



# **PROCEEDINGS *of*** **1<sup>st</sup> East Coast Pharmacy Research & Quality Assurance Conference**

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Transforming Research and Quality Initiatives  
Into Smarter Patient Care**

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## ORAL PRESENTATION



## RO-01

## Awareness and Satisfaction of Healthcare Providers on Drug Information Services at Hospital Sultanah Nur Zahirah

Sue Chyen, Tay<sup>1\*</sup>; Mohd Yusof, Nurul Faezah<sup>1</sup>; Wan Ibrahim, Wan Nur Hamizah<sup>1</sup>; Omar, Hasniza<sup>1</sup>

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## ABSTRACT

**Introduction:** Drug Information Services (DISs) are established in most hospitals to support healthcare providers (HCPs) by delivering timely and accurate drug-related information. However, the actual utilization and reliance on DISs remains questionable. **Objectives:** To study awareness and satisfaction of HCPs on DISs at Hospital Sultanah Nur Zahirah (HSNZ). **Materials and Methods:** A cross-sectional study was conducted among HCPs working in HSNZ via stratified sampling using an 18-item electronic anonymous validated questionnaire between November 2022 to April 2024. Sample size was calculated using Raosoft calculator and the sample size was 341 respondents which were distributed proportionally according to work designation. Data was analyzed using chi-square test, IBM SPSS (Version 27). A p-value <0.05 was set as statistically significant. **Results:** A total of 341 HCPs participated in this study comprising 119 doctors, 173 nurses, 30 medical assistants and 19 pharmacists. The majority of respondents were female (82.7%) and nearly half (47.5%) reported having more than 10 years of working experience. The most sought after drug-related information were dosage/administration (90.0%), adverse drug reaction/side effects (58.4%) and contraindications (53.5%). Overall, 66.0% (n=225) of HCPs were aware of DIS HSNZ. Awareness towards DIS was found to be significantly associated with gender (p=0.036), working experience (p=0.002) and work designation (p<0.001). HCPs primarily relied on pharmacists (82.7%) and followed by internet/website (64.8%) for drug-related information. 58.9% of them never used the services provided by DIS. 37.5% of respondents expressed satisfaction towards DIS and the satisfaction level was significantly associated with work designation (p=0.017). **Conclusion:** The majority of HCPs were aware of the DIS at HSNZ however, overall satisfaction levels remained low. Therefore, greater efforts are needed to raise awareness and promote DIS among HCPs.

**Keywords:** Healthcare provider, Drug Information Services, awareness, satisfaction

NMRR ID: NMRR ID-22-01508-PNA

## RO-02

## Clinical Features and Treatment Outcomes of Scrub Typhus: A Multicenter Malaysian Hospital-Based Study on Risk Factors, Laboratory Variations and Antibiotic Efficacy

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## ABSTRACT

**Introduction:** Scrub typhus caused by *Orientia tsutsugamushi*, is a significant re-emerging public health threat in Malaysia. Persistent diagnostic challenges often delay crucial treatment, thereby increasing patient risks. **Objectives:** This study aimed to characterize demographic, clinical, and laboratory parameters of scrub typhus patients; determine associations between clinical/laboratory findings and disease severity; assess factors impacting length of hospital stay. **Materials and Methods:** Cross-sectional study was conducted at Hospital Kuala Lipis and Hospital Raub using universal sampling. Subjects were included in study who fulfilled the inclusion criteria. A standardized form was used to extract demographics, clinical manifestations, laboratory data, antibiotic regimens, complications, length of stay. Multiple logistic regression was used to determine the factor association to disease severity while multiple linear regression was used to assess factor association to length of hospital stay. **Results:** Mean age of 62 patients were 40.4 (±15.5) years, with male majority (69.4%); most were rural residents (82.3%) engaged in agriculture (66.1%). Almost all patients presented with fever (98.4%), and eschar 62.9% (n=39). The presence of eschar showed a significant association with scrub typhus diagnosis (p < 0.001). Laboratory findings upon admission included elevated liver enzymes in 85.5% of patients, thrombocytopenia (59.7%), and proteinuria (45.2%). Over half the patients (58.1%, n=36) experienced moderate-to-severe disease, significantly predicted by factors including transaminitis (OR 28.7, 95% CI 5.86- 139.98, <0.001), proteinuria (OR 4.7, 95% CI 1-

21.82,  $p=0.050$ ), elevated creatinine (OR 5.75, 95% CI 1-33.13,  $p=0.050$ ). Doxycycline was the predominant antibiotic (91.9%) used to treat scrub typhus. The mean hospital stay was 5.57 ( $\pm 4.10$ ) days. Factors prolonging hospitalization included proteinuria ( $B=1.966$ ,  $p=0.013$ ) and diagnostic-to-antibiotic delay ( $B=1.224$ ,  $p=0.025$ ). **Conclusion:** Clinical and laboratory predictors for scrub typhus severity and prolonged hospitalization were identified.

**Keywords:** Scrub Typhus, Rickettsia, tsutsugamushi

**NMRR ID:** NMRR ID-25-01033-QJB

## RO-03

### The Direct Cost of National Immunisation Programme in Eastern Region of Pahang

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#### ABSTRACT

**Introduction:** Malaysia's National Immunisation Programme (NIP) has provided free vaccinations since the 1950s. However, understanding its operational costs from a public health provider perspective are limited. **Objectives:** This study aims to identify the major cost components contributing to the direct costs of the NIP in the eastern region of Pahang, estimate the total cost of complete immunisation per child up to 18 years of age, and compare the costs incurred between self-initiated visits to health facilities and school-based outreach vaccination services. **Materials and Methods:** This costing analysis using both

top-down and bottom-up approaches, was conducted across five health facilities (one tertiary hospital, two clinics, two School Health Units) in the districts of Kuantan, Rompin, and Pekan. Data on vaccines, consumables, personnel, and transport were sourced from logistics stores, facility records, and time-motion studies. **Results:** Total of 186,630 vaccinees with total estimated direct cost of RM 7,949,018.59 were reported in year 2023. Vaccines were the predominant cost driver (96.1%), followed by personnel (3.0%), consumables (0.8%), and transportation (0.1%). The total cost for complete immunisation was RM 843.51 per girl and RM 538.01 per boy. The personnel cost was the main contributor to the cost per school visit. Higher number of vaccinees contributed to lower total cost per vaccine injection. The median total cost was lowest in School Health Units in Kuantan compared to Pekan and Rompin (RM 3.71,  $n=20,294$  vs RM 5.34,  $n=5,113$  & RM 7.66,  $n=4,052$ ,  $p<0.01$ ). School-based outreach delivery demonstrated a significantly higher median injection cost compared to facility-based self-visits (RM 4.89 vs RM 1.13,  $p<0.01$ ). **Conclusion:** The study has identified vaccines as principal expenditures and higher cost of outreach strategies. The cost of school outreach programme might be reduced if the volume of vaccinees increase in district with larger area. The detailed cost data is vital to enhance vaccine delivery model efficiency for financial sustainability.

**Keywords:** Vaccines, direct costs, national immunisation programme

**NMRR ID:** NMRR ID 23-01588 WJE

## RO-04

### Evaluating the Impact of Pharmacy Integrated Community Care (PICC) on Quality of Life Among Diabetic Patients in Terengganu

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#### ABSTRACT

**Introduction:** Diabetes mellitus is a chronic condition that affects physical and mental health, resulting in diminished quality of life (QoL). Increasing attention is being directed to

QoL outcomes due to the influence of psychosocial factors on disease management. Therefore, Terengganu State Health Department had introduced Pharmacy Integrated Community Care (PICC) programme, a pharmacist-led community-based initiative comprising four interactive education modules in enhancing diabetic care. **Objectives:** This study intended to evaluate changes in glycemic control and QoL among diabetic patients before and after participating in the PICC programme across Terengganu. **Materials and Methods:** This quasi-experimental study was conducted at different places outside healthcare facilities from May to October 2024. Diabetic patients were selected based on inclusion and exclusion criteria from all districts in Terengganu. They were engaged in PICC and attending four pharmacist-led interactive sessions. Over a four-month period, four education modules were delivered (diabetes introduction, medication, complication and healthy lifestyle). The Revised Version of the Diabetic Quality of Life questionnaire (RVDQOL13) was administered before and after PICC to assess QoL (three domains: satisfaction, impact, and worry; 1-5 Likert responses, higher scores indicated poorer QoL). Data were analysed using descriptive and parametric tests (SPSSv.27), with  $p < 0.05$  considered statistically significant. **Results:** A total of 92 patients participated with majority being females (65.2%), Malay (98.9%) and mean age of  $59.8 \pm 1.38$  years. Patients showed significantly better in glycemic control and overall QoL following the PICC intervention ( $p < 0.001$ ). The mean HbA1c was reduced from  $10.16\% \pm 2.02$  to  $9.51\% \pm 1.92$  post PICC. Interestingly, the mean overall QoL scores decreased from  $46.85 \pm 14.31$  to  $36.00 \pm 10.16$  post intervention, which lower scores denoted better QoL. Meanwhile, significant QoL improvements were also observed across all domains after PICC ( $p < 0.001$ ). **Conclusion:** The PICC programme led to significant improvements in glycemic control and QoL among diabetic patients. These findings support its continued implementation as part of comprehensive diabetes care strategies.

**Keywords:** Community-based initiative, diabetes mellitus, glycemic control, pharmacist-led intervention, QoL, PICC

**NMRR ID:** NMRR ID-23-02439-SJQ

## RO-05

### Awareness and Knowledge of Glycosylated Hemoglobin (HbA1c) among Type 2 Diabetic Mellitus Patients (T2DM) in Besut District

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#### ABSTRACT

**Introduction:** The National Health and Morbidity Survey in 2023 reported that 15.6% of Malaysian adults had diabetes, with 40% unaware of their disease and 56% experiencing poor glycemic control. Previous study revealed that patients had low to moderate levels of awareness about their condition (35%–50%), highlighting ongoing challenges in diabetes management. **Objectives:** This study aimed to determine the awareness and knowledge of Glycosylated Hemoglobin (HbA1c) among Type 2 Diabetes Mellitus (T2DM) patients and their association with HbA1c level as well as the factors associated with good HbA1c knowledge. **Materials and Methods:** A survey study was conducted involving T2DM patients receiving treatment at seven clinics in Besut from March-May 2025. Eligible patients were aged  $\geq 18$  years and registered in the National Diabetic Registry. Trained pharmacists employed standardized form to collect demographic details, and patients' awareness and understanding of HbA1c. Previous HbA1c results were retrieved from laboratory information system with permission. Data were analyzed using SPSSv.27. **Results:** Overall, 414 patients participated with a mean age of  $58.49 \pm 10.97$  years and average of  $6.5 \pm 5.03$  years duration of diabetes. Majority were Malay (99.6%,  $n=412$ ), women (71.3%,  $n=295$ ) and had secondary education level (69.6%,  $n=288$ ). Mean HbA1c was  $8.717 \pm 2.66$  wherein 46% ( $n=190$ ) had well controlled HbA1c. Awareness of HbA1c was noted by 56% ( $n=232$ ), of whom only 59.1% ( $n=137$ ) possessed good knowledge. There was no significant association between knowledge and HbA1c level. Higher education level, higher income and had performed self-monitoring blood glucose were factors associated with good knowledge of HbA1c (aOR: $p < 0.001$ ; aOR: $p = 0.017$ ; aOR: $p = 0.002$ ), respectively. **Conclusion:** Almost half of patients demonstrated poor knowledge of HbA1c. Continuing efforts must be made to improve patient's awareness and knowledge



of their disease to optimize glucose control.

