monitored for any physical reaction to the application. Weekly skin tests to assess the trans-epidermal water loss (TEWL), hydration and erythema was also done with the Dermalab Combo® equipment.

Results and Discussion: Results show that the commercial formulation group caused significant increase in TEWL and erythema which indicates symptoms of skin barrier dysfunction. This is parallel to the observation of commercial group which showed skin turning dry, flaky and finally become wounds. Nanosponge group did show a slight increase in TEWL overtime, but it was not significant. Physical observation did show some dryness towards the end of the study but it quickly resolved.

Conclusion: The encapsulation of retinoic acid in a cyclodextrin based nanosponge may have helped reduce side effects as nanosponge has previously shown to provide sustained release in various studies. To further prove this behaviour, diffusion study can be done in the future.

Genotyping of SNPs in *ABCB1* (rs1045642, rs1128503) and *OPRM1* (rs1799971, rs9479757) Associated with Pain Control and Adverse Effects of Morphine among Cancer Pain Patients in Malaysia

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Background and Objectives: Single nucleotide polymorphisms (SNPs) affect treatment outcomes in opioid-treated patients with evidence predominantly from Caucasian populations. The association of SNPs with cancer pain treatment outcomes within multi-ethnic Malaysian population remains unknown. This study aimed to investigate the relationship of SNPs in *ABCB1* and *OPRM1* genes on morphine pharmacodynamic parameters (pain control, dose requirement, and adverse effects) and non-genetic pharmacodynamics of morphine (gender, ethnicity, ECOG scores and cancer stage).

Methods: 66 Malaysian solid tumour cancer patients treated with morphine were recruited from National Cancer Institute. Data (demographic and clinical) and saliva samples were collected from all participants. Patients' pain severity was evaluated by using Brief Pain Inventory. Incidence of adverse effects were determined through a questionnaire. Both questionnaires used Likert scales and were available in English and Malay. Due to COVID-19 restrictions, 38 out of 66 subjects completed the questionnaires. DNA extracted from saliva samples were genotyped for SNPs in *ABCB1* (rs1045642, rs1128503) and *OPRM1* (rs1799971, rs9479757). Statistical analyses were performed to determine the associations between genetic and non-genetic factors with morphine.

Results and Discussion: The AA genotype in *ABCB1* rs1128503 SNP had the highest pain score in the last 24 hours ($p=0.043$). *ABCB1* (rs1045642, rs1128503) and *OPRM1* (rs1799971, rs9479757) SNPs were associated with several adverse effects incidence ($p<0.05$). Ethnicity was associated with the incidence of hallucination ($p=0.041$) in patients. ECOG scores and cancer stages were also associated with several adverse effects incidence ($p<0.05$). However, morphine dose was not associated with genetic or non-genetic factors.

Conclusion: The association between genetic and non-genetic factors with pain severity and adverse effects incidence was seen in this study, but not with dose requirement. This pilot study should be validated in future genetic association studies on larger cohorts to elucidate the role of pharmacogenomics in treating cancer pain in Asian patients.

Evaluation of the CYP1A2, CYP2D6, and CYP3A4 Inhibition by the Ten DOH-Approved Philippine Medicinal Plants using Enzyme-Specific Fluorometric Substrates in Pooled Human Liver Microsomes

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Background and Objectives: Herb-drug interaction is a safety concern in using herbal medicines and plant-based dietary supplements. Cytochrome P450 enzymes (CYP) constitute the major enzyme family known for oxidative biotransformation of most drugs and other lipophilic substrates. CYP inhibition can result in high levels of unmetabolized drug molecule possibly eliciting toxic effects. This study aimed to determine the inhibition of CYP1A2, CYP2D6, and CYP3A4 by the ten Philippine herbal medicines approved by Philippine Department of Health (DOH).

Methods: CYP inhibition in pooled human liver microsomes was determined using a spectrofluorometric technique that involved isoform-specific substrates: 7-methoxyresorufin (7-MR), 7-benzyloxy-4-trifluoromethylcoumarin (BFC), and 7-benzyloxyquinoline (BQ) monitoring the activity of CYP1A2, CYP2D6, and CYP3A4, respectively. The substrates at K_m were incubated with microsomes, phosphate buffer (pH 7.4), and NADPH with or without methanolic extracts of each plant. Microsome-substrate mixtures were pre-incubated before adding NADPH, which initiated CYP activity. After incubation, microsomal protein was separated from supernatant. Fluorescence intensity of supernatant at fluorophore-specific emission and excitation wavelengths showed O-demethylation by CYP1A2 and O-dealkylation by CYP2D6 and CYP3A4. Percentage mean inhibition values were determined based on fluorescence intensity of uninhibited substrates. Extracts showing at least 50% inhibition at K_m were considered as having inhibitory effect on enzymes.

Results and Discussion: *Ehretia microphylla*, *Quisqualis indica*, *Blumea balsamifera*, and *Cassia alata* exhibited high CYP1A2 inhibition values: 82.98%, 64.81%, 63.75%, and 60.58%, respectively, at $50 \mu\text{g}\cdot\text{mL}^{-1}$. Only *Q. indica* showed more than 50% inhibition at $25 \mu\text{g}\cdot\text{mL}^{-1}$. CYP2D6 and CYP3A4 inhibitions were not observed even at the highest extract concentration ($72 \mu\text{g}\cdot\text{mL}^{-1}$). Nonetheless, *Allium sativum* at $14.6 \mu\text{g}\cdot\text{mL}^{-1}$ showed mean CYP3A4 inhibition above 50%.

Conclusion: CYP1A2, CYP2D6, and CYP3A4 have broad substrate specificity and clinical relevance. Due to possible CYP inhibitory action of some Philippine medicinal plants, their concomitant use with certain drugs should be considered with caution.

Neuroprotective Effects of Palm Oil Derived Tocotrienol-Rich Fraction in Aluminium Chloride Induced Vascular Dementia Rats

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Background and Objectives: Vascular dementia (VaD) is a common type of dementia and can be caused by aluminium exposure. Available medicines for the management of VaD are limited. Palm oil derived tocotrienol rich fraction (TRF) is known to produce neuroprotective actions in neurological conditions, however, its effect on VaD is not explored. Hence, the objective was to evaluate the neuroprotective effects of TRF in aluminum chloride (AlCl_3) induced VaD rats.

Methods: AlCl_3 (150 mg/kg; i.p.) was administered daily for 7 days to rats for inducing VaD and later rats were treated with TRF 30, 60, and 120 mg/kg; p.o. for 21 days. VaD induced memory loss was assessed by Morris water maze test. Biochemical markers like plasma homocysteine, brain acetylcholinesterase (AChE) activity, reduced glutathione (GSH), and superoxide dismutase (SOD) levels were estimated. Brain coronal sections were stained with hematoxylin and eosin for histopathological analysis.

Results and Discussion: VaD in AlCl_3 treated rats was confirmed by significant increase in the plasma homocysteine levels (9.61 ± 1.00 $\mu\text{mol/L}$) and brain AChE activity (6.16 ± 0.24 $\mu\text{mol/min/gm}$ of tissue), decrease in GSH (4.67 ± 0.29 $\mu\text{M/mg}$ of protein), and SOD (4.78 ± 0.86 U/mg of protein) levels as compared to normal rats. However, treatment with TRF 60 in VaD rats significantly decreased the levels of plasma homocysteine (5.50 ± 0.37 $\mu\text{mol/L}$) and brain AChE activity (3.81 ± 0.19 $\mu\text{mol/min/gm}$ of tissue), increased GSH (7.15 ± 0.48 $\mu\text{M/mg}$ of protein), and SOD (8.87 ± 0.68 U/mg of protein) levels as compared to AlCl_3 treated rats. Furthermore, neurodegeneration and memory loss were also significantly protected by TRF. Moreover, TRF 60 and 120 effects were found to be equipotent.

Conclusion: This study exhibits the neuroprotective role of TRF in VaD rats and hence provides new knowledge to understand TRF effectiveness in the management of VaD.

Pharmacokinetics of Loratadine after Intranasal Application of Its Gel Formulation

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Background and Objectives: Loratadine is a second-generation antihistamine administered orally to treat allergic rhinitis and urticaria. However, its oral administration can cause several side effects such as headache, dizziness, fatigue, and nausea. To address these issues, intranasal drug delivery is considered due to avoidance of the first-pass effect and improved bioavailability. *In situ* nasal gel formulation, in particular, is advantageous due to its sustained and controlled release of drugs.

Methods: In this study, an *in situ* gel formulation was evaluated for its pharmacokinetic parameters through an *in vivo* experiment in rabbits and was compared with that of loratadine administered as intravenous and intranasal solutions.

Results and Discussion: The *in situ* gel exhibited the highest mean residence time when compared with intravenous and intranasal solution which indicates the accumulation of loratadine in a specific tissue for a longer period of time and exhibits its therapeutic efficacy. The pH of the formulation was within the physiological range ($\text{pH} = 6.60 \pm 0.13$). Drug plasma concentration significantly increased 6 to 8 hours after administration of gel ($p < 0.05$). The fraction of dose absorbed for the *in situ* nasal gel ($F = 0.83$) was 2.3-fold higher than that of the intranasal solution ($F = 0.36$).

Conclusion: Based on the results, the rise in drug plasma concentration from the *in situ* gel formulation appeared to be slower and more gradual compared to the intravenous and intranasal solutions. The incorporation of loratadine into *in situ* nasal gels may be beneficial for patients suffering from diseases affecting the nasal mucosa, such as allergic rhinitis, due to its improved bioavailability, convenient dosing, and easy administration.

Anomalous Dissolution Enhancement of Aged Supersaturated Electrospun Solid Dispersion System

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Background and Objectives: Supersaturation was introduced as part of the strategy for improving the dissolution profile of the amorphous solid dispersion (ASD) system. However, supersaturation stability over time remains the main hurdle for a sustainable dissolution enhancement. Worse still, physical stability, particularly ageing and recrystallisation persist as the challenges which restrict the development of ASD. Therefore, this study aims to investigate the effect of storage conditions on the physical stability of the supersaturated electrospun system, particularly the sustainability of dissolution enhancement and inhibition of solution-mediated recrystallisation.

Methods: Electrospun samples were stored in two distinctive conditions, i.e., 75% RH, 40°C and 0% RH, 25°C for 3 months and 12 months respectively. Physical characteristics of aged electrospun samples were tested with polarised light microscopy, Differential Scanning Calorimetry and Attenuated Total Reflectance-Fourier Transform Infrared. Drug content assay was conducted to identify drug stability after storage. Dissolution studies were carried out in a non-sink condition to assess the release stability across recrystallisation tendency.

Results and Discussion: In the highly humid and relatively high temperature condition, the aged electrospun sample has recrystallised and lost the advantage of an ASD system in achieving supersaturation, resembling the dissolution profile of its crystalline counterpart. In contrast, electrospun sample stored in dry and temperate conditions has remained sample amorphicity and unexpectedly showed inhibition towards solution-mediated recrystallisation, hence sustaining the dissolution enhancement. Such positive transformation in the aged electrospun sample could be due to the achievement of an equilibrium glassy state by structural relaxation during the ageing process.

Conclusion: Structural relaxation was proposed to exert a stabilising effect on ASD which inhibit solution-mediated recrystallisation. The presented result suggested ageing improves the sustainability of dissolution enhancement in the ASD system which was not previously stabilised through a formulation design.



SO15

Phytochemical Investigation and Antioxidant Activity Determination using ORAC Assay of the Dried Bark and Fresh Leaves of *Pterocarpus indicus* Willd. (Fam. Fabaceae)

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Background and Objectives: The study aimed to look at the effects of different *drying and processing protocols* (DPPs) on selected parameters: IR peaks, Moisture Content (MC), Total Extractives (TE), Phytochemical Tests (PCS), and ORAC Score. The different DPPs can cause post-harvest modifications resulting to changes in the kind and amount of phytochemicals in each sample.

Methods: The samples were macerated in ethanol and the extract was vacuum evaporated. The extracts were then used for phytochemical screening and FTIR analysis. The collected peaks were binned and were analyzed with Hierarchical Clustering and Principal Component Analysis using R.

Results and Discussion: The PCS revealed that the DPPs with significant air-drying time (DPPs 1 and 2) tested positive for polyphenols and flavonoids. The combination of air- and oven-drying (DPP 2) may have led to some metabolite decomposition as evidence by a decrease in TE. Oven-drying only (DPP 4) resulted in a lower degree of variety in the metabolites present. The absence of any form of drying (DPP 3) resulted in a product that did not have any of the desired metabolites. The PCA and HCA analysis have revealed that clustering was observed on products from DPPs 3, 6, and 7 (air-drying only); DPPs 1, 2 and 5 (both air- and oven drying); lastly DPP 4 (oven-drying only). The ORAC score of DPPs 2,4, and 5 (all belonging to different clusters) were not significantly different to one another; the highest score was reported on DPP 5 (H-ORAC = 24627.7).

Conclusion: There may be an optimum combination of air- and oven-drying that will ensure the highest amount and activity of antioxidant compounds for the processed Narra bark. The methods used in this study may be used for the quality control of dietary supplements and herbal medicines.



Waste to Wealth: Turning Biomass Waste into Biocompatible and Biodegradable Hydrogels for Dermal Drug Delivery

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Background and Objectives: Palm oil is a nature's gift to Malaysia. However, the flourishing oil palm industry has generated 22 – 23 tons of oil palm empty fruit bunches (OPEFB) as biomass waste annually. Utilising unbleached OPEFB cellulose pulp as a feedstock for hydrogel development can tackle the environmental issues and wood supply constraints. Alkali solvent is commonly used to solubilise cellulose and the cellulose solubility can affect the hydrogel formation and characteristics. This study aims to develop hydrogels from unbleached OPEFB cellulose for dermal drug delivery with an emphasis on understanding the effect of alkali solvent compositions on the hydrogel properties.

Methods: Unbleached OPEFB cellulose powder (2%w/v) was dissolved in alkali solvents consisting of sodium hydroxide (NaOH) (6 – 8%w/v) and urea (4 – 6%w/v) before crosslinking with epichlorohydrin to form hydrogels. The hydrogels were evaluated for gel strength, swelling ratio (SR) and thickness. The biocompatibility and biodegradability of hydrogels were investigated using MTT assay and soil burial method, respectively. *Ex vivo* drug permeation study was conducted using hydrogels reswollen in ibuprofen solution.

Results and Discussion: The cellulose solubility (84 – 94%) increased with NaOH concentration due to the inhibition of the reassociation of cellulose chains. This encourages the crosslinking reactions that lead to the formation of highly swollen hydrogels but with a lower gel strength. Whereas urea did not show a significant impact on these parameters. Hydrogels prepared with 8%w/v NaOH were excluded from further investigations due to fragile characteristics. Hydrogels produced were biodegradable and non-cytotoxic to human fibroblast cells. Highly swollen hydrogels prepared from 7%w/v NaOH and 4%w/v urea (SR: ~2800%) can hold and deliver more ibuprofen into the skin.

Conclusion: Cellulose hydrogels developed from unbleached OPEFB cellulose are promising dermal delivery platforms due to its biocompatibility and biodegradability. The role of alkali solvent compositions is important in formulating hydrogels with a well-balanced SR and gel strength.



Abstracts of Poster Presentation

Community Pharmacy


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CP0	Tan Xin Yi	Exploring Chronic Kidney Disease Older Patients' Perception on Their Burden and Concerns on Medication Prescriptions In Hospital Tuanku Ja'afar
CP1	Adelin Suraya Mokhtar	Pharmacist's Preferences, Evaluation and Perceptions of Telepharmacy Application Services: A Pilot Study
CP2	Ben Chen	Role of Pharmacist during the COVID-19 Pandemic in Taiwan: A Scoping Review
CP3	Chen Yi-Chi	Evaluation of the Efficacy of Valproic Acid used in Residents of A Long-term Care Institution
CP4	Durga Bista	Patients' Perspective on Community Pharmacy Services of a Ward (10) of Kathmandu Metropolitan
CP5	Hsiang YP	Peace, Love and Care of Medicine on Radio Broadcasts
CP6	Hsieh Yi-Ni	Effectiveness of Individualized Health Education Provided by Volunteer Pharmacists on Tier C Local Stations
CP7	Jungkeun Lee	Exploring the Role of Pharmacy as A Community Drug Addiction Counselling Centre
CP8	I-Hsuan Heyman Lee	Establishment of the Betel Nut-free Environment by Community Pharmacists: A Pilot Study in Taiwan
CP9	Jonas L. Miranda	Direct Selling of Nootropic Drugs in An E-commerce Platform in the Philippines
CP10	Kwang Joon Kim	The Clinical Effects of Type 2 Diabetes Patient Management Using Digital Healthcare Technology: A Systematic Review and Meta-analysis




CP11	Kwang Joon Kim	Pharmacy services for the 2019 Federation Internationale de Natation (FINA) World Masters Championships in Gwangju, South Korea
CP12	Masako Hashimoto	Pharmacists Approach to Specialty Care Facilities for People who have Parkinson's Disease
CP13	Maureen Canda-Borcelas	Exploring the Lived Experiences of Community Pharmacists on Pharmacy-Based Immunization: A Phenomenological Study
CP14	Nai-Hwa Mei	Current Contributions and Future Opportunities for Community Pharmacists during the COVID-19 pandemic in Taiwan
CP15	Noelle Marie Hagos Fontanilla	Knowledge, Attitude and Barriers to Compliance for the Pharmacy Support Workforce Requirements and Responsibilities on the Philippine Pharmacy Act
CP16	Noor Batrisyia Aunib Zaidisam	Knowledge, Attitude and Perception of Community Pharmacists on Teleconsultation
CP17	Shao Ti Hsu	Analysis on the Effectiveness of Education Program for Improving Accessibility of Pharmacy Involvement in HIV Care
CP18	Wen Hsiu (Angela) Lin	Understanding the Influencing Factors of Telepharmacy Implementation in Taiwan: A Qualitative Study


Hospital and Clinical Pharmacy

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HP1	Chen Wei Ju	Analysis of the Effectiveness of OSCE Applied to Hospital Pharmacy Training
HP2	Chiao-Tan Chen	Using Beers Criteria for Older Inpatients to Assess Rational Drug Use at A Public Hospital in Taiwan





HP3	Chin-Wei Chang	Optimising the Evaluation Efficiency of Integrated Outpatient Clinic Prescriptions
HP4	Chou Kuang-Yu	Anti-COVID-19 Drugs Induced Elevated Liver Enzymes: A Case Series
HP5	Chu-Chen Cheng	Dose-related Study of Opioid Use in Critically Ill Patients Receiving Extracorporeal Membrane Oxygenation Maintenance System
HP6	Farizan Abdul Ghaffar	Utilisation of Cardiovascular Drugs among Pulmonary Hypertension with Valvular Heart Disease Patients before Valve Surgery
HP7	Fu-Yu Yang	An Evidence-based Therapy of Secondary Hyperparathyroidism
HP8	Hsiang YP	Statistical Analysis on Outpatient's Referral for Individual Medication Guidance by Pharmacists
HP9	Hsin-Yi Chou	Efficiency of Pharmacists' Pre-intervention for Elderly Outpatients with Polypharmacy
HP10	Hsu, Yung-Chia	Analysis of Severe Cases Risk Factors and Potential Drug-drug Interactions (DDIs) in Patients Receiving Oral Anti-COVID-19 Virus Drugs
HP11	Hsu, Yung-Chia	Analysis Potential Drug-drug Interactions (DDIs) and Risk Factors in COVID-19 Patients Receiving Oral Anti-Virus Drugs Paxlovid® and Molnupiravir
HP12	Kamol Kunaprasert	Clinical Outcomes of Pharmaceutical Care in Patients Receiving Warfarin at Ayutthaya Hospital: A Retrospective 15-years Study
HP13	Kwang Joon Kim	Investigation of International Status of Sports Pharmacy Guideline
HP14	Lai Yu Ci	The Evaluation of Inpatient Oral COVID-19 Medication Utilisation in Medical Centers of Southern Taiwan






HP15	Lin Wen-Ling	Retrospective Study of Drug Use Assessment for Plerixafor
HP16	Liu HP	Case Report of Suspect Adverse Effects of Piperacillin/Tazobactam Induced Drug Fever
HP17	Liu Tsun-Pin	Innovation and Evaluation of the Outdoor Outpatient Pharmacy in Response to COVID-19 Epidemic: A Pilot Study at A Regional Hospital in Southern Taiwan
HP18	Lyu BJ	Drug Utilization Evaluation of Remdesivir in A Regional Teaching Hospital in Southern Taiwan
HP19	Marilou Pascual	Survival Analysis of COVID-19 Patients Admitted in a Tertiary Government Hospital in Nueva Ecija: A Preliminary Report on the Compassionate Use of Remdesivir
HP20	Mejar Norlizawati bt Moktar	The Prevalence of Pill Dysphagia Among Adult Hospitalised Patients in Hospital Angkatan Tentera Tuanku Mizan (HATTM)
HP21	Nik Aisyah Najwa bt Nik Mustaffa Shapri	Revisiting Renal Transplant Medication Therapy Adherence Clinic Questionnaire on Immunosuppressive Medications Knowledge in Post Kidney Transplant Recipients: Item Generation & Content Validation
HP22	Nursyafiqah Moideen	bt Standardization of Medication Bin Labelling with Quick Reference Information to Reduce Medication Error and Improve Caller Waiting Time
HP23	Nurul Amirah Daud	Disaster Management Zone (DMZ): Military Pharmacists' Unconventional Innovation in Responding to Health Threats
HP24	Nurul Amirah Daud	Prescription Error in Tertiary Military Hospital – Prevalence and Pattern
HP25	Nurul Samsudin Syazfeeza	Systematic Review on Questionnaires to Measure Medication Knowledge in Post Kidney Transplant Recipients






HP26	Roongthip Tangsahasakri	Relationship of Nutritional Status and Sepsis Mortality
HP27	Shu-Chuan Pi	Applying Quality Control Tool Improves the Conformance Rate of Microbial Monitoring Performed by Chemotherapy Pharmacists
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HP29	Tai-Yung Yi	Low-dose Cefepime Efficacy Evaluation Using Real-world Data
HP30	Tay Siow Chia	Incidence of Liver Injury in Patients Initiated with Antiretroviral Therapy in Primary Care Clinics
HP31	Tseng, Shu-Cheng	Evaluation of Chinese Herbal Extracts on Eczema Skin
HP32	Tsung Wei Chang	Interprofessional Collaborative Practice in HIV Patient: Role of Pharmacist in A Regional Hospital
HP33	Tu Po-Yang	The Prevalence of Major Drug–drug Interactions in Patients Treated with Nirmatrelvir plus Ritonavir: A Retrospective Study
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HP35	Cheng Yih-Dih	Using Plan-Do-Check-Action Management Methods to Improve Medication Errors in Taiwan Hospital
HP36	Wen-Hwang Chen	Evaluation of the Appropriateness of Antibiotics Doses in Critically Ill Patients Receiving Extracorporeal Membrane Oxygenation System [ECMO]
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HP38	Yen, Ching-Hui	Valproic Acid Induced Alopecia in Patient with Post-stroke Epilepsy
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HP40	Yi-Fang Weng	The Effectiveness of Pharmacist Intervention in Heart Failure Integrated Clinic
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HP44	Zakiah Noordin	Mohd Withdrawal Factors from Smoking Cessation Program: Lessons Learnt from Defaulted Quit Smoking Clinic Attendees
HP45	Ching- Chih, Huang	Management of COVID-19 Infection Combined with Bacteremia Pneumonia in Cancer Patients with Neutropenia: A Case Report and Literature Review

Industrial Pharmacy and Marketing/Medicines and Health Information


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IMP2	Chia chang Hsu	Analysis of Patient Self-administered Satisfaction Questionnaires in Psychiatric Specialized Hospital
IMP3	Chin-Ju Chuang	Developing the Medication Reminder App to Improve Medication Adherence



IMP4	Cyan D. Meniado	Determinants and Perceived Effectiveness of Self-Medication Practices for the Prevention or Treatment of COVID-19 Symptoms among Adults in Cavite
IMP5	Hannah Kristnel Dv. Mesa	Knowledge and Perception of the General Public in Cavite, Philippines on Counterfeit Medicines
IMP6	Ming Hung Lin	Combined SGLT2 and ARNI Therapy to Reduce the Risk of Cardiovascular Disease in Type II Diabetes: A Nationwide Population-base Cohort Study
IMP7	Ng Xue Min	The Impact of Service Marketing Mix toward Customer Purchase Behavior from Pharmacy Services Online
IMP8	Uttam Budhathoki	Prediction of <i>in vivo</i> Performance of Dabigatran Capsules Produced in Nepal from <i>in vitro</i> (Dissolution) data Using Numerical Convolution Method
IMP9	Yung-Huei Fu	The Study of Drug Interactions between Herbal Medicine and Drugs
IMP10	Nurhazirah Zulkefli	Pharmacologistics Market Survey: Procurement Model for The Malaysian Field Hospital In Bangladesh

