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Abstract 001

Development and Evaluation of a Microsphere Loaded Cream Containing Solanum Lycopersicum for Tyrosinase Inhibition

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Introduction: Hyperpigmentation is a common skin disorder caused by excessive melanin synthesis. Hydroquinone, the current gold standard used for the treatment of hyperpigmentation disorders has been reported to cause several adverse effects. Medicated topical formulations are commonly associated with irritation and allergic reactions. Alternatively, botanically-derived agents have gained increased attention in the pursuit of novel effective depigmenting agents with milder side effects. Solanum lycopersicum or tomato has been linked with numerous health benefits and its tyrosinase inhibitory activity has also been reported. However, the current botanical formulations have been associated with ineffectiveness of skin penetration, shorter duration of action, less final quality, and lower depigmenting effects. Controlled drug delivery achieved via microsphere system may help to overcome the obstacles with enhanced stability and efficacy. Hence, a cream formulation incorporating tomato-loaded microspheres, currently unavailable in the market, would be the first and possibly a potential alternative for hyperpigmentation control. **Objective:** The objectives are to formulate tomato microsphere loaded cream and to determine its tyrosinase inhibition activity. **Method:** Double emulsion technique was used for the formulation of microspheres. The microspheres were evaluated for percentage yield, entrapment efficiency, loading capacity, surface morphology and drug-polymer interaction. The drug-loaded microspheres were then incorporated into the water removable cream followed by determination of tyrosinase inhibitory activity. GraphPad Prism was used for the construction of results and determination of IC₅₀. **Result and Discussion:** The 85.27% yield of tomato seed oil-loaded microspheres was prepared with an entrapment efficiency of 65.85% and a loading capacity of 21.95%. The formulated cream had desirable organoleptic characteristics. The mean pH of cream was 5.55 ± 0.09 with comparable spreadability with commercial products. The tyrosinase inhibitory activity of the formulated

cream was statistically significant compared with tomato seed oil (8.32 ± 0.23 mg/mL) and blank cream (10.87 ± 0.31 mg/mL) alone with the lowest IC₅₀ value (26.85 ± 0.24 µg/mL) but comparable to the positive control, kojic acid (1.65 ± 0.50 µg/mL). **Conclusion:** Solanum lycopersicum microsphere loaded cream was successfully formulated with a desirable *in vitro* tyrosinase inhibitory activity, suggesting its potential as an alternative for the treatment of hyperpigmentation disorders.

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Abstract 002

Expectation and Perception of Contract Pharmacists Regarding their Pharmacy Career

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Introduction: Ministry of Health (MOH) Malaysia introduced the contract system for pharmacists to reduce pharmacy graduates waiting period for the training program in government health facilities. Studies have been conducted to assess perception towards the training program in government facilities [1,2] and the overall job satisfaction among pharmacists [3], but little is known about the perception of contract pharmacists following the new policy. **Objective:** To explore contract pharmacists' expectation and perception of their pharmacy career in terms of future career plans and general perception of employability. **Method:** A cross-sectional study was conducted using a validated, self-administered online questionnaire involving contract pharmacists working in government health facilities within Kuala Lumpur and Putrajaya. Data were collected in November and December 2020 and sent through facilities' email. The questionnaire contains 24 main questions that assess career expectation and experience in job search using 5-point Likert-type questions and an open-ended question for

suggestions to improve aspects of their training. **Result and Discussion:** The response rate was 68.8% (n=97). Of the respondents, 92.8% expressed a desire to work with MOH, but only 24.7% were confident that they could obtain a permanent position within MOH, and only 27.8% believed that they could secure any job offer. Among the respondents, 35.1% (n=34) have started looking for alternative employment, but only eight of them managed to secure a job offer. The respondents perceived community pharmacy as the sector that offers the most job opportunities (88.5%). Long-term job security, work environment and opportunities for career development were rated the three most essential factors in choosing their career. Preference to work with the government may be attributed to long-term job security being the most crucial factor in career choice. **Conclusion:** The contract system poses various challenges for the new generation of pharmacists. There was an excess of demand for jobs in the government sector, with many uncertainties in employment opportunities. Early career advice and broader exposure to pharmacy career pathways are essential to broaden their career perspectives and equip them with the necessary skills to adapt and develop new roles to keep up with changing times.

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Abstract 003

An Evaluation on the Practices about the Use of Paracetamol among Parents in Treating their Children in Penang, Malaysia

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Introduction: Paracetamol is a common antipyretic used to treat fever in people of all ages, including children. The widespread availability of paracetamol over the counter has

led to its usage by parents, often without proper consultation with healthcare practitioners, putting children at risk of paracetamol poisoning. **Objective:** This study aims to evaluate the practices of paracetamol use among Malaysian parents in treating their children. **Method:** This was a cross-sectional quantitative structured interview using a questionnaire. Data was collected from a total of 93 parents from Penang, Malaysia, in August 2019. **Result and Discussion:** Most parents were between age 26 to 40 years (67.7%) and had at least two children (74.2%). About 54.2% of parents had children between 4 - 9 years old. The majority of parents (87.1%) had used paracetamol to treat their children, with 77.9% of them using it for fever. Approximately half (53.1%) of the parents used paracetamol when their children's body temperatures were between 37.5°C – 38°C. Syrup (66.1%) and chewable tablets (20.2%) were the most popular forms of paracetamol used to treat children. The parents mostly use paracetamol every 6-hourly (45.7%) and 4-hourly (38.3%). Among the 1 – 3 years old children who used paracetamol syrup, 37.5% of them exceeded the recommended total daily dose. Conversely, 64.7% of the children aged 10 – 12 years who consumed paracetamol syrup were found to have below the recommended total daily dose. **Conclusion:** In conclusion, the practices of paracetamol usage among the parents need to be improved to ensure better treatment outcomes for the children.

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Abstract 004

Antimicrobial Stewardship Integrated Approach: An Outcome Evaluation in Perak (AMSIA Study)

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Introduction: The antimicrobial stewardship (AMS) program has been implemented in most public healthcare facilities in Malaysia to promote judicious antimicrobial usage and minimize antimicrobial resistance. The AMS integrated approach (AMSIA) was implemented by ward pharmacists and the AMS team concurrently at five specialist hospitals in Perak to enhance several AMS initiatives. The initiatives include creating an antibiotic quick reference guide, intravenous-to-oral conversion algorithm, engagements, and continuous medical education (CME) sessions with stakeholders. **Objective:** To evaluate the impact of the AMSIA in terms of clinical outcomes among patients, and the antimicrobial cost savings based on the AMS recommendations provided. **Method:** This is a retrospective evaluation of the AMS database at the study hospitals comparing data between two phases before and after implementing the AMSIA. Data from the AMS review forms were extracted and analyzed. **Result and Discussion:** A total of 544 cases were referred for AMS recommendations during both phases. Of those recommendations, 474 (87.1%) were accepted by the primary team. Most patients (76.7%) were discharged well. Recommendations provided by ward pharmacists were more likely to be accepted than those offered by the AMS team ($p=0.022$). There was no association between 30-day infection-related mortality ($p>0.95$) with acceptance of those recommendations. However, accepting the recommendations contributed to a shorter duration of antimicrobial therapy ($p=0.001$), a shorter length of hospitalization ($p<0.001$), and a total antimicrobial cost saving of RM427.28, while rejection resulted in a cost increment of RM2122.32 over the study period ($p<0.001$). There were no differences in terms of the rate of acceptance of the recommendations as well as the clinical outcomes and

cost savings between the study phases. **Conclusion:** AMS recommendations resulted in cost savings, shorter hospitalizations, and duration of antimicrobial therapy without compromising patients' survival. Ward pharmacists played equally important roles as the AMS team in the AMS program.

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Abstract 005

Impact of an Antibiotic Stewardship Program on the Use of Carbapenem in a Malaysian Tertiary Hospital

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Introduction: Antimicrobial Stewardship (AMS) program has been advocated to promote the rational use of antibiotic prescribing. However, the outcome of AMS in promoting the judicious use of carbapenem and minimising resistance is not widely studied in Malaysia. **Objective:** To investigate the types of interventions made by the AMS team, its acceptance, and the impact on carbapenem consumption and carbapenem-resistant Enterobacteriaceae (CRE) pattern. **Method:** This was a retrospective study conducted in adult medical wards of Kuala Lumpur General Hospital (HKL), where data were extracted from AMS form of patients reviewed by the HKL AMS team from January to December 2016. **Result and Discussion:** The mean (SD) age of 169 patients included in this study was 59.2 (10.6) years, where almost half were male. Ertapenem was the most prescribed carbapenem (44.4%), followed by meropenem (34.3%) and imipenem/cilastatin (21.3%). Despite only 32% being empirically initiated, there were 68 cases (40.2%) classified as unjustified by the Antimicrobial Stewardship (AMS) team. Out of these, 39 cases (57%) were recommended to be discontinued, 25 cases (37%) to be de-escalated and 4 cases (6%) for changing/escalation. Acceptance rate was reported

to be around 73.5% (50 out of 68 cases). Post one year of AMS implementation, carbapenem consumption shown by defined daily dose/1000 inpatient bed-days reduced significantly (33.7%; $p < 0.0001$). Similarly, a notable decrease in CRE cases (33.3%; $p < 0.0001$) was seen post one year of AMS initiation. **Conclusion:** In conclusion, AMS-guided interventions were shown to be a useful strategy to reduce non-judicious use of carbapenem in a tertiary hospital. It was also able to demonstrate a reduction in carbapenem consumption as well as CRE rates in the medical wards. Therefore, future long-term studies are required to assess long-term effectiveness of AMS.

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Abstract 006

Factors Affecting Adoption of Electronic Medical Record System at Private Hospitals in Klang Valley

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Introduction: Electronic Medical Record (EMR) is one of the revolutionary digital technologies that has been able to produce a system for seamless documentation workflow of patients and this revolution has brought parallel developments that have not only structured the healthcare system but also provided better means of communication. The continuous determination of EMR also depends on the adoption and support from the core user of this system. The aim of the study is to explore the main factors that encourage the adoption of EMR systems among the medical specialists in private hospitals by using The Unified Theory of Acceptance and Use of Technology (UTAUT) model. **Method:** A cross-sectional survey was used to collect data from 95 respondents by using a quota sampling. The study used partial least square (PLS) method; a statistical analysis technique based on the structural equation modelling (SEM) to analyse the collected data. **Result:** There was a positive

and moderate relationship between performance expectancy with behavioural intention ($\beta = 0.581$, $T = 6.024$). The factor of social influences ($\beta = 0.106$, $T = 1.267$) was not significant while effort expectancy ($\beta = 0.174$, $T = 1.633$) represented a low significance and weak relationship. The relationship between facilitating condition and use behaviour was moderate but of significant impact ($\beta = 0.392$, $T = 4.128$). Behavioural intention influenced indicated ($\beta = 0.507$, $T = 5.223$) a moderate effect of intention toward the adoption of EMR. **Conclusion:** The findings suggest that healthcare providers adopt EMR systems and improve the system via customization based on the needs or make it more user friendly. The healthcare provider should consider technical sufficiency and training to facilitate the use of the EMR system.

