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CONFERENCE ABSTRACTS

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Pharmacy practice research

Comparing interns' pre-registration examination results: Transitioning from paper-based to online format between 2015 and 2022: Preliminary results

Kgotsuko Maloka[1,2], Fransina van Niekerk[1], Adele Naudé[1], Willem Basson[1], Irma Kotzé[1]

[1]Medicine Usage in South Africa (MUSA), Faculty of Health Sciences, North-West University, Potchefstroom, South Africa, Potchefstroom, South Africa

[2]South African Pharmacy Council, Pretoria, South Africa., Pretoria, South Africa

Background: In South Africa (SA), the South African Pharmacy Council (SAPC) regulates the pharmacy profession. Pharmacy students who have completed their Bachelor of Pharmacy degree must complete a one-year internship (pre-registration year) before registering as a pharmacist. The training of pharmacist interns can be carried out in the following approved sectors: community, institutional, manufacturing, or academic sector. The pre-registration examination of pharmacist interns in SA has undergone significant changes, moving from a paper-based format written at designated test centres to a remote online format. Online examinations were introduced in 2017 at designated test centres and, since 2020, conducted from remote sites. The pre-registration examination consists of two papers: paper one of general pharmacy practice-related questions and Paper two of pharmaceutical calculations.

Purpose: The study aimed to compare the pre-registration examination marks after transitioning from paper-based to online, which were used in the SAPC pharmacist internship training programme from 2015 to 2022.

Methods: An observational, longitudinal study was conducted using retrospective data obtained from the SAPC to analyse the pre-registration examination results from 2015 to 2022. The pre-registration examination results were analysed according to the following: paper-based (2015-2016), online at designated test centres (2017-2019) and online at remote sites (2020-2022). The possible influence of gender, sector of internship, university of graduation, and number of attempts on the pre-registration examination will be further investigated and presented.

Results: The average mark obtained for the examinations (papers 1 & 2) was 62.15% for written paper-based, 64.61% for online-based in designated centres, and 68.20% for online-based remote.
The median for paper one was 82.50% (IQR 66.25; 92.50) for written paper-based examinations, 76.92% (IQR 69.23; 84.62) for online at designated centres, and 72.24% (IQR 65.0; 80.0) for remote sites.
The median for paper two was 63.33% (IQR 58.33; 71.25) for written paper-based examinations, 54.0% (IQR 48.0; 60.0) for online in designated centres, and 59.12% (IQR 54.0; 66.0) for remote sites.

Conclusion: The preliminary results indicate that the pre-registration examination format may impact the examination outcome. The results appear to be higher for paper one than for paper 2. Possible reasons will be further investigated.

Factors influencing pharmacist internship sectors choices in South Africa

Adele Naude[1], Yolande Heymans[2], Willem Basson[1], Martie Lubbe[1]

[1]*Medicine Usage in South Africa (MUSA), Faculty of Health Sciences, North-West University, Potchefstroom campus, South Africa, Potchefstroom, South Africa*

[2]*Centre for Health Profession Education, Faculty of Health Sciences, North-West University, Potchefstroom campus, South Africa, Potchefstroom, South Africa*

Background: In South Africa, becoming a pharmacist entails a four-year undergraduate programme, followed by a year internship either at an approved pharmacy (community [corporate/private], institutional [public/private], manufacturing, or academic institution (leading to a Masters degree). Currently, pharmacy graduates struggle to secure internship positions in South Africa. Notably, nearly a quarter to a third of pharmacy graduates in 2017 struggled to secure internship positions for 2018, a concern repeated across social media platforms recently by interns experiencing similar challenges.

Purpose: This study aimed to identify challenges in securing internship positions and factors influencing the choice of pharmacist internship sites among undergraduate pharmacy graduates in South Africa.

Method: A cross-sectional survey was conducted using an online self-administered questionnaire between August 2022 and December 2023. The questionnaire was distributed to all pharmacist interns (N = 853) registered under the Pharmacy Act 53 1974. Ethical approval was obtained (NWU-00076-22-S1).