Pharmacy Education

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PP1	Anggun P. Wardhani	Varying Approaches for Modelling CPD — A Retrospective Review by Indonesian Young Pharmacists Group
PP2	Kanayuki Kitahara	Assessment of Clinical Competence of Entry Level Pharmacists based on Case-based Discussion



PP3	Liao LC	The Development of Teaching Method and Game-Based Materials for Medication-use Safety Modular Course
PP4	Md. Mirajul Islam	A New Platform to Advance Pharmacy Workforce Education
PP5	Nor Elyzatul Akma Hamdan	Drug-related Problems (DRP) Identified by Pharmacy Students during Telepharmacy Sessions
PP6	Hung-Chang Chou	Consultation and Education of Doping Among Athletes and Their Logistics Staff
PP7	Nugraha AT	Hybrid learning to answer the adjustment of learning models after the pandemic

Social and Administrative Pharmacy

ID	Presenting Author	Title
SAP1	Chan Yuk Ying	New Drug Budget and Reimbursement Policy in Taiwan
SAP2	Dongmun Ha	Development of a Searching Program of Nutrient Information for Patients who have Diabetes or Hypertension
SAP3	Hyuntai Kim	Development of a Computerized Pharmacy Management System Called PM+20 for the IT-based Community Pharmacy Practices in South Korea
SAP4	Izzati Yussof	Systematic Review of Factors Associated with Long-Term Adherence to Adjuvant Endocrine Therapy
SAP5	Kim Ann Pere	Knowledge, Attitudes, and Practices on the Use of Antibiotics among the Residents in Silago, Southern Leyte, Philippines: Basis for Antimicrobial Stewardship Program for Primary Health Care
SAP6	Ma. Bernadette A. Cirilos	Associated Factors Related to Influenza Vaccine Acceptance among Adults in Cavite During the COVID-19 Pandemic

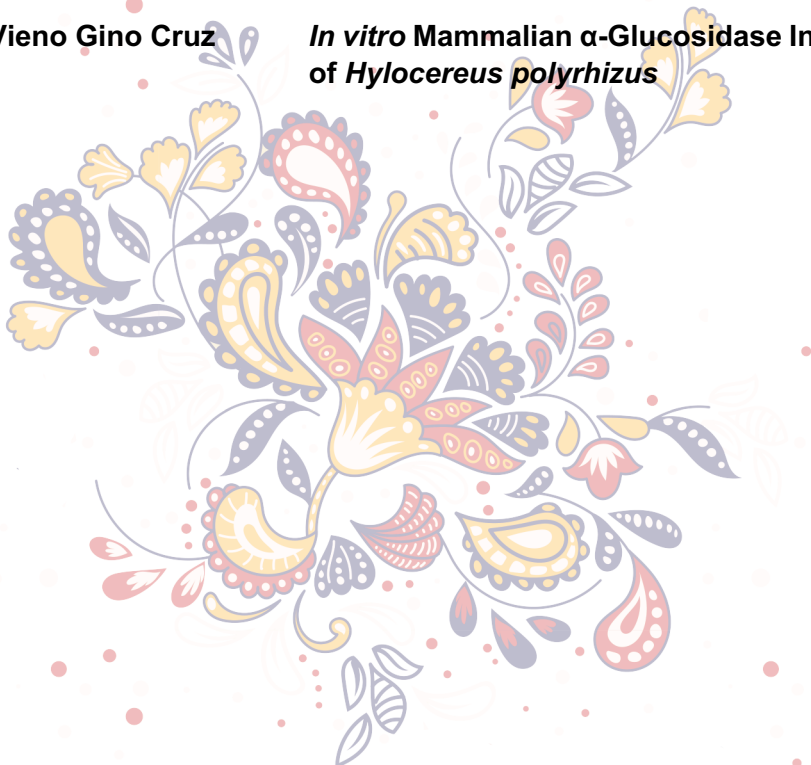
SAP7	Maj Amirah bt Rahmatullah Khan	Military Pharmacist Involvement in COVID-19 Vaccination Outreach Programme
SAP8	Mejar Muhammad Najhan Bin Md Bohari	Military Pharmacist Involvement in Greater Klang Valley Special Task Force (GKVSTF) – Medical and General Logistics Cluster (MedGenLog Cluster)
SAP9	Muhammad Amir Ehsan Bin Zamri	The Flying Pharmacist: Military Pharmacist's Experiences and Roles in Managing COVID-19 Vaccine Logistics using Royal Malaysian Airforce (RMAF) Aircraft
SAP10	Nurfikriah Husna bt Mohamad Radzi	Customer Satisfaction towards Logistic Pharmacy Services in HTJS
SAP11	Nursyafiqah bt Md Tahir	Patient Characteristics and Factors Associated with Defaulters among Drive-through Patients in Hospital Tuanku Ja'afar Seremban
SAP12	Soo Toh Wan Xin	Assessment of Public Satisfaction on National COVID-19 Immunization Services among the Malaysian Population
SAP13	Rosita S Ignacio	Perceptions, Attitude, and Barriers of PAPPI Regulatory Pharmacists Towards Regulatory Pharmacy Experiential Practice: A Basis for Capacity Programs
SAP14	Kamaliah bt Md Saman	Exploratory Factor Analysis of A Patient-Reported Outcome Measure: A Newly Developed Medication Adherence Measurement Tool for the Elderly in Malaysia

Scientific

ID	Presenting Author	Title
SP1	Reem Abou Assi	Transethosomal Gels as Nanocarriers for the Transdermal Delivery of Tamoxifen: Statistical



Optimization, Characterization, and *Ex vivo* Evaluation

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| SP2 | Rizal Za'im Bin Ramli | Viability Assay of Essential Fatty Acids from the <i>Benincasa hispida</i> Seed Extract in Keratinocytes |
| SP3 | Sharifah Shakirah Bt Syed Omar | The Development and Characterisation of Retinoic Acid Loaded Nanosponge |
| SP4 | Srinivasa Sastry D | Formulation and Evaluation of Voriconazole Gastro Retentive Floating Tablets |
| SP5 | Vieno Gino Cruz | <i>In vitro</i> Mammalian α-Glucosidase Inhibitory Activity of <i>Hylocereus polyrhizus</i> |
- 



CP0

Exploring Chronic Kidney Disease Older Patients' Perception on Their Burden and Concerns on Medication Prescriptions In Hospital Tuanku Ja'afar

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Background and Objectives: Old patients with chronic kidney disease are likely to receive treatment using multiple drugs for their multimorbidity conditions. This polypharmacy is associated with potential risk of medication-related adverse events and drug interactions which subsequently lead to treatment non-adherence. The aim of this study is to understand older patients' perceptions on their medication prescriptions and challenges they encounter.

Methods: Participants above 60 years or older shortlisted based on the inclusion criteria from the clinic appointment list from the Nephrology Clinic, Hospital Tuanku Ja'afar Seremban. A semi-structured interview was conducted with eight participants at respective slots via phone. Data were analysed using thematic analysis.

Results and Discussion: Age-related limitations such as forgetfulness, poor vision, are one challenge encountered by this population. However, old patients had positive perception towards adhering to their prescribed medicines, as they 'noted beneficial effects on body condition'. Some patients appreciated having active communications with healthcare professionals at clinics regarding proper administration of medicines and their disease progression. For prescriptions that require their own sponsor such as needles for insulin injection, some older patients found it a financial burden.

Conclusion: These identified factors serve as guidance to provide opportunities for further pharmacist interventions towards better patient-centred outcomes.

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CP1

Pharmacist's Preferences, Evaluation and Perceptions of Telepharmacy Application Services: A Pilot Study

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Background and Objectives: Information on the evaluation and opinions of telepharmacy application systems among pharmacists is needed to facilitate the adoption of telepharmacy services. The purpose of this study were to determine the i) preferences, evaluation, and perceptions of pharmacist towards the telepharmacy systems and ii) relationship between the demographic background and their preferences on telepharmacy application system services.

Methods: Self-administration survey was conducted via an online and face-to-face survey from April to May 2022. The target population was community pharmacists who work in community pharmacies in Klang Valley. An invitation link was sent via Gmail and Whatsapp platform to a list of community pharmacies. Data collected were analysed using descriptive statistics, Kruskal-Wallis and Mann-Whitney U test.

Results and Discussion: A total of 24 respondents met the inclusion criteria, with 14 (58.3%) had 1-5 years of working as a pharmacist, and two-third (66.6%) showed interest in using telepharmacy. Aspects to consider in using telepharmacy are ease of use and the ability to use telepharmacy application and conduct consultation from the smartphone. The pharmacists disagree to the statement 'I found no difference between how I conducted face-to-face consultation and how I provided consultation via telepharmacy'.

Conclusion: Despite the growing recognition of telepharmacy, its implementation and utilization of telepharmacy by pharmacists in Klang Valley is still quite low. Nevertheless, our study provides a current view of the telepharmacy setting, which will aid future development and application of telepharmacy by pharmacists, professional organizations, and government officials.

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CP2

Role of Pharmacist during the COVID-19 Pandemic in Taiwan: A Scoping Review

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Background and Objectives: Since the start of the new Coronavirus (COVID-19) outbreak in December 2019, pharmacists in Taiwan are playing a key role adopting innovative strategies to minimize the adverse impact of the pandemic. It is the objective to identify and describe core services provided by the pharmacist in Taiwan during the COVID-19 pandemic.

Methods: A literature search was performed in Google Scholar for studies published between December 1st, 2019 and August 20th, 2022 in English. Studies that reported services provided by pharmacists during the COVID-19 pandemic in Taiwan were included.

Results and Discussion: A total of 3980 records were identified, of which 16 studies fully met the eligibility criteria. Most of them were conducted in Taiwan. The most common type of publication were literatures describing the workplace of the pharmacist in community and hospitals. These findings showed the different roles of pharmacists during the COVID-19 pandemic, such as disease prevention and infection control, adequate storage and drug supply, patient care and support for healthcare professionals. Pharmacists' interventions were mostly conducted for healthcare professionals and patients, through one-to-one contact, telephone or video conference. The pharmacists' main responsibility was to provide drug information for healthcare professionals as well as patient counselling. Yet, pharmacists deliver medicine to patients at home under quarantine.

Conclusion: A reasonable number of studies that described the role of the pharmacists during the COVID-19 pandemic were found. All studies reported actions taken by pharmacists, although without providing a satisfactory description. Thus, future research with more detailed description as well as an evaluation of the impact of pharmacist intervention is needed in order to guide future actions in this and/or other pandemic.

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CP3

Evaluation of the Efficacy of Valproic Acid used in Residents of A Long-term Care Institution

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Background and Objectives: Drug use evaluation is rarely practiced in long-term care (LTC) institutions in Taiwan. Our study looked at the efficacy of valproic acid by analysing prescriptions, test values and clinical effects, and assessment of the rationale of the medicines in LTC institutions to ensure patient safety.

Methods: This was a retrospective study of residents, diagnosed with epilepsy and taking valproic acid in a private LTC institution in New Taipei City from January 1, 2017, to July 31, 2020, by regular tracking drug concentration, drug interaction, liver damage index, platelet values, and clinical effects.

Results and Discussion: We collected 56 medicine concentration data from total 19 residents, 31 cases were between the normal value of the valproic acid concentration, 23 cases were lower than the treatment range, 2 cases were higher than the treatment range, the symptoms of most residents were well control. We observed that residents' plasma concentration and the clinical efficacy of epilepsy treatment did not have an absolute relation, which was roughly the same as the results in published research literature. There were 4 pharmacy recommendations for dose adjustment of valproic acid, 1 for drug interaction, 1 for adverse reaction that occurs after taking the medicine, 2 for excessive dosage, 3 were for abnormal liver damage indicators, and 5 cases were platelet abnormalities. There were limited indicators that could be tracked regularly in the LTC institution, so the observed increase in liver injury indicators was not significantly associated with oral valproic acid.

Conclusion: Most LTC institutions had limited resources in Taiwan, so we must cooperate and re-educate all staffs in LTC to assess the effectiveness of treatment correctly to improve the safety of medication for residents.

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Patients' Perspective on Community Pharmacy Services of a Ward (10) of Kathmandu Metropolitan

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Background and Objectives: The patient-centered role of pharmacists is undervalued as the public are not aware about the roles of pharmacists. This research aimed to identify patients' perception and satisfaction towards pharmaceutical care service and factors affecting their preferences for community pharmacy.

Methods: A cross-sectional and mix method study. Quantitative study was done using a validated questionnaire and Q methodology study was done using a normal distribution grid and Q statements which is considered as both quantitative and qualitative study. Q methodology was used to collect the perception towards community pharmacists through the Q method software.

Results and Discussion: Out of 406 participants, 30.5% respondents perceived balance between business and health aspects of pharmacy practices, some as drug experts while others viewed pharmacists as being more concerned with business. In addition, 43.8% of the participants were found to discuss their drug related queries with pharmacists, may be due to the low cost of treatment. More than 70% of the respondents had no hesitancy when contacting pharmacists for health-related information regarding mild illnesses because they believed that pharmacists are sufficiently qualified to address drug-related questions. A high level of support (88.1%) was for the role of pharmacists to counsel the patient about the directions for use of medications. Level of satisfaction indicated that 72.4% were satisfied and highly satisfied with the service. They were also confident about pharmacists' ability to protect the privacy of their medical records and felt at ease to discuss their health with them. Out of 52 participants in Q methodology, a majority perceived pharmacists were competent to advise on good quality drug usage and monitor their health, providing sufficient counselling time.

Conclusion: Pharmacists were regarded as the most trusted personnel to contact. However, in order to facilitate the expansion of pharmaceutical care services, the public should be made aware about their distinctive professional talents.

Peace, Love and Care of Medicine on Radio Broadcasts

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Background and Objectives: Kaohsiung First Pharmacists Association (KFPA) cooperated with the Taiwan Drug Relief Foundation to promote peace, love and care of medicine on Kaohsiung Broadcasting Station. People can learn more about healthy information through radio broadcasts, and enjoy better medication environment under COVID-pandemic.

Methods: From January to December 2021, a total 30-minute topic was conducted on the first Thursday of each month. KFPA planned health themes and provided audiences with accurate medical information and health care knowledge.

Results and Discussion: In 2021, the KFPA hold a total of 7 broadcasts on Kaohsiung Broadcasting Station. The topics were women disease, drug side effect, ophthalmology, depression, hyperglycemia, and antibiotic management. These sharing were specially selected by the KFPA for community pharmacists and hospital pharmacists. Radio programs can use the official website of the TDRF and Facebook page of "Smart Drugs and Healthy Eating" to release the program preview information before the broadcast, and provided the link to audience. Such radio programs can be listened at anywhere, regardless of location and space. It's a very worth promotion during the COVID-19 pandemic.

Conclusion: The broadcast and network transmission speed are too fast, and the audience has no field and movement restrictions. In the COVID-pandemic prevention policy, broadcasting activities is an excellent method to promote community health education. KFPA had long cooperated with national and local health authorities, through the monthly radio program "Peace, Love and Care of Medicine", it can increase the public's correct concept of drug use, and also enhance the professional image of pharmacists regardless of the pandemic.

Effectiveness of Individualized Health Education Provided by Volunteer Pharmacists on Tier C Local Stations

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Background and Objectives: In Taiwan, pharmacists have become increasingly involved in community practice and long-term care institutions. This study combines the Taichung City Office of Food and Drug Safety with the power of the community by instructing volunteer pharmacists from the Taichung City Pharmacists Association to provide a wide range of pharmaceutical care services and improve medication use among the community population with support from the health resources of tier C local service stations.

Methods: Participants aged 45 years or older were recruited in this cross-sectional study from tier C local service stations in Taichung City, during September 2019 to November 2019. A single group pretest and posttest trial was conducted. Repeated attendees of activities organized by four tier C local service stations were eligible. The short-term effectiveness of educational medication safety lectures on health promotion in the tier C long-term care stations was assessed.

Results and Discussion: The volunteer pharmacists conducted 12 medication safety and health promotion events at four tier C local service stations in Taichung City. A total of 190 questionnaires were distributed to assess the efficacy of the program. All single items exhibited significant improvements 3 months after the educational medication safety lectures. We also designed a gamified intervention, namely “A Healthy Monopoly,” that aimed to motivate participants to increase their medication knowledge through the game.

Conclusions: These results demonstrated that volunteer pharmacists can play a valuable role in community health care and that pharmaceutical care interventions can improve the safety of the environment in Taiwan.



CP7

Exploring the Role of Pharmacy as A Community Drug Addiction Counselling Centre

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Background and Objectives: Pharmacy is a valuable local resource that provides not only medication counseling in the usual sense, but also counseling on narcotics and drug addiction. The present study was conducted to explore the role of pharmacy as a community drug addiction counselling centre.

Methods: As a member of Gyeonggi Pharmaceutical Association, 46 'Magmi Pharmacies' were selected to participate in the pilot project centering on pharmacies that share the common awareness on safe and correct use of legal narcotic drugs. The Project was carried out for two months from Oct .2021, and an 8-item questionnaire was used to survey the local residents who received the service.

Results and Discussion: We distributed promotional materials and brochures on drug abuse and addiction to more than 10,000 local residents. We also performed detailed information provision and counseling service on a total of 325 medications. Psychotropic drugs accounted for most of the drug counselling with 262 cases, as well as 2 narcotics and 26 non-narcotic prescription drugs and 35 over-the-counter drugs. When local residents were surveyed, the need for Magmi Pharmacy service and satisfaction with the counseling service were high regardless of gender, age, and occupation. The overall service was satisfactory, such as the expertise of the information obtained, and the reinforcement of the motivation to change through the service.

Conclusion: In order for pharmacies to function as community drug counselling centres, pharmacists must not only remain as experts in drugs, but also develop competence as 'counsellors' so that they can intervene in psychological and behavioral therapy as well as drug counselling. The Magmi Pharmacy project demonstrated that pharmacies have considerable potential and roles as local drug addiction counselling centres that can reinforce the correct use of drugs and prevention of drug misuse, ultimately contributing to public health promotion through an integrated drug counselling process.

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Establishment of the Betel Nut-free Environment by Community Pharmacists: A Pilot Study in Taiwan

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Background and Objectives: Regarding the hazards of betel nut, the International Agency for Research on Cancer concluded from various research outcomes that "chewing betel nut containing tobacco" or "simultaneous smoking and chewing betel nut" are harmful to humans. From the latest cancer registration data and cause of death statistics, over 8,000 new cases of oral cancer are diagnosed each year, and 3,300 people passed away from oral cancer, one of the leading cancers in Taiwanese male. To reduce the prevalence rate of betel nut chewing, the establishment of a base to control and eliminate betel nuts at community pharmacy is vital.

Methods: This study was performed from September 1st in 2021 to July 31st in 2022 in Taiwan. The lectures on betel nuts and cancer prevention were held in Eastern Taiwan for pharmacists to update their clinical regulation and knowledge. Surveys were conducted pre- and post-course. The pharmacists provided consultation and education to potential patients and held numerous events on health education in the community to improve the public health literacy.

Results and Discussion: The average accurate rate of examination for pharmacist professional education increases from $83.3 \pm 20.6\%$ to $90.5 \pm 14.9\%$ ($n = 83$, $p < 0.01$). After the courses, pharmacists in 15 community pharmacies participated in the consultation and education to the public. The consultations were raised by patients ($n = 42$, 60.9%) or their families ($n = 27$, 39.1%). The majority of patients were elderly, male and blue-collar workers. The reduction in betel nuts chewing was observed, and the percentage of complete abstinence from betel nuts was 28.1% ($n = 9$).

Conclusion: With this pilot study, the community pharmacy as a base for the prevention and control of betel nuts was successfully established, and this project would be further extended in Taiwan.

Direct Selling of Nootropic Drugs in An E-commerce Platform in the Philippines

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Background and Objectives: Availability of prescription and controlled substances, including nootropics, in e-commerce platforms has become a growing concern with an increase of Internet and social media users. Despite FDA restrictions, there is evidence of poor digital surveillance of regulated drugs. The objective of this study was to evaluate the regulatory issues on direct selling of nootropic (“brain boosting”) drugs on an e-commerce platform in the Philippines.

Methods: Search terms and other terms associated with nootropics were collected from an e-commerce website and Google. The nootropics found were initially filtered using the inclusion and exclusion criteria, and classified according to seller’s name and pertinent product information. Subsequently, duplicated items (same product and seller) were eliminated. Data validation was done while excluding ineligible data. Data were reviewed independently before characterization based on product category [over-the-counter (OTC) drug, prescription drug or food supplement], country/region of origin, popularity (number sold, ratings, reviews, and products sold), and FDA registration based on Philippines FDA Verification Portal and Indonesian BADAN-POM database. Final data were filtered using the eligibility criteria. Then, these were sorted and analysed.

Results and Discussion: A total of 96 unique nootropics products, of which 33 contained prescription and controlled drugs, were found in the e-commerce website. An examination of their registration status in their countries of origin confirmed that only products containing citicoline (24.2%) were registered; the rest were unregistered (75.8%). Even though citicoline products are registered, they require a prescription and these should not be sold direct-to-consumer. Of the unregistered nootropic drugs, two are categorized as controlled substances: namely, modafinil (27.3%) and armodafinil (15.2%). Both are popular in terms of the number sold, ratings, and reviews.

Conclusion: Unregistered drugs containing controlled substances were available and highly accessible direct-to-consumer showing lack of regulatory compliance among online sellers and the e-commerce platform. Direct-to-consumer regulatory policies need to be reviewed to strengthen digital surveillance of the online pharmaceutical marketplace.

The Clinical Effects of Type 2 Diabetes Patient Management Using Digital Healthcare Technology: A Systematic Review and Meta-analysis

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Background and Objectives: The disease control rate is very low (at less than 30%) for diabetes. The use of digital healthcare technology is increasing recently for continuous management in daily life.

Methods: In this study, a meta-analysis was conducted to evaluate the clinical effects of digital healthcare technology for patients WITH type 2 diabetes management. For a review of the literature, databases such as PubMed, Embase, and Cochrane Library were searched using Medical Subject Heading (MeSH) terms published up to 9 August 2021.

Results and Discussion: As a result, 2354 articles were identified, and 12 randomized controlled trial articles were finally included. Digital healthcare technology combined management for type 2 diabetes significantly decreased HbA1c ($p < 0.00001$, standardized mean difference (SMD) = -0.49) and marginally decreased triglyceride, compared WITH usual care ($p = 0.06$, SMD = -0.18). However, it did not significantly affect BMI ($p = 0.20$, SMD = -0.47), total cholesterol ($p = 0.13$, SMD = -0.19), HLD-C ($p = 0.89$, SMD = -0.01), LDL-C ($p = 0.95$, SMD = -0.01), systolic BP ($p = 0.83$, SMD = 0.03), or diastolic BP ($p = 0.23$, SMD = 0.65), compared WITH usual care.

Conclusion: These results indicate that digital healthcare technology can improve HbA1c and triglyceride levels of type 2 diabetes patients. Further well-designed randomized controlled clinical trials are needed to confirm the clinical effect of digital healthcare technology.

Pharmacy services for the 2019 Federation Internationale de Natation (FINA) World Masters Championships in Gwangju, South Korea

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Background and Objectives: The role of sports pharmacists is being emphasized in international athletic events. This study aimed to describe the pharmacy services for the 2019 Federation Internationale de Natation (FINA) World Masters Championships in Gwangju, South Korea.

Methods: Research focused on athletes and coaching staff who received medications after visiting medical centers and pharmacies located in the athletes' village from July 5 to July 29, 2019. We collected daily results of pharmacy's operation and prescription interventions. The data were analysed using Microsoft Excel, and were expressed as frequency (%).

Results and Discussion: Throughout the tournament, 633 patients received medications at the athletes' village pharmacy (gender: 338 men [53.4%], 295 women [46.6%]; nationality: 299 Korean [47.2%], 334 overseas players [52.8%]; patient type: 150 athletes [23.7%], 427 non-athletes [67.5%]). Therapy for musculoskeletal disorders was the most common (n = 29, 19.3%), and oral NSAIDs (n = 56, 22.0%) were the most frequently dispensed medications in the athletes. Pharmacists intervened 47 out of 491 prescriptions (9.6%), with dosage change (n = 21, 44.7%) being the most common intervention type.

Conclusion: Sports pharmacists at FINA World Masters Championships played a pivotal role in ensuring the safe usage of medications by all participants, especially athletes. This study results will be a useful reference for pharmacy services at future international or domestic sports competitions.