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Abstract 007

Patterns of Prescription Medicines' Sales through E-Marketplace in Malaysia and Associating Factors

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Introduction: Self-diagnose and obtaining various health products via the internet were extremely dangerous practices as it may increase the risks of patient injury or even death. **Objective:** This study aims to explore the patterns of prescription medicines' sales through e-marketplace (specifically: Shopee) in Malaysia as well as the associated factors. **Method:** Cross-sectional study secondary data of 983 Advertisement Screening Reports (reported from 1st January 2020 – 30th June 2020) in Johor State were collected. Descriptive statistics using frequency, percentages and/ bar charts using Microsoft Excel 2013 were used to report the patterns of prescription medicines' sales through e-marketplace (specifically: Shopee) in Malaysia based on types of prescription medicines that being advertised,

registration status of prescription medicine that being advertised as well as frequently violated Malaysia's law related to prescription medicine by sellers in Shopee. Factors associated were explored by logistic regressions using IBM SPSS Version 22 via Simple (Enter Method) and Multiple (Backward Elimination (LR) Method). **Result and Discussion:** 796 out of 852 (93.4%) prescription medicines' samples were not registered with the Drug Control Authority, Malaysia's Health Ministry. Hormones (62.6%, while sex hormones which were anabolic steroids showed the highest frequency; 58.3%) were the highest prescription medicines sold through the e-marketplace (specifically: Shopee) in Malaysia, while antibiotics, clomiphene (fertility drug), sibutramine (slimming pill) and prostaglandins and its synthetic derivatives (abortion pill) denote 4.8%, 2.2%, 1.8%, 0.4% respectively. The unregistered prescription medicines were found to be the highest to violate Section 13(a) of Poison Act 1952 which include 766 samples. Multiple logistic regression tests indicate that violation of Section 13 (a) of Poison Act 1952 (95% CI; 0.002, 0.058%; $p=0.000$), Regulation 7(1)(a) of Control of Drug and Cosmetic Regulations 1984 (95% CI; 194.694, 2726.963%; $p=0.000$) and Section 4B of Malaysia Advertisement and Sales Act 1956 (95% CI; 0.014, 0.260%; $p=0.000$) were the possible associated factors registration status prescription medicines' sales through e-marketplace. **Conclusion:** The findings in this study may give a brief idea for improving the current practice in order to curb the freely illegal prescription medicines' sales through e-marketplace (specifically: Shopee) without the supervision of professionals.

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Abstract 008

Medication Administration via Enteral Feeding Tubes: A Survey of Nurses' Knowledge and Practice

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Introduction: Enteral feeding is a type of nutritional support for critically ill patients who are unable to tolerate oral feeding. It is vital to ensure that nurses practise proper administration technique via enteral feeding tubes (EFT) to ensure that medication can be delivered safely and effectively. **Objective:** This study aimed to assess knowledge and practice of nurses on medication administration through EFT. Association between baseline characteristics and knowledge was also being explored. **Method:** This was a cross-sectional, self-administered, content-validated, pre-tested questionnaire survey involving all nurses who worked in ward setting at Hospital Queen Elizabeth II from August to December 2020. **Result and Discussion:** A total of 409 questionnaires were sent out with 252 responses received. Majority of respondents were female ($n=240$, 95.6%) with median working experience of 88 months (interquartile range of 44 months). Most nurses knew that the immediate released dosage forms ($n=237$, 94.4%) should be crushed and administered through EFT, but not the sublingual nitroglycerin (GTN) tablets ($n=232$, 92.8%) and nystatin suspension ($n=212$, 85.1%). About half of the nurses responded incorrectly on the EFT administration of sustained-release medications ($n=152$, 60.6%), soft gelatin capsules ($n=111$, 44.4%) and hard gelatin capsules ($n=102$, 40.6%). In terms of practice, majority of the nurses would routinely flush the EFT before ($n=226$, 90.4%) and after ($n=245$, 98.8%) the administration of medications. Only a small proportion of nurses ($n=93$, 37.5%) demonstrated good practice where they administer all medications separately all the time. It was also worth noting that nurses from the intensive care setting had more correct responses on some of the knowledge-based questions when compared to those from general ward setting ($p<0.05$). **Conclusion:** Knowledge gap and inconsistent practice may lead to suboptimal delivery of medication and potentially compromise patient outcomes. Hence, continuous educational programs should be carried out to ensure safe and effective drug administration through EFT.

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Abstract 009

Factors Associated with Oral Anti-Diabetic Drugs Preventable Returned Medications Among Type II Diabetes Mellitus Patients

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Introduction: In Malaysia, Type II Diabetes Mellitus (T2DM) is estimated to have a 31.3% prevalence rate among the adults by year 2025. Oral anti-diabetic drugs (OADs) are used to lower blood glucose level in T2DM treatment. In our setting, OADs was recorded to have the highest returned medication proportion (51.0%) as compared to other drugs. Substantial proportion of returned OADs has raised our concern in patients' medication taking behavior or drug related problems at home and their glycemic control.

Objective: This study aimed to investigate the factors associated with preventable OADs returned to pharmacy and to identify reasons for the return. **Method:** This was a cross-sectional study conducted at public health clinics in Klang district over a 4-week period. Patients with active prescriptions containing OADs were recruited using systematic sampling method whereby they have given their consent prior to the study and subsequently answered a validated questionnaire. From the unused OADs with potential return, patients are grouped into case (with return) and control (without return). The reasons for OADs return divided into non-preventable (e.g., change to other treatments) and preventable (e.g., non-compliance). Patients with non-preventable reasons for return were excluded due to no interventions by pharmacists. Computed data were analyzed using descriptive statistics and multiple logistic regressions. **Result:** Out of 168 patients interviewed, 43.4% (n=73) patients had preventable return, 13.7% (n=23) patients had non-preventable return and 42.9% (n=72) patients of the control group had no return. The main reasons for returning were non-compliance (76.7%) and difficulty in following instructions (21.9%). OADs return was significantly associated with the patient's educational level (OR 0.038; p-value 5.472 with 95% confidence interval [1.097-27.296]) where 63.7% of them from lower education background. Factors such as age, gender, T2DM diagnosis years, polypharmacy, OADs pill burden and traditional medicine taking showed no significant association with OADs return. **Conclusion:** Patient education level is a significant factor in preventable OADs return. By instilling

better knowledge on the importance of patients' medication taking, patients will be self-empowered to manage their medication and disease better. Future study is recommended to assess the possible interventions such as providing simplified education materials and utilizing patient teach-back method to improve patient's medication knowledge and eventually, improving compliance and preventing unnecessary medication return.

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Abstract 011

Perception and Attitude of Malaysian Community Pharmacists Towards the Implementation of Telepharmacy

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Introduction: Telepharmacy refers to the delivery of pharmaceutical care through telecommunications to patients in locations where they may not have direct contact with a pharmacist [1]. The role of community pharmacist has expanded during the COVID-19 pandemic to provide pharmaceutical care services remotely through telepharmacy [2]. This study aimed to assess Malaysian community pharmacists' perception and attitude towards implementing telepharmacy. **Method:** This cross-sectional study was carried out using an online questionnaire. 217 community pharmacists in Klang Valley were recruited through the convenience sampling method. 5-point Likert scales were used to evaluate the respondent's perceived benefits, perceived barriers, and attitude towards the implementation of telepharmacy. **Result:** 37.8% of the respondents showed positive perception while 53.9% are moderately positive towards the benefits of telepharmacy. Age (p=0.019) and familiarity with the term 'telepharmacy' (p=0.014) was shown to influence the perceived benefits on implementation of telepharmacy. On the other hand, only 8.3% of the community pharmacists perceived low barriers in telepharmacy implementation. Community pharmacists who have a Master's qualification have lower perceived barriers of implementing telepharmacy, as compared to those with a Bachelor's qualification (p=0.032). This may imply that

higher education level may lead to a broader view and understanding of the barriers faced in implementing telepharmacy. Overall, the respondents showed a positive attitude towards the implementation of telepharmacy. Younger community pharmacists were more likely to have a positive attitude towards the implementation of telepharmacy ($p < 0.001$), which is consistent with the study done by Biruk and Abetu, where 56% of healthcare provider within the age group of 20-29 showed positive attitude towards telemedicine [3]. Community pharmacists who were familiar with the term 'telepharmacy' and have more years of working experience were more likely to have a positive attitude towards the implementation of telepharmacy ($p < 0.001$). **Conclusion:** In conclusion, most Malaysian community pharmacists practicing in the urban area have shown positive perception towards the benefits of telepharmacy, and overall positive attitude towards its implementation. Nevertheless, the perceived barriers towards its implementation are high. A separate telemedicine education or training may be useful to promote the development of telemedicine to all the pharmacists [4].

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Abstract 012

Knowledge, Attitude and Practice of Malaysian Private Hospital Pharmacists on Medication Review Service

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Background: Medication review is emerging as one of the vital components of medication management to prevent medicine-related problems [1]. Studies have demonstrated a high prevalence of potentially inappropriate medication use in private aged care facilities [2]. Hence, there is a strong need for medication review in the private healthcare system in Malaysia to ensure pharmaceutical safety and effectiveness. This study aimed to determine the knowledge, attitude, and practice of private hospital pharmacists on

medication review service in Malaysia. **Method:** This cross-sectional study was carried out from October to November 2020 using an online questionnaire. Private hospital pharmacists in Malaysia were invited to participate in a validated 36-items questionnaire. Descriptive statistics, Spearman's Rank Order Correlation test, Mann-Whitney U test and Kruskal-Wallis H test were performed to analyze the data. **Result:** Survey questionnaires were completed by 104 out of 226 private hospital pharmacists, giving a response rate of 46.0%. From the total number of responses obtained, 80 pharmacists (76.9%) presented with a high level of knowledge on medication review, while 92 pharmacists (88.5%) had a positive attitude. Approximately two-third ($n = 68$, 65.4%) are providing medication review in the pharmacy, whereas 45 of them (43.3%) did not obtain patient's medication history at the time of admission or as early as possible. Besides, only 69 of the participants (66.3%) reconciled patient's medication with the prescribed medicines, and less than half of the respondents ($n = 47$, 45.2%) performed medication chart review throughout the patient's admission. Factors associated significantly with practice of medication review include age ($p = 0.010$) and years of experience as a private hospital pharmacist ($p = 0.016$). The knowledge on medication review had a statistically significant moderate positive correlation with attitude regarding medication review ($p < 0.001$). Three major perceived challenges of implementing medication review were lack of time (82.7%), insufficient training (79.8%) and lack of manpower (60.6%). **Conclusion:** Private hospital pharmacists in Malaysia have a high level of knowledge, a positive attitude, and a fair practice regarding medication review service. However, several challenges such as lack of time, insufficient training and lack of manpower might obstruct the practice of medication review in private hospitals.