Results: A total of 109 pharmacist interns responded, with 48,62% indicating they struggled to secure an internship position. Challenges identified include a lack of application feedback and limited available internship positions and tutors. The median number of internship applications submitted was 5 (IQR = 2; 9) across 3 (IQR = 2; 4) internship sites located in 3 (IQR = 1; 5) provinces. The geographical location of the internship sites was important to 79.79% of respondents.

A total of 39.25% of respondents declined internship positions. Reasons included preferred geographical location (n = 18), being closer to relatives (n = 13), offers in other pharmacy sectors (n = 12), and better compensation (n = 10).

A significant association was found between the intern's preferred and current working site (Fisher's exact test, p = 0,0052), with 43.14% of respondents not working in their preferred sector.

A total of 91.67% of respondents currently work in corporate-owned community pharmacies instead of their preferred sector. The manufacturing sector (50%) and institutional pharmacy [public] (38.64%) were identified as the top two preferred sectors for internships.

Conclusion: Pharmacy graduates applied selectively for internship positions across provinces and sectors. Limited positions and tutors, a lack of feedback on applications, and geographic constraints were identified as possible challenges. Perceived challenges and choices in internship sites must be investigated further to inform stakeholders.

Improving the quality of care of hypertension at the primary healthcare level in South Africa

Enos Rampamba[1,2], Johanna Meyer[1], Brian Godman[1,3], Ntodeni Ndwamato[4,5], Stephene Campbell[1,6]

[1]*Department of Public Health Pharmacy and Management, School of Pharmacy, Sefako Makgatho Health Sciences University, Pretoria, South Africa, Pretoria, South Africa*

[2]*Division of Pharmacy Education, Professional Affairs, South African Pharmacy Council, Pretoria, South Africa*

[3]*Department of Pharmacoepidemiology, Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde, Glasgow, United Kingdom, Glasgow, United Kingdom*

[4]*Department of Family Medicine, School of Medicine, University of Limpopo, Polokwane, Polokwane, South Africa*

[5]*Limpopo Department of Health, Limpopo, Polokwane, South Africa*

[6]*Centre for Epidemiology and Public Health, School of Health Sciences, University of Manchester, Manchester, UK, Manchester, United Kingdom*

Introduction: South Africa has a National Strategic Plan for the prevention and control of non-communicable diseases and guidelines for managing hypertension at the primary healthcare (PHC) level. However, evidence shows a lack of consistent data collection and process indicators in the management and monitoring of hypertension, especially in primary care. This makes it difficult to measure and improve the care of hypertension patients.

Purpose: To develop appropriate and feasible quality indicators for hypertension management at the PHC level in South Africa.

Method: A rapid evidence assessment of the literature was conducted to synthesise possible indicators. A multidisciplinary panel of experts assessed the appropriateness and feasibility of the synthesised quality indicators on a 9-point scale using an online 2-round RAND/UCLA Appropriateness Method. Agreement on quality indicators rated ≥7-9 was deemed appropriate or feasible.

Results: Of 102 synthesised quality indicators, 46 were found appropriate and feasible for monitoring and measuring the

quality of care in managing hypertension at the PHC level in South Africa (overall panel median of ≥7 for both appropriate and feasible). Feasible and appropriate indicators were identified for monitoring (n=16), review (n=5), lifestyle advice (n=9), tests (n=7), intermediate outcomes (n=6), referrals (n=2) and practice/facility structures (n=1). However, no indicator statements were rated as both appropriate and feasible for measuring blood pressure levels and treatment.

Conclusion: The authors have identified a set of evidence-based quality indicators for hypertension management in South Africa, which, if applied, would improve the quality of care for people with hypertension. The method used provides a foundation for the future development of quality indicators for managing other non-communicable diseases at the PHC level in South Africa and across Africa. The next ongoing step is testing the implementation of these indicators at PHC facilities in the Vhembe District of Limpopo Province.