Pharmacists Approach to Specialty Care Facilities for People who have Parkinson's Disease

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Background and Objectives: The treatment of people who have Parkinson's disease should be customized for each individual. The Temari Group attempted to provide optimal care by assembling a team of healthcare professionals including physical therapists, nurses, care workers, occupational therapists, and speech therapists.

Methods: The way the Temari Group approached this was to first gather information about the people who have Parkinson's disease and survey them to know what medications each individual had been taking. Further research was done to know the adherence to their daily medicine schedule, the effectiveness of the medicine, and to what extent people suffered from side effects. At the specialty care facility, we led a meeting about pharmaceutical care for patients with Parkinson's disease. We held monthly meetings with all healthcare professionals to discuss the care of people with Parkinson's disease, the effectiveness of their medicine, side effects, and so on. After one year, we met again to identify any issues we had and how they could be improved.

Results and Discussion: We were able to know about the patients who suffer from Parkinson's medicine intake, schedule, effectiveness of the medicine, and finally, the side effects. Furthermore, all healthcare professionals got together to share their thoughts, opinions, and information, so as to improve patient care in future.

Conclusion: We can see that the collaboration of healthcare professionals has contributed to and improved the activities of daily life and quality of life of those with Parkinson's disease. We continue to see pharmacists play an important role in the collaborative treatment of patients with Parkinson's disease, now and in future.

Exploring the Lived Experiences of Community Pharmacists' on Pharmacy-Based Immunization: A Phenomenological Study

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Background and Objectives: Increasing levels of vaccine hesitancy and the recent COVID-19 pandemic have necessitated the implementation of pharmacy-based immunization in the Philippines. However, this was a relatively new development in the field. Previous researches has primarily employed quantitative methods. This phenomenological study aimed to explore the lived experiences of community pharmacists on pharmacy-based immunization among the three districts of Davao City.

Methods: This study employed a phenomenological qualitative research design using purposive sampling. Data was gathered through in-depth interviews associated with validated semi-structured questionnaires, with four participants per district. Consent was sent through their emails and Google Meet platform was utilized. Data was duly analysed through thematic analysis to identify recurring concepts and, eventually, themes.

Results and Discussion: Utilizing thematic analysis, nine themes were generated: Positive experience, accessibility and convenience, enhanced trust and therapeutic relationship, advancing public health, insufficient manpower and more workload, unsuitable setting and inadequate training for vaccination and emergencies, lack of motivation and experience, top-down support for effective pharmacy-based immunization, and Increased Sales and Improved Brand Reputation. Younger participants were more open to the concept of administering vaccines in their pharmacy. Pharmacy-based immunization is beneficial because it capitalizes on the patients' preference for pharmacies over hospitals and other vaccination sites. While the major downside is the lack of manpower, resulting in negative impacts on the quality of their work.

Conclusions: Based on the results, effective implementation of pharmacy-based immunization required that the challenges are resolved and issues mitigated. Community pharmacists support pharmacy-based immunization. The relevant stakeholders (Pharmacy Organizations and Drug store Owners) could utilize this study to address concerns of community pharmacists, resulting in improved immunization services. Through the use of online platforms and heads of pharmacy organizations, this could help improve awareness of the program, educate the stakeholders, and create better guidelines.

Current Contributions and Future Opportunities for Community Pharmacists during the COVID-19 pandemic in Taiwan

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Background and Objectives: The global spread of COVID-19 continues to place unprecedented demands on healthcare services. In this time of crisis, innovative and adaptive methods of practicing will be required across all health professions. Community pharmacists in Taiwan have since played a vital role in response to the current pandemic. As their scope of practice extends to the optimization of chronic medication use, evidence-based health advice, rationing of personal protective equipment, and medication home deliveries, their expertise is undoubtedly still underutilized. Therefore, this study was to highlight the roles and activities that community pharmacists have taken to aid in relieving pressure on other healthcare services and government officials. The results of this study will act as a roadmap for policymakers when restructuring existing and expanding future health services provided by pharmacists in response to public health crises such as COVID-19.

Method: Data from March 2020 to June 2022 was collected from Guandu Song Community Pharmacy's electronic database and further analysed through software data, Microsoft Excel and STATA.

Results: Pharmacists performed an average of 50 daily medication reviews among the 10 participating long-term care (LTC) facilities. Overall, 99 drug-related problems (DRPs) and potentially inappropriate medication (PIM) were documented. This included suggestions to change an "inappropriate drug of choice", "no indication of drug use", and "duplicate medication". The acceptance rate from physicians was 91%. Whereas, the daily average of individual COVID-19 rapid test kits distributed was 410. In addition, pharmacists handed out more than 200 surgical masks per day in accordance with the government's rationing scheme.

Conclusion: This study suggests that community pharmacists have significantly contributed during a public health crisis by ensuring continuity of pharmaceutical services and providing novel services. Their vital role within a community during the COVID-19 health crisis further illustrates that they are an essential team player in the management of emerging infectious diseases.

Knowledge, Attitude and Barriers to Compliance for the Pharmacy Support Workforce Requirements and Responsibilities on the Philippine Pharmacy Act

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Background and Objectives: The New Philippine Pharmacy Act revolutionize Community Pharmacy practice which requires training and define specific roles for Pharmacy Support Workforce (PSW). The study assessed the knowledge, attitude, and barriers (KAB) in compliance to responsibilities and requirements on PSW among independent drug stores in Rodriguez, Rizal, Philippines

Methods: This quantitative, cross-sectional study used a descriptive research design that utilized a validated and pretested structured questionnaire administered face-to-face among all consented independent drug store where respondents include pharmacy owners and PSW such as pharmacy technicians, pharmacy assistants, and pharmacy aides. Statistical Package for Social Sciences (SPSS) was used to perform all descriptive statistics for summarizing KAB scores and non-parametric inferential statistics such as Mann-Whitney, Kruskal-Wallis, and Spearman's Correlation.

Results and Discussion: Owners (88.1%) and PSW (77.4%) had 'poor knowledge' but with 'positive attitude' towards compliance. Most are hesitant to finance their training. Inaccessibility of training site is a moderate barrier to compliance. KAB between owners and PSW did not significantly differ. Level of knowledge (LOK) significantly differed with training attendance ($p < 0.001$) for owners and PSW and with the highest educational attainment ($p = 0.018$) and length of employment (LOE) ($p = 0.0403$) for PSW. PSW's attitude differed with LOE ($p = 0.049$). Owner's LOK is positively associated with administrative barriers ($r = 0.32$) and owner's and PSW's attitude is negatively associated with personal barriers ($r_s = -0.39$ and $r_s = -0.53$, $p < 0.01$). Further PSW's attitude is negatively associated with administrative barriers ($r_s = -0.45$, $p = 0.001$)

Conclusion: Based on the results obtained, accessible and affordable training should be provided to owners and PSW to enhance their competencies and comply with requirements.

Knowledge, Attitude and Perception of Community Pharmacists on Teleconsultation

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Background and Objectives: Teleconsultation was increasingly used to communicate with patients, particularly during the COVID-19 outbreak. Most of the healthcare providers showed a positive attitude and perception of teleconsultation however, community pharmacists receive scant attention in the literature. This study was conducted to assess community pharmacists' knowledge, attitude and perception of teleconsultation.

Methods: A semi-structured interview was done with community pharmacists servicing in the Klang Valley, Malaysia. A selected number of community pharmacists were introduced to a video on consultation services provided by a telehealth provider and answered a set of questionnaires.

Results: A total of 27 community pharmacists participated in the semi-structured interview and 13 community pharmacists were selected for the video demonstration and were asked to answer a set of questionnaires. The themes which emerged from the interview were knowledge of teleconsultation, attitude and perceptions of teleconsultation application and barriers to teleconsultation. As for the demonstration, 69.2% showed good knowledge scores while 53.8% showed moderate scores in their attitude and 53.8% and 61.5% showed poor perception scores on usefulness and practicality, respectively. There are no statistically significant differences between the attitude scores of the participants with "good knowledge" and "moderate knowledge" (Kruskal-Wallis, $H = 0.032$, $p = 0.859$). There is a weak and positive correlation between overall knowledge scores and perception. At the same time, there is a strong and positive correlation between overall attitude scores and perception.

Conclusions: Community pharmacists were aware and knowledgeable about teleconsultation but their attitude and perception can be improved. As community pharmacists will be the ones to provide such services, efforts must be taken to improve their attitude and perception so they can provide good quality services in the near future.

Analysis on the Effectiveness of Education Program for Improving Accessibility of Pharmacy Involvement in HIV Care

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Background and Objectives: The number of community pharmacies in Taiwan joining the professional system of AIDS care continues to increase, from 17 to 56 between the years 2017 and 2021. Advanced knowledge of pharmacists to care for HIV- infected patients and their intention to provide public health services for prevention and treatment have to be evaluated, promoted and strengthened. In 2021, Taiwan Young Pharmacists Group hosted two educational training courses for pharmacists, supported by Taiwan CDC. Two courses were held in eastern and northern Taiwan, including online and on-site courses. This study was conducted to evaluate the effectiveness of the education and training courses.

Methods: Pre-test and post-test questionnaire data of trainees were collected and analysed for any differences in the training pharmacists' HIV prevention knowledge, attitude and behavior intention in the HIV education program. The questionnaire consists of five true or false questions and five multiple-choice questions, each with four options. The proportion of responses before and after the course were analysed using McNemar's test. The attitude and behavioral intention questions are based on a 5-point Likert scale and were analysed using paired sample t-test.

Results and Discussion: A total of 102 valid questionnaires were collected (102/114,89%). The average attitude score of pharmacists increased from 3.94 to 4.24, an increase of 0.3, reaching a statistically significant difference ($P < 0.001$). The attitude and behavioral intention score increased from 4.01 to 4.24, an increase of 0.23, with P value < 0.001 . We also found that pharmacists were still relatively unfamiliar with "pre-exposure and post-exposure prophylactic administration" and especially with "screening principles and related services".

Conclusions: Overall, the education program significantly improved and supported pharmacists in providing professional knowledge, better attitude and behavioral intentions towards HIV prevention. "Screening Principles and Related Services" related subjects and learning motivation should be continuously strengthened in the future.

Understanding the Influencing Factors of Telepharmacy Implementation in Taiwan: A Qualitative Study

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Background and Objectives: Through the literature review from Japan, Canada, and Europe, we can learn that telepharmacy is beneficial for the provision of drug information and to improve the safety of medication for people in remote areas. However, due to the current regulations in Taiwan, only pharmacists are allowed to deliver medicines. Therefore, at this stage, Taiwan's telepharmacy care services are only aimed at remote prescription review, teleconsultation, telepharmacy effects and monitoring. The aim of this study was to understand the factors for promoting telepharmacy, and the opinion of community pharmacists.

Methods: This study was performed from April 1st, 2022 to July 31st 2022 in Taiwan. The opinion of community pharmacists about telepharmacy was collected through semi-structured interviews. Seven pharmacists participated in this study, all of them have over 10 years of practice experience and are active in community pharmaceutical care.

Results and Discussion: Following the procedure of pharmaceutical care in community pharmacy, several pain points of practicing telepharmacy were found in this study. These included identifying the patient, ensuring information security, and collecting medical information from NHI. Several benefits were also foreseeable such as assisting medical intervention in remote or medically underserved areas, providing consultation immediately, and conquering the barriers of distance. All participants agreed that the impact on pharmacist practice could be divided into three levels: cost of training, regulations, and pharmacist competence.

Conclusions: With this qualitative study, we can identify the help and resistance to promoting telepharmacy for pharmaceutical care in Taiwan. To set up the telepharmacy system in Taiwan, more research and investigation are needed, and a pilot run is needed to understand how the entire model works.

Analysis of the Effectiveness of OSCE Applied to Hospital Pharmacy Training

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Background and Objectives: Interpersonal communication skills and the application of evidence-based medicine in clinical work are two of the core competencies of pharmacists. The Objective structured clinical examination (OSCE) is a more suitable assessment for these core competencies than the written and oral exams. The purpose of the study was to investigate the effectiveness of OSCE in assessing the clinical competence of PGY pharmacists and pharmacy interns.

Methods: Since 2018, we had arranged for PGY pharmacists and interns to attend joint OSCE training at a medical center. There were 6 themes in the OSCE, the topic of the intern's themes was all drug counseling, the themes of PGY pharmacists focus on the identification prescription errors and communication with the doctor. In addition to the trainee pass rate, the standard patient perceptions of trainee performance and trainee satisfaction scores on a five-point Likert scale were collected as a reference for subsequent improvement.

Results and Discussion: From 2018 to 2021, a total of eight PGY pharmacists and eight interns had participated in the joint OSCE training, six PGYs and seven interns passed the test. Standard patient assessments of PGY and intern's performance (e.g., professional attitude, appropriate response, empathy, overall performance, etc.) were 3.6 ± 0.5 each. The overall satisfaction level of the trainees included clear examination guidelines, standard patient performance seems real, appropriate feedback from the examiners, appropriate timing of the test, and appropriate difficulty of the test: 4.3 ± 0.6 for PGY pharmacists and 4.6 ± 0.4 for interns. All participants agreed that the OSCE arrangement was necessary and helpful.

Conclusion: The purpose of formative OSCE is for teaching. Participants could reflect on their performance and set future learning goals after the examiners, so we will continue to arrange for PGY pharmacists and pharmacy interns to participate in joint training OSCE.



HP2

Using Beers Criteria for Older Inpatients to Assess Rational Drug Use at A Public Hospital in Taiwan

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Background and Objectives: Patients over the age of 65 are a vulnerable population. Potentially inappropriate medications (PIMs) can be defined as medications for which use among older adults should be avoided due to an unfavourable balance of benefits and harms when safer and equally or more effective therapeutic alternatives are available. We aim to recognize the prevalence and the categories of PIMs and we monitor if there are any adverse reactions and give advices to physicians when necessary.

Methods: A retrospective analysis of prescriptions from medical records of patients over the age of 65 hospitalized in Taipei City Hospital Heping-Fuyou Branch ward using the AGS 2019 Beers criteria was performed. Data was collected for gender, mean age, medication prescribed, physicians' acceptance rate of pharmacists' interventions and polypharmacy (≥ 5 drugs/day). Descriptive statistics were used

Results and Discussion: A total of 482 elderly patients were identified and evaluated. The mean age was 77.3 (SD 8.4) and 54.6% were male. The mean number of drugs used was 6.3 (SD 3.9) and the mean number of PIM was 0.8 (SD 0.9). Polypharmacy (≥ 5 drugs/day) was prevalent in 62.2% of patients. The prevalence of PIM was high, at 51.7%. Among them, the most commonly prescribed PIMs were omeprazole (10.9%), metoclopramide (9.2%), tramadol (8.1%). This indicated the awareness of potential adverse events of prolonged PPIs use (i.e. risk of *C. difficile* infection and fracture) was low. Physicians' acceptance rate of pharmacists' interventions was 75%.

Conclusions: PIM prescription and polypharmacy were found to be common in Taipei City Hospital Heping-Fuyou Branch. We should make efforts to enhance both the medication safety and physicians' acceptance rate and if the use of PIMs is necessary, it is important to monitor patients' responses to the drugs.

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HP3

Optimising the Evaluation Efficiency of Integrated Outpatient Clinic Prescriptions

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Background and Objectives: There is integrated outpatient clinic service for elder people in our hospital. After evaluating patients' whole condition and medicines, the professional medical team, including doctors, pharmacists and medical case manager, offers new medical suggestions. However, the procedure of evaluating integrated outpatient clinic prescriptions took too much time. The aim of this retrospective study was to optimise the evaluation efficiency of integrated outpatient clinic prescriptions through lean thinking.

Methods: This is a retrospective study which pursue improvement by lean thinking. The procedure of evaluating prescriptions caused a lot of waste. First, the pharmacists needed to wait the referral mails from medical care manager to start evaluating prescriptions. Second, the pharmacists could not check mails immediately. Last, the pharmacists needed to open a lot of software for evaluating prescriptions. We wanted to diminish or eliminate the whole wasted time and set 15 minutes as goal. To evaluate whether the evaluation efficiency of integrated outpatient clinic prescriptions had improved, we compared the time of evaluating integrated outpatient clinic prescriptions before (Sep. 2020 to Feb. 2021), during (Jul. to Aug. 2021), and after (Sep. to Oct. 2021) the study.

Results and Discussion: After this improvement, we set up the new system and the phone message informing procedure for evaluating prescriptions. The time of evaluating integrated outpatient clinic prescriptions decreased from 40 minutes to 12 minutes, with a progress rate of 70.0%, and an achievement rate of 112.0%.

Conclusions: Through improving the process, we reduce a lot of time of evaluating prescriptions for integrated outpatient clinic in our hospital. We do optimise the evaluation efficiency of integrated outpatient clinic prescriptions.

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Anti-COVID-19 Drugs Induced Elevated Liver Enzymes: A Case Series

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Background and Objectives: COVID-19 had ravaged the world. Despite there are several antiviral therapies, numerous of them have adverse effects associated to liver in clinical trials. This study wanted to survey the events of anti-COVID-19 drugs induced elevated liver enzymes in real world.

Methods: It was a case series of patients who had elevated liver enzymes due to taking anti-COVID-19 drugs. We surveyed these cases according to the medical record in a quasi-medical center in Taiwan.

Results and Discussion: There were total three cases from January 1st to July 31st, 2022. The first case was a 61-year-old man who received remdesivir since May 24th. His AST/ALT were within normal range on 23rd. On 27th, his ALT elevated to 621 U/L, over 10 fold of upper limited normal. Doctor decided to discontinue his remdesivir treatment and prescribe silymarin to regulate liver function. His ALT got back to normal range on June 10th. The second case was a 5-year-old boy who received tocilizumab once and remdesivir since June 18th. His AST/ALT were 35/18 U/L on 18th and 898/897 U/L on 20th, which elevated from normal range to over 10 fold of upper limited normal. His remdesivir treatment was discontinued on 20th, and his AST/ALT slowly decreased since then. However, his ALT was still over upper limited normal on 27th. The third case was a 36-year-old man who received molnupiravir since June 27th to 31st. His AST/ALT were 294/86 U/L on 28th, so doctor prescribed silymarin. His AST/ALT decreased to 35/73 U/L on July 6th.

Conclusion: We evaluated the fluctuation of liver enzymes induced by anti-COVID-19 drugs in real world. All three cases had elevated liver enzymes after anti-COVID-19 drugs use. One got AST/ALT back to normal range and no irreversible liver injury found, but two still had ALT around 2 fold of upper limited normal at the end of follow-up.



HP5

Dose-related Study of Opioid Use in Critically Ill Patients Receiving Extracorporeal Membrane Oxygenation Maintenance System

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Background and Objectives: Patients with extracorporeal membrane oxygenation (ECMO) devices experience pain and may be agitated. The use of opioid analgesics can relieve pain and comfort in patients. Due to ECMO, drug hemodynamics may change, side effects or poor pain control may occur. This study evaluates the efficacy and dose-related effects of opioid analgesics in such patients.

Method: This study is a retrospective clinical case collection and analysis. During the data period from 2018.01.01 to 2020.07.30, a total of 20 opioid analgesics were used during the ECMO support period. The use of morphine, Fentanyl and pethidine drugs was converted into morphine equivalents, and the correlation of dose, days and pain score, and benzodiazepine (BZD) dose was evaluated.

Results and Discussion: The condition improved by 39.5%, against advice discharge under critical condition by 10%, and death by 49.5%. The most frequent use was morphine, followed by fentanyl and pethidine. Difference of pain index before and after analgesia (95% C.I. 1.6~3.9, $p < 0.0001$), correlation between analgesic dose and pain index ($r = -0.125$, $p = 0.598$), correlation between analgesic and BZD dose ($r = -0.1$, $p = 0.65$), the relationship between ECMO use days and analgesic dose ($r = -0.02$, $p = 0.93$), ECMO use days and opioid analgesic use days ($r = +0.59$, $p = 0.07$). The use of opioids for pain relief during ECMO can indeed reduce pain, and morphine is used with good pain relief and no metabolite relatively low side effects.

Conclusion: The duration of ECMO use increased, and the period of pain relief also increased (positive correlation), but the dose used was dependent on demand (not correlated), and the pain relief dose increased with the increase in patient pain level and disease severity (positive correlation), and BZD can reduce it. Dosage of opioid analgesics (concomitant with BZD doses is inversely related), and appropriate doses are given according to pain severity and time.

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Utilisation of Cardiovascular Drugs among Pulmonary Hypertension with Valvular Heart Disease Patients before Valve Surgery

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Background and Objectives: Valve surgery is the mainstay of treatment in pulmonary hypertension (PH) with valvular heart disease (VHD). However, a standard goal-directed medical therapy is still required while waiting for surgery. There were limited studies on the utilization of cardiovascular (CVS) drugs either before or after valve surgery. The current study was undertaken at a tertiary cardiac centre to identify the specific types and patterns of CVS drugs utilization before valve surgery.

Methods: A retrospective observational study (2014 to 2020) on adult patients WITH a confirmed diagnosis of PH WITH VHD, mean pulmonary artery pressure ≥ 25 mmHg, measured by invasive or non-invasive methods, underwent valve surgery and initiated WITH at least one oral CVS medication. Before surgery is defined starting from the pre-operative assessment visit and the day of surgery. Cardiovascular medications are defined as any agent that affects the function of the heart and blood vessels. All data obtained were analysed using descriptive analysis.

Results and Discussion: Sixty-one patients were included in this study. Patients were initiated and optimized with oral CVS drugs before surgery for underlying diseases such as hypertension and atrial fibrillation as recommended by recent international guidelines. Most of the patients developed PH with multiple and/or mixed valve diseases despite of the comorbidities which complicates the management of PH with VHD. The five most common of oral CVS drugs were loop diuretics (85%), phosphodiesterase-5 inhibitors (80%), vitamin K antagonist (46%), beta-blocker (69%) and potassium chloride (52%). Loop diuretics and potassium chloride were the common drug combination. Patients were prescribed with phosphodiesterase-5 inhibitors, to reduce pulmonary artery pressure before surgery. Patients who started with vitamin K antagonist, specifically warfarin, 32% of patients achieved International nationalized ratio target.

Conclusion: There were specific types and patterns of CVS drugs.



HP7

An Evidence-based Therapy of Secondary Hyperparathyroidism

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Background and Objectives : Secondary hyperparathyroidism (SHPT) is a major comorbidity of chronic kidney disease (CKD). It has been linked with cardiovascular disease, leading to poor outcomes. Treatment strategies directed to reduce the parathyroid hormone (PTH) concentrations have included calcimimetics (eg. etelcalcetide, cinacalcet), that are new options in reversing SHPT, but the benefits and harms on patient-level outcomes are uncertain. Since, the purpose of this study is to provide an evidence-based study in discussion efficacy and safety of the calcimimetics.

Methods : According to five steps used in evidence-based medicine, we searched the Cochrane library, Pubmed and Airiti library identifying completed and ongoing studies without language restrictions from 2017 to 31 July 2022.

Results and Discussion : Two studies met our eligibility criteria and were critically reviewed. Geoffrey et al shows that patients randomized to etelcalcetide were significantly reducing the ratio by more than 50% in Intact Parathyroid Hormone (iPTH) level compared to cinacalcet (OR, 12.2%; 95% CI, 4.7% to 19.5%), but hypocalcemia is higher in etelcalcetide (68.9% vs 59.8%). Palmer et al shows similar results in reducing iPTH level (OR, 2.78; 95% CI, 1.19-6.67), but gastrointestinal side effect is higher in cinacalcet.

Conclusion : Intravenous etelcalcetide can significantly reduce iPTH level compared to oral cinacalcet, but hypocalcemia is higher than cinacalcet. How to select drugs depends on patient's compliance, economic ability, and drug response. This study intends to provide more clinical information to medical practitioners.

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Statistical Analysis on Outpatient's Referral for Individual Medication Guidance by Pharmacists

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Background and objectives: In June 2022, a hospital in Taiwan, R.O.C. aimed to understand the efficacy of a referral system by the outpatient physician to pharmacist for patient's individual medication guidance at the consultation counter.

Methods: Through a computer platform, the outpatient physician identified the patient who needs special medication education and referred to the pharmacist at the consultation counter. Patients will be sent to the consultation counter to receive the pharmacist's medication guidance to improve patient's medication compliance. Drug evaluation and medication guidance satisfaction were conducted using the LIKERT 5 scoring method.

Results and Discussion: The data analysis showed that the patients from the Department of Respiratory were in needed for health education consultation (45.45%), followed by the Department of Nephrology (22.73%). Inhalation-type drug health education was the most requested categories of medication guidance (47.73%), followed by self-administrated injectables (27.27%). We found that patients were scored with 1.9 points LIKERT 5 scoring method before the medical education and 5 points after the medical education. Medication guidance satisfaction was 4.9 points for patients and 5 points for physician.