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Abstract 013

Prevalence of Nosocomial Infections in Pediatrics High Dependency Unit and Neonatal Intensive Care Unit Patients, their Bacteriological Profile and Antimicrobial Susceptibility Pattern in Tengku Ampuan Rahimah Hospital: A Retrospective Observational Study

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Introduction: Nosocomial infections (NIs) represent serious public health concern worldwide, and it is difficult to control especially in developing countries, due to financial constraints. The identification of pathogenic bacteria patterns and resistance trends in a facility is useful as a guide for the physician in choosing proper empirical antibiotic therapy for patients, and this is even more important in pediatric populations. **Objective:** To identify common pathogens causing NIs in Neonatal Intensive Care Unit (NICU) and Pediatrics High Dependency Unit (PHDU) HTAR, and the susceptibility and resistance patterns of these pathogens. **Method:** Single center study was carried out from January 2018 until June 2020 which includes all neonates aged 72 hours of life and pediatrics that showed positive cultures who have stayed in the facility for more than 48 hours. The data was collected from the Patients' Notification of Health Care Acquired Infection form and analyzed using SPSS version 22. **Result:** Number of NIs in NICU were 33 (2018), 36 (2019) and 9 cases (2020) while NIs in PHDU were 3 (2018), 5 (2019) and 0 (2020). Eye infection was the most common type of NIs in the NICU for the year 2018 (39.4%), 2019 (44.4%) and 2020 (55.6%). In PHDU, the most common type of NIs were respiratory tract infections, 66.7% (2018) and blood-related infections, 80.0% (2019). 'Coagulase-negative staphylococci (CONs), *P. Aeruginosa* and ESBL *Klebsiella* were found to be the most common organisms isolated in NICU, with 24.2%, 27.8% and 27.8% cases in the year 2018, 2019 and 2020, respectively. *P. Aeruginosa* was the most common isolates in 2018 (66.7%) and *Staph. Aureus* (60%) in 2019 for patients in PHDU. In NICU, CONs was susceptible to chloramphenicol and resistant toward

erythromycin; *P. Aeruginosa* was susceptible to gentamicin and ceftazidime but resistant toward imipenem. ESBL *Klebsiella* was susceptible to gentamicin but resistant to ampicillin. The resistance and susceptibility patterns were unable to be established for PHDU cases. **Conclusion:** Common organisms causing NIs in NICU HTAR are CONs, *P. Aeruginosa* and ESBL *Klebsiella*. This information will allow a more targeted choice of empirical antibiotics to eliminate these potential bacteria causing NI in the NICU.

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Abstract 014

Formulation and Evaluation of Solid Lipid Nanoparticles Containing *Kappaphycus alvarezii* Extract in A Cosmetic Gel

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Introduction: Marine algal extracts have been used in the formulation of cosmetics for years. In this study, the chloroform, methanol, and water extracts of marine algal were analyzed for their antibacterial and antifungal actions. The extract with maximum antimicrobial activity was selected for the preparation of Solid Lipid Nanoparticles (SLNs). The prepared nanoparticles were suspended in a cosmetic gel. **Objective:** To formulate and evaluate the cosmetic gel containing SLNs of *Kappaphycus alvarezii* (KA) chloroform extract to localize the extract topically for a longer duration to exert its antimicrobial properties. **Method:** Disc-diffusion agar plate method was used to evaluate the antimicrobial activity towards *Escherichia coli* (Gram-negative), *Staphylococcus aureus* (Gram-positive) and *Candida albicans* (Fungi). The SLNs were prepared using film hydration technique with ultrasonication. The dried SLNs were evaluated for its physical characteristics, Zeta potential, and the duration taken to release the

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encapsulated extract for the antimicrobial activity. Carbopol and HPMC were chosen as the gelling agent after compatibility studies with nanoparticle dispersions [1]. The formulated gel was analyzed for its pH, visual appearance, and in-vitro drug release. **Result and Discussion:** By comparing the zone of inhibition, chloroform extract of KA (120 µg) showed maximum antimicrobial activity than methanol and aqueous extracts. The SLNs prepared using chloroform extract showed a smaller cloudy and blurry zone of inhibition instead of a clear zone of inhibition. This result was due to the low diffusion of encapsulated drugs through the outer lipid layer of SLNs. SLNs showed a Zeta potential ranging between -11.0 to -37.4 mV. The formulated gel containing SLNs of chloroform extract of KA had an average pH value of 5.37, which was suitable to be used on human skin [2]. The maximum drug release was 60.28% over 5 hours. **Conclusion:** In this study, algal extracts were successfully encapsulated within the SLNs, and when applied topically, the SLNs can reside on the surface of the skin for localized action for a prolonged duration. The Zeta potential obtained for the SLNs was approximately within the limit of -30 mV that yields a formulation with reasonably good physical stability [3].

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Abstract 016

Awareness, Expectation and Satisfaction towards Ward Pharmacy Services among Patients in Medical Wards: A Multi-Centre Study in Perak

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Introduction: Patients' awareness and satisfaction towards ward pharmacy services may influence perceptions towards effectiveness and safety of drugs. This subsequently affects their medication adherence and clinical outcome [1]. **Objective:** To evaluate awareness, expectation, and satisfaction of ward pharmacy services among patients in medical wards and determine their association with demographic characteristics. **Method:** This was a cross-sectional study using a self-administered questionnaire. The study was conducted in the medical wards of fourteen Perak state public hospitals from September-October 2020. In-patients aged ≥18 years old eligible for ward pharmacy services were included. The questionnaire consist of four domains: demographic characteristics, awareness, expectation and satisfaction towards ward pharmacy services. The awareness, expectation and satisfaction were evaluated using a 5-point Likert scale. A pilot study was conducted to establish the reliability of the questionnaire (Cronbach alpha > 0.7). **Result and Discussion:** 467 patients agreed to participate (response rate=83.8%), but only 441 were included. The mean age of the patients was 54.9 years. Majority was male (56.2%), Malay (77.3%), with secondary education (62.9%), rural residents (57.1%) and reported good medication adherence (61.6%). The mean awareness score was 49.6 out of 60 [2]. Patients were less aware of drug-drug interaction (3.85 ± 1.15) and proper medication storage (3.98 ± 1.06). Elderly patients (β=-2.82, P < 0.001) obtained lower awareness scores. Patients with tertiary education (β=3.87, P=0.001), rural residents (β=3.65, P<0.001) and with good medication adherence (β=2.55, P=0.002) had higher awareness scores. The mean expectation score was 44.0 out of 50. The patient had a higher expectation of encountering a polite ward pharmacist (4.51 ± 0.56). Patients with tertiary education (β=1.86, P=0.024), rural residents (β=1.79, P=0.001) and with good medication adherence (β=1.48, P=0.006) demonstrated higher expectation. The mean satisfaction score was 43.6 out of 50. The patients had high satisfaction in the language used (4.45 ± 0.57) and level of knowledge demonstrated (4.41 ± 0.62) by the ward pharmacists. Patients with tertiary education (β=2.16, P=0.009), rural residents (β=1.82, P=0.001) and with good adherence (β=1.44, P=0.009) towards medication demonstrated higher satisfaction, while elderly patients (β=-1.17, P=0.031) had lower satisfaction towards ward pharmacy services. **Conclusion:** Patients demonstrated good awareness, expectation, and satisfaction towards ward pharmacy services in Perak state public hospitals.

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Abstract 018

Exploring Barriers to Retention in Methadone Maintenance Therapy among Opioid Dependent Clients in Klang Health Clinics: A Qualitative Study

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Introduction: Methadone maintenance therapy (MMT) was initiated in Malaysia back in 2005 as part of the national Harm Reduction strategy. Despite proven benefits of methadone in improving client's quality of life, issues such as non adherence and poor therapy retention rates remained as perturbing "mysteries" at Klang health care settings. **Objective:** This study was designed in unearthing client's perception of MMT and in identifying a confluence of multi-dimensional barriers faced by MMT clients leading to therapy defaults and proposed mitigation strategies. **Methods:** Heuristic qualitative mode using a transcendental phenomenological approach was selected. Data collection through audio taped, face to face in depth interviews (IDIs) in adherence to the COREQ-32 item checklist was carried out between November 2019 to January 2020 at three primary health care clinics (Pandamaran, Bandar Botanik, Bukit Kuda) with existing MMT services. Informational saturation of salient themes was achieved through 24 participants (10 clients & 14 health care professionals) during the six stages of thematic analysis. **Results & Discussion:** 3 major themes and 25 subthemes significantly emerged as study findings. Initial theme on T1 : Perception towards methadone maintenance therapy (MMT) displayed constructive benefits in the context of client's health status, enhanced social functioning within a benevolent health care institution. Second theme vis-à-vis T2 : Drivers to therapy non-adherence were most commonly quoted from the client's domain in adherence to the theory of planned behaviour (TPB). Intrapersonal devoid of client's insights on the significance of methadone, worsened by the nature of addiction (lepas rindu and sulam menyulam) lead to one's diminished self efficacy. Gaps due to volatile employment status, aggravated by dysfunctional dynamics in their social support systems and exposure to unshielded public opprobrium were equally reiterated. Additionally, patients subjected to poorly regimented methadone doses with risks of co-infection morbidities faced superior strains in therapy continuation. Porous provider-client engagements with

limitations to MMT service flexibility, internal staff stigmatisation and interference from private methadone sectors (new emergent subtheme) were justified. Robust target-oriented T3: Mitigation Strategies to Improve Methadone Therapy Outcomes were suggested in compliance with the social ecological model of nested intervention planning. **Conclusion:** Implementation of client centred correctional mechanisms are imperative in addressing the shift in drugs addiction paradigm from traditional heroin agents to a myriad of stimulant types and new psychoactive substances, whilst sustaining the noble role of methadone in the community.