**Keywords:** Type 2 diabetes mellitus, glycosylated haemoglobin (HbA1c), awareness, knowledge, Besut

NMRR ID: NMRR ID-25-00215-RJB

## RO-06

### Evaluation of Pharmacy Drive Through Service in Hospital Tanah Merah

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#### ABSTRACT

**Introduction:** Pharmacy Drive Through Service (PDTs) is a part of the broader Pharmacy Value-Added Services (PVAS) framework aimed at improving the quality and efficiency of pharmacy services in public healthcare institutions. There is currently limited data on user satisfaction and demographic patterns of its users. Understanding these factors is essential for evaluating the effectiveness of the service and identifying areas for improvement. **Objectives:** To evaluate the level of customer satisfaction with the Pharmacy Drive-Through Service at Hospital Tanah Merah and to determine its association with customer demographic characteristics. **Materials and Methods:** A cross-sectional study using convenience sampling was conducted to assess customer satisfaction with the Pharmacy Drive-Through Service (PDTs) at Hospital Tanah Merah. A total of 310 respondents (N=310) completed a survey consisting of demographic questions and a 14-item PDTs satisfaction scale. **Results:** A total of 310 respondents participated, with a high overall satisfaction score of 93.09%. The most highly rated aspect was reduced waiting time (95.8% very satisfied), while signage and directions received the lowest satisfaction (18.7% dissatisfied). Satisfaction was also high for medication quantity, helpful staff, and accessibility. One-Way ANOVA showed that only education level had a significant effect on satisfaction scores [F(2, 307) = 4.439, p = 0.013]. Post hoc analysis found that respondents with tertiary education were significantly more satisfied than those with only primary education (p = 0.014). **Conclusion:** The study found that most users were highly satisfied with the Pharmacy Drive-Through Service. Short waiting time, helpful staff, and convenience are elements that are mostly favoured by users. However, some users felt that the signs, packaging, and weather protection could be improved. People with higher

education levels were more satisfied with the service. Overall, the PDTs is a helpful and well-received service, with a few areas that can be made better.

**Keywords:** PDTs, satisfaction, demographic

NMRR ID: NMRR ID-25-00839-1LN

## RO-07

### Effectiveness of 'Kampungku Celik Ubat (KCU)' Programme on Medication Knowledge and Use Among Community in Dungun, Terengganu: A Quasi Experimental Study

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#### ABSTRACT

**Introduction:** A National Survey on the Use of Medicines (NSUM) III 2015 reported that 35% of respondents did not fully understand the proper use of their medicines. Thus, the Kampungku Celik Ubat (KCU) programme was launched to educate the community on proper medication use. **Objectives:** This study aimed to determine the difference in mean scores of knowledge and practice on appropriate use of medicines among control and intervention groups and to find association between demographic characteristics with patients' knowledge and practice. **Materials and Methods:** A quasi-experimental study was conducted from May to December 2024 in Kampung Burung Baru (intervention group) and Kampung Al-Muktafi Billah Shah (control group). A validated Malay NSUM III questionnaire was used to assess knowledge (12 items) and practice (9 items). KCU Programme was conducted at Kampung Burung Baru as an intervention tool comprising activities like Kenali Ubat Anda talk, exhibition and created an education corner and also informative signages placed in strategic areas around this village. All outcomes were



evaluated as pre and post-intervention with 2-months interval. Data were analysed using descriptive and parametric tests with  $p < 0.05$  considered statistically significant (SPSSv.27). **Results:** A total of 109 respondents were recruited with 57 in control and 52 in the intervention group. The mean age was  $46.9 \pm 12.53$  years (intervention group) and  $43.7 \pm 16.27$  years (control group). Majority were female (52.3%) and employed (61.5%). A significant improvement of knowledge was observed in the intervention group ( $p = 0.004$ ). No significant difference was detected for both parameters in the control group. Higher improvement in knowledge (2.0%) and practice score (1.6%) was seen in the intervention group as compared to the control group. No significant associations were found between knowledge and practice in different sociodemographic characteristics. **Conclusion:** The KCU programme showed a positive impact on community knowledge regarding proper use of medicines. Therefore, this pharmacist-led community-based initiative is crucial to deliver accurate health information effectively.

**Keywords:** KCU; community; knowledge; practice; use of medicine, Dungun

**NMRR ID:** NMRR ID-24-02619-TIC

## RO-08

### Knowledge, Attitude, and Practice (KAP) of Post-Exposure Prophylaxis (PEP) Against HIV Infection Among Healthcare Practitioners (HCP) in Pejabat Kesihatan Daerah Kota Bharu

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#### ABSTRACT

**Introduction:** Healthcare practitioners (HCPs) face a significant risk of HIV infection due to occupational

exposures, including needlestick injuries and contact with infected body fluids. Post-exposure prophylaxis (PEP) denotes a promising preventive strategy. However, its effectiveness is reliant on the knowledge, attitudes, and practices (KAP) of HCP. This study evaluates the KAP concerning PEP among HCPs in primary care clinics operating under the Pejabat Kesihatan Daerah Kota Bharu (PKDKB) in Kelantan. **Objective:** To evaluate knowledge, attitude, and practice regarding PEP among HCPs and assess the professional demographic factors that influence KAP on PEP. **Materials and Methods:** A cross-sectional study was conducted at four clinics using a structured, self-administered, and validated KAP questionnaire that had been previously applied in international studies. The study employed a comprehensive sampling method including 205 healthcare professionals who met the specified inclusion criteria. Data were analyzed using descriptive statistics and chi-square tests (SPSS v25), with statistical significance set at  $p < 0.05$ . **Results:** Of the 205 participants, only 32.2% demonstrated good knowledge of PEP, while 85.9% showed a positive attitude. However, only 12.7% reported good practices in managing occupational HIV exposure. Significant correlations were identified between KAP level and variables such as duration of service, prior occupational exposure and participation in Post-Exposure Prophylaxis (PEP) training. **Conclusion:** The study indicates that there is a gap between HCPs positive attitude toward HIV PEP and their poor knowledge and inadequate practice. Hence, comprehensive measures such as continuous training, standardized protocols, and institutional support are essential to enhance PEP-related competencies and protect front-line healthcare personnel.

**Keywords:** Knowledge, Attitude, Practice, Post-Exposure Prophylaxis (PEP), HIV, Healthcare Practitioners, Occupational Exposure, Cross-sectional, Chi-square

**NMRR ID:** NMRR ID-24-00028-MXV



## RO-09

## Knowledge, Awareness and Perception on Contraception Among Healthcare Workers in District Hospitals in Kelantan: A Cross-Sectional Study

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### ABSTRACT

**Introduction:** Contraception is key to reducing unintended pregnancies and sexually transmitted diseases, yet usage remains suboptimal in Malaysia. Healthcare workers (HCWs) play a central role in educating patients, making their understanding and attitudes crucial. **Objective:** To assess the level of knowledge, awareness and perception of contraception among HCWs in Hospital Jeli and Hospital Tumpat. **Materials and Methods:** A prospective, cross-sectional observational study was conducted from May 2023 to June 2025 among 221 HCWs in Hospital Jeli and Hospital Tumpat, using a validated online questionnaire. Stratified sampling methods were applied to include pharmacists, doctors, nurses, medical assistants, and pharmacy assistants. Descriptive statistics, Chi-square and Pearson correlation tests were used to analyze data. **Results:** Most participants were female (71.9%) and aged 30–39 years (60.2%). A majority (73.8%) showed good knowledge (mean=5.33±1.39), and 96.8% had good awareness (mean=36.39±5.29). However, only 6.8% demonstrated good perception (mean=26.94±5.23). Significant associations were found between knowledge and position/education, awareness with age/position, and perception with position/education. Weak but statistically significant positive correlations were observed between knowledge and awareness ( $r=0.215$ ,  $p=0.004$ ) and between awareness and perception ( $r=0.161$ ,  $p=0.032$ ). However, no significant correlation was found between knowledge and perception. **Conclusion:** Despite high awareness and moderate knowledge, negative perceptions among HCWs highlight the need for targeted training to enhance contraceptive counselling in district hospitals.

**Keywords:** Contraception; Knowledge; Awareness; Perception; Healthcare Workers

NMRR ID: NMRR ID-25-00199-KO6

## RO-010

## Assessment of Knowledge and Inhaler Technique among Patients in Hospital Hulu Terengganu, Terengganu

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### ABSTRACT

**Introduction:** Inhalers served as the primary treatment of asthma and chronic obstructive pulmonary disease (COPD), offering efficient drug delivery to the lungs with fewer side effects compared to oral or injectable therapies. Previous studies and practices revealed that nearly 90% of asthmatic patients did not use their inhalers properly. Correct inhalation technique was crucial to ensure optimal therapeutic outcomes and minimize side-effects. **Objectives:** This study aimed to (1) assess knowledge on inhaler technique; (2) identify the prevalence of poor inhaler technique and (3) determine the factors associated with poor inhaler technique among patients at Hospital Hulu Terengganu (HHT). **Materials and Methods:** This cross-sectional study was conducted among asthma and COPD patients at HHT from October 2024 to May 2025. Patients were guided and assessed by trained pharmacists using validated questionnaires (part 1: demography; part 2: 10 items on knowledge; part 3: 9 items on inhaler technique). Responses were scored as 1=correct answer; 0=incorrect or unsure. Total score  $\geq 7$  was indicated as good knowledge and technique. Data was analysed using Pearson chi-square test (SPSSv.27). **Results:** Of 95 patients, the mean age was 57.84±15.09 years with majority of them were males (62.4%), diagnosed with asthma (52.6%), and employed (49.5%). Most patients had been using inhalers for 1–5 years (58.8%) and used multiple inhalers (70.5%). Approximately 63.2% of them demonstrated good knowledge on inhaler technique. Poor technique was primarily observed among Metered Dose Inhaler [MDI] (20.2%) and Accuhaler (17.0%) users, while Breezhaler and Turbuhaler users exhibited good technique. Poor MDI technique was significantly associated with employment status ( $p=0.048$ ), duration of inhaler use ( $p=0.024$ ), and the number of inhalers used ( $p=0.031$ ).

**Conclusion:** The study revealed that targeted education was vital for improving inhaler technique and treatment outcomes, especially among MDI users and those with extended or single inhaler use.

**Keywords:** COPD; asthma; inhaler; knowledge; technique; Terengganu

**NMRR ID:** NMRR ID-24-01520-UOI

## RO-011

### Clinical and cost evaluation on oral treatment of iron deficiency anemia among children in Pahang

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#### ABSTRACT

**Introduction:** Iron deficiency anaemia (IDA) is one of the most prevalent causes of anaemia in children and is typically managed by giving syrup ferric ammonium citrate and syrup iron polymaltose. Although both formulations demonstrate comparable efficacy, there is a considerable cost disparity between them. There is an increasing trend of prescribing syrup iron polymaltose in the current setting that may contribute to increment in overall hospital expenditure on the treatment of iron deficiency anemia. **Objectives:** This study aimed to evaluate the efficacy of oral iron supplement treatment among iron deficiency paediatric patients in Pahang Hospital, to compare cost of medication for IDA in children and to describe the effect of weight, gender, dose, price and personnel that may affect cost of medication. **Materials and Methods:** This was a multi-centre, retrospective, cohort study. Data was retrieved through an electronic system from 4 different hospitals in Pahang from January 2022 to December 2023. Patients

with IDA aged less than 12 years old receiving oral iron medication with available data on baseline haemoglobin and 3 months after initiation of current therapy were included in the study. Patients with renal disease and cancer were excluded. Haemoglobin changes were compared using paired t-test. Direct costs included were medication cost and personnel cost. Tornado diagram was used to describe variables that may affect the price changes. **Results:** A total of 298 patients were included in this study. 189 was on syrup FAC and 108 was on syrup iron polymaltose. Paired t-test shows an increment of 9.71 to 11.8 ( $p < 0.001$ ) in the FAC group and an increment of 10.45 to 11.45 ( $p < 0.001$ ) in the iron polymaltose group. The cost of treatment per month of a 6kg weight child with iron polymaltose was RM12.96 per patient and FAC was RM2.03 per patient. Situational analysis showed that an increment of 1 kg will increase cost of RM2.16 for iron polymaltose and RM0.33 in FAC per month. Weight of the child is the most affecting variable on the cost, followed by dose, price and personnel. **Conclusion:** While both iron supplements effectively increased hemoglobin levels, syrup ferric ammonium citrate emerged as a cheaper option in managing pediatric IDA.