Conclusion: Outpatient physicians acknowledge the importance of patient's medication compliance; however, most patients were unfamiliar with or lack of sufficient knowledge of medication, resulting in poor medication compliance and poor disease control. Therefore, physicians referred patients to pharmacists to provide individual medication guidance, and specialized health education guidance based on individual patients' tailor-made problems. The results showed that the satisfaction of both physicians and patients was 5 and 4.9 respectively, indicating that the professional service by pharmacist plays an important role in medical behavior. Such referral indicated that pharmacist's service was well appreciated by the patients and physicians.

Efficiency of Pharmacists' Pre-intervention for Elderly Outpatients with Polypharmacy

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Background and Objectives: Inappropriate medication use, and polypharmacy are common among older adults. Many previous studies proved a comprehensive medication information system can help prevent drug-related-problem (DRP). Furthermore, continued monitoring of potential DRP is also necessary to ensure optimal medication use. To provide pre-visit medication evaluation and continued follow-up for elderly outpatients with polypharmacy by pharmacists in a medical center.

Methods: Between March 1, 2019, and February 29, 2020, we enrolled 2,729 patients with age over 65 years old receiving five or more medications and reviewed their current medication profile. Pharmacists confirmed the DRP with doctors before patient visit and keep monitoring to give suggestion up to four continued visits if the prescription remains unchanged. The classification of DRP and numbers of drugs per patient were surveyed before and after the intervention.

Results and Discussion: Among all the suggestion of pharmacists, the rate of physicians' acceptance was 61%. The prevalence of DRP was about 4.3% (117/2,729). Among the 117 DRP, improper dosage, drug contraindicate to renal impairment and duplications accounted for 44.4% (52/117), 28.2 % (33/117), and 21.4 % (25/117), respectively. This result shows that dosage adjustment in renal impaired patient is ignored. The mean numbers of drug items and the mean numbers of pill count per patient deceased from 45 to 40 ($p < 0.007$), 1687 to 1413 ($p < 0.0002$) during six months.

Conclusions: Pharmacists play an important role in preventing DRP. The result in our study shows continued monitoring and proactive intervention do improve the quality of patient care in polypharmacy elderly patients.



HP10

Analysis of Severe Cases Risk Factors and Potential Drug-drug Interactions (DDIs) in Patients Receiving Oral Anti-COVID-19 Virus Drugs

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Background and Objectives: In May 2022, Taiwan was at the peak of the COVID-19 epidemic. The oral antiviral drugs Nirmatrelvir/Ritonavir (Paxlovid®) and Molnupiravir were used for the first time in the treatment of patients with mild to moderate COVID-19 confirmed cases, mainly to reduce severe cases and mortality. The purpose of this study was to understand the distribution of severe cases risk factors in patients and to analyse the proportion of potential DDIs.

Methods: This study utilized retrospective analysis and collected confirmed cases of COVID-19 from May 20, 2022 to July 31, 2022, who were confirmed by physicians to have severe cases risk factors and were eligible for the use of the oral antiviral drug Paxlovid® or Molnupiravir, and perform descriptive statistical analysis.

Results and Discussion: A total of 415 cases were collected in this study, with an average age of 62.9 ± 17.04 years, 190 males and 225 females. The top 5 with severe cases risk factors were ≥ 65 years old (212; 51.1%), diabetes (115; 27.7%), chronic kidney disease (57; 13.7%), cancer (53; 12.8%), cardiovascular disease (45; 10.8%). The prescription ratio of Paxlovid® and Molnupiravir was 148 (35.7%): 267 (64.3%). In the Paxlovid® group, a total of 17 patients (6.4%) had potential DDIs with a total of 24 drugs. Among them, the literature recommends temporarily discontinuing the drugs was Rosuvastatin and Clopidogrel.

Conclusions: This study analysed the use of oral anti-COVID-19 virus drugs in the majority of people aged ≥ 65 years, showing that the elderly is one of the main risk indicators. Allowing the elderly to take medicine early can reduce the proportion of severe cases and mortality. Paxlovid® has the effect of CYP3A4 inhibitor, pharmacists must pay close attention to the DDIs, and educate patients on medication in a timely manner to maintain patient medication safety.

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Analysis Potential Drug-drug Interactions (DDIs) and Risk Factors in COVID-19 Patients Receiving Oral Anti-Virus Drugs Paxlovid® and Molnupiravir

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Background and Objectives: In May 2022, Taiwan reached the peak of the COVID-19 epidemic. The oral antiviral drugs Nirmatrelvir/Ritonavir (Paxlovid®) and Molnupiravir were treated for the first time in the patients with mild to moderate COVID-19, mainly reduce severe complication and mortality. The purpose of this study was to analyse the proportion of potential DDIs and risk factors in these populations.

Methods: This retrospective study collected mild to moderate COVID-19 infected patients who were confirmed by physicians from May 20, 2022 to July 31, 2022 in regional hospital in South Taiwan. These patients who were eligible for the treatment of the oral antiviral drug Paxlovid® or Molnupiravir on CECC criteria (Central Epidemic Command Center, Nation Health Command Center).

Results and Discussion: A total of 415 cases were collected in this study, with an average age of 62.9±17.04 years, 190 males and 225 females. The top 5 with severe risk factors were ≥65 years old (212; 51.1%), diabetes (115; 27.7%), chronic kidney disease (57; 13.7%), cancer (53; 12.8%), cardiovascular disease (45; 10.8%). The prescription ratio of Paxlovid® and Molnupiravir was 148 (35.7%): 267 (64.3%). In the Paxlovid® group, a total of 17 patients (6.4%) had potential DDIs. And mostly drug interaction with Paxlovid® were rosuvastatin and clopidogrel.

Conclusions: This study we found prescribed oral anti-COVID-19 virus drugs mostly aged ≥ 65 years, showing that the elderly is one of the main risk indicators. Allowing the elderly to take anti-COVID-19 virus drugs early can reduce the complication and mortality. Paxlovid® is CYP3A4 inhibitor, pharmacists must pay more attention to the DDIs, and educate patients and doctors how to avoid interaction to maintain medication safety.

Clinical Outcomes of Pharmaceutical Care in Patients Receiving Warfarin at Ayutthaya Hospital: A Retrospective 15-years Study

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Background and Objectives: This retrospective observation study aims to examine clinical outcomes of the pharmaceutical care processes for all patients who receiving warfarin therapy.

Methods: Patient information and clinical outcomes were collected from electronic database during the period of 2002 and 2017. Statistical analysis was carried out using Kaplan – Meier method and Chi – Square test.

Results and Discussion: All 1,867 participants were in the average age of 64 years old. Average period for warfarin therapy was 2.17 ± 3.09 years. Death in participants receiving warfarin during 2002-2007, 2008-2012 and 2013-2017 were not significantly different ($p=0.665$). Primary outcomes of death was due to major bleeding or major thromboembolism with the incidence reported as 3.42%. Incidence of re-hospitalization from major thromboembolism were 7.87%. Secondary outcomes reported the percentage of therapeutic INR in range were between 34.39% and 38.54% during 2013 and 2017. Most of their INR ranges were below 2.0. The higher percentages of therapeutic INR in range were correlated with lower mortality. Patients aged 75 years or older were significantly correlated with death from major thromboembolism ($p<0.05$).

Conclusion: Analysis of clinical outcomes showed that death from major bleeding and death from major thromboembolism were not significantly different over 15 years. However, survival rate after warfarin establishment and the percentage of therapeutical INR in range showed increased tendency.

Investigation of International Status of Sports Pharmacy Guideline

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Background and Objectives: The role of sports pharmacist is recently gaining increasing importance in international sports events such as the Olympics. The role of a sports pharmacist is to audit doping in the preparation of pharmaceuticals, recommend alternatives for prohibited drugs, and confirm or communicate information on therapeutic use exemptions (TUE). In addition, sports pharmacists assist in various ways, from providing drug information for athletes to counseling on healthy and functional foods.

Methods: This study aimed to investigate the current status of sports pharmacy by comparing the guidelines of pharmacies in the world's leading sports organizations. The research was conducted by collating information from the documents of the International Olympic Committee (IOC), Fédération Internationale de Natation Amateur, Federation Internationale de Football Association, guides of pharmacies in the host cities, and website information of World Anti-Doping Agency (WADA), Japan Anti-Doping Agency (JADA), and Korean Anti-Doping Agency (KADA).

Results and Discussion: The finding was that there were insufficient pharmacy guidelines in the world's leading sports organizations, except for the largest competition, the IOC. Compared to the IOC's host city pharmacy guidelines, differences were found in each pharmacy guideline in sports organizations. From the website information of WADA, JADA, and KADA, we could not find guidelines for sports pharmacists.

Conclusion: Therefore, it is necessary to review the importance of sports pharmacy in the medical service regulations of international competition for the safe medication use of athletes and fair sports competition.

The Evaluation of Inpatient Oral COVID-19 Medication Utilisation in Medical Centers of Southern Taiwan

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Background and Objectives: Paxlovid (nirmatrelvir tablet co-packaged with ritonavir tablet) and molnupiravir are the oral COVID-19 medication. Guideline indicates that Paxlovid is the first line treatment for mild COVID-19 infection, but it exhibits many drug-drug interactions (DDI) and precautions. Those patients who aren't suitable for Paxlovid will be prescribed molnupiravir. The purpose of this study was to assess the appropriateness of oral COVID-19 medication selection in in-patients of a medical center.

Methods: We retrospectively reviewed the medical records of residents from January 2022 to June 2022. The assessment included the reasons for prescribing molnupiravir, rational prescription rate, efficacy and safety.

Results and Discussion: 177 patients were included (male 59.8%), and the average age was 69 ± 16 years old. The proportion of Paxlovid and molnupiravir were 32.2% and 67.8% respectively. Reasons for prescribing molnupiravir included DDI (43%), nasogastric tube feeding (22%), renal function impairment (eGFR < 30mL/min) (17%), hemodialysis (17%), or contraindication to Paxlovid (1%). Among Paxlovid DDI, the medications were anticoagulant (N=14), follows by statins (N=12), antipsychotics (N=11), antiarrhythmic agents (N=4), narcotic analgesics (N=3) and others (N=8); while the rational prescription rate was 88.3%. For efficacy evaluation, we found that the cure rate was 89.8%, all-cause death rate 7.4%, and oral medication treated failure rate was 4%. During study period, two cases experienced adverse reactions.

Conclusion: The evaluations of oral COVID-19 medication show that it's safe and efficient. DDI is the most reason for prescribing molnupiravir, but not every DDI needs to avoid Paxlovid. It's reasonable to stop taking current medication or reduce the dosage for couple days when taking Paxlovid. Thus, when pharmacists find that DDI can be managed, we can advise doctors to choose Paxlovid. In the COVID-19 epidemic, it's our duty to make sure every patient can get their best therapy.

Retrospective Study of Drug Use Assessment for Plerixafor

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Background and Objectives: Plerixafor is indicated for patients with non-Hodgkin's lymphoma or multiple myeloma who require autologous transplantation, but who are poorly driven. In order to use at least one course of G-CSF combined with chemotherapy for stem cell-driven therapy, if the number of CD34+ cells collected is less than 2 million per kilogram of body weight, it can be applied for use. The study noted that the use of lenalidomide was associated with an increase in peripheral blood stem cell collection failures. This study retrospectively explored the clinical efficacy of plerixafor.

Methods: Retrospective medical records were reviewed from 2016 to 2021 for inpatient data of inpatients using plerixafor. Each patient was used with G-CSF. The primary assessment was the number of CD34+ cells collected per kilogram of body weight. It was used for descriptive and simple inferential analysis in Microsoft Excel 2016 version.

Results and Discussion: A total of 27 patients were included in the evaluation, 51.9% were male, and the mean age was 58.89 ± 8.49 years; 8 patients had CD34+ cells collected over 2 million per kilogram of body weight; 7 patients were diagnosed with multiple myeloma, Two of the patients were treated with lenalidomide at the same time, and it was found that the collection of CD34+ cells was insufficient and failed, and the collection of CD34+ cells in the remaining 25 patients increased, with an average of 1.21 ± 1.14 CD34+* 10^6 /kg.

Conclusion: At present, peripheral blood autologous hematopoietic stem cell transplantation is an important treatment option for non-Hodgkin's lymphoma or multiple myeloma, but it may be forced to abandon treatment due to insufficient peripheral blood hematopoietic stem cells. Therefore, the combination of plerixafor with G-CSF has been shown to increase the effect of motile hematopoietic stem cells and increase the number of peripheral blood hematopoietic stem cells to provide a new treatment option for transplant recipients.



HP16

Case Report of Suspect Adverse Effects of Piperacillin/Tazobactam Induced Drug Fever

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Background and Objectives: Drug fever is defined as a body temperature exceeding 38°C, without any detection of new infections or other causes or potential diseases that may cause fever. The occurrence of fever when the suspected antibiotics (piperacillin/tazobactam) ordered, and subsidence 48-72 hours after discontinuing the drug.

Method: A 59-year-old man was admitted to the hospital on February 16, 2020 for routine chemotherapy. On March 3, the result of blood culture test was *Enterobacter cloacae* complex, and the patient started fever, so ordered piperacillin/tazobactam 4.5g Q6H IV to treat. After 7 days antibiotic use, he still had a high fever (up to 39.4°C), and skin rashes erupted, chest X-ray examination showed no plaques or lung infiltration. On March 9, we ruled out drug-fever, discontinued piperacillin/tazobactam and switched to ertapenem 1g QD IV. Screened regimen only piperacillin/tazobactam could be a culprit drug causing drug fever.

Result and Discussion: After discontinued piperacillin/tazobactam for 48 hours, the body temperature returned to normal, and skin rash subsided. Some literature reported the average length of drug fever caused by antibiotics is 6-7.8 days, of which β -lactams occurs more frequently. Hypersensitivity reaction is the main mechanism of drug fever caused by antibiotics (5% of patients will also had skin rash). In this case, the fever continued during the use of piperacillin/tazobactam, and even reached to 39.4°C on the 7th day. After discontinued piperacillin/tazobactam for 48 hours, body temperature returned to normal without other infection signs. So it is highly suspected to be a drug fever caused by piperacillin/tazobactam.

Conclusions: We hope this case would keep medical staffs alert to identify drug fever timely, which could avoid unnecessary diagnostic procedures, inappropriate treatments, and extended hospital stay.

HP Liu: Presenting author



Innovation and Evaluation of the Outdoor Outpatient Pharmacy in Response to COVID-19 Epidemic: A Pilot Study at A Regional Hospital in Southern Taiwan

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Background and Objectives: The COVID-19 Epidemic constituted to the challenges of meeting the medical needs of drugs for the patients who are PCR positive or diagnosed by rapid screening, and protection of medical personnel. This study aims to develop an innovative outpatient pharmacy service in response to the needs for a safe, fast and effective pharmaceutical service provision.

Methods: This study had three stages: (i) co-production of an innovative outdoor outpatient pharmacy with the medical team; (ii) implementation of the service innovation from 2022/5/9 to 2022/5/31; and (iii) service evaluation. The pharmacists who work at the innovated outdoor pharmacy completed a satisfaction questionnaire.

Results and Discussion: The innovative medical prescription by the physician, innovative drug and the relevant information provision by pharmacists have been developed and implemented. It includes simultaneous printing of the consent form to remind the issuance, drug interaction and contraindications, dosage suggestions and prompts for the issuance of prescription drugs. A total of 10 questionnaires were completed and returned for evaluation. About 87% of the respondents were satisfied with process practicability, 88% of them reported about easy to learn, 83% with information quality, 86% with interface quality. Overall satisfactory degree 90%.

Conclusion: The innovated Outdoor Epidemic Pharmacy was opened in just 1 weeks and received good satisfaction. It suggested that making good use of information technology and medical team coordination and cooperation can result in more comprehensive care for patients.



HP18

Drug Utilization Evaluation of Remdesivir in A Regional Teaching Hospital in Southern Taiwan

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Background and Objectives: According to previous research, remdesivir have shown to shorten the time to recovery in adults who were hospitalized with COVID-19. We brought in remdesivir since 2022 May due to the pandemic and this study aimed to evaluate the utilization of remdesivir in a regional teaching hospital in southern Taiwan.

Methods: A retrospective study was conducted. We selected hospitalized patients from 2022 May to 2022 June who used remdesivir as the treatment of COVID-19 disease. We used descriptive statistics to summarise patients' profiles (contains laboratory data and POMR records) in the inpatient system to review whether the adverse drug reactions can be observed.

Results and Discussion: There were 10 patients enrolled in this study, 7 males and 3 females. The mean age was 72.2 ± 13.5 years. 4 patients with cancer comorbidity. The average days from being diagnosed COVID-19 to discharged (or expired) was 8.7 days. 2 patients died during the treatment period, 4 patients discharged while still need self-health monitoring and 4 patients scheduled outpatient department follow-up after discharging. Reason for using remdesivir: 1 patient with $SPO_2 \leq 94\%$ on room air, 7 patients required supplemental oxygen (6 patients with at least one risk factor for disease progression) and 2 patients with at least one risk factor for disease progression which defined by the US CDC. Due to the small sample size, there were no common adverse drug reactions (ex. GI disturbance, abnormal liver function or abnormal renal function) observed in this study.

Conclusion: The utilization of remdesivir in patients with older age or comorbidity is reasonable. We found no observable adverse drug reactions during the treatment. Since there are not enough clinical experience in using remdesivir, physicians and pharmacists should carefully monitor any reaction during remdesivir therapy.

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HP19

Survival Analysis of COVID-19 Patients Admitted in a Tertiary Government Hospital in Nueva Ecija: A Preliminary Report on the Compassionate Use of Remdesivir

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Background and Objectives: A number of research studies and clinical trials were initiated in the search for an effective drug for COVID-19. Remdesivir, originally developed against the Ebola virus, became an early candidate. Remdesivir, the first authorized COVID-19 antiviral medication in Europe, received “Compassionate Special Permit” for use in hospitals from the Department of Health (DOH) and the Philippine Food and Drugs Administration (FDA) upon request by health institutions. The provision of a baseline set of data can provide information for deeper study of possible contributory factors on the survival of COVID-19 patients.

Methods: The study concluded with a total of two-hundred sixty-six (266) patients based on inclusion and exclusion criteria. 16.92% of COVID-19 patients received remdesivir. Average age was 54.8 and can be seen dominantly on patient 50 years old and above; and 93.6% patients were non-healthcare workers. Result also shows the ranked distribution of patient’s co-morbidity. Topping the list of co-morbidities was hypertension with 52.25% of the patients, followed by diabetes mellitus (31.95), and renal related disease (8.27%).

Results and Discussion: Log rank test results showed that there were no significant differences between the categories of sexes ($p=0.214$), exposure ($p=0.727$), and occupation (unable to test for difference) with regards to survival under remdesivir. Likewise, there were also no noted significance in comparing the survival of each category between treatments. Over-all survival probability on the comparison of the Kaplan-Meier Curves between Remdesivir and Non-remdesivir treatments showed a non-significant logrank value ($p=0.536$). Univariate Cox proportional hazard regressions results showed age (HR=1.065), oxygen saturation (HR=0.878), and ventilator days (HR=0.748) was found to be significant factors on the survivability of COVID-19 patients under remdesivir group.

Conclusion: There was a significant higher risk of death in male patients, who has a high BMI, with elevated renal markers or have renal related diseases and with longer hospital stay. Also, the current studies concluded that early remdesivir treatment from symptom onset may have better clinical outcomes.

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The Prevalence of Pill Dysphagia Among Adult Hospitalised Patients in Hospital Angkatan Tentera Tuanku Mizan (HATTM)

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Background and Objectives: Pill dysphagia can be due to dysphagia or drug-induced dysphagia. This problem can lead to non-compliance. This study aimed to determine the prevalence of pill dysphagia, identify interventions by pharmacists and evaluate the appropriateness of Pill-5 Questionnaire (P-5Q) as an assessment tool.

Methods: A cross-sectional study was done from July to August 2022 according to all inclusion criteria. The P-5Q was used to assess patients with pill dysphagia and pharmacists will perform medication reviews.

Results and Discussion: The prevalence of pill dysphagia among adult hospitalized patients in HATTM was 4.04% (n=8). Interventions have been done by pharmacists whereby 62.5% (n=5) of patients were suggested to have alternatives dosage forms, 12.5% (n=1) were suggested to switch to smaller size pills, 12.5% (n=1) were suggested with alternative drugs with a lesser anticholinergic burden score and 12.5% (n=1) has no intervention performed. From P-5Q analysis, there were significant differences between patients without pill dysphagia (M=0.38, SD=0.999) and patients with pill dysphagia (M=12.00, SD=2.796); $p < 0.01$. There were also significant differences between both groups for all five questions in P-5Q ; $p < 0.01$.

Conclusion: Pill dysphagia patients were detected in this study by using P-5Q as an initial screening tool. Pharmacists can play a vital role to increase patient safety and compliance by doing a medication review.

Revisiting Renal Transplant Medication Therapy Adherence Clinic Questionnaire on Immunosuppressive Medications Knowledge in Post Kidney Transplant Recipients: Item Generation & Content Validation

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Background and Objectives: Kidney transplant recipients who have better knowledge of immunosuppressants have higher adherence to immunosuppressants and are associated with better overall treatment outcomes. Questionnaires are commonly used to evaluate kidney transplant recipients' immunosuppressant knowledge either as the primary or surrogate measured endpoints to educational interventions both in practice and clinical research. Several questionnaires are available to evaluate immunosuppressant knowledge, but none is validated including the questionnaire in the Renal Transplant Medication Therapy Adherence Clinic (RTMTAC). This study aims to revise the content of the RTMTAC questionnaire.

Methods: Firstly, preliminary items were generated based on domains and sub-domains that were previously identified. Secondly, the items' content was validated in a 3-round Delphi study by an expert panel of 11 renal pharmacists. The experts rated the items' relevance, comprehensibility, and comprehensiveness. Items with $\geq 75\%$ of experts' agreement were considered relevant. Finally, the relevant items were translated into the dual language of Bahasa Malaysia and English through a forward-backward translation process by 3 external translators and 2 researchers.

Results and Discussion: A total of 24 preliminary items were generated. In Round 1 Delphi study, 20 out of 24 preliminary items were relevant and 9 new items were suggested. In Round 2, 13 preliminary items were rated of which 8 were relevant. In Round 3, 5 preliminary items were rated and 1 was relevant. The final experts' revision produced 27 items.

Conclusion: This study laid the foundation for a validated questionnaire on immunosuppressive medications in kidney transplant recipients through the identification of a set of relevant and comprehensive items. Future studies should continue with face validity assessment through cognitive interviews with kidney transplant recipients. Accurate evaluation of immunosuppressant knowledge through a validated questionnaire will help to formulate tailored educational interventions for better treatment outcomes.



HP22

Standardization of Medication Bin Labelling with Quick Reference Information to Reduce Medication Error and Improve Caller Waiting Time

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Background and Objectives: To reduce 100% medication errors related to wrong information given during phone conversation and to improve caller waiting time (targeted 50% reduction) for Prescriber & Staff Nurses while calling Pharmacy to obtain medication's information.

Methods: This project began in the 4th quarter 2020 and went on until June 2021 involving three phases. **In phase 1**, list of problems that leads to medication error and increase caller waiting time were identified such as time consuming by the Pharmacy Staff to read medication leaflet, MIMS Drug Reference or BNF (British National Formulary) thus it will increase caller waiting time. We had also listed the frequently ask questions from the prescriber or Staff Nurses when they called Pharmacy for medications' information. **Phase 2** project was to eliminate the problem by developing a standardized medication bin labelling with quick reference tools on the label such as medication's generic and brand name, Poison group, storage and stability, special precautions, breastfeeding and pregnancy category, therapeutic category, maximum tolerated dose, route of administration and dilution or reconstitution information. **Phase 3** is to have a sustainability of this project in the future for new medications listed in our hospital formulary.

Results and Discussion: The average waiting time required for drug enquiry from healthcare provider was 3.7 minutes before the bin labelling implementation and it has been improved to 15 seconds (93.4% waiting time reductions) post implementation. This Implementation had successfully reduced near missed medication error related to wrong information given from 12 cases to zero (100% reduction). Furthermore, this standardization was a combination idea of quality improvement project and 5S certification project. 5S which consist of Sort, Straighten, Shine, Standardize and Sustain is a practice to organize workplace to create a clean, safe, orderly, high-performance work environment that promotes efficiency.

Conclusion: Both study objectives were achieved, and continuity of the project should be recommended to Pharmacy Services in other hospital. This quality improvement project had tremendously improved Pharmacy staffs confident level, knowledge and their work efficiency.