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Abstract 019

Exploring Local Challenges and Solution for Progress in Medication Supply through Ubat Melalui Pos Services during Nationwide Movement Control Order

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Introduction: Ubat Melalui Pos (UMP) is one of the value-added services (VAS) majorly used during nationwide MCO to reduce patient's physical engagement at the local health care facilities. **Objective:** This study is aimed at identifying local challenges and solutions for progress in medication supply through UMP services during nationwide MCO in population dense Klang city. **Methods:** Retrospective cross-sectional study covering the health clinics in Klang district was conducted from 18th March 2020 to 12th May 2020. Participants were conveniently sampled based on their online requests for UMP services through customised Google sheet filling. A total of 403 participants were recruited. Inclusive criteria for UMP were stable patients having at least one

tablet medication on their valid prescriptions. Patients on insulin, inhalers and less postage friendly medications were excluded from the study. **Results & Discussion:** Demographically from the active pool of 403 UMP requests received, (n=265, 65.8%) of them were from female patients. Common challenges were mainly technical strains with (n=41, 10.17%) due to incomplete prescription attachment, (n=38, 9.43%) with expired prescription and (n=33, 8.19%) UMP requests for less postage friendly medication. Geographically, most UMP requests were from urbanised clinics in comparison to suburban counterparts. Ground breaking analysis discovered that most applications of client's UMP were performed by their inner social circle, in comparison to (n=33, 8.19%) UMP requests successfully delivered by the patients themselves. Robust approaches are required in improving primary care UMP services within our Klang vicinity. Acts in strengthening client's awareness with regards to UMP, in addition to inculcating positive familial support in medication seeking behaviours of vulnerable geriatrics are necessary. Concerted health care teleconsultation for stabilised UMP clients, followed by vigorous health promotion campaigns through dignified social representatives (DUTA Kenali Ubat Anda) are encouraged. Additionally, introduction to subsidised UMP, innovative Pharmacy Value Added Services (VAS) and training of trainers (TOT) are pivotal health promotion efforts in sustaining medication accessibility and availability at times of unprecedented crisis. **Conclusion:** UMP services are indeed beneficial in the context of prompt, efficient and cost effective mechanisms of medication supply. A handful of local challenges centred towards client's knowledge, attitude and practice to UMP requests are modifiable through timely public health education towards the community.

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Abstract 021

Pre and Post Medical Deployment Experiences of Military Healthcare Professionals

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Introduction: Military field hospitals provide crucial medical service for injured soldiers on the battlefield. Although war no longer becomes the primary displacement of the human population, natural and man-made disasters take place. Inherited from the battlefield, military field hospitals currently continue to serve the disaster's victims and refugees. The healthcare professionals served in military field hospitals face numerous challenges during field operation especially for the first timers. By sharing their previous experiences perhaps, it will help military and other organizations for conducting medical deployment. **Objective:** This study is conducted to determine the pre and post medical deployment experiences of military healthcare professionals. **Method:** Semi-structured interviews were conducted with healthcare professionals who served in various field hospital deployments. Purposive and snowball sampling were employed to ensure a diverse group of informants. The interviews are audio-recorded, transcribed verbatim, and data analyzed using thematic analysis. Data collection, coding, and interpretation were carried out until the saturation point was reached. **Result and Discussion:** Twenty-one respondents from different demographic characteristics were recruited. Seven major themes were identified. Four themes emerged for pre deployment experiences such as operation preparation, personal preparation (mental and family readiness), preventive medicine (vaccination and medical check-up), and logistic preparation. Meanwhile, three themes emerged for post medical deployment experiences such as operation withdrawal, preventive medicine (mental and physical check-up), and logistic withdrawal. During the medical deployment, challenges include harsh environment, extreme weather, different cultural and tasteless food which require their sacrifices, mental strength and physical endurance in order to accomplish the mission. **Conclusion:** Based on healthcare professionals' experience, four things needed to be done before a mission, namely preventive medicine, operation, personal and logistic preparations. Meanwhile, three things needed to be done after a mission, namely preventive medicine, operation and logistic withdrawal. By understanding the experience before and after a mission, organisations may prepare more efficiently and improve the medical service in the future deployment.

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Abstract 022

Factors Associated with Non-adherence to Medication among Type II Diabetes Mellitus Patients in A Tertiary Hospital in Kelantan, Malaysia

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Introduction: It is estimated that around the globe, 40% to 50% of type II diabetes mellitus (T2DM) patients are not adherent to their medications. This is alarming as non-adherence can lead to worsening of health outcomes as well as unnecessary cost burden to the healthcare system.

Objectives: The aim of the study is to determine the prevalence of non-adherence to medication and its associated factors among T2DM patients treated in Raja Perempuan Zainab II Hospital (HRPZ II), Kelantan. **Method:** A cross-sectional survey was carried out among T2DM patients using convenience sampling at the outpatient pharmacy from November 2018 to March 2019. A minimum sample size of 189 subjects was estimated using a single mean formula. Medication Compliance Questionnaire (MCQ), a self-administered validated instrument consisting of seven items, was given to eligible patients to assess the level of medication adherence. Those with a score of less than 27 out of 28 were considered non-adherent. All data were gathered and analyzed using IBM SPSS Statistics for Windows version 25.0.

Results and Discussion: A total of 200 patients were recruited and they were mostly between the age of 40 to 60 years old. The mean (SD) score for MCQ was 26.0 (1.6) with more than half non-adherent (55.0%, n=110). It was noted that the common reason for non-adherence was forgetfulness with mean (SD) score of 3.35 (0.69). In the multiple logistic regression model, non-adherence was found to be associated with marital status [AOR 4.50; 95% CI: 1.95-10.41, $p < 0.001$], financial income [AOR 0.37; 95% CI: 0.19-0.73, $p=0.004$] and types of diabetes medications [AOR 0.23; 95% CI: 0.12-0.44, $p < 0.001$] which were consistent with previous findings. **Conclusion:** The prevalence of non-adherence to medication among T2DM patients was high in HRPZ II. It was observed that patients who were married, had a low salary and were prescribed with insulin were more likely to become non-adherent. Future intervention targeting these subgroups should be designed within the facility to improve adherence.

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Abstract 025

Diabetes-Related Quality of Life and its Determinants: A Single Centre Analysis

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Introduction: Type 2 diabetes mellitus (T2DM) is a devastating chronic disease which if uncontrolled, often leads to other serious health conditions. The debilitating consequences such as retinopathy and nephropathy can significantly impact their quality of life (QoL). **Objective:** The study was conducted to measure diabetes-related QoL and identify its determinants among T2DM patients attending Raja Perempuan Zainab II Hospital (HRPZ II), Kelantan. **Method:** In this cross-sectional study, a total of 200 adult T2DM patients were recruited through convenience sampling at the outpatient pharmacy from November 2018 to March 2019. Then, the revised version of Diabetes Quality of Life (DQOL) instrument containing 13 items in Malay language was self-administered by eligible respondents. A higher average score indicated a poorer QoL with the possible range of score was between 13 to 65. Statistical Package for the Social Sciences (SPSS) software version 25.0 for Windows was used to perform multiple linear regression. **Result and Discussion:** The majority of T2DM patients were between the age of 40 to 60 years old. The mean (SD) score for the overall revised DQOL was 25.5 (8.9) while each domain of "satisfaction", "impact" and "worry" had mean (SD) scores of 12.0 (5.0), 7.7 (3.4) and 5.9 (2.7), respectively. Stepwise regression model which accounted for 40% of the variability in QoL, showed that a higher DQOL score was found to be associated with older age [β : -4.93 (95% CI: -7.18, -2.67), $p < 0.001$], female gender [β : 4.69 (95% CI: 2.62, 6.77), $p < 0.001$], married status [β : -8.34 (95% CI: -10.78, -5.89), $p < 0.001$] and shorter disease duration [β : -4.85 (95% CI: -7.03, -2.67), $p < 0.001$]. All four variables were commonly reported to influence QoL in

previous literature. Interestingly, the current study observed a contradiction to the previous finding whereby older patients in the current study had better QoL. **Conclusion:** The T2DM patients in HRPZ II showed satisfactory diabetes-related QoL. It seemed that the disease did affect their QoL but not to a great extent. More attention should be paid to male, single patients of working age and diagnosed with T2DM for over 10 years who are more likely to have poorer QoL score.

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Abstract 028

Carers' Perspectives on Home Medication Review conducted by Medical Outreach Team of a Hospital in Malaysia

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Introduction: Home Medication Review (HMR) is a continuation of patient care from health facilities to their home to assess patients' pharmacotherapy by a multidisciplinary team. Bedridden patients are the leading group receiving this service. To improve the provision of HMR, we need to understand carers' viewpoints of the current service. **Objective:** To explore the carers' perspectives of HMR conducted by the medical outreach team (MOT) of a Malaysian hospital. **Method:** A qualitative study was conducted among carers involved in the HMR programme for more than six months. Four themes identified: understanding of the services, perceived benefits, difficulties faced and suggestions for improvement. Carers are chosen as respondents as patients have impaired cognitive function or cannot communicate/cooperate in the interview. Subjects were recruited by purposive sampling from August 2019 to December 2019. In-depth interviews were conducted at patients' homes, until data saturation. The audio recordings were transcribed verbatim and afterwards subjected to

thematic analysis. **Results and Discussion:** Nine carers were interviewed. All respondents had limited understanding of HMR although they claimed to be adequately counselled prior to admission into the programme. Carers' good understanding of the programme may improve patients' preparedness and lead them to be actively engaged in decision making during the home care visits. The convenience of not having to go to the hospital was perceived as the primary benefit. Healthcare providers were welcomed during each visit. Recognising the presence of a pharmacist in the MOT was not a problem. There was a concern about requiring them to refill medications from the hospital. Some participants suggested increasing the frequency of visits and hoped for more financial aids. **Conclusion:** In this study, carers' comprehension of HMR was generally poor although they were satisfied with our HMR programme. Furthermore, several aspects of our HMR need to be strengthened to improve patients' wellbeing. Despite HMR being temporarily replaced by telemedicine during the current pandemic, HMR remains relevant in the post-COVID-19 era.

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Abstract 029

Investigation of the Moisturizing Effect of Cocoa Butter on Skin Cream

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Introduction: Cocoa butter (CB) is a natural product that has been incorporated as a moisturizer in various topical creams over the years. However, CB is not the main ingredient despite numerous studies claimed about its moisturizing capacity. [1] [2]. The chemical compositions of CB could contribute to its potentiality as an occlusive agent that helps to maintain skin hydration [3]. **Objective:** The main objective of this research was to investigate the effect of CB as the primary ingredient of skin moisturizing cream. **Method:** The oil-in-water emulsions were prepared by adding an aqueous phase to the oil phase in several pre-determined proportions before subjecting to high-speed homogenization. A total of 15 prototype formulations were prepared. The oil phase consisted of CB, beeswax and PEG 200, whereas the aqueous phase included Poloxamer 188 and

distilled water. Other ingredients (Poloxamer 407, Cinnamon Oil, Almond Oil and Vanillin) were added to enhance the product attributes. The developed cream formulations were characterized by pH, spreadability, in-vitro occlusivity, sun protection factor (SPF), antioxidant activity using hydrogen peroxide method and antimicrobial activity by disc diffusion method. **Result and Discussion:** The physicochemical parameters of formulations S1-S14, i.e. pH, occlusion factor and spreadability were found to be in the range of 5-5.5, 54.10-24.20, 0.850-2.917 cm respectively. The formulation, S14 showed the lowest occlusion factor ($F=24.20$), high spreadability (1.533 cm) and improved sun protection factor (SPF) of 25.4 and was found to be more effective compared with the other prototype formulations. There was also a general trend of increase in antioxidant activity when the concentration of the sample increased. Besides, the S14 formulation showed greater inhibition against the *S. aureus* than *E. coli*. The formulation, S14 was stable at the accelerated conditions ($40 \pm 5^\circ\text{C}$, $75 \pm 5\%$) regarding color, liquefaction, pH and phase separation for three months. **Conclusion:** To conclude, CB has the potential to be used as the main ingredient of skin moisturizing cream due to its optimum pH, spreadability, occlusivity, SPF, antioxidant activity and antimicrobial activity. However, clinical studies were required to evaluate its further benefits in maintaining skin hydration *in vivo*.