**Keywords:** anemia, children, iron supplement

**NMRR ID:** NMRR ID-24-00416-GPE

## RO-012

### Clinical and Economic Impact of Pharmacist-led Interventions on Drug-related Problems in Haematology Unit, Hospital Tengku Ampuan Afzan

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#### ABSTRACT

**Introduction:** Clinical pharmacists play a vital role in haematology by resolving drug-related problems (DRPs), especially in patients with hematological malignancies who face high risks due to immunosuppression and complex treatments. However, the clinical and economic impact of this service remains underexplored. **Objectives:** This study aimed to evaluate the clinical and economic



impact of clinical pharmacist interventions in the haematology unit, and identify factors associated with DRP occurrence. **Materials and Methods:** A retrospective study was done among patients reviewed by clinical pharmacists in the haematology wards. The DRPs identified were classified according to Pharmaceutical Care Network Europe (PCNE). Clinical impact was graded from -1C (negative) to 4C (avoids fatality). Economic impact was determined by the net economic benefit and benefit-cost ratio. Generalised estimating equations (GEE) was used to identify factors associated with DRP. **Results:** A total of 368 patients with 1052 admissions were included. Most were Malay (83.7%), male (57.6%), and malignant cases (82.6%). Thirty-five percent had DRP, totalling 730 interventions. Most interventions involved anti-infectives (27.9%) and antineoplastics (18.5%). Majority of the DRPs occurred on the treatment effectiveness (57.8%) and commonly caused by drug selection (n=485). The acceptance rate was high (98.9%). The majority of DRPs had moderate impact (51.5%), while 17.3% had major impact, translating into cost avoidance of RM1,037,434.81. The net economic benefit was RM611,698.14 with benefit-cost ratio of 2.39. Length of stay (OR 1.14, 95%CI 1.09-1.19), chemotherapy (OR 1.84, 95%CI 1.35-2.51), and presence of infection (OR 2.72, 95%CI 1.65-4.44) were identified as contributing factors towards DRP. **Conclusion:** Clinical pharmacists contribute significantly to both clinical and economic outcomes in haematology. Further validation is warranted, and credentialing should be considered to strengthen the service delivery in this subspecialty.

**Keywords:** clinical pharmacy, haematology, clinical impact, economic impact, pharmacy services

**NMRR ID:** NMRR ID-24-01874-7QP

## RO-013

### Assessment of Haemoglobin Level and its Determining Factors among Pregnant Women using Different Oral Iron-Containing Supplements in Public Health Clinics at Kuala Krai

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#### ABSTRACT

**Introduction:** Anemia in pregnancy remains a significant public health issue, particularly in developing countries. Anemia is defined as a haemoglobin level less than 11 g/dL, with iron deficiency accounting for approximately 95% of cases. In Malaysia, the prevalence of iron deficiency anemia (IDA) among pregnant women ranges between 31.6% and 34.6%. IDA during pregnancy has been associated with increased risks of preterm delivery, low birth weight, and maternal morbidity. The significance of this study is to identify the most appropriate regimen for the treatment of IDA in pregnant women. **Objective:** This study aimed to determine prevalence of IDA in pregnant women at Kuala Krai, to identify demographic and clinical factors associated with IDA, and to determine mean changes of haemoglobin level among three groups of oral iron supplement. **Methodology:** A retrospective longitudinal study was conducted in public health clinics at Kuala Krai. From 1197 antenatal patients registered in 2023, 230 fulfilled the criteria. Data taken from antenatal books by using standardized data collection forms were categorized into demographic, antenatal, and clinical characteristics. Haemoglobin changes before and after treatment with three types of oral iron supplements were compared using one-way ANOVA testing. **Results:** Prevalence of IDA in pregnant women at Kuala Krai was 19.21%. Among 230 patients, analysis revealed no statistically significant differences in haemoglobin level improvement between the different iron supplement regimens ( $p = 0.275$ ,  $\alpha = 0.05$ ). The overall mean (SD) hemoglobin change was 0.689 (0.867) g/dL. Additionally, pregnant women of Malay ethnicity, with secondary education and who were unemployed, were more likely to be affected by IDA. **Conclusion:** Different oral iron supplement regimens

yielded comparable outcomes in hemoglobin improvement among pregnant women with anemia. Further research should explore other contributing factors such as dietary intake, supplement adherence, and comorbid conditions that may influence treatment effectiveness.

**Keywords:** Oral iron-containing supplements, hemoglobin, iron deficiency anemia, pregnant women

**NMRR ID:** NMRR ID-24-03591-IS6

## RO-014

### Validation and Item Reduction Potential of the Malaysia Medication Adherence Assessment Tool (MyMAAT) in Non-Dialysis Chronic Kidney Disease Patients

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#### ABSTRACT

**Introduction:** Medication adherence is crucial for managing chronic kidney disease (CKD) and preventing its progression. In Malaysia, adherence is commonly assessed using the 12-item Malaysia Medication Adherence Assessment Tool (MyMAAT-12), though it has yet to be validated in CKD patients. Given the complex medication regimens and frequent appointments associated with CKD, a shorter, more practical tool may enhance clinical utility. **Objectives:** This study aims to validate the MyMAAT-12 and explore its potential for item reduction

among non-dialysis CKD patients. **Materials and Methods:** A cross-sectional, multi-centre study was conducted across eight health facilities in Pahang from December 2023 to August 2024. Non-dialysis CKD patients aged  $\geq 18$  years, with or without diabetes, attending outpatient clinics completed the self-administered MyMAAT-12 and selected items from the Beliefs about Medicines Questionnaire (BMQ). Demographics, HbA1c levels, and serum phosphate changes from the preceding three months were also collected. Exploratory factor analysis (EFA) was used to examine the scale dimensionality, reliability, and criterion validity. A simulation analysis evaluated the feasibility of reducing the number of items. **Results:** A total of 246 respondents participated, predominantly female (54.5%) and Malay (91.5%), with a mean age of  $59.5 \pm 12.5$  years and an average CKD duration of  $5.0 \pm 5.4$  years. The average medication adherence score was poor to moderate ( $< 54/60$ ). MyMAAT-12 demonstrated excellent internal consistency (Cronbach's  $\alpha = 0.90$ ) and significant association with BMQ categories ( $\chi^2(2) = 16.8, p < 0.01$ ). EFA identified a two-factor structure. MyMAAT-12 adherence categorization was significantly associated with HbA1c% ( $< 8\%$  vs.  $\geq 8\%$ ) ( $\chi^2(2) = 4.7, p = 0.03$ ) and phosphate level changes ( $\chi^2(2) = 5.48, p = 0.02$ ). Results indicated that reducing MyMAAT-12 to a 7-item scale was feasible, while maintaining strong psychometric properties (Cronbach's  $\alpha = 0.87$ ) and a significant association with HbA1c% ( $\rho = -0.22, p = 0.01$ ). **Conclusion:** MyMAAT-12 is a valid and reliable tool for assessing adherence in non-dialysis CKD patients. The MyMAAT-7 provides a shorter, practical alternative with robust psychometric performance, supporting its potential use in routine clinical practice.

**Keywords:** medication adherence; chronic kidney insufficiency; validity and reliability; beliefs about medication

**NMRR ID:** NMRR ID-23-02445-G60

## RO-015

**Knowledge and Adherence to Oral Iron Consumption Among Pregnant Women Attending Health Clinic in PKD Machang****Abd Malik, Nur Alyaa Bajana<sup>1\*</sup>; Abdul Ghani, Nur Afera<sup>1</sup>; Ismail, Eni Fazihan<sup>2</sup>; Mohd Hasali, Nor Hafizah<sup>3</sup>**<sup>1</sup>Department of Pharmacy, Klinik Kesihatan Labok, Machang, Kelantan<sup>2</sup>Department of Pharmacy, Klinik Kesihatan Machang, Machang, Kelantan<sup>3</sup>Department of Pharmacy, Klinik Kesihatan Batu 30, Machang, Kelantan\* Corresponding author: [nurafera@moh.gov.my](mailto:nurafera@moh.gov.my)**ABSTRACT**

**Introduction:** Anemia in pregnancy is a significant public health concern. In PKD Machang, there has been an increasing number of anemic pregnant mother, leading to a rising demand for iron sucrose injections due to failure of oral iron therapy. **Objectives:** To determine knowledge and adherence of pregnant women to oral iron consumption. The specific objectives were to determine association between knowledge score and adherence score with sociodemographic profiles, pregnancy characteristics and iron supplementation. Additionally, to determine correlation between knowledge score with adherence score. **Materials and Methods:** This was a cross-sectional study conducted on 376 pregnant women attending 11 Maternal and Child Health Clinics under PKD Machang from 1<sup>st</sup> September to 31<sup>st</sup> December 2024. Data were collected using a validated, self-administered questionnaire in Malay consisting of 49 items across four sections. Descriptive statistics were used to analyze sociodemographic profiles, pregnancy characteristics, oral iron consumption details, knowledge and adherence. Associations were assessed using correlation, independent sample t-tests and one-way ANOVA. Where ANOVA results were significant, Bonferroni post hoc tests were applied. The association between knowledge score and adherence score was analyzed using Pearson's correlation. **Results:** Among 376 respondents, only 69 (18.4%) demonstrated good knowledge, while 255 (67.8%) had good adherence to oral iron consumption. Marital status, education level, occupation, husband's education level, gestational age, gravidity, history of anemia in previous pregnancy, history of oral iron intake, awareness of their hemoglobin level, name and dose of oral iron pills were significantly associated with knowledge score. Alternatively, history of oral iron intake in previous pregnancy and education level

were significantly associated with adherence score. There is a significant correlation between knowledge score and adherence score ( $p=0.046$ ). **Conclusion:** Knowledge regarding oral iron supplementation is significantly associated with adherence. Improving maternal knowledge through targeted health education may enhance adherence, thus reducing iron-deficiency anemia in pregnancy.

**Keywords:** Pregnant women, anemia, oral iron consumption, knowledge, adherence

**NMRR ID:** RSCH-ID-24-01685-WIX



## POSTER PRESENTATION



## RP-01

### Health-Related Quality of Life (HRQoL) among Solid Cancer Patients in Hospital Tengku Ampuan Afzan (HTAA)

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#### ABSTRACT

**Introduction:** Solid cancers significantly impact Malaysian patients' health-related quality of life (HRQoL), yet HRQoL data is scarce. Understanding HRQoL is crucial for healthcare providers to develop effective interventions. **Objectives:** This study aimed to determine the HRQoL among solid cancer patients, to measure the health utilities of solid cancer patients and identifies factors associated with HRQoL among this population in HTAA. **Material and Methods:** A cross-sectional study was conducted involving 149 solid cancer patients aged 18 years and above treated inpatient at the oncology wards in HTAA. HRQoL was assessed using EUROQoL EQ-5D-5L for Health Utility Index (HUI) and Visual Analogue Scale (VAS). The five domains for EQ-5D-5L are mobility, self-care, usual activity, pain/discomfort and anxiety/depression, ranging from <0 to 1 (worse to best). For VAS, patients rated their perceived health from 0 to 100 (worst to best imaginable). Data were analysed using SPSS version 21. Multiple linear regression was used to analyse sociodemographic, clinical and treatment factors associated with HUI. **Results:** Patients' average age was  $52.58 \pm 12.83$  years, predominantly female (66.4%) and Malay (79.2%). Both the mean HUI ( $0.9 \pm 0.11$ ) and VAS ( $75.68 \pm 15.15$ ) indicated a relatively high self-perceived HRQoL. Multiple treatment modalities had significantly higher HUI scores compared to those who received chemotherapy alone ( $B=0.053$ , 95% CI 0.014-0.093;  $p=0.009$ ). Patients with a moderate Charlson

Comorbidity Index (CCI) had significantly better HUI scores than those with high CCI ( $B=0.041$ , 95% CI 0.004-0.078;  $p=0.031$ ). **Conclusion:** This study showed that solid cancer patients at HTAA had a positive perception of well-being, as reflected by a high mean health utility index. Health-related quality of life was positively influenced by combination treatment modalities and a moderate comorbidity index.