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Disaster Management Zone (DMZ): Military Pharmacists' Unconventional Innovation in Responding to Health Threats

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Background and Objectives: The COVID-19 pandemic is an unprecedented public health emergency that caused the healthcare system under immense pressure, especially in Klang Valley. In response to this, Tuanku Mizan Armed Forces Hospital launched its DMZ to curb this issue. Located at the hospital basement car park, DMZ has catered for a total of 1079 COVID-19 patients from categories 4 and 5. This paper intends to underline operational and strategic revamp adapted by military pharmacists especially when DMZ was operated after 36 hours of activation with limited manpower.

Methods: Strategies employed throughout DMZ operation include: (1) Weekly stock monitoring to ensure all-time medications and consumables readiness; (2) Daily stocktaking in Red Zone by pharmacy personnel to prevent excessive unused medications; (3) Medication reconciliation, pharmacotherapy rounds and medication counseling by which initiatives done to reduce exposure to COVID-19.

Results and Discussion: All patients received medications as per clinical needs, evidenced by zero stock-out issues. Reduce unused and returned medications in Red Zone at the end of operation compared to early operation days. Medication safety was guaranteed, as evidenced by 129 medication errors successfully intervened. Rapid provision of medications and counseling with minimal contact.

Conclusion: DMZ has leveraged military pharmacists in managing medication supply, maintaining pharmaceutical care, and responding quickly to the call of emergency relief operations. This paper serves as a guide for standard operating procedures (SOPs) development in managing future health emergencies.

Prescription Error in Tertiary Military Hospital – Prevalence and Pattern

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Background and Objectives: Prescription error accounts for most medication errors reported in Malaysian tertiary hospitals. With the limitations of digital hospital management systems, manual prescribing is susceptible to human error. Identification of the prevalence and pattern of prescription errors in an inpatient tertiary military hospital is deemed necessary to formulate appropriate solutions.

Methods: A retrospective study was conducted over 1 month by inpatient pharmacists and assistant pharmacists using a standardised data collection form. Data taken from inpatient prescriptions from all wards excluding intensive care unit (ICU) throughout May 2019. Errors were classified into omission errors, commission errors, inappropriate prescriptions, and miscellaneous. A comparison of prescribing errors between different categories of prescribers is also analysed. All results were expressed as percentages.

Results and Discussion: Prescribing errors in the hospital ward are within the range of similar studies conducted both locally and internationally. Most come from omission errors that are less likely to cause harm. This might be contributed to a lack of training on proper prescribing, since most medical officers came from various military unit backgrounds. The percentage of prescribing errors in the pediatric ward is higher than that in the surgical and medical wards. By category of prescribers, prescribing errors are predominated by junior prescribers, despite prescriptions being countersigned by senior doctors.

Conclusion: Prescription error is moderately prevalent in Tuanku Mizan Armed Forces Hospital, but its pattern varies from pre-existing studies. Introduction of e-prescription and continuous education on Good Prescribing Practice can reduce prescription errors. Future research should incorporate patient clinical data to ensure precise clinical judgment on drug regimen selection.

Systematic Review on Questionnaires to Measure Medication Knowledge in Post Kidney Transplant Recipients

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Background and Objectives: Good understanding of immunosuppressants (IS) among post kidney transplant recipients (KTR) is associated with better outcomes. The level of medication knowledge in this population is commonly obtained from transplant-specific questionnaires. We aim to identify the constructs and quality limitations of the questionnaires that have been used to measure knowledge on IS in KTR.

Methods: Relevant articles were identified from PubMed, MEDLINE, CINAHL, Web of Science, Cochrane Library, and Scopus for all periods until July 2021. Search terms were derived from three keywords: 'kidney transplant patients,' 'assessment tools,' and 'drug knowledge.' The criteria for relevant articles were: 1) English language, 2) involved adult KTR and 3) original article on the validation of transplant-specific questionnaires that measure knowledge on IS therapy or the first published article using the questionnaire as a tool to measure knowledge on IS therapy. Constructs were identified by extracting questions related to IS knowledge. The quality of the questionnaires was evaluated using the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) checklist. Four reviewers were involved throughout this study.

Results and Discussion: The search yielded 5,216 articles, of which ten fulfilled the inclusion criteria. These ten articles reported on eight questionnaires involving eight countries. Fifty-one questions related to IS knowledge were extracted from a total of 121 questions (42%). The primary constructs derived include 1) knowledge on the importance of IS medications; 2) knowledge on handling IS; 3) knowledge of the treatment outcomes. All eight questionnaires demonstrated insufficient content validity and low-level evidence for internal consistency.

Conclusion: The current transplant-specific questionnaires are incomprehensive to measure IS knowledge, and the majority had inadequate evidence of validity and reliability. Future studies should aim to develop validated questionnaires to measure the knowledge on IS therapy among KTR with appropriate constructs.

Relationship of Nutritional Status and Sepsis Mortality

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Background and Objectives: Sepsis is a complex, dangerous illness that leads to a critical condition and is the leading cause of death among hospital patients. It was found that nutritional status had an impact on survival and the mortality rate of critically ill patients. It is associated with organ failure, risk of complications and death. Objectives are to study the relationship between nutritional status and mortality of sepsis patients in Rajavithi Hospital also to study factor related to sepsis mortality.

Methods: This study was conducted by collecting data from patients admitted to Rajavithi Hospital between January and December 2019 who was diagnosed by a physician as having sepsis, have the results of the screening (SPENT nutrition screening tool) or nutritional assessment (nutrition alert form(NAF)).

Results and Discussion: Of the 808 patients diagnosed with sepsis, 475 were female, 333 were male, and 400 died (49.5%). The mean age of the deceased patients was 65.61 ± 16.48 years. The prevalence of malnutrition in patients with sepsis was 71.2%. Patients at risk of malnutrition have significantly higher mortality. When analyzing factors contributing to mortality among sepsis patients, it was found that patients over 60 years of age (> 2times), patients with septic shock (4.26 times), patients receiving parenteral nutrition(PN) (3.53 times), patients receiving both enteral nutrition(EN) and PN (3.75 times), patients with kidney disease (2.04 times), patients with cancer (1.92 times) , patients treated with vancomycin (1.64 times) and colistin (1.93 times) were significantly associated with higher mortality than those without the aforementioned factors. The likelihood of death was reduced by 38and 52 percent in patients receiving quinolone and metronidazole respectively.

Conclusions: Although sepsis patients with malnutrition died more than patients who has normal nutritional status, administration of PN or both EN and PN did not reduce mortality. Sepsis patients with septic shock, age over 60 years, has underlying of kidney disease or cancer had higher risk of mortality.

Applying Quality Control Tool Improves the Conformance Rate of Microbial Monitoring Performed by Chemotherapy Pharmacists

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Background: Chemotherapy injections are hazardous drugs – if they are not handled properly then they will cause health hazards to related personnel and the environment. Given that non-conformance cases in routine microbiological monitoring of biosafety cabinet (BSC) by chemotherapy pharmacists in our hospital, therefore we decide to kick off a quality improvement project.

Methods: This study was brainstormed by the member of the chemotherapy pharmacist to address the non-conformance incidents in microbiological monitoring operation of the BSC performed. The characteristic factor diagram combined with the Plan-Do-Check-Act (PDCA) method to formulate improvement strategy.

1. Strengthen the orientation training of newcomers to chemotherapy: (1) Introduce virtual reality (VR) teaching; (2) use simulated teaching props to shoot newcomer execution videos. Only after discussion and feedback can they be officially launched.
2. Strengthen the work flow: (1) Revise the direct observation of procedural skills (DOPS) for microbial monitoring for the error-prone and neglected steps; (2) formulate the teaching and evaluation by dedicated pharmacists to ensure the accuracy and consistency of learning.

Results: Comparing data before (2017/01-2018/12) and after (2019/01-2022/06) project implementation, the BSC sterility conformance rate was raised from 83.3% to 96.7%. The DOPS score increased from 85.7 points to 95.8 points. The overall satisfaction rate is more than 4 points based on the Likert scale 5 point method. The most satisfying part is "shooting newcomers execution videos" and "DOPS assessment" (5 points), followed by "teaching and evaluation by dedicated pharmacists" (4.75±0.45) and "VR reality teaching" (4.42±0.51).

Conclusion: Through process reengineering and refined personnel education, it can effectively improve the non-conformance events of the pharmacist performing microbial monitoring operations. However, the follow-up should continue to analyse, review and revise the relevant operating procedures at any time.

The Role of High Serum Uric Acid Levels in Androgenic and Non-Androgenic Polycystic Ovarian Syndrome Patients

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Background and objectives: Serum uric acid (SUA) has been found to be an independent risk factor for metabolic syndrome (MS). However, the reports pertaining to link between uric acid levels among the androgenic, non-androgenic (clinical) PCOS subjects are conflicting. Hence, it was aimed to determine incidence of hyperuricemia and its association among the PCOS subjects.

Methods: A single centre hospital based cross-sectional study conducted in south India PCOS subjects during the March 2021 to August 2021. A total 80 subjects were recruited and were stratified into androgenic and no androgenic PCOS with each of forty subjects in both groups. The incidence of hyper uricemia was found to be 66.25% (n = 53).

Results and Discussion: The mean and SD values of metabolic components such as HbA1C and FPG levels and triglycerides, low density lipoproteins and total cholesterol were showing statistically significant ($p < 0.05$) among the groups. The circulating sex hormone binding globulins (SHBG) are low in both groups. These levels are significantly low in androgenic PCOS subjects. The Total testosterone (TT), SHBG, HOMA-IR and LDL levels were positively correlated with both hyper and non-hyper urinemic groups and remaining parameters showed negative correlation.

Conclusion: The incidence of hyperuricemia is high in PCOS subjects. The TT and SHBG, HOMA-IR and LDL levels were positively correlated with both hyper and non-hyper urinemic groups. HbA1C and FPG and FSI are negatively correlated among the groups.



HP29

Low-dose Cefepime Efficacy Evaluation Using Real-world Data

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Background and Objectives: A review of the cefepime medication records revealed that most physicians prescribed doses within UpToDate's usual range, which is above 2 grams per day, while a few did not exceed 2 grams per day. The purpose of this investigation was to determine whether low-dose cefepime was insufficiently effective.

Methods: This retrospective study covered the period from 2016 to 2021. Inclusion criteria: patients admitted to the hospital who received cefepime. Exclusion criteria: under the age of 20 or not consecutively using cefepime. Low-dose is defined as a daily dosage not exceeding 2 grams and an eGFR greater than 60 mL/min/1.73 m². Propensity score matching was used because there were few low-dose cases. Gender, age, eGFR, CRP, and WBC were used as the matching variables. Effect indicators were hospitalization days, medication days, CRP changes, and WBC changes. Two-sample t test was performed.

Results and Discussion: There were 41 participants in each of the low-dose and non-low-dose groups, and 26 (63%) of them were males. The mean (SD) of continuous variables: age was 73.0(16.1) and 73.3(19.6), eGFR was 93.5(18.9) and 92.4(21.5), WBC was 8750(6280)/m^{cL} and 10280(6970)/m^{cL}, CRP was 7.1(4.9) mg/dL and 6.5(5.7) mg/dL. The results of the efficacy comparison between the low-dose group and the non-low-dose group (represented by their respective mean values and p values): the number of days of medication was 7.4 days, 6.2 days, p = 0.238, the days of hospitalization were 26.4 days, 28.9 days, p = 0.507, WBC differences were 1000/m^{cL}, 860/m^{cL}, p=0.888, CRP differences were -1.3mg/dL, -0.3mg/dL, p=0.216, all efficacy indicators were not statistically significant. Research limitations include: 1. Confounding factors are difficult to control in observational studies; 2. Antibiotic prescriptions are not dependent on test results, and variables have missing values. In the low-dose group, hospitalizations were slightly lower, but medication days were slightly higher. As there was no statistical difference, it is still necessary to examine whether taking into account efficacy can actually reduce the consumption of medical resources.

Conclusion: A low dose was not associated with lower efficacy in this study. Physicians can utilize this information in prescribing common dose ranges and making clinical decisions.

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HP30

Incidence of Liver Injury in Patients Initiated with Antiretroviral Therapy in Primary Care Clinics

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Background and Objectives: Liver injury is an alanine aminotransferase (ALT) elevation of greater than 1.25 times the upper limit of normal (ULN) values. Drug-induced liver injury affected the clinical use of antiretroviral therapy (ART). This study aimed to assess the incidence of liver injury on ART initiation and to identify any contributing risk factors.

Methods: We conducted a retrospective cohort study (NMRR ID: NMRR-20-1482-54763) involving 362 HIV positive patients with normal liver function initiated with first-line ART in 15 primary health clinics in Kuala Lumpur and Putrajaya, Malaysia from May 2017 to December 2019. Baseline ALT measurements were recorded and followed up monthly for 12 months. Chi-square and Fisher's exact tests were used to study the association of liver injury with ART regimen, concomitant *Pneumocystis carinii* pneumonia (PCP) prophylaxis and isoniazid prophylaxis therapy (IPT). Cox-regression analysis was used to identify risk factors involved.

Results and Discussion: Upon ART initiation, the incidence of liver injury was 34 cases/100 person-year while that of severe liver injury was 2 cases/100 person-year. Mild and moderate liver injury cases increased over the first three months of ART exposure and gradually reduced starting fourth month. Subjects using Tenofovir/Emtricitabine regimen developed higher liver injury risk compared to Lamivudine/Zidovudine regimen ($p=0.035$, $OR=2.174$). No significant difference was found between subjects using Efavirenz and Nevirapine. Concomitant PCP prophylaxis demonstrated significantly lower risk of liver injury ($p=0.006$, $OR=0.483$) while higher risk was observed with concomitant IPT ($p=0.019$, $OR=1.793$).

Conclusion: In summary, monthly monitoring of liver enzymes was important for the first three months of ART initiation. Subjects initiated with tenofovir/emtricitabine, with concomitant isoniazid therapy and without PCP prophylaxis were the high-risk groups that required close monitoring of the liver enzymes.

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HP31

Evaluation of Chinese Herbal Extracts on Eczema Skin

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Background and Objectives: About 10% people in the U.S. have eczema during their lifetime. Steroids are commonly used in treating eczema but can easily lead to many side effects. Eczema is often difficult to be cured, and severely affects patients' quality of life. It's an important issue worth further study. According to the composition of the traditional Chinese medicine prescription, "ku shen si tang", we add other Chinese herbal extracts such as *Plectranthus amboinicus* and *Salvia plebeia* to make a cream. It is applied to the affected area of eczema.

Methods: This study was conducted in the Department of Traditional Chinese Medicine of Taichung Tzu Chi Hospital, from April to November in 2021. Patients aged 20 to 80 years old diagnosed with eczema were included in the study. The experimental cream was applied to the lesion twice a day. Three questionnaires (DLQI, SCORAD, and EASI) were used every two weeks to evaluate the outcome, and there were 6 visits during this 12 weeks study.

Results and Discussion: We recruited finally 10 cases. The statistical results of DLQI were highly affected to mildly affected (16.2 to 4.5); of SCORAD were moderately affected to mildly affected (34.52 to 10.42); and of EASI were mildly affected to mildly affected (4.98 to 1.39). All of those were showed significantly improved after treatments.

Conclusions: The cream formulation of Chinese medicine extracts is effective in treating patients with eczema and has no side effects.

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Interprofessional Collaborative Practice in HIV Patient: Role of Pharmacist in A Regional Hospital

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Background and Objectives: Dispensing and providing medication is basic service in regional hospital pharmacy setting. With the progress of diverse pharmaceutical care provided by clinical pharmacist, our hospital has also implemented pharmacy service for HIV patient and pharmacist cooperated with different medical staff such as physician and HIV case manager. In this article, we would like to share our experience and common drug-related problems during providing HIV care.

Methods: Since 2019, our infection department decided to provide medical service for HIV patient. According to the project from Centers for Disease Control, Ministry of Health and Welfare in Taiwan, pharmacists were regulated to be one of a member in HIV patient care team. We collected pharmaceutical care related to HIV care form 2019-2022.

Results and Discussion: Pharmacists were got involved in rural health care with physician and HIV case manager monthly, and we can communicate with each other via face to face, social software or phone call smoothly. Pharmacists were also responsible for patient or health care member education, such as delivering speech “Novel trend in antiviral agent in HIV” or “alleviating discrimination in HIV patient”. Additionally, we provided thirty interaction-related consultations for HIV patients. Among these consultations, we found interactions between nutrition supplements and antiretroviral drugs were asked most frequently.

Conclusion: Pharmacists can be in different clinical teams and collaborate with others professionals’ members. With the pharmacy service, drug-related problem form HIV patients can be solved. It might increase the drug compliance and enhance better disease control.

The Prevalence of Major Drug–drug Interactions in Patients Treated with Nirmatrelvir plus Ritonavir: A Retrospective Study

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Background and Objectives: Nirmatrelvir plus ritonavir (Paxlovid[®]) is an antiviral agent, which is used as the treatment of mild to moderate Coronavirus Disease (COVID-19). Ritonavir is a potent CYP3A4 inhibitor that interacts with many other medications. We assessed the prevalence of major drug-drug interactions (DDIs) among patients who were prescribed Paxlovid[®] and summarised the data to find out which drug class may be commonly involved in major DDI with Paxlovid[®].

Methods: We utilized our hospital's computer-based medication prescription system to search for the DDIs between Paxlovid[®] and other medications. The level of drug-drug interaction was identified mainly by the website, Liverpool and manual screening methods. We categorized the drug related to major DDI according to their drug class.

Results and Discussion: We collected the data from June to July in 2022. In the 203 patients included in this study, 188 patients from out-patients and 15 from emergency, 92 major DDIs were found in 50 (24.6%) patients. 72 major DDIs were classified as "potential interaction" and 20 DDIs classified as "Do Not Coadminister". Cardiovascular medications were most associated with major DDIs, and psychotropic medications took the second place. In cardiovascular medications, atorvastatin and rosuvastatin were concerned in most major DDIs cases. Clonazepam, triazolam and silodosin were the most common medications which were contraindicated with Paxlovid[®].

Conclusion: Patients on Paxlovid[®] therapy may be at risk of potential DDIs. This study provided a descriptive statistic to the prevalence of DDIs in patients treated with Paxlovid[®]. Pharmacists should be more aware of these frequent DDIs and manage them properly.

The Prevalence and Risk Factors of Drug–drug Interactions with Nirmatrelvir-ritonavir in COVID-19 Infection: A Cross-sectional Survey in Taiwan

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Background and Objectives: Nirmatrelvir-ritonavir is the preferred option of COVID-19 therapy for adults with severe risk factors and children over 12 years old who have been diagnosed with mild to moderate COVID-19. However, the ritonavir component has several drug-drug interactions (DDIs). The objective of this study was to assess the prevalence of DDIs of nirmatrelvir-ritonavir, and to examine possible predictors of potential DDI exposure.

Methods: Data from patients who had started a nirmatrelvir-ritonavir regimen in May 2022 were retrospectively evaluated. The DDIs for nirmatrelvir-ritonavir and co-medications were assigned according to prescribing information and Micromedex®. The prevalence of DDIs was calculated. Logistic regression was used to examine the association between underlying disease, Charlson comorbidity index (CCI), and the number of co-medications. Statistical analysis was performed by SPSS® 25.0.

Results and Discussion: 714 patients were included (mean age \pm SD = 68.70 \pm 15.11 years). All patients received at least one medication (mean \pm SD = 8.35 \pm 4.16). The mean CCI of all patients was 3.29 (SD \pm 1.71). The drug interactions were found in 241 patients (33.75%). A total of 374 potential DDIs were identified in those patients, out of which 22.46% were “Contraindicated”, 57.75% were “Major”. The most common DDIs were with calcium channel blockers (n=148, 39.57%), followed by HMG CoA reductase (n=124, 33.16%). Total number of co-medications [odds ratio (OR) 1.22, 95% CI 1.16 to 1.27; p < 0.001] and cardiovascular events (cardiovascular diseases vs. not, OR 1.55, 95% CI 1.04 to 2.31; p = 0.031) were significantly associated with DDIs.

Conclusions: On the basis of high prevalence of DDIs, establishing strategies to detect the potential DDIs and monitor the safety of those patients is necessary. In addition, those with polypharmacy and cardiovascular events are at a significantly increased risk. Awareness is required when nirmatrelvir-ritonavir is administered to users of these medication combinations.

Using Plan-Do-Check-Action Management Methods to Improve Medication Errors in Taiwan Hospital

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Background and Objectives: The percentage of medication errors was found about 36% (24,846/68,203) in hospital according to the Annual Report 2020 of Taiwan Patient-safety Reporting System. The rate of medication error is about 0.0145% (2,695/18,551,036) in our hospital in 2020. The objective of this study was to evaluate whether using Plan-Do-Check-Action (PDCA) management methods to improve medication error at each stage of the medication process.

Methods: The study was conducted in a 2,111-bed care academic medical center located in central Taiwan. We assessed the error rates of medications at each stage of the medication process before and after implementing eight PDCA management methods, including all patient prescriptions from January 2020 to June 2022. PDCA cycle is the combination of the first letters of Plan, Do, Check and Act, also known as the quality cycle, which is a general model in the management model.

Results and Discussion: Six major problems were found after reviewing the medication process, and the eight PDCA strategy and effectiveness verification are as follows: PDCA strategy 1~4 – Reducing the medication error of the physician's prescription: The error rate of prescribing was significantly reduced from 0.0175% (Q1/2020) to 0.0044% (Q2/2022) ($p < 0.005$) after using PDCA strategy 1~4. PDCA strategy 5~7 – Reducing the medication error of the pharmacist dispensing. The error rate of dispensing was reduced from 0.0041% (Q1/2020) to 0.0007% (Q2/2022) ($p < 0.005$) after using PDCA strategy 5~7. PDCA strategy 8 – Reducing the medication error of the nursing administration: Implementation of automated dispensing cabinet (ADC). The rate of administering error was reduced from 0.0003% (Q1/2020) to 0.0001% (Q2/2022) ($p = 0.207$) after using PDCA strategy 8. The medication error rate was significantly decreasing about 75% from 0.0221% (Q1/2020) to 0.0055% (Q2/2022) ($p < 0.005$) through continuous improvement for about two years using eight PDCA strategies in our hospital from January 1, 2020, throughout to June 30, 2022.

Conclusions: Repeated PDCA cycles could significantly decrease the incidence of medication errors at each stage of the medication process, reduce potential medical risks, and ensure the safety of drug use in patients. Overall, our results suggest that the PDCA management methods can deserves strong consideration as a tool to reduce medication error and to improve patient safety.

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Evaluation of the Appropriateness of Antibiotics Doses in Critically Ill Patients Receiving Extracorporeal Membrane Oxygenation System [ECMO]

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Background and Objectives: Interactions between ECMO equipment materials and antibiotics had changed human hemodynamics and antibiotics pharmacokinetics. This situation may affect the efficacy of the drug or increase the possibility of related adverse reactions, so whether the dosage of the drug needed adjustment became an important issue in this type of patients. Here we tried to analyse and determine the rationality of antibiotic dosage in our hospital for patients with ECMO.

Methods: This study is a retrospective clinical study analysis. Data collected from 2018.01.01 to 2019.09.30. A total of 46 patients with conditions that needed ECMO support were used to analyse the difference and rationality between the antibiotic dose and the dose recommended in the literature.

Results and Discussion: In these 46 patients, a total of 105 doses of antibiotics were given, of which 58.1% adhered to the dosing recommendations for patients on ECMO. In this 58.1% , piperacillin/tazobactam accounted the highest at 19.7% followed by ceftriaxone 16.4%, and vancomycin 16.4%, imipenem/cilastatin 14.8%, cefazolin 13.1%, gentamicin 6.6%, levofloxacin 3.3%, moxifloxacin 3.3%, etc. 45.9% of our patients were given standard dose while 54.1% were not. Furthermore, if we excluded impaired renal function patients, 85.2% of our patients met the recommended standard dose for patients on ECMO machine. In our hospital there was high rate of compliance but it is unclear whether physicians have considered drug pharmacokinetics when patient with ECMO devices. In addition, 14.8% of antibiotics we used had never been studied in critically ill patients receiving ECMO hence no recommended standard dose was given.

Conclusion: However, clinicians need to pay attention to dose adjustment or monitoring of efficacy when using these antibiotics since their renal function may change. I hope that more studies establish a new guideline in order to optimize drug dosing in critically ill patients receiving ECMO.

Real-world Efficacy of Low-dose Cefepime: a Retrospective Study

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Background and Objectives: A review of the cefepime medication records revealed that most physicians prescribed doses within UpToDate's recommended dosage, which is 2 grams every 8 to 12 hours, while a few patients with normal renal function did not receive enough dose. The purpose of this study was to determine whether low-dose cefepime was effective.