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Abstract 030

Development of *In vitro* Dissolution Method for Nateglinide Formulations

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Introduction: Nateglinide (NTG) is a derivative of D-phenylalanine, an agent that stimulates insulin secretion in pancreatic β cells. NTG is under BCS Class II drug, which is characterized by low solubility and high permeability. Thus, the dissolution of NTG is a rate-determining step for

bioavailability. For this reason, to correlate the *in vivo* performance of NTG, the development of *in vitro* dissolution method is important. **Objective:** The objective was to develop an *in vitro* dissolution method for NTG formulations to correlate the *in vitro-in vivo* performance of NTG. **Method:** Two formulations (tablets and capsules) were prepared and evaluated for their physical properties. The dissolution mediums were developed based on the solubility of NTG in different six dissolution mediums. The dissolution study for NTG tablets and capsules was investigated by using USP Apparatus 2 (paddle) and USP Apparatus 1 (basket), respectively. Each aliquot at predetermined intervals was filtered through $0.45 \mu\text{m}$ syringe filter and measured using UV spectrophotometer. For each formulation sample, drug concentrations were determined from the standard calibration curve. **Result and Discussion:** The solubility of pure NTG in six different dissolution mediums were as follows: water (0.0748 mg/mL), 0.5% w/v SLS in water (1.1695 mg/mL), 1% w/v SLS in water (1.0697 mg/mL), buffer pH 7.4 (1.8840 mg/mL), 0.5% w/v SLS in buffer pH 7.4 (2.5150 mg/mL), and 1% w/v SLS in buffer pH 7.4 (2.8259 mg/mL). The prepared NTG tablets showed the highest percentage of drug dissolved in 1% w/v SLS in buffer pH 7.4 (104.97%) whereas NTG capsules showed the highest percentage of drug dissolved in 0.5% w/v SLS in buffer pH 7.4 (105.46%). **Conclusion:** Hence, 1% w/v SLS in buffer pH 7.4 and 0.5% w/v SLS in buffer pH 7.4 are suitable dissolution media for NTG tablets and capsules respectively. The *in vitro* drug release kinetic properties of NTG formulations can be used to provide the desired *in vitro-in vivo* correlation information.

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Abstract 031

Drug Utilization Review in Emergency Department of Hospital Tuanku Ampuan Najihah: A Major-Specialist Hospital

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Introduction: Drug utilization review (DUR) is required to initiate discussions on rational drug use. Furthermore, suggestions and measures to improve prescribing habits can be performed. Unfortunately, DUR in the emergency departments (ED) in Malaysia is rarely performed.

Objective: This study aimed to identify the pattern of drug utilization among patients discharged from the ED in a tertiary hospital in Malaysia. **Method:** A one year retrospective drug utilization study was conducted in the ED of Hospital Tuanku Ampuan Najihah. A total of 833 patients discharged prescriptions were reviewed to extract data on the pattern of drug use excluding incomplete prescriptions and patients discharged from wards. The rationality of prescriptions was evaluated using WHO core indicators of drug utilization. **Result:** The three most prescribed categories of drugs were respiratory (39%), analgesia (20%) and gastrointestinal (16%). The rationality of prescriptions was average of 2.6% drugs per encounter, 15.7% antibiotics per encounter, essential drugs list or formulary was 100% of drugs prescribed, and percentage of drugs prescribed by generic names was 66.8%. All drugs were found to be used rationally. The use of generic names was lower than the recommended optimal level of 100%. **Conclusion:** The rational use of drugs in the ED, HTAN as a major specialist hospital was successful based on standard WHO prescribing indicators. However, there was a lack of generic names used during prescribing.

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Abstract 032

Community Pharmacists' Perceptions on Medication Review Service Model Implementation in Retail Setting in Malaysia

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Introduction: Pharmacists' roles have been evolving to include more patient-centered care services such as medication review that help patients to get the most benefits out of the medication [1-3]. In Malaysia, although medication review services have been established in the government

health care settings, it is yet to be widely implemented in community pharmacy setting. Since the two settings have different patient population and orientation, it is important to develop the service model that specifically design for community pharmacy. Hence, input from community pharmacists and their stakeholders is important to propose a feasible medication review service module in Malaysia.

Objective: To explore the community pharmacists and their stakeholders' perceptions on the barriers, facilitators and strategies for the implementation of a medication review service model in Malaysia. **Method:** A focus group discussion with semi-structured interviews were conducted among purposively sampled community pharmacists. Respondents were continued to be recruited until saturation was achieved in which no new coding or themes aroused from two consecutive interviews. The interview was video and audio-recorded and transcribed verbatim. Data was analysed using thematic analysis with ATLAS.ti version 8 software and themes were classified according to the framework for implementation research on pharmacy services [4]. **Result and discussion:** A total of 14 pharmacists participated in this study. Among them, 9 pharmacists were from independent pharmacies and the remaining from chain pharmacies. Participants reported 13 barriers, 14 facilitators and 9 recommended strategies for medication review service model in Malaysia. The main barriers reported were absence of a structured service model and health care system that will support the service, lack of monetary value and remuneration and pharmacist's poor knowledge, communication skills and lack of confidence to implement the service. The current factors that were found to facilitate future implementation of the service were the availability of other advanced services and medication review that are currently being offered in some community pharmacies, presence of well-trained pharmacists with passion to conduct the service. Recommended strategies included the need for a standardized model, fee and documentation system to guide pharmacists as well as the need for accreditation and training for community pharmacists. The service model suggested included engaging customers to the service through good communication and education, appointment-based service, targeting customers who benefit most and collaborating with doctors. **Conclusion:** The findings will help to guide the development of a medication review service model that is suitable for implementation in the community pharmacy settings in Malaysia.

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Abstract 033

Evaluation of Warfarin Related Knowledge and International Normalized Ratio (INR) Control Among Atrial Fibrillation Patients in Rural Area

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Introduction: INR control is important for warfarin patients to maintain the ideal anticoagulation effect of warfarin. Warfarin related knowledge affects INR control among patients where patients with higher warfarin related knowledge will have better control. **Objective:** This study aimed to assess warfarin related knowledge and INR control among atrial fibrillation patients, and to identify the association between warfarin related knowledge and INR control. **Method:** A cross-sectional survey was carried out among atrial fibrillation patients on warfarin therapy at the Medical Outpatient Department (MOPD) in Hospital Tuanku Ampuan Najihah (HTAN). A convenient sampling was used to recruit the subjects. A validated questionnaire which consists of mainly 3 parts covering the demographic data, INR level and Oral Anticoagulation Knowledge (OAK) test. **Result:** A total of 133 subjects were recruited and the mean knowledge score of the subjects was 51.39 ± 18.11 which indicates moderate level of warfarin related knowledge. Most of the subjects (95.5%) know the indication of warfarin. There was a statistically significant difference for warfarin related knowledge between patient with different education level as determined by one-way ANOVA ($p < 0.001$). The mean time in therapeutic range (TTR) of our respondents is 71.7% which indicates moderate INR control. Kruskal Wallis test showed a significant difference in TTR ($p < 0.001$) and percentage of days in range ($p = 0.004$) with different warfarin related knowledge levels. There was a significant relationship between total knowledge score with TTR ($r = 0.268$; $p = 0.002$) and anticoagulation knowledge and percentage of day in range ($r = 0.233$; $p = 0.007$). **Conclusion:** Atrial fibrillation patients on warfarin therapy in HTAN were observed to have moderate warfarin related knowledge and moderate INR control. Warfarin related knowledge is significantly related to INR control.

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Abstract 034

Quality and Quantity of Patient's Own Medicine's Brought to Hospital Tuanku Ampuan Najihah during Admission: A Cross-Sectional Study

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Introduction: Patients' Own Medicines (POMs) is a relatively recent programme in Malaysia, with its management guidelines first published in 2016. Studies relating to the quantity and quality of POMs are limited in Malaysia. **Objective:** This study aimed to evaluate the quality and quantity of POMs brought by patients admitted to Hospital Tuanku Ampuan Najihah (HTAN). **Method:** A cross-sectional study was carried out among patients admitted in the medical ward, in HTAN. Convenient sampling was applied and 170 respondents were recruited from the medical ward. Data was collected by interviewing patients using a structured data collection form by investigators. The parameters studied were the quality, quantity and socioeconomic characteristics that might influence the quality of POMs. Data were analysed using Chi-Square tests to identify potential associated factors and Spearman's analysis to assess the correlation between the number of POMs and their usability. **Result:** Total number of patients who brought POMs were 170, and the calculated total number of POMs were 752. POMs brought by patients to HTAN were generally in good condition in which 93.7% ($n=679$) of POMs were usable while 6.3% ($n=46$) of POMs were unusable. Out of 752 POMs, 87% were in good condition, 98% were not expired and 72% of them were labelled with batch number, expiry date and presented in original packaging. No significant associated factors was found between POM's usability and patient's socioeconomic characteristics. There was a correlation between the number of medicines and the usability of POMs (R -value= -0.151, p -value= 0.049). **Conclusion:** Most of the POMs brought by patients are usable in the ward. Pill burden could be the

reason for poor management of medicines at home. Future study shall include the cost and savings incurred of POMs.

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Abstract 035

Public Knowledge and Practices Regarding Antibiotic Use: A Nationwide Cross-Sectional Survey in Malaysia

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Introduction: Antibiotic resistance is a global threat to human health worldwide, and a major contributing factor is the inappropriate use of antibiotics. There is a need for a nationwide study on the Malaysian general public to identify knowledge gaps regarding antibiotic use, its resistance, and practices related to antibiotic use. **Objective:** This nationwide study aimed to assess the knowledge of antibiotic use and resistance, and to identify any inappropriate practices related to antibiotic use among the Malaysian general public. **Method:** A cross-sectional survey was conducted, where Malaysians aged 18 years old and above from all states in Malaysia were recruited via quota sampling, followed by convenient sampling. A validated self-administered questionnaire was used to collect data. **Result:** A total of 1971 respondents were recruited. Half of them had engaged in at least one inappropriate practice related to antibiotic use (56.6%), with the most common being not completing an antibiotic course (48.8%). The mean total knowledge score was 8.57 ± 4.24 (range 0-20). The majority of the respondents were unsure or incorrectly answered that antibiotics work on viral infections (79.1%) and colds and coughs (77.0%), and 42.8% were unsure or incorrectly answered that antibiotics could be stopped when symptoms improved. Most respondents were unsure or wrongly answered that antibiotic resistance occurs when the body becomes resistant to antibiotics (90.2%), and antibiotic resistance is not an issue in Malaysia (62.9%). Respondents who had engaged in at

least one inappropriate practice related to antibiotic use were observed to have lower mean total knowledge scores (8.11 ± 4.00 versus 9.26 ± 4.40 , $p < 0.001$). Respondents who reported had ever not completed their antibiotic courses had significantly lower mean knowledge scores (8.09 ± 3.93 versus 9.10 ± 4.42 , $p < 0.001$). **Conclusion:** Important knowledge gaps on antibiotic use and resistance, and a high rate of non-completion of antibiotic courses were observed among the general public. Improving the knowledge of antibiotic use and resistance among the general public may be a key strategy to correct misconceptions and promote the prudent use of antibiotics.