**Keywords:** HRQoL, EUROQOL EQ5D5L, solid cancer

**NMRR ID:** NMRR ID-23-02711-WN2

## RP-02

### Prescribing Pattern of Nicotine Replacement Therapy (NRT) in Health Clinics, Kemaman

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#### ABSTRACT

**Introduction:** Globally, the majority of smokers are aware that smoking is not good for their health but have difficulty quitting. Malaysia is still committed to strengthen the smoking cessation services. Therefore, Clinical Practice Guideline (CPG) was developed to ensure smokers gets the latest evidenced-based treatment to ensure higher quit smoking success rate. **Objectives:** This study intended to observe the prescribing patterns of Nicotine Replacement Therapy (NRT), to assess adherence to National CPG on treatment recommendation and to determine the smoking cessation success rate in Health Clinics in Kemaman. **Materials and Methods:** An observational study was conducted in Smoking Cessation Clinics involving eight Government Health Clinics in Kemaman from January to December 2023. All registered patients during this period were included and required data were extracted from patients' record. Initial NRT dosing patterns and adherence to the national CPG on Treatment of Tobacco Use Disorder were analysed descriptively. The cessation success rate was analysed using Fisher's exact test, with  $p<0.05$  considered statistically significant. **Results:** Of the 142 participants, 97.2% were male and 68.3% were employed. Among them, 78.2% had comorbidities, with

hypertension (26.1%), diabetes mellitus (15.5%) and dyslipidaemia (12.0%) being the most common. The mean number of cigarettes smoked per day was 14.6 sticks. Gum 2mg was the most frequently prescribed NRT (57%), followed by gum 4mg (21.8%). Patch-only regimens were less common, with 1.4% using the 10mg patch and 2.8% the 15mg patch. Combination therapy with both patch and gum was prescribed to 24 patients (16.9%). Prescribing patterns showed high adherence to the national CPG. However, the smoking cessation success rate remained low, with only 16.2% of participants successfully quitting. **Conclusion:** The success rate of smoking cessation remains low despite the availability of treatment options. Further study is necessary to identify the factors contributing to the low smoking cessation rate among patients in Health Clinics, Kemaman.

**Keywords:** Nicotine Replacement Therapy; smoking cessation; prescribing pattern, Kemaman

*NMRR ID: NMRR ID-24-01544-FEH*

## RP-03

### Costing Study on Treatment of Anemia in Pregnancy Among Orang Asli (OA) Patients in Pahang

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#### ABSTRACT

**Introduction:** Anemia in pregnancy is a significant global health concern, particularly affecting pregnant Orang Asli (OA) women in Malaysia (37.6%), where accessing healthcare facilities is challenging. **Objectives:** The study

aimed to estimate the cost of managing anemia in pregnancy among the OA population in primary healthcare settings and to determine major cost components in treatment of anemia. **Materials and Methods:** This cross-sectional study retrospectively analyzed antenatal OA patients meeting predefined inclusion and exclusion criteria using convenience sampling from the government's perspective. The costing analysis used both top-down and bottom-up approaches. Data on direct (medications, lab tests and consultation) and non-direct (transportation) medical costs were collected from patients' antenatal records spanning January 2023 to December 2023 using a structured data collection form. **Results:** Initially, 181 patients were collected. After exclusions (59 non-anemic, 8 who gave birth in 2022, 3 transferred out), cost calculation used data from 111 patients. The average treatment cost per anemic antenatal patient was RM1,597.08, with individual costs ranging from RM170.32 to RM2,935.85. The prevalence of anemic antenatal patients in this study cohort was 65.29%. Direct medical costs were primarily driven by laboratory tests, which averaged RM832.26. Consultations followed with an average cost of RM315.12, while medications represented the lowest component, averaging RM107.84. Non-direct medical cost: transportation costs averaged RM22.17. Treatment costs varied; for instance, severe anemia cases, defined by a hemoglobin level below 7.0 g/dL, averaged RM1661.48 in treatment costs. Furthermore, earlier detection of anemia, specifically between 1 to 5 weeks of gestation, correlated with higher average costs of RM2479.67. **Conclusion:** The average cost treatment per patient is RM1,597.08, majorly contributed by lab tests. Further study on assessing the cost-effectiveness of initiating treatment with Iberet-Folic as opposed to haematinics could be considered. Overall management of anemia in pregnant OA is deemed superior with Iberet-Folic due to improved compliance and convenience.

**Keywords:** Anemia, Pregnancy, Orang Asli, Antenatal

*NMRR ID: NMRR ID-24-00040-OI3*



## RP-04

### Evaluation of Adverse Drug Reactions at Hospital Besut: A 5-Year Retrospective Study

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#### ABSTRACT

**Introduction:** An adverse drug reaction (ADR) is an unintended and harmful response to a medicinal product and is a significant cause of morbidity and mortality. Despite its importance, no prior systematic ADR evaluation has been conducted at Hospital Besut. **Objectives:** This study aimed to analyze ADR patterns reported within 5 years (2019 to 2023) in Hospital Besut, focusing on affected organ systems and types of drugs involved, causality, severity, outcomes, and to identify associations between demographics, severity, and reaction onset. **Method:** A retrospective observational study was conducted using all ADR reports recorded in Pharmacy Information System (PhIS) and submitted to the National Pharmaceutical Regulatory Agency (NPRA). Data from January 2019 to December 2023 was collected and analyzed from June to November 2024. The descriptive and statistical analysis of the Chi-square test has been used to present the findings, with significance set at  $p < 0.05$  using SPSS version 27. **Results:** A total of 289 ADR forms with 413 reactions were analyzed. The occurrence of ADRs was common among females ( $n=151$ , 52.2%) followed by males ( $n=138$ , 47.8%). The average mean age of patients was 36 (SD+21.9) years. Most ADRs involved the skin ( $n=280$ , 67.8%) and respiratory system ( $n=44$ , 11.6%). The drug-reaction relationships were mostly classified as probable and possible which were 114 (39.4%) respectively. In addition, most of the onset of ADR occurred within minutes ( $n=117$ , 40.5%) and the reactions were mild ( $n=171$ , 59.2%), with 181 (62.6%) of patients recovered from the ADR. Antibiotics ( $n=94$ , 32.5%) and analgesics ( $n=55$ , 19.03%) were responsible for most ADRs. Only age was significantly associated with the reaction severity ( $p=0.037$ ). **Conclusion:** This study emphasizes the importance of pharmacovigilance in

identifying common ADR patterns and promoting safer medication practices in Hospital Besut.

**Keywords:** Adverse drug reaction; ADR reports; Malaysia; Pharmacovigilance, Hospital Besut

**NMRR ID:** NMRR ID-24-01593-NWD

## RP-05

### From Struggle to Strategy: A Qualitative Study of Smoking Cessation Barriers among Patients with Chronic Obstructive Pulmonary Disease

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#### ABSTRACT

**Introduction:** Despite the clinical urgency for smoking cessation, patients with chronic obstructive pulmonary disease (COPD) face complex challenges in quitting. Understanding these barriers is crucial for developing effective, patient-centred interventions within the public healthcare setting. **Objectives:** This study aimed to explore the psychological, social, and healthcare-related barriers experienced by patients with COPD in their efforts to quit smoking. **Materials and Methods:** A qualitative study was conducted through in-depth interviews with a purposive sample of participants recruited from the Respiratory Clinic of Hospital Sultanah Nur Zahirah. Patients who were unable to quit smoking despite receiving treatment for COPD were included. The interviews were audio-recorded, transcribed verbatim, and thematically analysed using the Atlas.ti version 23. **Results:** A model with three key themes emerged, reflecting the decision-making process of the



study participants. (1) Engagement with assisted smoking cessation: Participants had limited awareness of cessation programs, misconceptions about therapy, and negative experiences with nicotine replacement products, leading to low participation and repeated quit failures; (2) Requiring support while maintaining autonomy: While many preferred to quit independently, they often lacked structured support. Family encouragement was frequently perceived as ineffective or intrusive, and healthcare referrals were inconsistent or absent; and (3) Motivational factors: Motivation to quit was volatile. Some were triggered by worsening symptoms, while others struggled with long-term dependency, negative peer influences, or lack of faith in success, often shaped by observing others' failed attempts. **Conclusion:** Smoking cessation among patients with COPD is influenced by internal struggles, limited support systems, and inadequate engagement with cessation programs. Addressing these barriers requires patient-centred interventions that improve awareness, dispel misconceptions, and offer empathetic, tailored counselling. Pharmacists are well-positioned to deliver behavioural support and personalised counselling to encourage and facilitate patients' readiness to enrol in cessation programs. Strengthening such programs aligns with national priorities for integrated, outcome-oriented chronic disease management.

**Keywords:**

Smoking cessation, chronic obstructive pulmonary disease, qualitative study, patient-centred care, behavioural barriers, Malaysia

**NMRR ID:** NMRR ID-22-01429-2ET

**RP-06****Knowledge, Attitude and Practice of Painkillers among Patients in Jeli District Health Clinics, Kelantan**

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**ABSTRACT**

**Introduction:** Improper use of analgesics is an emerging public-health concern in Malaysia, yet data from rural primary-care settings remain limited. Thus, knowing how patients feel about using painkillers can help the doctors and patients communicate more effectively and support the creation of public education campaigns for patients and the general public. **Objectives:** To assess patients' knowledge, attitude and practice (KAP) on painkiller use in Jeli District Health Clinics, Kelantan, and to determine their associations with demographic factors and pain severity. **Materials and Methods:** A prospective, cross-sectional observational study was conducted among 125 adults receiving painkiller prescriptions at six outpatient health clinics in Jeli, Kelantan from October 2024 to June 2025. Proportional sampling was applied. A validated self-administered questionnaire measured KAP; scores were classified using Bloom's cut-offs (Good  $\geq 80\%$ , Moderate 60–79%, Poor  $< 60\%$ ). Descriptive statistics and Chi-square tests examined associations between KAP domains, demographics and pain severity. **Results:** Respondents were predominantly female (56%), aged 30–44 years (32%) and Malay (93.6%). Overall, 96% exhibited poor knowledge, whereas 72% showed good attitude and 64.8% good practice toward painkiller use. Knowledge level was not significantly linked to any demographic variable. Education level, however, was significantly associated with attitude ( $P=0.005$ ). No significant associations emerged between demographic factors and practice. Inter-domain analysis revealed no significant relationships between knowledge and attitude ( $P=0.731$ ), knowledge and practice ( $P=0.577$ ), or attitude and practice ( $P=0.116$ ). Pain severity displayed a borderline association with knowledge ( $P=0.054$ ) but not with attitude or practice. **Conclusion:** Most rural clinic patients lacked adequate knowledge of analgesics despite

generally favourable attitudes and practices, suggesting that the respondents only follow the health cares' instruction rather than understanding the underlying reasons. Educational attainment influences attitudes, and severe pain may modestly prompt information seeking. Thus, targeted, education-level-specific counselling and community outreach are recommended to bridge knowledge gaps and support safe analgesic use.