Methods: This retrospective study covered the period from 2016 to 2021. The inclusion criteria were met as follow: 1. Hospitalized patients receiving cefepime; 2. eGFR greater than 60 mL/min/1.73 m²; 3. Age over 20. The outcomes included the length of hospital stay, duration of cefepime use, the change in CRP, and the change in WBC. Two-sample t test was performed.

Results and Discussion: There were 41 participants in each of the low-dose and non-low-dose groups, and 26 (63%) of them were males. The results of the efficacy comparison between the low-dose group and the non-low-dose group (represented by their respective mean values and p values): the mean length of hospital stay were 26.4 days, and 28.9 days ($p=0.507$), the mean use durations of cefepime were 7.4 days vs 6.2 days ($p=0.238$), the change in CRP were -1.3mg/dL, and -0.3mg/dL ($p=0.216$), and the change in white blood cells were 1000/mcL, and 860/mcL ($p=0.888$). The length of hospital stay were slightly lower in low-dose group, but the mean days of cefepime use were slightly higher than non-low-dose group. There was no statistical difference between two groups.

Conclusion: The efficacy of low-dose cefepime is similar to non-low-dose group in this study. But it is still necessary to carefully evaluate the efficacy of low-dose cefepime.

Valproic Acid Induced Alopecia in Patient with Post-stroke Epilepsy

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Background: Drug induced alopecia may range from a barely detectable shedding to an irreversible baldness. Valproic acid (VPA) is an antiepileptics, also used in bipolar disorder, migraine prevention and many other off-label use conditions. Common side effects of VPA include weight gain, gastrointestinal disturbances, and liver dysfunction. Statistically, VPA-induced hair loss is more common in women, and up to 28% of patients who take VPA suffer temporary alopecia, occurring in 2 to 6 months after treatment with a new hair growing again in 2 to 3 months after hair loss.

Case: A 63-year-old woman, with a history of high blood pressure and diabetes mellitus, presented consciousness change and right hemiparesis. She was diagnosed with ischemic stroke and post-stroke epilepsy. Initial treatment was VPA 1000 mg/day. After 6 weeks of treatment, severe hair loss on the top of the head was found about 200 hairs/day. VPA-induced hair loss was suspected. Thus, VPA was discontinued and changed to levetiracetam 1000 mg/day. A Further inspection of hair loss-related laboratory data showed TSH of 3.92 μ U/mL, Free-T4 of 1.28 ng/dL, Hb of 11.8 g/dl, ANA of \leq 1:40X (-), RPR of non-reactive, Zn of 66.3 μ g/dL (low). Alopecia was treated using zinc supplements, and her symptoms improved after 9 months of VPA withdrawal. Causality assessment according to Naranjo's scale showed a probable relationship between the drug and the reaction with a score of 5.

Discussion: Most conditions return to normal after reducing drug use or being stopped. To prevent hair loss, VPA can be used with low dosage at first, and then it can be gradually increased. Such a strategy can minimize the effects of adverse reactions.

Conclusion: Alopecia might not be reported by every patient. The pharmacist needs to be aware of this adverse drug reaction.

Further Evaluation of Cephalosporin and the Risk of Hypoprothrombinemia.

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Background and Objectives: One of the beta-lactams, cephalosporin is commonly prescribed to treat infectious diseases. However, some of these which have *N*-methylthiotetrazol (NMTT) structure may cause prothrombin time (PT) prolongation through inhibition of vitamin K-epoxide reductase and vitamin K-dependent carboxylase. This study aimed to understand the occurrences of the adverse drug event (ADR) among these different NMTT antibiotics through different analysis.

Methods: It is a nested-case-control study from the data of our hospital which is a dedicated infection hospital. Four antibiotics with NMTT structure were involved: cefoxitin, flomoxef, cefmetazole, cefoperazone/sulbactam (CPZ/SUB). Data were collected from 2019-2021 to understand if there were the events of PT prolongation or vitamin K supplement under antibiotic treatment. The data were matched 1:1 for age (\pm 5 years), sex, and the cohort entry date (\pm 1 year). The result and associations between 4 cephalosporins are presented as Cumulative Defined Daily Dose (DDDs) and adjusted odds ratios (aORs).

Results and Discussion: Total 582 cases were involved. 79.4% was age \geq 65 years old and 52.9% were male. The Cumulative DDDs for daily and 14 days are 0.91 ± 0.28 and 7.81 ± 5.15 respectively and both have significant finding. The analysis of indication with significant finding was sepsis which 13% of cases were involved. The average PT value of ADR cases was 17.89 ± 18.52 secs. When we use cefoxitin as reference, CPZ/SUB has significant finding with 2.47 of aOR.

Conclusion: The study showed the DDDs do have significant finding for ADR whether daily or in 14 days. In addition, we also found CPZ/SUB has a comparably significant higher incidence rate of the event with general DDDs among the medical category. Thus, the PT value should be considered to monitor routinely for patients to avoid disease deterioration and the prolongation of the hospitalization.

The Effectiveness of Pharmacist Intervention in Heart Failure Integrated Clinic

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Background and Objectives: Heart failure (HF) integrated care can help to improve symptom control and quality of life. Furthermore, good medication adherence and using guideline-recommended medical therapy (GRMT) for patients with HF are beneficial to reduce hospitalization due to HF (HHF), mortality, and cardiovascular (CV) events. Therefore, the study aimed to analyse the effectiveness of pharmacists' intervention in HF integrated care in clinics.

Methods: The observational study was conducted by the 6-month program of HF integrated care of clinic in a single medical institute in Taiwan. Patients with a new diagnosis of HF from 2017/12 to 2021/12 and fully participating in this program were included. The pharmacists in the program provided medication education and monitored medication adherence to ensure patients take medicine appropriately. The use pattern analysis contained the use categories of GRMT for HF and their use rate with the target dose. The effectiveness was assessed by changes from baseline in left ventricular ejection fraction (LVEF), HHF, and occurrence of CV events within 6 months.

Results and Discussion: There were 32 patients with a mean age of 68.2, including 25 males (84.4%) and 7 females (15.6%), with well medication adherence. Twenty-six patients received ACEI/ARB/ARNI (81.3%), but 2 of them used olmesartan not listed as GRMT. 30 individuals received beta-blockers of GRMT (93.8%) and 4 patients added ivabradine to lower heart rate (12.5%); besides, 21 patients used spironolactone (65.6%). In patients receiving ACEI/ARB/ARNI, beta-blockers/ivabradine, and spironolactone, 70.8%, 93.5%, and 47.6% of individuals achieved the target dose, respectively. The average LVEF increased by 21.7% from baseline. Despite five CV events occurring, there was no HHF or death within 6 months.

Conclusions: Through pharmacists' intervention, individuals in HF integrated care in the OPD clinic had optimal medication adherence to GRMT and their average LVEF was improved without any HHF or death.

Topiramate May Not Increase Risk of Age-related Macular Degeneration: A Population-based Cohort Study in Taiwan – A Preliminary Report

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Background and objectives: Topiramate is an effective antiepileptic drug for seizure and migraine. Evidence that supported an association of topiramate and maculopathy were limited to case reports or series. The aim of this study was to determine if an association exists between topiramate use and age-related macular degeneration (AMD) in a nationwide population-based cohort study.

Methods: This cohort study used claims data from the Taiwan National Health Insurance Research Database for the 2000–2015 period. We analysed 10836 topiramate users and 10836 age, gender, index year and comorbidities matched control patients (non-topiramate users) at a ratio of 1: 1. The risk of AMD was analysed using Kaplan–Meier analysis with log-rank test, followed by Cox proportional hazard regression.

Results and Discussion: The incidence of topiramate users for AMD risk was 0.96 per 1000 person-year, while the incidence of non-topiramate user was 1.05 per 1000 person-year. The proportion of patients who developed AMD in the patients receiving topiramate was not different from that of the control patients ($p = 0.506$, X^2 test). The AMD free survival was not different between the patients receiving topiramate and the control patients ($p = 0.569$, log-rank test) in Cox proportional hazard regression.

Conclusions: Topiramate may not increase the risk of AMD in an observational nationwide cohort study. This study did not find the relationship between topiramate use and AMD incidence, regardless of sex, among a Taiwanese population of patients.

Optimisation of Medications by Pharmacists in A Respiratory Care Ward – The Experience from A Regional Hospital in Northern Taiwan

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Background and Objectives: Patients depending on prolonged mechanical ventilators in Taiwan are stepped down in the respiratory care ward (RCW) for further respiratory care. Although these patients are relatively stable with the goal of weaning off ventilators, they may occasionally experience acute symptoms or have multiple underlying comorbidities that need pharmacotherapy. Interventions by pharmacists have always been considered as valuable input in the patient care process for reducing medication errors, rationalizing prescriptions, and lowering the cost of therapies. The present study aims to describe the necessary interventions conducted by pharmacists to optimize pharmacotherapy in an RCW of a regional hospital in northern Taiwan.

Methods: The retrospective electronic medical records data were obtained for a period of 2 years (from 2020 to 2021) comprising the patient demographics, medication-related information, and the specific interventions suggested by the pharmacists. The data were evaluated, classified, and submitted to descriptive analysis.

Results and Discussion: A total of 136 pharmacists' interventions were performed with an acceptance rate of 97.8% in 97 patients. The main interventions include dose adjustment (21.4%), deletion of a drug (19.9%), drug interaction monitoring (19.1%), microbiological culture request (17.6%), addition of a drug (13.2%), and others (8.8%). Among the adjusted medications, gastrointestinal agents (25%) and glucocorticoids (20.6%) were the most common classes involved, followed by antibiotics (19.1%), cardiovascular agents (14.7%), antiepileptics (13.2%), and others (7.4%). Pharmaceutical interventions showed beneficial in clinical (87.5%), preventive (52.2%) and economic (48.5%) impacts.

Conclusion: Other than respiratory care, pharmacists' interventions appear to provide additional pharmaceutical care for patients admitted to the RCW. These interventions not only improve the clinical outcomes but also beneficial for preventive and economic impacts.

Prescription Patterns for Acute Myocardial Infarction (AMI) Patients in Secondary Prevention

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Background and Objectives: According to the AHA/ACCF Guideline suggestions, patients should receive long-term treatment to prevent future events or death after experiencing an acute coronary syndrome event. Medications for secondary prevention, including DAPT, ACEI/ARB, statins, and beta-blockers, should be initiated prior to hospital discharge. The aim of this study was to analyse the prescription patterns for acute myocardial infarction (AMI) patients in secondary prevention.

Methods: We retrospectively analysed the discharge prescriptions for AMI secondary prevention from 75 patients who experienced an AMI event in a regional teaching hospital between April 2022 and August 2022.

Results and Discussion: There were 46 prescriptions (61.3%) with the four medications as suggested by the AHA/ACCF guidelines. All 75 prescriptions included DAPT (100.0%); 60 prescriptions included ACEI/ARB (80.0%); 71 prescriptions included statins (94.7%); and 63 prescriptions included beta-blockers (84.0%). All 75 patients in the dataset had Percutaneous Coronary Intervention (PCI) for AMI treatment, so they received DAPT for secondary prevention. The 15 patients who were not prescribed ACEI/ARB had low blood pressure (Average 100/61 mmHg). The 4 patients who did not use statins had regular LDL data (Average 73mg/dl). The 12 patients who did not need beta-blockers had regular heart rates (Average 59 bpm).

Conclusions: The best prescription for AMI secondary prevention should include DAPT, ACEI/ARB, statins, and beta-blockers. However, we still need to consider the clinical conditions of the patients to make an individual and appropriate AMI secondary prevention prescription for patients experiencing an AMI event.

Withdrawal Factors from Smoking Cessation Program: Lessons Learnt from Defaulted Quit Smoking Clinic Attendees

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Background and Objectives: Malaysia's quit smoking clinics (QSCs) reported high number of smokers withdrawing from smoking cessation program before successfully quitting despite increasing trend of recruitment into the program. This study explored the factors contributing to withdrawal from cessation prior to achieving six-month abstinence.

Methods: Using purposive sampling, fifteen active smokers who defaulted QSCs were interviewed via telephone and face-to-face. Interviews were audio-recorded, transcribed, and analysed using thematic analysis.

Results and Discussion: Factors contributing to discontinuation from QSC were divided into individual and clinic levels. At individual level, low intrinsic motivation including unreadiness to quit, low self-efficacy and ambivalence on smoking cessation were barriers to attain successful cessation. Influence of extrinsic factors such as work-related factors, social interaction, and ill-health burden lead to poor commitment with QSC. At clinic level, healthcare professional's competency, personal attributes, pharmacotherapy's efficacy, safety, and availability were important components that may affect a participant's effort to quit.

Conclusion: The majority of QSC attendees comprised of working adults and working commitment was highlighted as the primary barrier for a successful cessation. This emphasized the need for effective intervention and collaborative effort between health care facilities and employers to optimize adherence among this group of smokers in smoking cessation which subsequently will enhance their quitting rates.

Management of COVID-19 Infection Combined with Bacteremia Pneumonia in Cancer Patients with Neutropenia: A Case Report and Literature Review

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Background and Objectives: COVID-19 pandemic has continued for almost three years. With the development of vaccine and high vaccination rate, the situation has gradually improved. However, in cancer patients, the infection of Covid-19 can still easily induce critical situation. In this research, we discuss one critical case of cancer patient infected by Covid19. In this patient after COVID-19 tested positive and antiviral agent was prescribed, high fever remained and respiratory depression was noted. Also, during COVID-19 infection, the WBC (white blood cell) and ANC (absolute neutrophil count) had sharply dropped beyond normal range. Literature such as representative guidelines from ESMO(European Society for Medical Oncology) and NCCN(National Comprehensive Cancer Network) will also be reviewed in this research.

Methods/Case description: A 46 year-old patient with head and neck cancer was under chemotherapy of PF4 protocol (first day of cisplatin 75 mg/m² and 5-fluorouracil 1000 mg/m² , followed by three days of 5-Fluorouracil 1000 mg/m²) and had just finished his third cycle of treatment. Three days after chemotherapy, the patient showed fever and illness. C.R.P(C-Reactive Protein), blood culture, sputum culture and severe acute respiratory syndrome coronavirus 2 Ag (antigen) test were checked. Afterwards, the COVID-19 antigen test showed Positive and lab data showed WBC 10500 / μ L, ANC 6420 / μ , C.R.P 7.49 mg/dL. Molunpiravir was prescribed. However, high fever still persisted and respiratory depression was noted. Therefore, Piperacillin-tazobactam and teicoplanin were prescribed. One day later, sputum culture results showed *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* infection. On the fifth day after COVID -19 tested positive, the lab data showed WBC 700 / μ L, ANC 390 / μ L. Consequently, G-CSF (granulocyte colony- stimulating factor) was then prescribed. 156 Results: After combining use of antiviral and antibacterial agents, the situation of patient improved and gradually recovered from the infection. With the use of C-G-CSF, WBC and ANC increased to normal range.

Conclusion: In cancer patients, while fever is noted and COVID–19 is tested positive, another microorganism infection should not be ruled out and combining use of empirical antibiotics should be considered. The indication of G-CSF should be expanded to chemotherapy protocol with lower neutropenia risk for cancer patient during COVID-19 pandemic.

IMP1

Acetic Acid Derivatives Improve Cardiovascular Disease in Patients with Dyslipidemia

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Background and objectives: About 53% of adults in the United States have high LDL-C. Fewer than 50% of patients received treatment, and of those who received treatment, less than 35% achieved control. In addition, patients with high LDL-C had approximately twice the incidence of Atherosclerotic Cardiovascular Disease (ASCVD) compared with normal patients. The aim of this study was to investigate whether anti-inflammatory drug treatment improves acute cardiovascular disease outcomes in patients with dyslipidemia.

Methods: National Health Insurance Research Database of the Ministry of Health and Welfare of Taiwan, 10,143 dyslipidemia patients were diagnosed from 2004, followed up from 2004 to 2013. After excluding patients with severe comorbidities, we included eligible patients (treatment group) and matched patients receiving acetic acid derivatives. Untreated control group by propensity score (untreated group). Participants were followed for acute coronary syndrome and stroke occurrence after receiving the acetic acid derivative or the corresponding calendar date. Results were finally presented using Cox proportional hazards models and Kaplan-Meier survival curves.

Results and Discussion: Dyslipidemia patients had a higher risk of cardiovascular disease. After using acetic acid derivatives. In age, sex, comorbidities and drug treatment adjusted Cox models. The incidence of acute coronary syndrome (ACS) was reduced by 36.9% (HR=0.631; CI=0.535 to 0.744; P<0.0001), and stroke was reduced by 36.3% (HR=0.637; CI=0.516 to 0.786; P<0.0001). In this study, the database was counted, and the patients' medication compliance and living habits could not be known, and the results may be biased.

Conclusions: Acetic acid derivatives reduce the incidence of ACS and stroke in patients with dyslipidemia. The combined use of acetic acid derivatives and hypolipidemic drugs may be a new therapeutic strategy.

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Analysis of Patient Self-administered Satisfaction Questionnaires in Psychiatric Specialized Hospital

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Background and Objectives: Patient satisfaction is an important indicator to understand patients' needs and assess the quality of medical care. The purpose of our study is to investigate the patient's satisfaction with hospital services and to seek the influential factors. These factors could be used as reference to improve the quality of patient's care.

Methods: Our study enrolled 100 patients or family members from the Military medicine ward, day-care, rehabilitation center, and outpatient clinics. The questionnaire was designed by the five-point Likert scale. The higher the score, the higher the level of satisfaction with hospital services. Kruskal-Wallis t-set and T-test analyses were used to compare the differences in satisfaction of demographic variables. A generalized linear model was used to examine the predictors of patient satisfaction, and then to explore the relationship between demographic characteristics and patient satisfaction.

Results and Discussion: The distribution of cases was mostly male, aged from 26 to 46, university graduates, outpatients, and patients themselves. The satisfaction of inpatients was higher than outpatients. Hospitalization, age, education level, and different medical divisions were important predictors of patient satisfaction. We found that inpatients, older age and lower education level were correlated to higher satisfaction, and psychiatric patients had lower satisfaction than Internal medicine patients.

Conclusion: Our research provides non-severe mentally ill patients' autonomous perceptions of service satisfaction as a reference for medical care providers. More focus should be paid on outpatients, younger patients, and high-educated patients to improve the overall satisfaction.

IMP3

Developing the Medication Reminder App to Improve Medication Adherence

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Background and Objectives: This study aims to develop the second phase of medication reminder app for the IOS operating system. We expect it may contribute to increasing medication adherence in patients.

Methods: We designed the new version of IOS APP. Patients could use the app with their smartphones to scan the QR code on the medication guidance leaflet. We also upgraded the app including user interfaces and overall operation process.

Results and Discussion: We developed a local medication reminder mobile application to improve patient adherence with prescribed medication. The new app called 「全方位吃藥提醒與記錄」 was developed successfully. The app had the following features: Scan QR code, Drug information, Medication reminder and Medication history. Users scan the QR code on the medication guidance leaflet and their medication list is directly transmitted to the mobile phone. The app offers personalized reminders to take medicine at the right time and information about drug and food interaction. Medication errors, such as missing doses, dosing errors, duplicate medications and drug-food interactions, could be avoided.

Conclusion: In the future, we will try out the new app in the Drug Counseling Room of our hospital. The pharmacists help patients download the app and teach them how to use it. We observe users' responses and enable to measure their satisfaction after using the app. Furthermore, we will promote the app to NTUH healthcare system and other hospitals of the Yunlin County. Medication reminder app is expected to reduce medication error and improve patient adherence to medical prescriptions.

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IMP4

Determinants and Perceived Effectiveness of Self-Medication Practices for the Prevention or Treatment of COVID-19 Symptoms among Adults in Cavite

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Background and Objectives: The increasing trend of self-medication practices (SMPs) against COVID-19 symptoms poses numerous risks, especially in low to middle income countries. This study aimed to determine the factors affecting SMPs through the modified Andersen model of health service utilization, and their perceived effectiveness in preventing or treating COVID-19 symptoms among adults in Cavite, Philippines.

Methods: An online cross-sectional survey was employed between April and May 2022. Data was analysed using descriptive and inferential statistics.

Results and Discussion: Among 385 respondents, most reported having experienced fever (61.8%) and body ache (52.7%). A total of 77.4% of the respondents performed self-medication using one or more drugs and complementary and alternative medicine methods (CAMs) simultaneously. Paracetamol (60.8%), nasal decongestants (39.5%), and cough medicines (35.1%) were the most frequently used drugs, while vitamins and supplements (67.5%), steam therapy (41.8%), and gargling with warm salt-water (29.1%) were the most frequently used CAMs. Contrary to other studies reporting high prevalence of Ivermectin use for COVID-19, only 1.6% occurrence was found in the study. Having minor and easy-to-treat symptoms (41.6%) were the top reasons for self-medicating, whereas fear of worsening their condition (12.7%) was the top reason against the said practice. Level of knowledge ($p=0.047$), throat pain ($p=0.038$), dry cough ($p=0.025$), and body ache ($p=0.041$), were found to be statistically associated with self-medication. The use of all drugs, except Ivermectin, and all CAMs were significantly associated with perceived effectiveness.

Conclusion: The study found that level knowledge and several COVID-19 symptoms are associated with SMPs. Mismatches between symptoms experienced and SMPs were also observed; thus, the implementation of health promotion and educational campaigns to the public regarding proper use of medications and CAMs is recommended.

Nicole Allyson Carabeo: Presenting author





IMP5

Knowledge and Perception of the General Public in Cavite, Philippines on Counterfeit Medicines

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Background and Objectives: The problem of counterfeit medicines persists in developing Asian countries such as the Philippines. Increased demand for over-the-counter medicines and use of e-commerce platforms due to the COVID-19 pandemic have compounded the problem. Thus, this study aimed to assess the knowledge and perception of the general public in Cavite, Philippines on counterfeit medicines and to identify factors associated with knowledge and perception.

Methods: This study utilized a non-experimental, analytical cross-sectional design. Participants (N = 392) were residents of Cavite aged 18-59 years old. Healthcare professionals and students were excluded from the study. An online survey questionnaire was used to collect data on socio-demographics, experiences in purchasing/ using medicines, knowledge, and perception towards counterfeit medicines. Pearson's Chi Square test and Spearman's Rho Correlation test were used to determine association between variables.

Results and Discussion: Most respondents (48.5%) demonstrated a high level of knowledge and perceived counterfeit medicines negatively (66.1%). A significant percentage (17.9%) had a low level of knowledge, while 1.5% of respondents had a positive view of counterfeit medicines. Most respondents viewed price as an indicator of medicine quality, and cited affordability as a possible reason for purchasing counterfeit medicines. Age, sex, and monthly household income were found to be associated with the level of knowledge and monthly household income was found to be associated with perception. Source of medicine information was also found to be associated with knowledge and perception, while frequency of medicine purchase/ use was found to be associated with knowledge.

Conclusion: This study demonstrated that while the majority of the general public may oppose counterfeit medicines, factors such as unaffordability of medications and poor knowledge of counterfeit medicines continue to put patients at risk. Thus, pharmacists must play an active role in educating the public and ensuring access to quality affordable medicines.

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IMP6

Combined SGLT2 and ARNI Therapy to Reduce the Risk of Cardiovascular Disease in Type II Diabetes: A Nationwide Population-base Cohort Study

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Background and Objectives: Both atherosclerotic cardiovascular disease (ASCVD) and heart failure are leading causes of mortality and morbidity for individuals with diabetes and coronary heart disease. As such, it is important to systematically assess the risk factors associated with CVD to prevent and manage ASCVD

Methods: The National Health Insurance Research Database (NHIRD) was used to investigate the association between the non-use of SGLT2i or Entresto and the use of SGLT2i or Entresto with the risk of ASCVD in diabetes and heart failure patients from 2017 to 2018.

Results and Discussion: The primary outcome of the study was ASCVD including a composite of cardiovascular death and hospitalisation for worsening heart failure. Secondary outcomes were all-cause death, cause of cardiovascular death, recurrence of heart failure, non-fatal myocardial infarction, non-fatal stroke, ischaemic stroke, haemorrhagic stroke, and new renal replacement therapy. The case group comprised 8,691 patients with coexisting diabetes and heart failure without the use of SGLT2 or Entresto and the control group contained 8,691 patients with coexisting diabetes and heart failure who used the SGLT2 or Entresto.

Conclusion: The use of SGLT2 significantly reduced the risk of all-cause death, non-fatal stroke, new renal replacement therapy, cause of death in cardiovascular and recurrence of heart failure in patients with diabetes and heart failure, therefore a combination of these therapies will help improve the management of diabetes and heart failure.