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Abstract 036

A Study on Knowledge, Attitude and Practice on Medication Error Reporting Among Healthcare Practitioners in a Primary Care Setting.

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Introduction: Medication error (ME) is a worldwide issue affecting the healthcare system. In Malaysia, a total of 17357 medication error reports were submitted to the National Medication Error Reporting System (MERS) in 2016. However, the majority of the medication error reports come from pharmacists. **Objective:** To assess the knowledge, attitude and practice (KAP) on medication error reporting among healthcare practitioners working in primary care settings under the District Health Office of Kota Bharu. **Method:** A cross-sectional survey was conducted between Nov 2020 and Jan 2021 using a web-based self-administered questionnaire with 6 closed-ended questions for each section: knowledge, attitude and practice. Participants included healthcare practitioners (physicians, pharmacists and nurses) working in the 20 primary care health clinics within Kota Bharu District. KAP toward

medication error reporting was assessed using three options (yes, no or maybe). **Result and discussion:** A total of 221 respondents participated in the survey. Almost half (46%, n=101) of the healthcare professionals were not knowledgeable and 44% of them (n= 97) had negative attitudes towards medication error reporting. The pharmacists had the highest proportion, 65% (n=26) of them were knowledgeable and 73% (n=29) had a favorable attitude. Almost half of them (57%, n=126) have previous experience in reporting ME. Among the listed variables, respondents' attitude and practice of medication error reporting are significantly associated to gender with $p=0.002$ and $p=0.043$, respectively. This data was found quite similar to the previous study. There was a weak correlation between knowledge-attitude ($p<0.001$, $r=0.330$) and attitude-practice ($p<0.001$, $r=0.391$). A moderate correlation was found between attitude-practice ($p<0.001$, $r=0.561$). Meanwhile, knowledge and practice show moderate correlation and significance ($p<0.001$, $r=0.561$). **Conclusion:** Our study revealed that knowledge, attitude and practice among the respondent are above borderline, i.e. merely above 50%. Therefore, more efforts are needed to improve the knowledge and attitude of the healthcare workers. Educational talk, disseminating ME material or displaying a clear flow chart on the reporting process are some of the examples that could be carried out.

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Abstract 037

Prevalence of polymorphisms in gastrointestinal (GI) disorder-related gene, Tryptophan hydroxylase 1 (TPH1) among Healthy Malays

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Introduction: Polymorphisms in the genes associated with genetic disorders have shown variable prevalence among different populations in the world. Today, the genetic polymorphisms database is considered a key to success in guiding treatment decision-making for genetic diseases. Tryptophan hydroxylase 1 gene (TPH1) which encodes the enzyme that catalyzes the rate-limiting step in the serotonin or 5-hydroxytryptamine biosynthesis pathway, is one of the leading candidate genes associated with gastrointestinal (GI) disorders. **Objective:** With these perspectives, this research aimed to study the genotype distributions and allele frequencies of two single nucleotide polymorphisms (SNPs) of TPH1 among healthy Malays in Malaysia. **Method:** Nested allele-specific multiplex polymerase chain reaction (PCR) was performed on 404 archived Malays' DNAs to determine the distributions and frequencies of TPH1 SNPs; rs4537731 (A-6526G) and rs211105 (T1803375G). Genotyping results were confirmed through direct Sanger sequencing. **Result and Discussion:** The genotype frequencies of A/A (A-6526G) and T/T (T1803375G) were 51.49% and 59.16%, respectively. The heterozygous frequency for A/G (A-6526G) was 36.39% and for T/G (T1803375G) was 33.66%. The homozygous variant was only found in A-6526G with a frequency of 12.13%. Concurrently, the wild type allele frequencies appeared to be higher than the mutant type in both SNPs with 69.7% to 30.3% for rs4537731 and 76.0% to 24.0% for rs211105. The findings from this study described low frequencies of TPH1 variants rs4537731 and rs211105 among healthy Malays, to which the symptoms of irritable bowel syndrome and severe GI including bloating, diarrhea and watery stool can be attributed. However, more studies should be performed to solidify the findings. For example, studies on Malaysian patients with GI disorders are recommended to determine the association of TPH1 polymorphisms to the condition, locally. **Conclusion:** The genetic polymorphism data obtained from this study is important to enhance our current knowledge on the genetic profiles among healthy Malays. Such data can be used to explore more on the association of GI disorders and the genetic variations of Malaysians in the future.

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Abstract 038

The Impact of Lithocholic Acid as A Surfactant on the Characteristics and Cytocompatibility of Azithromycin Loaded Self-Emulsifying Drug Delivery System

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Introduction: The self-emulsifying drug delivery system (SEDDS) has emerged as an effective pharmaceutical strategy for addressing the issue of poorly soluble drug bioavailability, specifically candidates belonging to BCS classes II and IV including azithromycin (AZM, log p = 4). Aside from oil, the main component in SEDDS is the surfactant, which is presented in high concentrations leading to complex physiological interactions raising the possibility of toxicity. Surfactants derived from bile acid have transpired as an excellent choice of bio-compatible pharmaceutical excipient. Unconjugated lithocholic acid (LA) has recently been reported to improve formulations' drug release and stability. **Objective:** To investigate LA as a safe and effective surfactant in liquid SEDDS (L-SEDDS) and compare it with LA-free L-SEDDS and solid SEDDS (S-SEDDS) states of AZM. This is in terms of reduced particle size (PS), dispersity (Đ), self-emulsification efficiency (T%), zeta potential charge in distilled water (DW), 0.1 mM HCl, and simulated intestinal fluids (SIF), as well as cellular viability. **Method:** L-SEDDS was formulated with Capryol 90[®] oil (22.22%), Tween 20[®] as surfactant and Transcutol HP[®] (2:1 ratio) as co surfactant. S-SEDDS was produced by adsorbing the L-SEDDS(s) to Aerosil 200[®] as a solid carrier (at 2:1 ratio of L-SEDDS to Aerosil 200[®]). In L-SEDDS, LA was incorporated at high (B-L-SEDDS3), medium (B-L-SEDDS2), and low (B-L-SEDDS1) concentrations of 7.75, 3.6, and 1.03 mg/ml respectively. Later, AZM was loaded. MTT assay was performed on human Colon carcinoma cell lines. **Result and Discussion:** Significant reduction in PS and Đ values was observed upon the addition of LA (p<0.05) in both blank and loaded B-L-SEDDS and compared to LA-free AZM-loaded liquid and solid SEDDSs, respectively. Besides, the size reduction was LA concentration-dependent and could be advantageous for drug absorption and lymphatic uptake, while the Đ reduction represents SEDDS improved

homogeneity. After the addition of LA, T% increased up to ~ 100%, while ZP charges were negative in DW and SIF, with charge shift to positive in HCl diluent. Almost all SEDDSs formulations exhibited good cytocompatibility (> ~85%). **Conclusion:** LA is a potential surfactant for desired features of SEDDS (PS, Đ and T%) with a good safety profile.

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Abstract 039

COVID-19: Embracing the New Normal; Are We Ready for This? A Cross-Sectional Study

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Introduction: The rapid spread of Coronavirus brought fear and chaos to Malaysians. Amidst pandemic, educating, engaging, and mobilising the public to become active participants may help achieve public health emergency preparedness, reducing the overall population's vulnerability. However, false media information may mislead Malaysians, making it necessary to access Malaysians' baseline knowledge and preventive practices against COVID-19. **Objective:** The study aimed to evaluate the knowledge, attitude, perception and practices towards the prevention of COVID-19 among the general public in Malaysia. **Method:** A cross-sectional study was conducted online among the general public in Malaysia from June 2020 to August 2020. Participants were conveniently recruited through multiple social media platforms to encourage nationwide participation. A patient-administered questionnaire was used to assess their knowledge, attitude and practice towards the prevention of COVID-19. Descriptive analysis, percentage, mean, and standard deviation were used to report demographic characteristics, knowledge, attitude, and practice scores. For inferential analysis, t-test, ANOVA, Pearson's correlation, Spearman's correlation, Chi-square test and binary logistic regression was used to analyse the

differentiation, association and correlations of the study variables. The confidence interval selected for this study was 95%. **Result:** A total of 420 respondents participated in this survey. The majority of the participants (n=412, 98%) were aware of COVID-19. Most participants learnt about the pandemic through social media. About half of the participants had inadequate knowledge (45.5%) and a negative attitude (43.3%). Participants residing in urban areas showed good preventive practices than those residing in rural areas ($P < 0.05$). There was a significant association between participant's attitudes and preventive practices towards COVID-19, where the majority of the participants (57.4%) who showed negative attitudes were more likely to follow poor preventive practices. Malaysians each hold a perception that differs from individuals according to their mindsets, perspective and acceptance towards COVID-19. **Conclusion:** Despite having good knowledge, participants with a negative attitude towards COVID-19 were less likely to follow the preventive practices of COVID-19. The Public's mindset and willingness may play an important role in influencing their practices, giving them another perspective, which may change their perceptions. As a result, strategies should be made to change the mindset of these vulnerable groups through proper counselling and education.

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Abstract 041

A Study on Academic Stress Level among Undergraduate Pharmacy Students

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Introduction: Pharmacy course has always been regarded as a highly stressful program among university undergraduates. This worsens tremendously during the Covid-19 pandemic when there is a sudden shift to e-learning. **Objective:** To examine the severity of academic stress among pharmacy students and the factors affecting it. **Method:** A cross-sectional study using a convenient sampling technique was conducted among undergraduate pharmacy students in a tertiary university in Malaysia. A self-administered validated

questionnaire was distributed to the students through emails. The questionnaire includes sociodemographic information and questions to examine the academic-related factors which render student stress during the Covid-19 pandemic. All the data were analysed using SPSS version 26.0. **Result and Discussion:** Overall, 102 pharmacy students participated in this study. The majority of the students face a moderate level of academic stress (63.8%), followed by severe stress (23.5%) and mild stress (12.7%). Academic factors, such as struggling with difficult subjects through e-learning, feeling stressed when deadline submission is approaching, and dealing with high academic workloads might be the reasons for stress.

Furthermore, this study discovered that the year of study, especially for students in year one and smoking, were two significant independent factors causing academic stress among students (P -value < 0.05). **Conclusion:** This study highlights the worsening academic stress which could affect the psychological well-being of the students. The mental health status of the students should not be neglected. Therefore, school management needs to develop effective counselling modules and intervention strategies to help students alleviate academic stress.