**Keywords:** Painkillers, Knowledge, Attitude, Practice, Outpatient, Malaysia, Jeli District

**NMRR ID:** NMRR ID-25-01025-Z8T

## RP-07

### Evaluation of the Impact of Pharmacy Integrated Community Care (PICC) on Medication Adherence and Clinical Outcomes among Diabetic Patients in Terengganu

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#### ABSTRACT

**Introduction:** Suboptimal glycaemic control and low medication adherence remain key barriers to diabetes management in Malaysia. The National Health and Morbidity Survey 2023 reported that 40% of Malaysian adults unaware of their disease condition and 56% had poor glycemic control. **Objectives:** This study aimed to evaluate the impact of PICC programme towards medication adherence and clinical outcomes among diabetic patients in Terengganu. **Material and Methods:** This quasi-experimental study was conducted at different places in community settings from May to October 2024. Diabetic patients were selected based on inclusion and exclusion criteria from all districts in Terengganu. They were engaged in PICC programme and attending four pharmacist-led interactive sessions. Over a four-month period, four education modules were delivered. The Malaysian Medication Adherence Assessment Tool (MyMAAT-12) was administered before and after PICC

to assess adherence (1-5 Likert responses, higher scores denoted better adherence). Other clinical parameters including glycosylated hemoglobin (HbA1c), random blood sugar (RBS) and blood pressure (BP) were also collected. Data were analysed using parametric test (SPSSv.27), with  $p < 0.05$  considered statistically significant. **Results:** A total of 92 patients participated. Majority were Malay (98.9%), women (65.2%) and mean age of  $59.8 \pm 1.38$  years. The mean adherence scores increased significantly from  $46.28 \pm 8.88$  to  $54.36 \pm 5.77$  ( $p < 0.001$ ), with the proportion of patients demonstrating good adherence rising from 32.5% to 72.5% post PICC. Patients showed significantly better in glycemic control with mean HbA1c levels decreased from  $10.16\% \pm 2.02$  to  $9.51\% \pm 1.92$  accompanied by significant reductions in RBS ( $p < 0.001$ ). Although BP readings showed numerical improvement, the changes were not statistically significant. **Conclusion:** The encouraging overall findings seemed to support the adherence and clinical benefits of diabetic patients. Hopefully, this PICC programme can be expanded nationwide through strategic collaboration with community leaders, non-governmental organisations, and private sector partners to complement current healthcare services and strengthen long-term chronic disease management in Malaysia.

**Keywords:** Diabetes mellitus, medication adherence, HbA1c, clinical outcome, PICC, Terengganu

**NMRR ID:** NMRR ID-23-02439-SJQ

## RP-08

**Analysis of Pharmacist's Intervention on Prescription at Outpatient Pharmacy Setting**

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## ABSTRACT

**Introduction:** Medication error is a risk for patient safety. Pharmacist interventions are key, but underreporting hinders improvement. Better understanding of intervention can help to improve medication safety. **Objectives:** To calculate percentage underreporting of pharmacists' intervention through Medication Error Reporting System (MERS). To analyse pharmacists' intervention; to compare type of intervention done between hospital and clinic. **Materials and Methods:** A cross-sectional study in West Pahang outpatient pharmacies. Real-Time Observation technique was used to observe pharmacists' interventions over one week. Using purposive sampling, data on interventions, MERS use, and personnel details were collected via standardized form. Chi square test was used to compare type of intervention done between facility. **Results:** Out of 6,930 prescriptions, 169 (2.44%) involved pharmacist interventions. Documentation practices revealed that 76.33% of these interventions were recorded in pharmacy reports, whereas only 3.55% were reported through the MERS. Pharmacists performed most interventions, with an average service length of 6.67 years. The predominant error type leading to intervention was inappropriate prescriptions (63.31%), followed by incomplete prescriptions; miscellaneous errors were least common

(2.37%). There was no significant association between facility type (Hospital vs. PKD) and the intervention ( $\chi^2=1.011$ ,  $p=0.315$ ). Fisher's Exact Test showed significant association between prescription type (manual vs. electronic) and type intervention ( $p<0.001$ ). Electronic prescriptions linked to lesser incomplete prescription errors (post hoc  $p<0.001$ ). Majority of interventions (84.13%) pertained to commonly prescribed medications. The highest number of interventions performed by pharmacists occurred between 11am and 12 pm with 16.57% of total interventions.

**Conclusion:**

Pharmacist interventions are vital for medication safety, yet significant MERS underreporting persists. Promoting MERS use and addressing all error types are crucial. Higher prescribing errors during peak hours may be caused by increased patient load, practitioner stress, and critical distractions. The administration should address this issue to reduce prescribing errors and improve medication safety.

**Keywords:** Pharmacist intervention; prescribing errors; medication errors; outpatient pharmacy; MERS reporting; West Pahang.

**NMRR ID:** NMRR ID-23-03614-BAA

## RP-09

**The Utilization Pattern of Psychotropic Drugs in a District Hospital in Pahang - Hospital Bera (HOSBER)**

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## ABSTRACT

**Introduction:** Mental health disorders pose a significant burden on healthcare systems globally. Psychotropic medications play a crucial role in managing psychiatric conditions, yet in Malaysia, studies on their utilization patterns remain limited, especially in district hospital settings. Understanding drug utilization supports effective pharmacotherapy review and resource allocation. **Objectives:** This study aims to evaluate the utilization patterns of psychotropic drugs at Hospital Bera in 2023 by



analyzing prescribing trends based on age, gender, and race, and identifying the most commonly prescribed drug classes and individual agents. **Method:** A retrospective observational study was conducted using outpatient data from January to December 2023. Demographic and prescription data were obtained from the Pharmacy Information System (PhIS) and Hospital Information System (HIS). Drug utilization was analyzed using descriptive statistics in Microsoft Excel and expressed as Defined Daily Dose (DDD) per 1,000 population per year.

**Result:**

A total of 202 patients met the inclusion criteria, with a male predominance (56.9%). Most patients were Malay (67.8%) and aged between 36–45 years (25.7%). Schizophrenia and related disorders (61%) were the most common diagnoses. Antipsychotics accounted for the majority of prescriptions (90.3%), followed by antidepressants (9.7%) and anxiolytics/sedatives (<0.1%). Atypical antipsychotics were predominantly used, with sulpiride (40.35 DDD/1,000/year) and quetiapine (39.45 DDD/1,000/year) being the most common. Among antidepressants, selective serotonin reuptake inhibitors (SSRIs) were preferred, with fluvoxamine (11.74 DDD/1,000/year) being the most frequently prescribed. Prescribing patterns varied across demographic groups.

**Conclusion:** The study highlights the predominant use of atypical antipsychotics and SSRIs in treating psychiatric conditions at Hospital Bera. These findings provide insights into current prescribing trends and support rational drug use. Further research is recommended to evaluate long-term outcomes and cost-effectiveness.

**Keywords:** Psychotropic drugs, drug utilization, antipsychotics, antidepressants, Malaysia, Hospital Bera

**NMRR ID:** NMRR ID-24-00618-72E

## RP-10

### Knowledge on the Use of Proton Pump Inhibitors among Healthcare Professionals in Terengganu Health Clinics

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#### ABSTRACT

**Introduction:** Proton Pump Inhibitors (PPIs) are mostly prescribed medication for the treatment of heartburn and acid-related disorders. Poor knowledge of PPIs among healthcare professionals may lead to their unnecessary use, which can be associated with severe adverse outcomes and increased healthcare costs. These factors can ultimately affect the appropriate utilization and clinical efficacy of the drugs. **Objectives:** This study intended to evaluate the knowledge on the use of PPI and to identify the association of knowledge with demographic characteristics among the healthcare professionals at three District Health Offices in Terengganu. **Materials and Methods:** A cross-sectional study was conducted in 12 clinics from Marang, Kuala Terengganu and Kuala Nerus District Health Offices. Consented participants, involving medical doctors and pharmacists, were recruited from Jun to October 2024. Study tools were validated questionnaires adopted from previous study which consist of sociodemographic section and knowledge section (20 questions; 'yes' or 'no' answers; correct answer=1 point; wrong answer=0 point;  $\geq 16$  total scores=good knowledge). The data were analysed by descriptive analysis and affirmed by parametric test using SPSSv.28. **Results:** Out of 252 participants, majority were medical doctors (n=161, 63.9%), females (n=191, 75.8%) had bachelor's degree (n=245, 97.2%) within 6 to 10 years of working duration (n=106, 42.1%) and mean age of 33.43 $\pm$ 0.342 years. Most of the participants were found to have poor to moderate knowledge on the use of PPIs (n=190, 75.4%). Knowledge status was found to be significantly associated with participants' age, types of profession and

working duration ( $p < 0.001$ ). Doctors were relatively more knowledgeable about PPIs than pharmacists. **Conclusion:** Knowledge on the use of PPIs was unsatisfactory and relatively lower among pharmacists compared to doctors. These findings emphasize the importance of ongoing clinical exposure and continuous professional development in maintaining up-to-date knowledge on PPIs to reduce the widespread overuse of them and financial implication.

**Keywords:** Knowledge; Proton Pump Inhibitor; healthcare professional; Terengganu

**NMRR ID:** NMRR ID-24-01554-W64

## RP-11

### Low Molecular Weight Heparin versus Unfractionated Heparin as Venous Thromboembolism Prophylaxis in Neurosurgery

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#### ABSTRACT

**Introduction:** Venous thromboembolic events (VTE) contribute significantly to post-operative morbidity and mortality in neurosurgery. In the local setting, there is an increasing trend of VTE post neurosurgery and unfractionated heparin (UFH) is commonly prescribed as prophylactic anticoagulant. However, direct comparison of efficacy and safety between UFH or low molecular weight heparin (LMWH) is limited. **Objectives:** This study aimed to describe the use of LMWH and UFH as prophylactic anticoagulants among post-operative neurosurgical patients. Post-operative VTE rate, bleeding rate and all-cause mortality were compared between patients receiving LMWH versus UFH. **Materials and**

**Methods:** A retrospective medical record review was conducted for 40 patients admitted to neurosurgery ward at our institution from the year 2021 to 2022. Patients below 18 years old, had previous history of anticoagulant use and those who did not receive surgical procedure were excluded. Patient demographics, surgery related data and clinical characteristics were obtained. Fisher-Exact Tests were performed using Statistical Package for Social Sciences (SPSS) version 25, comparing rates of post-operative VTE, bleeding and all-cause mortality for each group. **Results:** After screening and applying exclusion criteria, 40 patients were included. Thirty patients (75%) received LMWH while 10 patients (25%) received UFH. Patients receiving prophylactic LMWH and UFH, exhibited similar rates of post-operative VTE (13.3% vs 10%,  $p=0.554$ ) which comprised solely of pulmonary embolism (PE). No difference was found in terms of post-operative bleeding rate by group; however, major bleeding was reported only in patients who received UFH (0% vs 10%,  $p=0.367$ ). No significant difference was found for all-cause mortality (23.3% vs 10%,  $p=0.653$ ). Additionally, the time of anticoagulant initiation in patients receiving LMWH was earlier as compared to UFH (4 days vs 5.5 days,  $p < 0.01$ ). **Conclusion:** Rates for post-operative PE, bleeding complications and all-cause mortality were similar between patients received prophylactic LMWH or UFH after cranial procedures. Further studies are needed to determine whether specific subpopulations demonstrate improved benefit from either prophylactic anticoagulant.

**Keywords:** Venous thromboembolism; pulmonary embolism; neurosurgery; cranial procedures; unfractionated heparin; low molecular weight heparin; bleeding.

**NMRR ID:** NMRR ID-23-00066-5YC



## RP-12

### Return and Disposal of Unused and Expired Medications (ReDiUEM) Among Patients Visiting Outpatient Clinics in PKD Pasir Puteh, Kelantan

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#### ABSTRACT

**Introduction:** Improper disposal of unused or expired medications poses significant risks to both environmental sustainability and public health. Pharmaceuticals that enter the environment through inappropriate disposal methods can contaminate water sources and affect ecosystems. In Malaysia, despite existing programs like the Medicine Return Programme (MRP), public awareness and participation remain low, especially in rural regions such as Pasir Puteh, Kelantan. **Objectives:** This study aimed to assess knowledge, attitude, and practices (KAP) regarding medication disposal and identify associated socio-demographic factors among patients visiting outpatient clinics in PKD Pasir Puteh. **Methods:** A cross-sectional survey using a validated and structured questionnaire was conducted from September to December 2024. The study included 464 adult patients across eight outpatient clinics. Data analysis was performed using SPSS version 25.0, applying chi-square and non-parametric tests to determine associations between KAP scores and socio-demographic factors. **Results:** A total of 464 respondents have completed the questionnaire. Most respondents were female (n=250, 53.9%) and Malay (n=378, 81.5%). While most respondents knew improper disposal harms the environment (n=444, 95.7%), only a small portion of them aware that wastewater treatment cannot remove most medicines (n=55, 11.9%). Non-adherence was common, with nearly half of them keeping unused medications (n=221, 47.7%). Most respondents preferred returning tablets (n=406, 87.5%) to pharmacies. However, unsafe method were still practiced such as pouring liquid

medicines down the sink (n = 184, 39.7%) and flushing them down the toilet (n=172, 37.1%). Significant associations were found between KAP scores and variables such as age, gender, education, and healthcare employment. **Conclusion:** Although knowledge on proper medication disposal is high, gaps remain in actual practices. Targeted education, community awareness, and accessible disposal facilities are essential to bridge the knowledge-practice gap and protect public and environmental health.