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The Impact of Service Marketing Mix toward Customer Purchase Behavior from Pharmacy Services Online

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Background and Objective: Pharmacy service is an essential healthcare service in Malaysia. Commonly provided by the community pharmacists in the physical pharmacy stores, pharmacy services are now delivered online. Online pharmacy services are useful particularly when the public is advised to stay at home amidst the Coronavirus disease 2019 pandemic. The customers can easily obtain pharmacy services, such as health consultations, counseling services and home deliveries of medicines, online. The concept of the service marketing mix has always shaped the marketing strategies of service organizations. This study examines the impact of service marketing mix toward customer purchase behavior from pharmacy services online.

Methods: The service marketing mix dimensions evaluated consist of product, price, place, promotion, people, process and physical evidence. Data of 420 respondents was collected using online survey questionnaires. Respondents were asked to evaluate 32 items regarding the importance of service marketing mix dimensions and their purchase intention of pharmacy services online.

Results and Discussion: The findings revealed that place and promotion positively and statistically significantly influenced the customer purchase intention, which had a positive impact toward customer purchase behavior from pharmacy services online.

Conclusion: The community pharmacies should focus on the place and promotion dimension when devising the marketing strategies to deliver their pharmacy services online. Consequently, optimal pharmaceutical care can be provided at the convenience of customers while the community pharmacies are benefited from the increase in the sale of pharmacy services.



IMP8

Prediction of *in vivo* Performance of Dabigatran Capsules Produced in Nepal from *in vitro* (Dissolution) data Using Numerical Convolution Method

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Background and Objectives: To ensure the *in vivo* performance of the products. bioavailability or bioequivalence study are performed but in Nepalese context marketing license are issued without the *in vivo* Performance study data. The main motive of this study is to predict *in vivo* study data of locally produced Dabigatran capsules (coded as Product A and Product B which are marketed without *in vivo* performance study using *In vitro in vivo* correlation (IVIVC) method.

Methods: Among two approaches of IVIVC i.e. Convolution and Deconvolution, Convolution approach was used for the prediction of *in vivo* performance of the products from the dissolution data. Dissolution study was carried out for test product their plasma drug concentration was determined using this numerical convolution technique. "Product A" and "Product B" were the two test products. From predicted plasma drug concentration –time data, Area under the curve (AUC) and maximum plasma drug concentration (C_{max}) were determined for both test products. Whether they are statistically different or not was determine and, on that basis, would be concluded that whether test products are bioequivalence or not.

Result and Discussion: C_{max} , AUC of "Product A" from the convolution method was found to be 0.9562 ng/ml/mg, 16.441 hr*ng/ml/mg. Similarly, C_{max} and AUC of "Product B" was found to be 0.8638 ng/ml/mg and 14.8175 hr*ng/ml/mg. The percentage prediction error (%PE) values for C_{max} and AUC were found to be -15.034 and 51.342 for "Product A" and -27.344 and 46.009 for "Product B" Finally, C_{max} and AUC for "Pradaxa 110 mg" obtained from literature was found to be (0.8-1.4) ng/ml/mg and (6-10) ng*h/ml/mg respectively. The predicted error of AUC and C_{max} are not within the $\pm 20\%$ range for both local generic products (Product A & B).

Conclusion: From this study, it can be concluded that the rate and extent of absorption of test products are not similar with the reference product. Since dabigatran, an anticoagulant is a lifesaving drug, there may be risk to the patients rather than benefit using local generic products though they are comparatively cheaper compared to reference product.

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The Study of Drug Interactions between Herbal Medicine and Drugs

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Background and Objectives: P-glycoprotein (P-gp) is widely expressed in the epithelial cells of tissue, especially in the intestine, which is one of critical factors in drug absorption and disposition. P-gp mediated drug efflux is a major factor contributing to the variance of absorption and distribution of many drugs. Appropriately co-prescribed diet and herbal remedies could increase drug efficacy and lessen drug toxicity. The purpose of this project is to study herbal medicine and drug interactions through P-gp inhibition.

Methods: A simple and reliable *in vitro* screening method was setup and characterized using HCT-15 cell lines to study the effect of herbal medicine on P-gp mediated transport of a model substrate. A specific P-gp substrate, rhodamine 123, was used as a fluorescent marker. The increase in intracellular retention of rhodamine 123 is reflected in increased intensity of rhodamine 123 fluorescence. The functional activity of P-gp was evaluated by measuring rhodamine 123 retention/efflux in the presence of herbal medicines.

Result and Discussion: The increase in intracellular retention of rhodamine 123 is reflected in increased intensity of rhodamine 123 fluorescence. Intracellular accumulation of rhodamine 123 was measured by flow cytometry. In our study, we found several herbal medicines are P-gp modulators. HCT-15 cell lines indicated that the efflux of rhodamine 123 was inhibited by some herbal medicines. As our results, intracellular retention of rhodamine 123 increased 4.16 to 7.00 fold of the control by *Moutan cortex*, *Spatholobi caulis* and *Aurantii fructus*, respectively, at a high concentration (10mg/ml). Intracellular retention of rhodamine 123 increased 3.30 to 5.35 fold of the control at a low concentration (2 mg/ml). It also shows concentration dependent manner in herb-drug interactions.

Conclusion: In conclusion, this study demonstrated that the presence of the herbal medicines significantly decreased the P-gp efflux function in HCT-15 cell lines.

IMP10

Pharmacologistics Market Survey: Procurement Model For The Malaysian Field Hospital In Bangladesh

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Background: The Malaysian Government in collaboration with Bangladesh Government, Bangladesh Army, Saudi Arabia, UAE and Brunei, established a Level 3 Malaysian Field Hospital at Cox's Bazar, Bangladesh. MFH acts as the main referral field hospital for 15 units Level 1 and 2 units of Level 3 international field hospitals. MFH started on 20th November 2017 to cater for healthcare needs of the Forcibly Displaced Myanmar Nationals (70%) and also the Bangladeshi nationals (30%). Operating with 54 personnel, MFH provide multispecialty clinical services and currently recognized as the most complete field hospital facility. MFH is made the referral field hospital for all the 7 refugee camps in Bangladesh. Upon establishment, the MFH had seen an increasing number of patients and case-mix intensity. It had treated more than 65,000 cases till today, of which 1,800 were surgical cases. To maintain its efficiency, MFH establishes an innovative Local Procurement Arrangement (LPA) with local pharmaceutical companies.

Purpose/Aim/Information Gap Addressed: To explore the pharmaceutical market profile, identify the supply chain structure in Bangladesh and to find solutions on pricing issues and outsourcing challenges of the medicine's procurement.

Methods: A retrospective study from the first Operation Starlight (Op SL1) team's experiences, prospective study from the second Op SL team reports and qualitative analysis through interviews with local pharmaceutical players.

Results: 242 types of medicines underwent this market survey. Six out of top 10 local pharmaceutical manufacturers have been assessed. Three options were recommended to the Malaysian government based on the criteria of the shortest lead time, counterfeit prevention, saving, best value for money, flexibility, practicality, and agility.

Conclusion: Pharmaceutical market survey in mission area is part of pharmacologistics intelligence that is vital to provide visibility and transparency to the mission organisers. Optimization of all resources is important to MFH especially in its procurement practice to provide the highest quality, effectiveness, efficiency, safety and shariah compliant medicines.

Limitations: Challenges include lack of access to reliable/relevant data due to poor documentations submitted by local pharmaceutical, communication barrier between researcher and local players and time constrain to gather adequate information from local players.



PP1

Varying Approaches for Modelling CPD — A Retrospective Review by Indonesian Young Pharmacists Group

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Background and objectives: As part of healthcare professionals, pharmacists need to always demonstrate and maintain their competency throughout their careers. One of the assessment components is through Continuing Professional Development (CPD). CPD is an ongoing and planned learning and development process. However, most of the CPD provided by professional associations is theory centric with one-way communication. Accordingly, the Indonesian Young Pharmacist Group (IYPG), an organization under the Indonesian Pharmacist Association (IAI), that specifically accommodates Pharmacists under 35 years old, aims to have different CPD activities delivery. IYPG took a chance to develop a CPD program that can be relevant for young pharmacists.

Methods: A retrospective review was selected to elaborate the CPD models on the events held by the Indonesian Young Pharmacists Group (IYPG) in the span of 2020-2022. Four big events were accounted for the delivery of CPD to young pharmacists: the IYPG summit, COVID-19 charity nights, IYPG talk, and IYPG team upgrading events. These events accommodated both learning and social-work CPD activities. All participant was given the post-event questionnaire to evaluate their satisfaction (using the Likert scale).

Results and Discussion: The findings suggested that the events have accommodated the CPD relevant to young pharmacists. The IYPG Summit is the main annual event where the experts shared the learning CPD (10 credits), and the attendees were also involved in selected social work (5 credits), while the COVID-19 charity night mostly concerned about social work CPD (4 credits) and also increase the collaborative action during the COVID-19 pandemic (2 learning CPD credit). The expert talks are incorporated in IYPG Talk (2 learning credits & 3 social work credits) and upgrading events (total 4 learning credits), enabling CPD learning aspects for the attendees. The total number of participants for total these four events was 2.773 pharmacists. Using the Likert scale with a score of 1 to 5, of which 5 are the highest levels (Very Satisfied), on average more than 52% of the participant was Very Satisfied with the event. Moreover, at the recent IYPG Talk event, 82% of respondents were most likely to join the upcoming events held by IYPG.

Conclusions: To conclude, the CPD models incorporated in IYPG events (2020-2022) was found to be relevant for young pharmacists. Not only that they were able to fulfil the CPD requirements from the pharmacist association, but also bolstered greater interest of young people to get CPD.

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Assessing the Clinical Competence of Entry-to Advanced-level Pharmacists using Case-based Discussions in Japan

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Background and Purpose: Although more than 50 hospitals offer a pharmacy residency program in Japan, there is no foundational core curriculum to achieve clinical competence. The Royal Pharmaceutical Society (RPS) in the UK has published the Foundation Pharmacy Framework for band 6 pharmacists. Case-based discussion (CbD) is one of the tools in the framework for assessing clinical decision-making and the application of pharmacological knowledge in patient care. Therefore, we conducted this study to determine whether CbD is a usable tool for assessing clinical competence in Japan.

Methods: The subjects were first-year pharmacy residents as entry-level (n=78), pharmacists in years 2-5 without specialty certification as basic-level (n=9), and the board-certified pharmacists (BCPs) as advanced-level (n=5). Pharmacy residents had trained in four wards for one year, and CbD was performed at the end of each ward training. Other Pharmacists had a one-point measure. For pharmacy residents, CbD scores administered at the end of each ward training were plotted and changes over time were analyzed using one-way ANOVA. For other pharmacists, the presence of a ceiling effect was assessed.

Results and Discussion: Pharmacy residents showed a significant increase in scores on 4 of the 5 CbD items, except "Treatment Recommendations". No ceiling effect was observed for the basic-level, while a ceiling effect was observed for the advanced -level. These results suggest that CbD can be used to visualize the degree of growth of pharmacists with less than 6 years and no specialty certification (entry- and basic-level) but not for advanced-level pharmacists such as BCPs in Japan.

Conclusion: CbD is useful for assessing clinical competence of entry-level and basic-level pharmacists in Japan. However, it is difficult to assess advanced-level pharmacists with CbD. Further studies are needed with a larger number of pharmacists at multiple facilities to evaluate the usefulness of CbD.

The Development of Teaching Method and Game-Based Materials for Medication-use Safety Modular Course

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Background and Objectives: The purpose of the study is to develop a game-based teaching method and materials in order to improve learning effectiveness of medication use safety course for the elderly.

Methods: A focus group discussions methodology was used in this study to facilitate the discussion of participants' perceptions on the learning module and game-based learning material. Neuroscientists, pharmacists and elder education experts were recruited in the focused group to evaluate the validity of the medication-use safety modular course. The board game was tested by external experts at 3 workshops.

Results and Discussion: The learning module and game-based learning material called 「藥您健康 99」 was developed successfully. The board game includes instruction manual and 4 types of cards consist of body, organ, question and answer cards. Due to the COVID-19 pandemic, the community health activities were shut down almost. Therefore, the online board game was developed for testing. There were 3 elderly played the online board game and provided positive feedback.

Conclusion: Based on the results of the first year, the purpose of next year is to test the prototype of the medication use safety board game and validate its effectiveness. It will further test in Active Aging Learning Center with 30 senior citizens to get the information about flow, medication-use knowledge, and behavior change.

A New Platform to Advance Pharmacy Workforce Education

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Background and Objectives: In developing countries, patients often rely on pharmacies as the first point of access to care. Pharmacy workers perform critical functions in the continuum of care, yet they tend to be undertrained and undervalued. To address this problem, Vennue built a health workforce education model that equips pharmacists, as well as pharmacy staff and students, with the necessary skills and knowledge to provide high-quality care. Vennue also provides a community for professional development, bringing together practitioners from around the world to connect through shared learning and practice enhancements.

Methods: Vennue's proprietary curriculum is offered through a hybrid learning model. Each participant benefits from an educational toolkit with the following components offered through in-person classroom instruction and via the Vennue Digital Hub (hub.vennue.org): • Interactive training sessions led by Vennue's instructors • Roundtable Q&A with international guest speakers and clinical experts • Simulation activities to strengthen consultation skills • Hands-on workshops to develop Standard Operating Procedures • Peer Learning Circles to sustain knowledge into the future

Results and Discussion: Launched in January 2021, the Vennue Hub demonstrated the following results: • 992 learners enrolled as new Hub Members from 15 countries around the world • 764 individuals earned certificates in "Fundamentals of Quality Pharmacy Care" • 54% gain in knowledge of pharmacy best practices, measured by pre/post tests at the start and finish of each training module • 96% of learners confirmed the learning materials will improve their practice, reported in feedback surveys From January 2021 to September 2022, the new learning platform enabled Vennue to expand its program reach, while delivering strong performance gains in core competencies. These results serve as an important proof-of-concept as Vennue continues to invest in the integration of additional certification courses onto the Hub.

Conclusions: The Vennue Hub provides flexible, consistent training for pharmacy workers and students of all skill levels. It offers cost-free, uninterrupted access to learning resources and community connections. Vennue's new platform can be scaled to advance patient care and health outcomes.

Drug-related problems (DRP) Identified by Pharmacy Students during Telepharmacy Sessions

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Background and Objectives: Telepharmacy (TP) services received much attention during the COVID-19 pandemic. In order to equip future pharmacists, components of TP were incorporated during final year pharmacy students' clinical pharmacy clerkship (CPC). During the TP, students interacted with patients and conducted medication use reviews. The objective of this study was to characterize the types of drug-related problem identified by the students during the TP sessions.

Methods: A group of four to five final-year pharmacy students interviewed one (1) patient during the TP session. There was a total of 48 groups of students. Patients were recruited from their family members and relatives that prescribed at least two (2) chronic medications (i.e diabetes, hypertension, and hypercholesterolemia). Each session lasted for about 30 minutes. Students were briefed on the conduct of TP prior to interacting with patients. Each group was given a data collection form to document patients' details and descriptions of the DRPs identified under the supervision of a lecturer. These were further analysed retrospectively. Descriptive statistics and chi-square analysis were used to evaluate the data.

Results and Discussion: 187 students completed 48 medication use reviews via TP. The students reviewed 48 patients and identified 122 DRPs. On average, the patients were 56 years old and were taking a median of 5 medications. The most common DRPs reported were non-compliance issues and adverse drug reactions.

Conclusion: Pharmacy students were able to identify a substantial number of DRPs through medication use review activities via TP under the supervision of their lecturer. TP also enhanced pharmacy students' communication skills and their medication history-taking ability.



PP6

Consultation and Education of Doping Among Athletes and Their Logistics Staff

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Background and Objectives: The World Anti-Doping Agency has raised that education are the primary goals of their anti-doping strategy. Doping control is the norm for athletes whether they are in competition or non-competition period; however, many medicines on the market contain doping ingredients even though they are legally marketed drugs. To prevent the misuse of medicine, the Chinese Taipei Anti-Doping Agency provides consultation for service athletes and their logistics staff and has established an "Interactive Consultation Platform for Doping Dosing in Sports" to provide information for athletes to confirm the legality before using drugs or nutritional supplements.

Methods: The consultations were conducted from November 1st in 2018 to April 30th in 2021 in Taiwan. The consultations were raised via online systems and assigned to the specialists such as pharmacists, nutritionists and physical therapists within 24 hours. A total of 276 questions were assessed as eligible.

Results and Discussion: Most consultations were raised from athletes (n = 188, 67.6%) and logistics staff (n = 61, 21.9%). The categories of consultations are Western medicine (192, 69.6%), food/nutritional supplement (62, 22.5%), herbs (16, 5.8%) and others (6, 2.2%). Among all the consultations, the doping-related questions are 25.5%. According to the survey of consultations, two articles were prepared and delivered to the athletes and logistics staff to prevent the misuse of the medicine, named "The Invisible Killer of Athletes: Ephedrine" and "Stomach Medicine as Doping: Oxethazaine."

Conclusion: It is vital to provide appropriate tool and information of athletes and logistics staff on the topic of doping consultation. More education about doping for athletes and logistics staff would prevent the misuse of medicines.

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PP7

Hybrid learning to answer the adjustment of learning models after the pandemic

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Background and Objectives: Hybrid learning has become an attractive learning delivery method in recent years. Many Universities are trying to develop their own Hybrid learning courses as an option to replace part of the face-to-face time with online classes. In terms of theoretical learning, there is no significant difference between the results of hybrid students and distance learning, in fact most of the participants prefer visual presentations rather than verbal explanations. The aim of this research to knowing the quality of lectures conducted in a hybrid with modification.

Methods: Participants who took the hybrid medicinal plants and simplicia lectures were students from the Department of Pharmacy, the University Islam Indonesia and the Department of Pharmacy, Ma Chung University. The lecture is carried out in three stages, preparation stage, program socialization, implementation and evaluation. The evaluation was carried out twice, in the middle of program to improve something that was felt to be inappropriate. Evaluation is done by looking at the midterm exam, final exam scores and also conducting a satisfaction survey to students. Data processing is done by descriptive analysis.

Results and Discussion: The results of this study show that there are differences in student motivation to learn. Students feel that the hybrid can increase their sense of learning. However, the learning outcomes are not significantly different still equally both online and offline. Students also feel that offline, online and hybrid methods have their respective advantages.

Conclusion: Hybrid learning provides flexibility and still gets a sense of learning compared to offline or online only. But still have the same quality.

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SAP1

New Drug Budget and Reimbursement Policy in Taiwan

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Background and Objectives: Taiwan's healthcare system is internationally regarded for its National Health Insurance (NHI) program, which provides universal, easily accessible and affordable healthcare with overall 99.9% coverage (23.6m people). The relative low spend reflects tight-control of expenditure. We evaluated the budget and reimbursement policy of innovative new drugs for the recent 5 years (2013-2017).

Methods: All data were collected from the meeting notes of the Expert Advisory Meetings, the PBRs committee; and the new drug HTA reports released on the NHI Administration Web site. We used descriptive statistics to analyse the trend of the prescription volume and drug expenditure for new drugs from the NHI claims data.

Results: The total new drug budget of each year is decided by the Ministry of Health and Welfare according to the average spending for new drugs in the previous 5 years with an assumption of treatment substitution effect, the new drug will replace the current treatment within 5 years since it covered by NHI and no more budget thereafter. Each new drug will be classified as one of the three categories (I, 2A, 2B) by their therapeutic value and compared to the current best comparator. A 5-years-budget-scheme is estimated with reference to these three categories. In our results, there were 189 new drugs (18 in category 1, 61 in category 2A, 110 in category 2B) getting covered by NHI with a spending of USD\$1.96 billion in the past 5 years, but with a budget of only USD175 million.

Conclusion: Obviously, the budget allocation for new drugs is seriously insufficient. The shortage of spending was compensated by healthcare providers. Ageing population and growth in chronic disease, associated with rising costs of new health technologies, were putting further strain on the healthcare system's resources. A reform should be advocated for the new drugs budget and reimbursement policy, which has been implemented for 10 years.

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SAP2

Development of a Searching Program of Nutrient Information for Patients who have Diabetes or Hypertension

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Background and Objectives: It is essential to supply adequate nutrients for the prevention and treatment of chronic diseases. The aim of this study was to develop a program that can evaluate nutritional deficiencies of patients who have chronic diseases in South Korea.

Methods: A database was built on the potential nutritional status changes caused by chronic diseases or treatment agents for them such as diabetes and hypertension by conducting a systematic review of clinical articles regarding those diseases. Based on the database constructed, we developed a searching program that could find deficient nutrients, evidence levels (low, medium, and high) of clinical articles, severity levels (negative impacts), and intake information by each disease when patients entered their demographic factors such as age, sex, dietary or exercise habits and drugs they were taking.

Results: Active pharmaceutical ingredients for diabetes that can cause nutrient deficiency were metformin, sulfonylureas, and insulin. Those for hypertension were beta blockers, angiotensin-converting enzyme inhibitors, calcium channel blockers, and hydralazine. Five nutrients (vitamin B12, folic acid, magnesium, coenzyme Q10, and vitamin D) for diabetes, four nutrients (vitamin B6, vitamin D, zinc, and coenzyme Q10) for hypertension, and two (vitamin D and coenzyme Q10) nutrients for both diseases were determined. The evidence levels and severity levels varied based on each nutrient and disease. Intake information by each disease such as the required amount of each nutrient per day and food sources were presented as well.

Conclusion: Medications for treating diabetes and hypertension have shown nutritional deficiencies in patients who have those diseases. The searching program of nutrient information developed for the prevention and management of chronic diseases is very useful.

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SAP3

Development of a Computerized Pharmacy Management System Called PM+20 for the IT-based Community Pharmacy Practices in South Korea

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Background and Objectives: Recently, the application of a comprehensive pharmacy management software has become essential in community pharmacies. The pharmacy management software, PharmIT3000, was developed and maintained by KPIC to assist pharmaceutical practices. Currently, about 50% of Korean pharmacies use PharmIT3000, which allows the easy-to-use management of prescription information, billing and invoicing, reimbursement claims, and inventory management. To improve this program by catching up with the evolving practices in pharmacy, PM+20 was designed and implemented.

Methods: The PM+20 was distinctively designed and conceptualized based on the analysis of requirements by pharmacists. The program was implemented by the technical counseling and cooperative work of experts, including software engineers, programmers, database administrators, and web designers. The framework was developed using Delphi 10.3.3 as the programming language. This system runs on Microsoft SQL2014 Server for database management. Additional components, such as TMS, TMS VCL Chart, FastReport, CPort, Image En, and WebSocket were applied. Also, a data migration program was developed to support efficient data transfer.

Results and Discussion: The major functions of PIT3000 were upgraded and new functions were constructed with user-friendly interfaces in PM+20. Following the testing of the beta version of PM+20, currently, it has finally been released in community pharmacies and is under the maintenance phase. The PM+20 exhibits quick activation of the program and enhanced accuracy and integration of data documentation with chart-form statistics and analysis utilities. Above all, PM+20 provides integrated drug information based on the KPIC database as implemented in the Pharm Chart Menu.

Conclusion: This integrated platform will improve the computerized pharmaceutical practices in community pharmacies by minimizing the manual processes and by enhancing the efficiency and accuracy of practices. PM+20 is expected to assist the expansion of the pharmacist's capability as a digital healthcare innovator. Our efforts are currently underway to establish and optimize this platform.

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SAP4

Systematic Review of Factors Associated with Long-Term Adherence to Adjuvant Endocrine Therapy

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Background and Objectives: Adjuvant endocrine therapy (AET) for five to ten years can reduce risk of recurrence by up to 50% in patients with hormone-receptor positive, early breast cancer. However, studies have shown that long-term adherence was often suboptimal. The objectives of this study were to determine the rate of five-year adherence among female breast cancer patients taking AET and identify the factors associated with adherence.

Methods: Relevant articles that measured adherence in the implementation or persistence phase and its associated factors were identified from Embase, Medline, AMED, and PsycINFO. Only studies that measured adherence for a period of at least five years using objective or multiple measures of adherence were included. Two authors reviewed the titles, abstracts and full articles to determine eligibility, and any discrepancies were discussed with a third author.

Results and Discussion: Twenty-six studies were included. Fifth-year adherence for implementation phase was $66.2 \pm 17.3\%$, and mean persistence was $66.8 \pm 14.5\%$. Adherence decreased by $25.5 \pm 9.3\%$ from the first to fifth year. Over 50 different factors were found to significantly affect patients' long-term adherence to AET. Nineteen of these were found to be significant in two or more studies, and were grouped according to the World Health Organization framework of factors affecting medication adherence, with majority being in the 'Social and economic factors' domain. Extreme age, higher comorbidity index, adverse effects and depression were associated with decreased adherence. Patients treated with aromatase inhibitors, received chemotherapy, and had prior medication were associated with increased adherence.