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Abstract 043

Qualitative Analysis on Interprofessional Collaboration in the Management of Paediatric Bronchial Asthma: Challenges and Suggestions for Improvement

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Introduction: Multi-disciplinary healthcare providers need to move beyond task-based responsibility towards a more

collaborative approach. Chronic childhood diseases such as bronchial asthma demanded effective multidisciplinary team meetings to improve patient care. **Objective:** We aimed to examine the interprofessional collaboration between physician and pharmacist in the management of paediatric bronchial asthma, to explore the views and experiences of both pharmacists and physicians on the important aspects of paediatric respiratory medication therapy adherence therapy (PRMTAC) and patient-centredness, and to identify barriers to shared decision-making in the management of paediatric bronchial asthma. **Method:** The study involved a face-to-face interview involving the paediatrics medical team and pharmacists involved with PRMTAC. The semi-structured interview included four pharmacists and three paediatrics residence from Hospital Tuanku Fauziah, Perlis, Malaysia. A full audio recording was used for detailed data retrieval and verbatim transcription. The session was deemed completed once all the probed questions have reached the thematic conclusion. **Result and Discussion:** There were three main themes emerged: (i) The relevance and necessity of PRMTAC service to complement paediatric outpatient bronchial asthma management, (ii) the lack of communication between pharmacist-physician in outpatient bronchial asthma management, and (iii) recommendation for the combined clinic in the management of outpatient paediatric bronchial asthma. PRMTAC services were rated as highly relevant in the management of outpatient bronchial asthma among all study respondents, irrespective of profession. The detailed assessment of medication compliance and technical demonstration provided by PRMTAC services were deemed fundamental in holistic patient care. The current clinical scenario demonstrates that the pharmacist and paediatric medical team work independently and in parallel rather than collaboratively—such workflow challenges in tandem decision-making regarding patient-focused medication. The lack of interaction also impedes sharing of ideas and new knowledge that could benefit both parties in relation to the management of outpatient bronchial asthma. A combined clinic was synonymously suggested to remedy this. **Conclusion:** Therefore, proper planning regarding allocation of support system and mobilisation of human resources needs to be instituted to realise the implementation of a nationwide combined clinic in the management of paediatric bronchial asthma.

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Abstract 044

Views, Barriers and Facilitators of Pharmacists Regarding Trastuzumab Biosimilar in the Treatment of HER2+ Breast Cancer

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Introduction: Despite the introduction of trastuzumab biosimilar in 2019 and scientific proof that biosimilar has no clinically meaningful difference from its originator, the uptake of trastuzumab biosimilar in one teaching hospital in Malaysia was still low in 2021.^{1,2} Therefore, we aimed to explore the views, barriers and facilitators of pharmacists regarding trastuzumab biosimilar in the treatment of HER2+ breast cancer.^{3,4} **Method:** This qualitative study was conducted from March to September 2020 at the University Malaya Medical Centre. Pharmacists involved in the procurement, dispensing, and reconstitution of trastuzumab was recruited. In-depth interviews were conducted in either English or Malay, using a semi-structured topic guide. Interviews were audio-recorded, transcribed verbatim and analysed using a thematic approach. **Result and Discussion:** Eight out of 14 pharmacists agreed to participate. They were 31-59 years of age with 6-34 years of work experience. Three themes emerged from our data analysis: 1) Affordability of trastuzumab biosimilar. The introduction of trastuzumab biosimilar reduced the price of the originator. This allowed patients and healthcare professionals to choose which trastuzumab they preferred. Some pharmacists did not like the idea of having both options available in the pharmacy as this complicated trastuzumab's inventory. 2) Efficacy and safety of trastuzumab biosimilar and its originator. Most pharmacists believed that trastuzumab biosimilar and its originator had no clinically meaningful difference. However, they were not confident in assuring doctors and patients on the efficacy and safety of trastuzumab biosimilar due to lack of training. 3) Who should decide if trastuzumab biosimilar or the originator should be used. Pharmacists believed that the decision lies with the doctor or the patient as they were not directly involved in the management of breast cancer. **Conclusion:** The price war between trastuzumab biosimilar and its originator has provided the option for doctors and

patients to choose between the two. Pharmacists believed that trastuzumab biosimilar has no clinically meaningful difference from its originator. However, they were not confident in recommending trastuzumab biosimilar due to lack of training. Ultimately, they believed that the decision should be made by either the doctors or the patients.

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Abstract 045

Evaluation of Patient's Knowledge and Perception Regarding Generic and Innovator Drugs and its Associated Factors Among Patients in Public Health Clinics in Rembau District

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Introduction: Healthcare costs are on the rise. Generic drugs are a cheaper alternative to innovator drugs. Thus, it is vital for the public to have adequate and precise knowledge regarding innovator and generic drugs. **Objective:** The objectives of this study were to describe the level of knowledge and perception regarding generic and innovator drugs among patients in health clinics in Rembau district and to determine the relationship between patient's sociodemographic factors (age, gender, educational level, and income) and their level of knowledge and level of perception about generic and innovator drugs. **Method:** This cross-sectional study involved 368 outpatients who collected their medications at health clinics under Health Division of Rembau District from September 2020 to November 2020. **Result and Discussion:** The term generic and innovator drugs were only recognized by 49.4% (n=182) of the respondents. Despite this, only 21.74% (n= 80) of the respondents have good knowledge about generic drugs. Most

of the surveyed patients obtained information about generic drugs mainly from health care provider (44.3%) and electronic media (33.4%). Age [χ^2 (1, n=368) = 4.995, p = .025], educational level [χ^2 (1, n=368) = 9.180, p = .002] and income level [χ^2 (1, n=368) = 17.505, p = .0001] are factors associated with level of knowledge. As for perception towards generic drugs, 56.8% (n=209) of the respondents have a positive perception. About 43.2% believed that generic drugs are equal in quality. Almost half of the respondents, 53.8%, agreed that generic drugs are cheaper; nonetheless, only 18.5% believe that it can help in reducing medication cost. Factors found to be associated with level of perception are age [χ^2 (1, n=368) = 5.484, p = .019] and income level [χ^2 (1, n=368) = 7.842, p = .005]. **Conclusion:** Based on this study, the knowledge on generic drugs are still lacking among patients in Rembau district. Nevertheless, most of the patients have positive perceptions of generic drugs. Therefore, educational and promotional activities on generic drugs should be emphasized to improve patient's knowledge on generic drugs and maintain the positive perception among the patients.

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Abstract 046

Military Pharmacists' Roles in Medical Logistics & Supply Chain During COVID-19 Pandemic

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Introduction: Coronavirus disease 2019 (COVID-19) outbreak has immensely impacted healthcare management globally. Malaysia, in particular the Malaysian Armed Forces (MAF), has experienced shortage of vital medical supplies as most of the pharmaceutical items, active pharmaceutical ingredients, raw material for medical devices and medical devices were heavily imported from other countries. In the MAF, military pharmacists play crucial roles in managing

medical logistics and supply chain. The pandemic has implicated the ability of military pharmacists to provide stable and steadfast medical logistics support for the troops to combat the COVID-19 outbreak and to execute routine operational activities. **Objective:** To study the impacts of COVID-19 pandemic on military pharmacists' roles during COVID-19 pandemic. **Result & Discussion:** (1) Deployment need to Tawau Field Hospital which consists of 100 beds (15 Oct 20 until 6th Jan 2021) as military pharmacist and also medical logistics officer to support Ministry of Health, Tawau Hospital and treating non-COVID-19 patients particularly medicine, general surgery, obstetrics and gynaecology, orthopaedic and paediatric services. Responsibility of military pharmacists was not limited to continuity of pharmacy services but also ensuring availability of medical assets and many other medical equipment throughout the operation. (2) Agility needs to support PPEs distribution for Operasi Penawar nationwide. Operasi Penawar is an operation by the MAF together with the Royal Malaysian Police during Movement Control Order (MCO). It was started on 18th March until 3rd May 2020 for MCO 1.0. Military pharmacists' good networking skills had ensured sufficient and timely deliveries of PPEs nationwide including to East Malaysia within 5 hours after receiving the initial instruction until the end of operation. (3) Increased need to coordinate the distribution of PPEs, medicines and vaccines to ensure stock readiness at all MAF health facilities nationwide. There are 60% increment of logistics communication frequencies using the Royal Malaysia Air Forces (RMAF) A400M and C-130 aircrafts to support East Malaysia. (4) Military pharmacists managed to increase 60% of PPE stocks sustainability rate in the MAF from 36.9% to 96.4% in one month. Despite having difficulties to secure stocks during pandemic, Military pharmacists were able to maintain PPE stocks sustainability rate above 90% from April 2020 onwards. This was achieved by rigorous effort of doing supplier mapping, identifying source of materials and shifting to other alternatives. Maintaining smart partnership also contributed to the success of ensuring 100% PPE stocks sustainability. **Conclusion:** COVID-19 pandemic has really impacted the conventional roles and tasks of military pharmacists in the MAF. Despite ordinary roles and tasks, military pharmacists must be agile and able to execute extra tasks without failed by practicing good networking skills with other stakeholders and good management skills to provide stable and steadfast medical logistics support for the troops to combat the COVID-19 outbreak as well as to execute routine operational activities.

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Abstract 047

Metabolomics of Metformin in Urine Samples of Healthy Volunteers

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Introduction: Metformin is a first-line anti-diabetic agent that has been widely used for treatment of type 2 diabetes mellitus (T2DM). The drug is responsible for increasing the glucose uptake in the liver and skeletal muscles, and suppressing gluconeogenesis in the liver and interstitial glucose absorption. Non-targeted metabolomics is a comprehensive investigation to identify the pharmacological effects and adverse effects of a medicine (1). **Objective:** The objective of this study is to identify the metabolic pathways of metformin in urine samples of healthy subjects. **Method:** The study is registered with ClinicalTrials.gov, approved by ethics committee and performed in accordance to Malaysian Good Clinical Practice (2). Subjects who underwent at least 10 hours fasting were given single doses of metformin 1000mg tablet. Urine samples for six subjects at pre-dose and every 4 hours post dose until 12 hours after oral administration were analyzed using Liquid Chromatography Mass Spectrometry Quadrupole Time-of-flight (LCMS-QTOF) with reverse phase column. Modified METLIN method (3) was used in the instrumental setting for global metabolomic analysis in positive and negative modes. Pooled quality control samples and internal standards were spiked into the samples to control the analysis and batch-to-batch consistency. The chromatograms were further processed using MetaboAnalyst software (4). Multivariate analysis and parametric statistical analysis were performed to identify compounds. The compounds were paired with the Kyoto

Abstract 049

Transforming Pharmacy Education via a Gamified Flipped Classroom Approach

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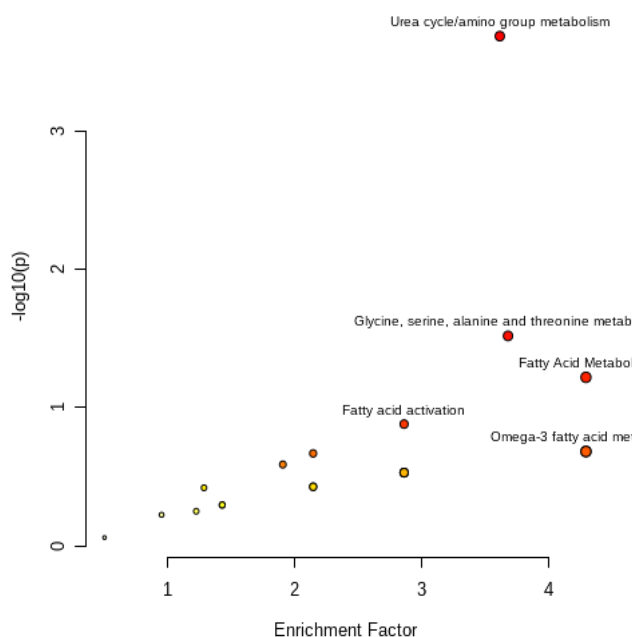


Figure 1. Metabolic Pathways using Mummichog Enrichment Analysis for pre-dose versus 4 hours post-dose urine samples.