**Keywords:** Return medications, expired medications

NMRR ID: NMRR ID-24-02725-PUF

## RP-14

### Treatment Costs of Bleeding Complications in Hospitalized Patients on Warfarin Therapy in Hospital Tengku Ampuan Afzan

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#### ABSTRACT

**Introduction:** Treatment with warfarin imposes considerable financial burdens on healthcare systems due to its complications. There are currently limited studies in Malaysia examining warfarin use and its financial impact due to overwarfarinisation. **Objectives:** This study aimed to describe the demographic and clinical characteristics of patients with bleeding complications, estimate the treatment costs and identify the cost drivers for the treatment of bleeding complications associated with warfarin therapy. **Materials and Methods:** This retrospective, cross-sectional study was conducted through a review of medical records at Hospital Tengku Ampuan Afzan in Kuantan, Malaysia. The



study included patients aged more than 18 years old who were hospitalized due to overwarfarinisation between January 1, 2022 and December 31, 2023. Purposive sampling was employed to identify eligible cases from various available registries. Cost analysis was conducted from the healthcare provider's perspective using a bottom-up costing approach. Direct medical costs were estimated by accounting for expenses related to medications, laboratory investigations, medical procedures, personnel, blood transfusions and consumables. All costs were captured in Malaysian Ringgit (MYR). Analysis was performed using descriptive statistics. **Results:** A total of 31 patients were included for the costing analysis. The mean age was 57.5 (15.6) years. More than half (51.6%) of them were on warfarin for prevention of stroke in atrial fibrillation. Major bleeding occurred among 17 (54.8%) patients, with 25.8% experiencing gastrointestinal bleed. The total direct medical costs for overwarfarinisation ranged from MYR1,351.91 for minor bleeding to MYR2,642.84 for major bleeding. Total medical cost for managing overwarfarinisation was MYR2291.80. The main cost driver identified was drug therapy (26.2%) in which prothrombin complex concentrate use contributed an average of MYR400.65 per patient. **Conclusion:** The average treatment cost for overwarfarinisation was MYR2,291.80 per patient, contributed mainly by drug therapy.

**Keywords:** warfarin, medical cost, complications.

**NMRR ID:** NMRR ID-23-02545-IGP

## RP-15

### Patient Preferences for Inhaler Devices in Chronic Obstructive Pulmonary Disease (COPD) Patients in Hospital Muadzam Shah (HMS): A Qualitative Study

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#### ABSTRACT

**Introduction:** Various inhaler devices are available for treatment of chronic obstructive pulmonary disease (COPD) including pressurised metered-dose inhalers (pMDIs), dry powder inhalers (DPIs), and soft mist inhalers (SMIs). The technical effectiveness and safety of inhalers are the main subjects of research, but aspects like comfort, convenience of use, and personal preferences receive less attention. **Objectives:** This study aimed to explore the factors affecting patient preferences toward inhalers and the most preferred types of inhalers among COPD patients in Hospital Muadzam Shah. **Materials and Methods:** A semi-structured in-depth interview was conducted with COPD patients who had experience using more than one type of inhaler device, continuing until data saturation was reached. Participants were selected through purposive sampling. All interviews were audio-recorded and transcribed verbatim. Thematic analysis was applied to identify recurring themes and subthemes. **Results:** A total of 12 participants were recruited for this study. Six major themes emerged: (1) treatment effectiveness; (2) ease of use and practicality; (3) emotional and psychological factors; (4) healthcare interaction; (5) adherence and routine use; and (6) practical and environmental barriers, with treatment effectiveness identified as the most influential factor. Participants in this study demonstrated a preference for DPIs over other types of inhalers. **Conclusion:** Patients' experiences and preferences play a central role in the successful use of inhalers. A patient-centered approach, incorporating device training and shared decision-making, can improve adherence and disease outcomes.

**Keywords:** Inhaler; COPD; qualitative study; patient preferences.

**NMRR ID:** NMRR ID-24-03375-REI

## RP-16

### Knowledge, Attitude and Practice Regarding Disposal of Unused and Expired Medicines Among Patients in Outpatient Pharmacy in PKD Tanah Merah, Kelantan

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#### ABSTRACT

**Introduction:** Improper disposal of medicines can harm the environment, endanger health, and raise healthcare costs through water contamination and accidental ingestion. Public awareness is crucial for proper waste management, but data on patient KAP in PKD Tanah Merah remains limited, highlighting the need for local research. **Objective:** This study aims to assess the knowledge, attitudes, and practices (KAP) related to the disposal of unused and expired medications among patients at the outpatient pharmacy of PKD Tanah Merah, Kelantan. **Materials and Methods:** A cross-sectional study was conducted among 460 adult patients at seven outpatient pharmacies under PKD Tanah Merah. A validated questionnaire by Nur Feazira Abdul Kadir et al. (2021) was administered digitally via QR code. Systematic sampling was employed by selecting patients with odd queue numbers from the outpatient register. Descriptive statistics were used to summarize variables, while bivariate and multivariable logistic regression analyses assessed associations, with significance set at  $p < 0.05$ . Adjusted odds ratios (AOR) was reported. **Results:**

Of the 460 respondents, most were female (63.7%), aged 18–35 (40.4%), Malay (95.7%), with 47.0% holding tertiary education, 61.3% employed, and 70% married. While 72.6% showed good knowledge and 63.0% had a positive attitude, only 51.7% practiced proper medicine disposal. Older adults (55–88 years) were more likely to have good knowledge (AOR = 2.12; 95% CI: 1.03–4.37;  $p = 0.042$ ). Good knowledge significantly increased the likelihood of a positive attitude (AOR = 2.70; 95% CI: 1.67–4.38;  $p < 0.001$ ) and appropriate disposal practices (AOR = 5.23; 95% CI: 3.15–8.69;  $p < 0.001$ ). A positive attitude also predicted better disposal practices (AOR = 2.13; 95% CI: 1.36–3.35;  $p < 0.001$ ). **Conclusion:** Knowledge and attitude are key to encouraging proper medicine disposal. Targeted education and awareness campaigns by healthcare providers are vital to foster responsible behaviour and support environmental sustainability.

**Keywords:** Knowledge, Attitude, Practice, Disposal Practice

**NMRR ID:** NMRR ID-22-01370-6DZ

## RP-17

### Impact of Educational Intervention Towards knowledge and Practice of Sublingual Glyceryl Trinitrate among Acute Coronary Syndrome Patients in Dungun Hospital

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#### ABSTRACT

**Introduction:** Acute Coronary Syndrome (ACS) is highly prevalent worldwide and remains the top cause of death. The treatment can be self-managed with Sublingual Glyceryl Trinitrate (GTN) tablets and remain first-line therapy for many patients. However, there is limited local data reported on the knowledge and practice among patients.

**Objectives:** This study aimed to determine the difference in mean scores of knowledge and practice on Sublingual GTN among control and intervention groups, to compare patient's knowledge and practice between both groups over-time and to identify association between demographic characteristics with patients' knowledge and practice. **Materials and Methods:** This was an interventional study involved ACS patients with Sublingual GTN at Dungun Hospital. Data was collected from September 2024 to January 2025. They were randomized into 2 groups; control (received counselling) and intervention group (received educational intervention comprising counselling, pamphlets and video of Sublingual GTN usage). Patients were interviewed pre and post intervention with one month interval using validated questionnaires (part 1: demography; part 2: 8 items on knowledge, 7-8 scores=good knowledge; part 3: 6 items on practice, 5-6 scores=good practice). Data was analyzed using SPSS v.29, employing descriptive statistics and parametric tests. **Results:** A total of 61 patients were recruited [control group=35 (57.4%); intervention group=26 (42.6%)] with mean age=57 ( $\pm$ 12.8) years old; male=48 (78.7%); Malay=59 (96.7%). Within group comparison, there were significant differences of knowledge and practice after intervention for both control and intervention groups ( $p < 0.001$ ). However, no significant difference was detected for knowledge and practice in neither intervention nor control group post intervention ( $p > 0.05$ ). There also no significant association was found between knowledge and practice in different sociodemographic characteristics. **Conclusion:** There were improvements in knowledge and practice of Sublingual GTN pre and post study among intervention group indicating the importance of repeated education and counselling. Larger samples should be taken for more promising results.

**Keywords:** Acute Coronary Syndrome, Sublingual Glyceryl Trinitrate, Knowledge, Practice Educational Intervention

**NMRR ID:** NMRR ID-24-02629-12R

## RP-18

### Pain as 5th Vital Sign: An Evaluation of Knowledge Among Healthcare Workers in Hospital Tanah Merah, Kelantan

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#### ABSTRACT

**Introduction:** In 2008, Malaysia implemented the "Pain as the 5th Vital Sign" initiative, introducing the Pain Free Hospital concept across healthcare institutions. In line with this national effort, Hospital Tanah Merah (HTM) will undergo an audit in 2025 as part of the process to obtain certification as a Pain-Free Hospital. The findings of this research can support the development of more effective training programs and inform policy makers about the need for targeted pain management workshops. Ultimately, this will help address knowledge gaps and improve the quality of patient care. **Objectives:** This study aims to assess the level of knowledge regarding P5VS among healthcare workers in HTM and to determine the relationship between their knowledge levels and socio-demographic factors including gender, age, job role, and years of service. **Materials and Methods:** A quantitative cross-sectional study was conducted between 20 August 2024 to 20 November 2024 involving 384 full-time healthcare workers at HTM. A validated questionnaire adapted from the Ministry of Health's Pain-Free Hospital Manual (3rd Edition) was distributed online. A knowledge score of  $\geq 80\%$  was considered passed. Descriptive statistics and one-way ANOVA were used to explore associations between variables. **Results:** A total of 80.5% of respondents scored  $\geq 80\%$ , indicating an overall good level of knowledge. Doctors, pharmacists, and nurses recorded the highest pass rates, while allied health and dental staff showed lower performance. Among the socio-demographic variables, only professional role was significantly associated with knowledge scores ( $p < 0.001$ ). No significant correlation was found with gender, age, or years of service. **Conclusion:** While most healthcare workers at HTM demonstrated good knowledge of P5VS, disparities between professional groups indicate a need for targeted, role-



specific training. Continued education and structured reinforcement are vital to ensure consistent, effective pain assessment practices across all departments.