A review of adherence to guidelines in the management of antipsychotic-induced weight gain in patients with severe mental disorders at a tertiary teaching hospital using the utilisation of olanzapine tablets as a proxy.

Grace Owusu Aboagye[1], Daisy Naa Lamley Lamptey[1], Desmond Kwakye[2], Josephine Mensah[2], Angela Ofori Atta[5], Justice Kwesi Baah[3], Delali Fiagbe[5], Berko Panyin Anto[4], Daniel Freeman Owusu Ansah[2]

[1]Korle Bu Teaching Hospital, Accra, Ghana

[2]Pharmacy Directorate, University of Ghana Medical Centre, Accra, Ghana

[3]Medical and Scientific Research Center, University of Ghana Medical Centre, Accra, Ghana

[4]Department Of Pharmacy Practice, Faculty of Pharmacy and Pharmaceutical Sciences, Kwame Nkrumah University of Science and Technology, Accra, Ghana

[5]Department of Psychiatry, University of Ghana Medical School, Accra, Ghana

Introduction: Severe Mental health disorders (SMD) are progressively becoming a major burden worldwide and are associated with increased healthcare costs and low productivity for both patients and carers. Antipsychotics have been used for decades in effectively managing SMD. However, their use exposes patients to the likelihood of developing poor physical health on account of their propensity to cause metabolic effects such as weight gain, new-onset diabetes and dyslipidaemia.

Aim: To evaluate the level of adherence by prescribers to the guideline recommendations on the management of antipsychotic-induced weight gain using olanzapine as a proxy in a tertiary psychiatric setting.

Methods: A retrospective observational study design was employed. Medical records of all new and antipsychotic naïve patients seen at the Department of Psychiatry over the study period (17 months) who were prescribed and taking olanzapine tablets were selected for review. The data collected was analysed using STATA version 17 and presented as descriptive statistics.

Results: Prescribers adhered to the guidelines in managing olanzapine-induced weight gain in 10% (n=6) of patients out of the 30.3% (n=57) who gained significant weight; education on lifestyle modification (n=3), switching from olanzapine to an antipsychotic with less propensity to cause weight gain (n=2), offering patients cognitive behavioural therapy (CBT) for weight loss (n=0), and or augmenting olanzapine therapy with metformin tablets (n= 1). Approximately 1 in 5 patients (21,8%) of patients initiated on olanzapine was inappropriate based on their risk assessment. Prompt intervention was offered to 2 patients who gained significant weight post-initiation on olanzapine tablets.

Conclusion: Inadequate management of antipsychotic-induced weight gain was evident. The findings were tabled at a multidisciplinary meeting. Optimisation of the management of antipsychotic-induced weight gain is essential for improved adherence and patient outcomes.

A survey of the delivery of clinical services in independent community pharmacies in South Africa

Tahir Ismail[1], Ane Orchard[2], Muhammed Vally[3], Razeeya Khan[4]

[1]University of the Witwatersrand Department of Pharmacy and Pharmacology, Johannesburg, South Africa

[2]University of the Witwatersrand Department of Pharmacy and Pharmacology, Johannesburg, South Africa

[3]University of the Witwatersrand Department of Pharmacy, Johannesburg, South Africa

[4]University of the Witwatersrand Department of Pharmacy, Johannesburg, South Africa

Introduction: The community pharmacists' role has evolved from traditional medicine dispensing to patient-centred service provision. Community pharmacy clinical service provision is integral to public health intervention and contributes to universal health coverage. The extent of clinical services offered in community pharmacies in South Africa has yet to be studied. Assessing the extent of clinical service provision in community pharmacies provides insight into the willingness of South African pharmacists to deliver these services.

Aim: This study aimed to identify the clinical services offered in independent community pharmacies in South Africa and the extent to which these services are available. In addition, the willingness to provide clinical services and the barriers to service provision were also assessed.