Encyclopedia of Genes and Genomes (KEGG) to predict the biological perturbation involved after metformin absorption.

Result and discussion: From the untargeted metabolomic analysis, metformin was found in all the post-dose urine samples but not available in any pre-dose sample. Metformin was absorbed and excreted through urine in healthy subjects. Figure 1 demonstrates the metabolic pathways for pre-dose versus 4-hour post-dose. In the 4-hour and 8-hour post-dose urine samples, urea cycle or amino group metabolism and glycine, serine, alanine and threonine metabolism are having significant biological perturbation in the control environment. Similar metabolic pathways were observed by study on T2DM subjects (5). **Conclusion:** Untargeted metabolomic analysis in urine samples using LCMS-QTOF is able to identify biological perturbation of metformin. This emerging approach sheds light on the pharmacological effects of the drug during phase one clinical trials.

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Introduction: Pharmacy education in the 21st century has fast-transformed from the traditional classroom to flipped classroom lessons where instructional videos are viewed prior and scheduled lessons have instead become avenues for working through problems. In collaborative learning, engagement is key. **Methods:** Using an open-source application, QuizWhizzer, two academic pharmacists together with an undergraduate developed an online, interactive teaching and learning mode for pharmacotherapeutics – a subject often considered ‘dry’ by students. Two or more players could engage in a competitive game, where their goal is to answer as accurately as possible the questions on cancer-associated thrombosis (CAT). Questions were designed in sets of 10 seconds, with varying degrees of difficulty: from easy, medium to difficult. The two academic pharmacists reviewed and rated the reliability of questions. Pilot testing of undergraduates’ perception was done. A 4-item questionnaire, with a 5-point Likert scoring, was distributed to 30 students who attempted QuizWhizzer. These students had completed the course “Neoplastic disorders”. Areas assessed were: engagement, evaluation of intellectual skills, problem-solving skills and motivation. A bivariate correlation was performed to evaluate the correlation between game scores and student perception. **Results and discussion:** The game is web-based and compatible on all gadgets and operating systems. It used two concepts of engagement: quiz and utilising a board game. Score keeping via a leaderboard meant that students effectively compete and positively challenge one another. With every accurate answer, the student gets a turn to roll a virtual dice, which will determine how far “up the ladder” he or she will proceed. Upon completion of each level, the player is to advance to a more complex level of difficulty throughout the game. The player who reaches the top first, is awarded as the winner. It took the 30 students an average of approximately 30 minutes per pair to complete the game. The accompanying questionnaire was filled in within an average

of 2 minutes. From the student's feedback, the average score obtained was 20 out of 30 marks (70%, ± 2.4). Students (100%) perceived the game as exciting and fun (engagement). Students (100%) rated the game as positive in helping them solve problems. While a majority (86.7%) felt that the game was challenging, promoted healthy competition among themselves to remain motivated, 4 students were not satisfied with the feedback available in the game as it did not assist with enhancing their intellectual skills. Game scores and perception levels were found to be moderately positively correlated, $r = 0.34$, $p = 0.032$. The game can be rolled out to undergraduate students enrolled into a course on neoplastic disorders in order to assess the effectiveness of the novel teaching and learning or assessment method. **Conclusion:** Preliminary evaluation of students' perceptions regarding QuizWhizzer, showed positive ratings in the aspects of engagement, assessing intellectual skills, problem-solving ability, academic performance and motivation. Future directions to include perceptions of educators to assess student knowledge and memory retention of the lessons delivered via the flipped classroom approach are plausible.

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Abstract 050

Evaluation of Degradation Kinetics of Flibanserin Bulk Drug under Oxidative Stresses

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Introduction: Flibanserin was approved by the United State Food and Drug Administration (USFDA) as the first drug for the treatment of hypoactive sexual desire disorder (HSDD). It is also prescribed as a treatment for mental disorders such as Schizophrenia, depression, anxiety as well as Parkinson's disease. Drug stability studies play an essential role in pharmaceutical products to ensure its quality, safety and efficacy. Determination of degradation kinetics is extremely

crucial as it can be used to determine the half-life and shelf life of the drugs under specific storage conditions. **Objective:** The objectives of this study are to evaluate the degradation kinetics and to determine the half-life and shelf life of flibanserin bulk drug under oxidative stresses. **Method:** The study was conducted using oxidative stress on flibanserin. The oxidising agents used were hydrogen peroxide (H_2O_2) and radical initiator, azobisisobutyronitrile (AIBN) at room temperature and at $50^\circ C$, respectively. The analysis was performed using High Performance Liquid Chromatography (HPLC) equipped with a Phenomenex C-18 column. The mobile phase used was acetonitrile: ammonium acetate buffer (60:40 ratio). The flow rate was set at 0.5 ml/min. The injection volume was 10 μL . The detection wavelength used was 250 nm. The time for each analysis was 20 minutes. **Result and Discussion:** Degradation of 62.45 % had been observed after 8 hours treatment under H_2O_2 oxidation. A by-product was detected in the HPLC analysis. The degradation kinetics of flibanserin under H_2O_2 oxidation followed the first order kinetics. The half-life determined was 5.527 hours while the shelf life ($t_{90\%}$ and $t_{95\%}$) was 0.837 hours and 0.409 hours, respectively. Free radical degradation of flibanserin was observed to be 82.97 % following the first order kinetics. Four unknown by-products were detected. The half-life obtained was 2 days while the shelf life ($t_{90\%}$ and $t_{95\%}$) obtained was 7.848 hours and 3.840 hours, respectively at $50^\circ C$. **Conclusion:** Flibanserin was sensitive to H_2O_2 oxidation and radical degradation. Both oxidation degradation follows first order reaction.

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Abstract 051

Evaluation of a Local Protocol of Vancomycin-Therapy in Haemodialysis Patients Based on Targeted Trough Level and Extrapolated Area Under the Curve in a General Hospital

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Introduction: Recent published data from the 2020 IDSA guidelines on vancomycin dosing has no longer advocated the use of trough concentrations as surrogate markers for clinical efficacy. Protocols developed before the revised targets may not reflect the true efficacy marker for vancomycin, which is AUC 400-600. Vancomycin exposure in haemodialysis patients is influenced by both patient pharmacokinetic parameters and variables of the haemodialysis units which reduces the likelihood of target attainment. **Objective:** To evaluate the clinical efficacy of local vancomycin dosing protocol in achieving target trough concentration and area under the curve (AUC) among haemodialysis patients in Hospital Tengku Ampuan Rahimah (HTAR). **Method:** Retrospective record review of eligible research participants according to previously validated data collection form. The AUC of each individual was extrapolated via the use of a PK modelling software, PrecisePK. Chi-square test of independence was used to determine the association between trough concentrations to extrapolated AUC/MIC (minimum inhibitory concentration). A p-value of 0.05 was considered statistically significant. **Result and Discussion:** Eighty HD patients were included after the screening, involving cases between December 2019 and January 2021. 62.5% of haemodialysis study patients show AUC/MIC >800 (mean \pm SD=2320.2 \pm 1418.2). The trough concentrations across all four groups of AUC/MIC (<400; 400-600; 600-800; >800) remain similar in distribution. Chi square analysis between trough concentrations and extrapolated AUC/MIC showed a lack of association ($X^2(6) = 11.370, p=0.51$). AUC/MIC was heavily influenced by MIC of the infecting microorganism, ($X^2(12) = 164.93, p=0.00$). Majority of MRSA cases were found in the AUC/MIC > 800 with MIC values of 0.38 μ g/ml.

Conclusion: Exclusive trough guided dosing may not translate well in achieving the clinical efficacy of vancomycin in haemodialysis patients. Other contributing factors such as MIC should be factored, as small MIC values account for greater reciprocal AUC/MIC values. AUC/MIC > 800 in haemodialysis patients risks the loss of residual kidney function. Preserving residual kidney function of HD patients serves as an important prognostic factor for reduced mortality in this patient population.

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Abstract 052

Knowledge, Attitude & Practice of Alcohol Use among University Students: A Cross-sectional Study

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Introduction: Alcohol consumption is frequently reported among university students in many countries. It is a social issue that should not be overlooked as they are the pillars of the country's future. **Objective:** To study the knowledge, attitude, and practice of alcohol use among university students and to associate demographic variables with alcohol use among university students in Kuala Lumpur. **Method:** A cross-sectional study was conducted and participants aged 18 to 30 years old were recruited using the convenience sampling method at UCSI University, Kuala Lumpur. The questionnaire was validated by a panel of experts and a pilot test was done among 37 university students to ensure the reliability. Data were collected between August and September 2020 and analyzed by SPSS version 20. **Result and Discussion:** A total of 374 participants completed the survey. The findings showed that 54% of participants had good knowledge of alcohol use while 46% of them had poor knowledge of alcohol use. About 54.3% of participants had a positive attitude towards alcohol use, while 45.7% of them had negative attitude towards alcohol use. A total of 69% of participants started their first drink < 21 years old. Friends influenced alcohol use the most, followed by parents, siblings, or relatives, and curiosity. Approximately 72% of participants rarely consume alcohol. Also, 58.3% of the participants received a low level of harm from alcohol use

while 22.7% of them received a high level of harm from alcohol use. The level of harm experienced was significantly associated with gender, religion, course studied, and perceived parents' socioeconomic status with p-values showed <0.05. **Conclusion:** Majority of the university students had good knowledge of basic alcohol information but they had inadequate knowledge of standard drinking, binge drinking, and heavy episodic drinking terms. More than half of them had positive attitudes toward alcohol use and the majority of university students tend to experience a low level of harm from alcohol use. Even though most of the university students in the study rarely consume alcohol, interventions to reduce alcohol consumption among university students should not be disregarded.

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