**Keywords:** Pain, Fifth Vital Sign, Knowledge, Healthcare Workers, Hospital Tanah Merah

**NMRR ID:** NMRR ID-24-01504-FYR

## RP-19

### Investigating Decline in Estimated Glomerular Filtration Rate in Atrial Fibrillation Patients Treated with Warfarin vs Novel Oral Anticoagulants (IDEAL-AF)

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#### ABSTRACT

**Introduction:** Renal function decline is a concern in atrial fibrillation (AF) patients on long-term anticoagulation. Warfarin may promote nephropathy through vascular calcification, but comparative data with novel oral anticoagulants (NOACs) remain limited. **Objective:** To evaluate the reduction in estimated glomerular filtration rate (eGFR) in patients with AF treated with warfarin versus NOACs. **Methods:** This retrospective cohort study included 86 AF patients from Hospital Pekan. eGFR was calculated using the CKD-EPI formula at baseline and follow-up. The primary outcome was the mean annual eGFR change in patients on warfarin (n=46) versus NOACs (n=40: rivaroxaban and dabigatran). The secondary outcome was the incidence of eGFR <50 mL/min/1.73m<sup>2</sup>. Multivariate logistic regression was used to determine adjusted odds ratios (ORs). **Results:** Mean age was 69.88 ± 10.97 years and 51.16% were women. The mean annual eGFR change was -2.61 ± 5.44 for warfarin, -3.37 ± 4.99 for rivaroxaban (p=0.798 vs. warfarin), and 0.06 ± 4.67 for dabigatran (p=0.422 vs. warfarin), with no statistically significant differences

(p=0.289 overall). Although the differences did not reach statistical significance, dabigatran demonstrated a numerically favourable renal profile. Patients with baseline eGFR <50mL/min/1.73m<sup>2</sup> had higher rates of heart failure (p=0.034) and stroke/TIA (p=0.011). The adjusted OR for developing eGFR <50mL/min/1.73m<sup>2</sup> with NOACs versus warfarin was 3.28 (95% CI: 1.08–9.96, p=0.036), indicating increased odds in the NOAC group. **Conclusion:** Although not statistically significant, dabigatran demonstrated a trend toward renal preservation. Findings underscore the need for individualized anticoagulant choice in AF patients, especially those at risk of renal impairment. Cost-effectiveness considerations, including budget impact, are essential in guiding optimal therapy.

**Keywords:** atrial fibrillation, warfarin, novel oral anticoagulants, anticoagulant, chronic kidney disease

**NMRR ID:** NMRR ID-25-00651-YB4

## RP-20

### Knowledge, Attitude, and Practice of Community Pharmacy Professionals on Generic Medicines in Pahang

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#### ABSTRACT

**Introduction:** Generic medicines are crucial for sustainable healthcare, offering affordable yet effective treatment alternatives. Community pharmacy personnel are key advocates, but their knowledge, attitudes, practices influence integration of generics into practice remains unclear. **Objectives:** To assess the level of knowledge, attitude, and dispensing practices regarding generic medicines, identify factors associated with knowledge and attitude scores and factors influencing selection and dispensing them among community pharmacy personnel in Pahang. **Materials and Methods:** This cross-sectional study surveyed 91 Pahang community pharmacy personnel using an adopted self-administered online questionnaire (Jan-Mar 2025). The questionnaire assessed socio-demographics, knowledge, attitudes, practices and views on generics, as well as selection and dispensing influences.



Knowledge scores of  $\geq 35/40$  defined strong knowledge, attitude score  $\geq 30/45$  defined positive attitude and practice scores of  $\geq 30/40$  indicated a higher level of generic medicine use. Data analysis involved descriptive statistics, and multiple linear regression. **Results:** Mean scores for knowledge are high ( $35.79 \pm 2.885$ ), mean scores for attitude are positive ( $35.15 \pm 4.379$ ), mean scores for practice show strong orientation toward the use of generic medicine ( $30.96 \pm 3.812$ ). MLR identified female gender ( $b = -1.834$ ; 95% CI:  $-3.021, -0.646$ ;  $p = 0.003$ ), Chinese ethnicity ( $b = -1.622$ ; 95% CI:  $-2.978, -0.266$ ;  $p = 0.020$ ), and 6-10 years' experience ( $b = 1.312$ ; 95% CI:  $0.080, 2.544$ ;  $p = 0.037$ ) as significant knowledge predictors. Over 10 years' experience showed significantly lower practice scores favouring generic medicine ( $b = -3.034$ ; 95% CI:  $-5.276, -0.791$ ;  $p = 0.009$ ). No significant predictors of attitude score were identified. Consumer preference (98.9%), cost-effectiveness (96.7%), and affordability (95.6%) were found to influence the selection and dispensing of generic medicines. **Conclusion:** Community pharmacy personnel in Pahang show strong knowledge, positive attitudes and highly favourable practice towards generic medicines. Dispensing practices are heavily driven by consumer demand and cost factors, with notable concerns about manufacturer credibility.

**Keywords:** Generic medicines; knowledge; attitude; practice; barriers; community pharmacy; Pahang

**NMRR ID:** NMRR ID-24-03510-BOY

## RP-21

### Exploring Perceptions of Hemodialysis Patients towards Medication Therapy Adherence Clinic Services

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#### ABSTRACT

**Introduction:** Pharmacists conduct Medication Therapy Adherence Clinic (MTAC) services to improve patient knowledge and adherence to medications, as the patients undergoing hemodialysis (HD) are at high risk of healthcare and pharmaceutical care issues. Hospital Raub and Hospital Jerantut are the only hospitals in Pahang, Malaysia providing MTAC services for HD patients. **Objective:** To explore the perceptions of HD patients towards MTAC services. **Materials and Methods:** A qualitative study with health belief model and grounded theory approach was used as a framework for this study. In-depth face-to-face interviews with semi-structured topic guide were conducted among eleven patients from Hospital Raub, Pahang, Malaysia. Data were collected using purposive sampling until data saturation. All the interviews were audio recorded, transcribed verbatim and then thematically analysed using NVivo 13. **Results:** Six major themes were identified: (1) Initial diagnosis and emotional impact, (2) perceived importance of medications, (3) medication adherence, (4) satisfaction with pharmacy service, (5) family support, and (6) impact on quality of life. The patients reported high satisfaction with pharmacy services, particularly valuing the expertise and support of MTAC pharmacists. They felt that having strong family involvement was essential in supporting medication adherence and overall treatment plans. This study suggests that strengthening family support and providing continuous and personalized care are vital to improving the patient's outcomes. **Conclusion:** HD patients had positive perceptions towards MTAC services in improving disease understanding and medication compliance for optimal health outcomes. These findings

underscore the importance of MTAC services in enhancing medication adherence for HD patients prescribed with complex pharmacotherapy. HD MTAC should be expanded to other facilities to help HD patients better understand their medications. Further research should explore long-term impacts and strategies to enhance MTAC services.

**Keywords:** Medication Therapy Adherence Clinic (MTAC), haemodialysis (HD), qualitative study, pharmacists, Malaysia

**NMRR ID:** NMRR ID-22-01473-5NE

## RP-22

### A Study of High Dose Versus Moderate Dose Methadone Maintenance: Evaluating Outcome in Controlling Illicit Substance Use

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#### ABSTRACT

**Introduction:** Methadone dosing has long been a topic of debate among clinicians. In the government-run Methadone Maintenance Treatment (MMT) programs, the average daily dose remains below 40mg. Multiple studies have suggested that a daily methadone dosage of 60 to 100mg is necessary for effective treatment and the reduction of opiate use. Typical methadone doses have increased over time, supported by evidence that doses below 60mg/day are insufficient, while doses near to 100mg/day yield superior outcomes. **Objectives:** This study aimed to compare the percentage of patients taking illicit drug between high-dose and moderate-dose methadone groups and to determine patient compliance with the MMT program. **Materials and Methods:** A retrospective chart review was conducted on patients

receiving MMT at 8 health clinics in Kemaman from January to December 2023. Patients were divided into two groups based on their daily methadone doses: moderate dose (60 to 79mg) and high dose ( $\geq 80$ mg). The groups were compared using urine drug screens for illicit substances at the first month and again at the 12<sup>th</sup> months of the study duration. A structured form was used for data collection and was analyzed using descriptive statistic and chi-square tests with  $p < 0.05$  considered statistical significant (SPSSv.26). **Results:** A total of 100 Malay male patients included (mean age=46.95 $\pm$ 6.90 years; married=43%; employed =87%;  $\leq$  secondary education=76%; mean methadone dose=82.3 $\pm$ 22.42 mg). About 51 patients received moderate doses and the others received higher doses. Urine drug screen showed a reduction in illicit drug use in both groups. In the moderate-dose group, 23.5% tested positive at baseline and 13.7% at follow-up, while in the high-dose group, rates were lower at both time points (18.4% and 6.1%, respectively). All patients demonstrated good compliance with the MMT program. **Conclusion:** Higher methadone doses were resulted in reduced opiate and illicit substance use compared to moderate doses as indicated by lower percentage of positive urine drug screens.

**Keywords:** MMT; Methadone dose, illicit substance, opiates

**NMRR ID:** NMRR ID-24-01069-3ZH

## RP-23

### Stroke Risk and Behaviour Change of Working-Age Adults (18–64 Years) with Hypertension in a Malaysian Setting

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#### ABSTRACT

**Introduction:** Hypertension is a significant risk factor for stroke among adults aged  $< 65$  years in Malaysia. While research has identified various factors influencing hypertension management, studies on psychosocial factors



are limited. This study seeks to inform targeted public health interventions to enhance hypertension management and lower stroke risk in working-age adults. **Objectives:** This study examined the association between the accuracy of perceived stroke risk and the readiness for behaviour change, with blood pressure control status, among working age adults with hypertension in a Malaysian setting. **Materials and Methods:** A cross-sectional study was conducted across six health clinics in Kuantan district, involving 158 patients aged 18–64 years who were on at least one antihypertensive medication. Participants completed a validated questionnaire assessing their perceptions, lifestyle, medication adherence and stroke knowledge. Blood pressure data were retrieved from participant's medical records. Binary logistic regression was employed to determine the associations between perceived stroke risk accuracy and readiness for behaviour change, towards blood pressure control. **Results:** Among 134 participants analysed, the majority were married (82.8%), Malay (90.3%), with a mean age of  $48.87 \pm 9.25$  years. Approximately 60.4% were women, 73.1% had secondary education or lower, and 79.8% were from low-income backgrounds. Only 33.6% accurately assessed their stroke risk, while 58.2% were not ready for behaviour change. Accurate perceived stroke risk was positively associated with controlled blood pressure (aOR = 3.084, 95% CI: 1.006–9.458,  $p = 0.049$ ). Being ready for behaviour change was negatively associated with controlled blood pressure (aOR = 0.455, 95% CI: 0.144–1.436,  $p = 0.180$ ). **Conclusion:** Accurate perception of stroke risk is crucial for effective hypertension management. Targeted educational strategies and technology can enhance awareness and promote healthy lifestyle choices among at-risk working-age adults. Further research is needed to deepen the understanding of the relationship between behavioural readiness and hypertension control in this demographic.

**Keywords:** Stroke; hypertension; risk perception; behaviour change

**NMRR ID:** NMRR ID-24-01026-5IS

## RP-24

### Evaluation of Meropenem Dosing Adequacy and Clinical Outcomes in ICU Patients: A Model-Informed Retrospective Study

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#### ABSTRACT

**Introduction:** Critically ill patients often experience altered pharmacokinetics (PK), making standard meropenem dosing suboptimal and potentially compromising therapeutic outcomes. Model-informed precision dosing (MIPD) offers a strategy to individualize dosing and optimize drug exposure. For meropenem, a pharmacodynamic target of 100% time above the minimum inhibitory concentration (100% T>MIC) is recommended to maximize efficacy. Based on the EUCAST breakpoint (MIC of 2 mg/L), a steady-state concentration above 8 mg/L is suggested for optimal bacterial killing. In Malaysia, however, therapeutic drug monitoring (TDM) for meropenem is not routinely available, limiting individualized dosing. **Objectives:** This study aimed to evaluate the adequacy of meropenem dosing in ICU patients and explore its association with bacterial resistance and mortality. **Materials and Methods:** A retrospective study was conducted in ICU patients treated with meropenem at Hospital Raja Perempuan Zainab II (HRPZ II). Patient demographics, renal function (creatinine clearance), dosing regimens, microbiological data, and clinical outcomes were collected. Dosing adequacy was assessed using a published MIPD simulation based on creatinine clearance, targeting a 24-hour meropenem concentration >8 mg/L. Statistical analysis was performed to evaluate associations between dosing adequacy, bacterial resistance, and mortality. **Results:** Among 253 patients included, mortality was 56.5% (n=143). Inadequate dosing was observed in 79.1% (n=200), and 46.2% (n=117) developed bacterial resistance. Serum creatinine at meropenem initiation was significantly associated with dosing adequacy. Inadequate dosing increased mortality risk (OR = 4.94; 95% CI 2.20–11.10)

and prolonged ICU stay by about four days but was not significantly linked to resistance. Older age reduced mortality risk (OR = 0.965/year), while higher body weight increased it (OR = 1.025/kg). **Conclusion:** Standard meropenem dosing often results in suboptimal exposure. Integrating MIPD into routine care may improve meropenem adequacy and clinical outcomes in critically ill patients.