Conclusions: Various factors relating to patient condition, therapy, healthcare-system, and socioeconomic condition were reported, indicating the dynamic and complex nature of medication adherence. Several opportunities for intervention to improve adherence were identified, including patient education to improve knowledge of AET, and management of its adverse effects.

Izzati Yussof: Presenting author



SAP5

Knowledge, Attitudes, and Practices on the Use of Antibiotics among the Residents in Silago, Southern Leyte, Philippines: Basis for Antimicrobial Stewardship Program for Primary Health Care

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Background and Objectives: The study sought to determine knowledge, attitude, and practices (KAP) of residents Silago, Southern Leyte, Philippines on the use of antibiotics which served as the basis for a proposed Antimicrobial Stewardship (AMS) program for Primary Healthcare. This study specifically sought to identify associations of residents' characteristics, their knowledge on antibiotics, their attitude towards antibiotic, and their practices on the use of antibiotics.

Methods: This quantitative, cross-sectional study used a descriptive research design that utilized a validated and pretested structured questionnaire administered face-to-face during Department of Health (DOH) COVID-19 "Resbakuna" Vaccination Program among 383 residents who consented from 15 barangays who have used an antibiotic at least once. Statistical Package for Social Sciences (SPSS) was used to perform all descriptive statistics for summarizing KAP scores and non-parametric inferential statistics such as Mann-Whitney, Kruskal-Wallis, Spearman's Correlation, and Chi-square test.

Results and Discussion: Results showed that residents obtained "moderate knowledge" ($M=67.53 \pm SD=16.77$), "moderate attitude" ($M=65.34 \pm SD=20.52$), and "high practice" ($M=78.61 \pm SD=17.65$) on antibiotic use. Study revealed ages "50-59", and those who acquired antibiotics "appropriately" were significantly associated with "high" knowledge, attitudes, and practices on the use of antibiotics.

Conclusion: Findings showed that residents of Silago have the appropriate practice on antibiotics use but have inadequate knowledge and attitude on antibiotics use, thus, it is hoped that this will provide baseline information for primary health care AMS program implementation.

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SAP6

Associated Factors Related to Influenza Vaccine Acceptance among Adults in Cavite During the COVID-19 Pandemic

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Background and objectives: National COVID-19 vaccination campaign officially started on March 1, 2021 in the Philippines. Aside from COVID-19, seasonal flu caused by Influenza viruses becomes an additional health concern for co-infection. This study aimed to investigate the associated factors related to influenza vaccine acceptance among adults in Cavite during the COVID-19 pandemic. The study also intended to investigate the significant relationship between influenza vaccine knowledge, influenza vaccine perceptions, and influenza vaccine acceptance.

Methods: Data was collected in the province of Cavite using an online self-administered questionnaire. The significance of associations was determined using Pearson Chi-Square and its strength was identified using Cramér's V, while Spearman's Rho was used to measure correlations.

Results: The results of this study showed that most adults had a high level of knowledge (69.55%), the average of the respondents had a fairly positive perception (Mean=3.55), and only some (35.8%) showed acceptance to influenza vaccine during the COVID-19 pandemic. Sex, and educational attainment had a strong significant association, while employment status had a moderate significant association with Influenza vaccine knowledge. Educational attainment had a strong significant association with influenza vaccine perception, while employment status had a strong association with Influenza vaccine acceptance.

Conclusion: The study concludes that a high level of influenza vaccine knowledge would lead to a positive influenza vaccine perception and will increase vaccine acceptance. Moreover, influenza vaccine perception has a strong positive relationship with vaccine acceptance.

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Military Pharmacist Involvement in COVID-19 Vaccination Outreach Programme

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Background and Objectives: In Malaysia, National COVID-19 Vaccination Programme (NCVP) started in 24th February 2021. Traditionally, it is well-known among the public that the vaccination program is often linked with doctors and nurses in our local healthcare scene. Pharmacists also have their roles in this massive vaccination program which include the areas of regulatory, procurement, distribution, advocacy as well as in monitoring and reporting of Adverse Event Following Immunization (AEFI).

Methods: The Military Health Division of Malaysian Joint Force Headquarters organized COVID-19 Vaccination Outreach Programme at South Panching River Federal Land Development Authority (FELDA), Pahang in August 2021 as part of the Civil-Military Cooperation (CIMIC) Programme in collaboration with Kuantan District Health Office, Ministry of Health Malaysia.

Results and Discussion: Overall, the programme managed to deliver 3,864 doses of COVID-19 vaccine in a timely manner, targeted to the FELDA population in anticipation of floods that usually happens in this area during the monsoon season usually at the last quarter of the year. Throughout this programme, military pharmacists have been actively involved as the coordinator of the programme and have successfully undertook the responsibility, mainly in distribution and AEFI monitoring. Apart from that, military pharmacists were also involved in advocating vaccination by addressing the population's vaccine hesitancy, together with the religious officer from the headquarters. By implementing effective communication strategies, military pharmacists managed to inform the public about the safety and efficacy of available vaccines, addressed their concerns and fears and dispel myths and misconceptions, thus allowing the public to make informed an decision which can finally lead to developing herd immunity against the virus.

Conclusion: With proper recognition, investment and training, military pharmacists can do more significant roles other than the established roles to achieve high vaccination coverage, advocating public health as well as ensuring medication safety among the public.



SAP8

Military Pharmacist Involvement in Greater Klang Valley Special Task Force (GKVSTF) – Medical and General Logistics Cluster (MedGenLog Cluster)

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Background and Objectives: The GKVSTF was established and responsible for the planning and execution of the COVID-19 Pandemic Action Control Plan in the Greater Klang Valley Region when COVID-19 cases accelerated in July 2021, reaching up to 12,000 cases daily. GKVSTF was tasked to implement contingency measures to mitigate the crisis. Objective of this report is to share Military Pharmacists' experience in managing challenges in the GKVSTF especially in the Medical and General Logistics (MedGenLog) Cluster.

Methods: MedGenLog cluster's terms of references are to collect and analyse relevant logistic data and implement actions accordingly with regards to the medical and general logistics needs of all health facilities within GKV, liaise with the Finance Cluster to secure budget, identify appropriate procurement methods, carry out the procurement process, manage and coordinate an effective and efficient supply chain system from the process of receiving, storage and distribution to the facilities.

Results and Discussion: Throughout the mission, MedGenLog cluster had engaged with all respective hospitals and other relevant government and non-government agencies to manage vital medications and consumables supply, manage oxygen supply, hospital medical and non-medical equipment, patient transportation, communication as well as other logistic matters.

Conclusion: GKVSTF had significantly managed the surge of COVID-19 patients by implementing out-of-the-book strategies to mitigate the issues. Military Pharmacists involvement in MedGenLog Cluster were vital and gave an impact in implementing and supporting the strategies and managing challenges. The efforts and initiatives from GKVSTF had been subsequently replicated and extended to other regions of the country to manage the COVID-19 pandemic.

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SAP9

The Flying Pharmacist: Military Pharmacist's Experiences and Roles in Managing COVID-19 Vaccine Logistics Using Royal Malaysian Airforce (RMAF) Aircraft

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Background and Objectives: The first batch of COVID-19 vaccine roll-out among the Malaysian Armed Forces (MAF) started in late February 2021, targeting approximately 50,000 military and healthcare personnel in MAF who had been categorized as frontliners and as a high risk group. In accordance with the Chief of Defence Forces (CDF) command to ensure a swift vaccination program to the targeted group, the Royal Malaysian Air Force (RMAF) was given the 'green light' to deploy its strategic aircraft assets to facilitate vaccination programs throughout Malaysia. The general objective of this case report is to share military pharmacists' experiences and roles in managing COVID-19 vaccine logistics support from planning to distribution using RMAF aircraft.

Methods: This is a retrospective case report, observational study, by military pharmacists who had been intensively involved with a total of 35 cumulative flying hours in delivering COVID-19 vaccines.

Results and Discussion: It is observed that delivering vaccines using aircraft proved to speed up the vaccination program among the Armed Forces Health Facilities in the designated delivery areas. There are many key challenges faced in handling COVID-19 vaccine logistics as the vaccines are fragile and sensitive to extreme temperature variation thus required proper handling and monitoring to ensure the viability of the vaccine is preserved. Pharmacists are well versed in this process as they are exposed both theoretically and practically via pharmacy training modules prior to the National COVID-19 Immunization Programme.

Conclusion: Military pharmacists play critical roles in performing the Pharmaceutical and Medical Logistics (Pharmamedlog) support in accomplishing the mission objectives as well as supporting the National COVID-19 Immunization Programme.

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Customer Satisfaction towards Logistic Pharmacy Services in HTJS

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Background: Customer satisfaction is one important indicator of the quality of care because it reflects whether or not a given service is meeting customer's expectations and is consistent with their values. This study aimed to determine the level of customer satisfaction towards logistic pharmacy services and factors that affect the satisfaction of customers towards logistic pharmacy services in Tuanku Ja'afar Hospital, Seremban (HTJS).

Objectives: The objectives of this study were to determine the level of satisfaction of customers towards logistic pharmacy services and to identify factors that affect the satisfaction level of customers towards logistic pharmacy services.

Methods: A study was conducted in Tuanku Ja'afar Hospital, Seremban. The total number of respondents were 80. A validated questionnaire was used, and it consisted of two types of questions. First was "Customer Satisfaction Study" and second was "Servqual's model". The study only included hospital staff involved in indenting from logistic pharmacy. They were referred to as customers in this study. The questionnaire took 15 to 20 minutes per respondent. Data were analysed using IBM SPSS System (Version 26) to determine the association and correlation between factors that affected the satisfaction level. P-value <0.05 indicated the data were statistically significant.

Results: Out of all 80 respondents, 58 of them (72.5%) were satisfied with the overall services provided by the logistic pharmacy unit. Meanwhile, the remaining 22 respondents (27.5%) felt very satisfied with the services. The three possible factors that contributed towards customer satisfaction were facilities, customer service and quality of service, which showed a statistically significant correlation with the overall satisfaction of the end user (χ^2 : 16.2, p: 0.006).

Conclusion: Most of the respondents were satisfied with the facilities, customer service and quality of services provided by the logistic pharmacy unit in Hospital Tuanku Ja'afar. In addition, current services provided by the logistic pharmacy unit in Hospital Tuanku Ja'afar Seremban met end users' expectations.

Patient Characteristics and Factors Associated with Defaulters among Drive-through Patients in Hospital Tuanku Ja'afar Seremban

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Background and Objectives: Drive-through pharmacy service was introduced to resolve the problems encountered by patients during medicine collection visits such as inadequate parking space and long waiting time. However, defaulters among drive-through patients contribute to insufficient storage space for packaged defaulter medication, waste of manpower and finances. This study aimed to investigate the characteristics and associated factors of defaulters among drive-through patients.

Methods: A retrospective cohort study was conducted, and simple random sampling was performed across newly registered and existing drive-through patients in Hospital Tuanku Ja'afar from May 2021 to June 2021. The outcome measure was the status of the patients categorized as defaulter and non-defaulter. Collected data consisted of the patient's demographic, patient characteristics, prescription characteristics, knowledge of characteristic and logistic issues. All data were analysed descriptively, and multiple logistic regression was used in analyzing the association of factors with defaulters.

Results and Discussion: A total of 335 drive-through patients were included in this study. The prominent characteristics of defaulter patients were 66.7% female with a mean (standard deviation (SD)) age of 57.3 (17.67) years, 48.5% Malay, 57.6% new registered patients and 72.7% patients who were dependent. The proportion of defaulters were 10.7% (95% CI: 6.2, 15.8) and 8.9 % (95% CI: 4.4, 13.3) in new registered and existing drive through patients respectively. In multivariable analysis, factors significantly associated with defaulters were female (OR= 2.58; 95% CI:1.18 - 5.62; P=0.017), semi or fully dependent (OR= 2.66; 95% CI: 1.17- 6.05; P=0.020) and those who did not receive notification (OR= 3.35; 95% CI: 1.43 - 7.84; P=0.005).

Conclusion: There was a higher proportion of defaulters among new patients compared to existing patients. Female patients, semi or fully dependent patients and those who did not receive notification had greater risk to become a defaulter.

Assessment of Public Satisfaction on National COVID-19 Immunization Services among the Malaysian Population

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Background and Objectives: National COVID-19 Immunization Programme (PICK) is a programme implemented by the Malaysian government to curb the COVID-19 pandemic in Malaysia. The public is the beneficiary in health systems. Therefore, by measuring public satisfaction and preferences regularly, the effects of services to the public can be improved continuously. In this study, we assessed public satisfaction on national COVID-19 Immunization services among the Malaysian population.

Methods: A cross-sectional survey using snowball sampling method was conducted among Malaysians, aged 18 and above, who have received free COVID-19 vaccinations in Malaysia, able to comprehend English. The questionnaire consisted of two sections: socio-demographic data and public satisfaction towards national COVID-19 immunization services. Satisfaction was measured using 15 satisfaction-related items with 5 determinants of satisfaction: with a 5-point Likert scale, with 5 for very satisfied and 1 for very dissatisfied. Descriptive and inferential statistics were utilized for data analysis, with a level of significance at $p > 0.05$.

Results and Discussion: Response rate was 89.5% (459/513 approached). Females made up 65.4%. Majority of the respondents were aged below 39 (66.2%), MySejahtera users (92.8%), Chinese (79.3%), and had tertiary education (78.4%). The overall mean satisfaction score (SD) was 4.14 (± 0.56). Factors which showed statistically high positive correlation with overall public satisfaction include immunization system ($P < 0.01$), consultations by healthcare professionals before vaccination ($p < 0.01$) and attitudes of staff at the vaccination centre ($p < 0.01$).

Conclusion: The overall satisfaction level towards COVID-19 immunization services is high among the Malaysian population. Regardless of the high satisfaction rate, more extensive and further research needs to be conducted to provide a better insight on this matter and we still need to keep improving the measures in place to further boost the satisfaction among Malaysians towards the immunization services, which can help further strengthen healthcare delivery standards.

Perceptions, Attitude, and Barriers of PAPPI Regulatory Pharmacists Towards Regulatory Pharmacy Experiential Practice: A Basis for Capacity Programs

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Background and Objectives: As one of the major fields in the experiential pharmacy practice, regulatory pharmacists are involved in the preceptorship of pharmacy students to help engage them in the acquisition of knowledge and skills for their future responsibilities. This study determined the perceptions and attitudes of the regulatory pharmacists regarding their roles, benefits, and scope as preceptors, as well as the barriers that they might encounter in the integration of the regulatory pharmacy experiential practice in the new pharmacy curriculum.

Methods: The research employed an exploratory descriptive design. With regulatory pharmacists from the Philippine Association of Pharmacists in the Pharmaceutical Industry (PAPPI) as respondents, an online instrument, tested for content validity and internal consistency, was administered.

Results and Discussion: Response turn-out was 50.42% of the total population. The regulatory pharmacists showed high perception and attitudes to the roles, scope, and benefits of preceptors as well as on the scope of training. As for the barriers, it was found that provision of facilities, technical infrastructures, organized regulatory pharmacy experiential practice, lack of time and motivations, were some of the factors that may be encountered in the provision of the regulatory experiential pharmacy practice. Based on the results, there was a significant positive correlation between perception and attitude of regulatory pharmacists to RPEP ($p < .01$).

Conclusion: To ensure provision of an excellent regulatory experiential practice, it is recommended that capacity building programs, strong collaboration between academia and industries, as well as workshops on preceptorships, be implemented. Furthermore, it is proposed that the workload of preceptors be revised, and recognition be provided for the contribution of the regulatory pharmacists in the experiential pharmacy practice.

Exploratory Factor Analysis of A Patient-reported Outcome Measure: A Newly Developed Medication Adherence Measurement Tool for the Elderly in Malaysia

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Background and Objectives: Measurement of medication default among the elderly is still a growing concern worldwide, compounded by the scarcity of a reliable measure specific for this cohort of people. Recently we developed a patient-reported outcome measure (PROM) to measure level of non-adherence to medication among the elderly, named Medication Alert Tool For the Elderly (MeSATE). In line with the Consensus-based Standards for the Selection of Health Status Measurement Instrument (COSMIN), this study aimed to validate MeSATE reliability for usability purpose in Malaysia by using exploratory factorial analysis (EFA).

Methods: This cross-sectional study was conducted among the residents of long-term nursing care homes around Klang Valley, as well as patients from the outpatient, geriatric and diabetic medication therapy adherence clinic in one of the government tertiary hospital and a health centre in Selangor and Johor respectively (n=391).

Results and Discussion: Factor analysis on the MeSATE questions showed that there were four underlying structures, while the Cronbach alpha coefficient indicates that MeSATE had an acceptable internal consistency.

Conclusion: MeSATE is a valid and reliable measurement tool for food medication adherence measurement among the Malaysian elderly population.



SP1

Transethosomal Gels as Nanocarriers for the Transdermal Delivery of Tamoxifen: Statistical Optimization, Characterization, and *Ex vivo* Evaluation

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Introduction: Tamoxifen is the drug of choice for the prevention and treatment of estrogen dependent breast cancer. Its oral administration is associated with low solubility, life threatening side effects and consequently low patients' adherence. Thus, to circumvent these drawbacks, the transdermal delivery of tamoxifen was developed. Precise consideration was given to understanding nonionic surfactants impact with different hydrophilic–lipophilic balance (HLB) values when used as edge enhancers in the transethosomal production and performance.

Methods: Tamoxifen-loaded transethosomes (TEs) were prepared by the cold method and statistically optimized using three sets of 2⁴ factorial design experiments for three different edge enhancers of HLB values 16.7, 8.6, 4.3 respectively. The optimized formulations were incorporated into Carbopol 940[®] gel base. The prepared tamoxifen-loaded transethosomal gels were further characterized for vesicular size, dispersity, zeta potential, entrapment efficiency, pH, viscosity, yield, rheological behavior, and *ex vivo* skin permeation through pig skin.

Results and discussion: The results showed that the tamoxifen-loaded TEs had aspherical irregular shape, nanometric size range in all TEs, with higher entrapment efficiency in lower HLB values, which is attributed to such edge enhancer ability to solubilize more tamoxifen. All the formulated gels exhibited non-Newtonian plastic flow without thixotropy. Regardless of the HLB value, tamoxifen-loaded transethosomal gels were able to significantly enhance the skin permeation parameters of the drug in comparison to the non-ethosomal gel.

Conclusion: These findings suggested that the transethosomal gels (with high or low HLB values) are promising carriers for the transdermal delivery of tamoxifen, providing an alternative route for breast cancer therapy administration.

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SP2

Viability Assay of Essential Fatty Acids from the *Benincasa hispida* Seed Extract in Keratinocytes

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Background and objectives: Both omega-3 and omega-6 fatty acids (FAs) play different crucial roles in human body, and they are the important components in cell membranes and the main precursors of other FAs which are needed for growth and repair functions in the human body. *Benincasa hispida* seed extract's (BHSE) main contents were found out to be mainly consists of polyunsaturated fatty acids (PUFAs). In this study, two methods were carried out which were the cell culture of HaCaT cells and the MTS viability assay.

Methods: The viability assay was first started with the culture of HaCaT cells in the 96-well microplate at cell density of 1×10^5 . The growth of the cells was monitored and maintained using the high glucose Dulbecco Modified Eagle Medium and in an incubator at 37°C and 5% carbon dioxide level. After one day of incubation, the cells were found to be confluent (~ 80%) and the cells were treated with six different concentrations of BHSE (1000 µg/mL, 500 µg/mL, 250 µg/mL, 125 µg/mL, 62.5 µg/mL and 31.25 µg/mL). Three set of plates were cultured with each plate was cultured at 24 hours, 48 hours and 72 hours prior measuring the absorbance (after 4 hours of incubation with MTS reagent) using the microplate reader at 490 nm.

Results and discussion: This study has found that there was no cytotoxicity effect of the extract towards the HaCaT cells (overall cell viability was more than 80%) with significant differences were found from 31.25 µg/mL until 500 µg/mL after 24 hours and 48 hours treatment durations.

Conclusion: To sum up, this data is important in the safety application of the extract especially the PUFAs in any studies to be conducted especially in dermatology studies for the involvement of the keratinocytes.

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The Development and Characterisation of Retinoic Acid Loaded Nanosponge

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Background & Objective: Retinoic acid (RA) has high efficacy against acne but is insoluble in water, unstable in the presence of light, heat and air; and may cause side effect on the skin such as dryness, peeling and pruritus. Nanosponge with its porous structure can entrap RA and maybe able to enhance the solubility and stability of RA, improving its delivery while reducing side effects. The objective of this study is to develop RA loaded nanosponge formulation with favourable characteristics.

Methods: Nanosponge was prepared with β -cyclodextrin as the polymer and carbonyldiimidazole as the cross-linker. The nanosponge was then characterized by assessing its particle size, zeta potential, surface morphology, Attenuated Total Reflectance Fourier-transform Infra-Red (ATR-FTIR) Spectroscopy study, Differential Scanning Calorimetric (DSC) Study. The entrapment efficiency was also analysed.

Results & Discussion: The RA nanosponge showed desirable characteristics with particle size of below 300nm, polydispersity index below 0.5 and zeta potential value of -24.1 mV. Encapsulation efficiency obtained was 78.19% which is optimal as it is above 60%. Both ATR-FTIR and DSC study confirmed inclusion of RA in the cyclodextrin.

Conclusion: Retinoic acid can be loaded into the nanosponge and obtain favourable characteristics suitable for further in-depth research.



SP4

Formulation and Evaluation of Voriconazole Gastro Retentive Floating Tablets

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Objective: The present study was a systematic approach for development of intragastric buoyant tablets of voriconazole with a view to enhance its oral bioavailability and efficacy.

Methods: Gastro retentive floating tablets of voriconazole using various polymers guar gum, xanthan gum, ethyl cellulose and sodium bicarbonate, magnesium stearate and talc in different proportions were prepared by direct compression method and subjected to *In vitro* drug release studies. Drug polymer compatibility studies were carried out by FT-IR study. The formulation blend was subjected to various preformulation studies, flow properties and all the formulations were found to be good indicating that the powder has good flow properties. All the formulations were evaluated for hardness, friability, weight variation, drug content and *In vitro* drug release.

Results and Discussion: Among all the formulations, formulation prepared with guar gum retarded the drug release up to 12 hours (F2). The formulations prepared with xanthan gum and ethyl cellulose also retarded drug release for more than 12 hours. Hence, they were not considered. The optimized formulation dissolution data was subjected to release kinetics, from the release kinetics data was evident that the formulation followed Higuchi mechanism of the drug release.

Conclusion: Thus, the above study clearly indicated that voriconazole may be formulated as gastro retentive floating tablets by direct compression method.

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In vitro* Mammalian α -Glucosidase Inhibitory Activity of *Hylocereus polyrhizus

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Background and Objectives: Dragon fruit (*Hylocereus polyrhizus*), a regular priority commodity in the Central and Northern region of the Philippines, may pose as one of the potential novel solutions as functional food to the existing uncontrollable incidence of diabetes. The purpose of the study investigates mammalian α -glucosidase inhibition, *in vitro*, of *H. polyrhizus* peel to provide information towards the development of alternative approaches in managing diabetes.

Methods: Spectrophotometric method was performed to examine the mammalian α -glucosidase inhibition of ethanol fractions (EF), methanol fractions (MF), ethyl acetate fractions (EAF), and chloroform fractions (CF). Fifty percent maximal inhibitory concentration (IC₅₀) was determined from the generated four-parameter logistic (4PL) non-linear regression interpolated from concentration-percent inhibition plot. Standardized phytochemical analyses was employed to identify the presence of phytochemical constituents.

Results and Discussion: EF showed a concentration-dependent inhibition towards mammalian α -glucosidase enzyme displaying the lowest IC₅₀ (0.533 mg/mL) among different fractions. Alkaloid, flavonoid, and polyphenol detected might be responsible for inhibitory activity. Chromoalkaloids (betanin, isobetainin, phyllocactin, and isophyllocactin) and Polyphenolics (kaempferol, quercetin, phloretin, and myricetin) were reported active inhibitor of α -glucosidase needed for management of diabetes.

Conclusion: The results provided scientific evidence in inhibiting α -glucosidase for the managing diabetes where fractions, especially EF, displayed notable IC₅₀. Isolation and standardization of the active components detected may contribute to the inclusion on the potential candidates in the formulation of standardised drug product and functional food.

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MALAYSIAN Journal of Pharmacy

Vol 9 Issue 1, June 2023

2023

Submission deadline : 31 March 2023



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