**Keywords:** Meropenem, Model-Informed Precision Dosing (MIPD), Critically Ill Patients, Pharmacokinetics, Mortality

**NMRR ID:** NMRR ID-24-03287-ASZ

## RP-25

### Evaluation of Healthcare Providers' Knowledge and Attitude about the Handling of Chemotherapy Drugs at Hospital Setiu, Terengganu

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#### ABSTRACT

**Introduction:** Chemotherapy treatment started at Hospital Setiu in June 2023. Safe handling is essential to reduce health risks like cancer, infertility and birth defects with prolonged exposure. Healthcare providers face potential exposure to cytotoxic drugs, making good knowledge and proper attitude crucial. Currently, no local data has been reported on this issue. **Objectives:** This study aimed to assess knowledge and attitude on chemotherapy drugs handling among healthcare providers in Hospital Setiu and to identify the association of knowledge and attitude with demographic characteristics. **Materials and Methods:** A cross-sectional was conducted from May 2024 to February 2025. An anonymous online survey was distributed among healthcare providers involved in chemotherapy drug handling with consent obtained prior to participation. Study tools were validated questionnaire on knowledge

comprising 40 questions (four domains; 2.5 scores per correct response; total score=100) and 5 closed-ended questions on attitude of chemotherapy drugs handling. Data were analyzed using descriptive and parametric test (SPSSv.27). **Results:** A total of 98 healthcare workers participated, with a mean age of 37±8.18 years. Majority were female (81.6%) and 54.1% involving nurses. They had an average of 14±8.22 years of working duration and 2±1.90 years of experience in handling chemotherapy. The mean knowledge score was 66.82±16.85. Most staff were disapproved of improper practices either among peers (83.7%) or during hectic time (90.8%). About 81.6% of them were worried about long-term side effects from occupational exposure. Significant negative associations were found between age and working duration with all knowledge domains, except for knowledge on chemotherapy exposure, which correlated positively. Only attitude of applying safety measures showed statistically significant with age and working duration ( $p<0.05$ ). **Conclusion:** Findings revealed that study participants had moderate knowledge and attitudes on handling chemotherapy drugs, highlighting an urgent need for additional training, establishing institution guidelines, emphasize good attitude and safety practice.

**Keywords:** Chemotherapy drugs, Knowledge, Attitude, Healthcare providers, Setiu

**NMRR ID:** NMRR ID-24-01593-NWD

## RP-26

### Knowledge, Attitude, Practice and Complication Awareness Among Type 2 Diabetes Mellitus Patients in Health Clinics, PKD Bachok

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#### ABSTRACT

**Introduction:** There was a decreasing trend on the

achievement of HbA1c at PKD Bachok from 32.54% (2022) to 30.95% (2023) and it is worrying as it could affect glycaemic control and diabetic complications. This study is conducted since a very limited study regarding diabetes knowledge, attitudes, practice and complications awareness among Type 2 diabetic patients in Bachok district. **Objectives:** To evaluate the knowledge, attitude, practice and complication awareness among Type 2 Diabetes Mellitus (T2DM) patients in Health Clinics, PKD Bachok. **Materials and Methods:** A cross-sectional study using a validated questionnaire conducted in 8 Health Clinics from 1<sup>st</sup> July till 31<sup>st</sup> August 2024. The inclusion criteria was adult patients aged  $\geq 18$  years old, diagnosed with T2DM, able to read and understand Malay language. The sampling method was systematic random sampling, sample size was calculated using Raosoft (MOE:5%, CI:95%, PS:29942, RD:50%) and association analysis was tested using Independent t-test and Chi-square test. **Results:** 380 respondents participating in this research were mostly Malay female (67.6%, n=257) with the mean age of 49 years old. 59.7% (n=227) respondents graduated secondary school and 72.6% (n=276) had family history of Diabetes. Findings showed respondents had good knowledge (64.2%, n=244), good attitude (49.2%, n=187), good practice (82.6%, n=314) and good complication awareness (61.6%, n=234). There was significant association between family history of diabetes with knowledge (p=0.035) and attitude (p=0.001). Also, educational status was significantly associated with attitude (p<0.001), practice (p=0.009) and complication awareness (p=0.001). A significant association was found between attitude (p=0.001) and practice (p=0.003) with complication awareness. **Conclusion:** Family history of diabetes and educational status were the most significant factors, while practice and attitude were significantly associated with complication awareness of diabetes. This study highlights the need for well-organized health education and counselling to improve patients' attitude and practice regarding diabetes.

**Keywords:** Type 2 Diabetes Mellitus, Knowledge, Attitude, Practice, Complication Awareness

**NMRR ID:** NMRR ID-24-02973-CDR

## RP-27

### The Appropriateness of Intravenous Proton Pump Inhibitors Usage and Its Direct Costs In Hospital Tengku Ampuan Afzan

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#### ABSTRACT

**Introduction:** The lack of national guidelines for proton pump inhibitor (PPI) use has led to variability in prescribing practices, which may result in unnecessary healthcare costs and potential adverse effects, particularly in hospitalized settings. Intravenous (IV) PPI is commonly prescribed in Hospital Tengku Ampuan Afzan (HTAA) among non-critically ill patients. This raises concerns over the possibility of inappropriate use of IV PPIs in the local setting. **Objectives:** This study aimed to assess the appropriateness of the prescribed IV PPI utilization in adult patients admitted in medical wards based on established guidelines and to determine the direct cost associated with inappropriate use of IV PPIs. **Materials and Methods:** A prospective cohort study was conducted at HTAA from December 2023 to January 2024. The study population consisted of adult patients who were admitted to medical wards and received IV PPIs. The appropriateness was assessed using American College of Gastroenterology (ACG) guidelines and American Society of Health-System Pharmacist (ASHP) Therapeutic Guidelines On Stress Ulcer Prophylaxis. The direct cost of IV PPI therapy included the drug, consumables, personnel and admission costs. Descriptive analysis was performed using SPSS version 21.0. **Results:** Of the 150 patients included, the most common indication for IV PPI was for prophylaxis use (76%). Overall, 84% of IV PPI prescriptions were appropriate based on clinical guidelines,

while 16% were deemed inappropriate. Among the inappropriate cases, 91.7% were due to unclear indications. The inappropriate use of IV PPIs resulted in an avoidable direct cost of RM586.30 with an average of RM24.42 per patient. Assuming that the rate of inappropriate use is constant, estimated cost incurred will be RM3517.80 per year. **Conclusion:** The prevalence of inappropriate use of IV PPIs in HTAA was 16%, which is similar across other studies. This leads to an estimated avoidable cost of RM3517.80 per year.

**Keywords:** PPI, proton pump inhibitors, appropriateness, direct cost

**NMRR ID:** NMRR ID-23-03388-FWD

## RP-28

### The Impact of Medication Therapy Adherence Clinic (MTAC) on the Understanding of Medication Knowledge, Adherence and Clinical Outcomes for Dialysis Patients in Kelantan: A Multicentre Study

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#### ABSTRACT

**Introduction:** Pharmacist-led Medication Therapy Adherence Clinic (MTAC) has been implemented to manage complex medication regimens and high pill burdens of ESRD patients undergoing dialysis. However, the effectiveness of MTAC among dialysis patients in Kelantan remains limited in evidence. **Objectives:** To evaluate the impact of MTAC on medication knowledge, adherence, and selected clinical outcomes (potassium, phosphate, calcium, and hemoglobin levels) among

dialysis patients. It also examines the relationship between knowledge and adherence and identifies sociodemographic predictors influencing both. **Materials and Methods:** This retrospective cohort study involves conveniently sampling 91 adult dialysis patients who completed three MTAC visits at three public hospitals in Kelantan between January 2022 to May 2024. Medication knowledge was assessed using DFIT tool, adherence via MyMAAT and clinical outcomes through laboratory parameters. Repeated measures ANOVA, correlation and regression analyses were employed. **Results:** There were statistically significant improvements in both medication knowledge (mean DFIT: 94.56 to 99.05,  $p < 0.001$ ) and self-reported adherence (MyMAAT >50%: 57.1% to 78.0%,  $p < 0.001$ ) across the three MTAC visits. No significant changes were observed in clinical outcomes, although modest improvements in potassium and calcium levels were noted. Correlation between knowledge and adherence was weak, with significance only at the second visit ( $r = +0.261$ ,  $p < 0.05$ ). Sociodemographic factors showed limited predictive value, except for gender at first visit, where females had significantly better adherence compared to males ( $p < 0.05$ ). **Conclusion:** MTAC has been proven effective in enhancing medication knowledge and adherence among dialysis patients in Kelantan. Although the short-term effect on biochemical outcomes was limited, behavioral improvements were evident in this study. The research data portrays the requisition for this study to be done as baseline to assess longer-term effects of MTAC implementation for dialysis patients in Kelantan, entailing broader population and robust study models integrating multidisciplinary elements.

**Keywords:** Medication Therapy Adherence Clinic, Dialysis, Pharmacist Intervention, Medication Knowledge, Adherence, Clinical Outcomes, Kelantan

**NMRR ID:** NMRR-24-3178-VY8



## RP-29

### The Impact of Medication Regimen Complexity Level on Glycemic Control in Older Adults with Type 2 Diabetes Mellitus (T2DM) in a Primary Health Care, Pasir Mas, Kelantan

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#### ABSTRACT

**Introduction:** The higher the complexity of the medication regimens, the more challenging for patients to maintain consistent adherence, leading to poorer glycemic control and higher HbA1c levels. **Objectives:** To assess the impact of medication regimen complexity level on glycemic control in older adults with Type 2 Diabetes Mellitus. **Materials and Methods:** Retrospective record research was conducted in the outpatient health clinic in Pasir Mas district. Demographic, clinical characteristics, and medication-related characteristics of older adults from January to June 2024 were collected from Advanced Clinic Management (ACM). The complexity of the patients' medication regimens was assessed using the Medication Regimen Complexity Index (MRCI) tool. Logistic regression analyses were used to identify the factors influencing glycemic control. **Results:** A total of 284 older adults were included in the study, of whom 40.5% had poor glycaemic control as indicated by elevated HbA1c levels (>8%). The mean number of medications prescribed for diabetes management was 1.5 (SD = 0.7). Additionally, 34.5% of the patients were found to have a high diabetes-specific medication regimen complexity index (MRCI). Meanwhile, multiple linear regression analysis showed young-old (60-74) age (Adjusted  $\beta$  = 0.723, 95% CI: 1.092-3.885,  $p$  = 0.026), presence of polypharmacy (Adjusted  $\beta$  = 0.713, 95% CI: 1.028-4.049,  $p$  = 0.041), high medication regimen complexity (Adjusted  $\beta$  = 2.130, 95% CI: 1.702-41.597,  $p$  = 0.009) and injectable dosage form (Adjusted  $\beta$  = 1.513, 95% CI:

1.274-16.176,  $p$  = 0.020) are the significant factors of poor glycaemic control. **Conclusion:** The findings addressed the importance of reducing medication complexity to improve glycaemic control, particularly among individuals at greater risk such as those with polypharmacy and long-standing T2DM. Strategies such as regimen simplification should be considered to reduce MRC and enhance treatment outcomes.

**Keywords:** Type 2 diabetes mellitus (T2DM), Older adults, MRC index level, HbA1c levels

**NMRR ID:** NMRR ID-24-03019-G