Method: A quantitative, cross-sectional exploratory research design was used. Responsible pharmacists of the Independent Community Pharmacy Association member pharmacies were invited to participate in an anonymous electronic REDCap© survey from September 2022 to March 2023. Data was exported to Microsoft Excel® and analysed using descriptive statistics.

Results: Of the 156 responses received, most were located in urban areas (70%) and based in Gauteng (34.8%). The most frequently delivered clinical services were diabetes screening (88.9%), blood pressure measurement (80.8%) and Influenza vaccination (78.9%). Clinical services were primarily delivered by a pharmacist (39.5%), with most pharmacists (94.7%) willing to implement additional clinical services. However, lack of time and remunerations for services (57.1%) were identified as barriers to implementation. Most pharmacists also expressed an interest in additional training to improve clinical skills.

Conclusion: This study revealed the extent of clinical service delivery in independent community pharmacies in South Africa. Although community pharmacists are willing to provide clinical services, significant barriers limit these interventions. This study also informs service providers of training programmes that need to be developed to meet the specific needs of independent community pharmacists. Further research must address how the barriers identified may be mitigated to facilitate clinical service implementation in community pharmacies.

Pharmacy websites in South Africa: Outlining the roles of key stakeholders

Deanne Johnston, Divishka Balraj, Nomvelo Mntambo, Kuyabonelelwa Lembede, Menelisi Madikane, Della Reece Daniel

Discipline of Pharmaceutical Sciences, Faculty of Health Sciences, University of KwaZulu-Natal, Durban, South Africa

Introduction: The online sale of medicine has increased exponentially since the 1990's. Consumers have often opted for the convenience of purchasing medicine at the click of a button without walking into a pharmacy or interacting face-to-face with pharmacy personnel. Around the world, red flags have been raised, and there is growing concern regarding the regulation of the online sale of medicine and the potential for selling counterfeit, falsified, and/or inappropriate medicines. In South Africa, the South African Health Products Regulatory Authority regulates the sale of medicines. A website selling medicine must be operated by a community or hospital pharmacy and comply with the minimum standards outlined in Good Pharmacy Practice. This study aimed to review websites selling medicines to the South African market. From these results, the key roles of stakeholders in safeguarding the online sale of medicines were outlined.

Method: A quantitative descriptive approach was employed to determine which medicines were sold online and if these websites complied with the minimum standards for pharmacies operating websites. A purposeful report form was designed, and information was captured using Microsoft Forms and descriptively analysed using Microsoft Excel. An ethics waiver was obtained from the Biomedical Research Ethics Committee of the University of Kwa-Zulu Natal (Ethics Number: 00022221), as all information used was public.

Results: Twenty-five websites selling medicines in South Africa were reviewed. Although registered community pharmacies operated 92% (n=23), compliance with the minimum standard was poor, where only a few provided the name of the responsible pharmacist (n=10) and the pharmacy's Y number (n=5). Just less than half the websites (n=11) had an online shop. Four websites sold only non-scheduled medicines, seven websites sold schedule 1 and 2 medicines, and only one sold schedule 3-6 medicines. The remaining three websites, although claiming to be a pharmacy, could not be linked to registered pharmacies and were termed "*illegitimate sites*". They also permitted the purchase of Schedule 3 and above medicine without a prescription, which is illegal in South Africa.

Four stakeholder groups were identified, and their key roles were outlined. 1) Regulatory authorities: Enforce legislation and encourage reporting of non-compliant websites; 2) Owners of the pharmacy websites: Comply with legislation and advertise that they are legitimate websites; 3) Healthcare professionals: Understand the legislative framework and educate the public; 4) Consumers: Through educational programmes, consumers should be empowered to be responsible for the medicines they take, use legitimate websites, and report websites and medicines they are unsure of.

Conclusion: The study described websites selling medicines in South Africa, identified four stakeholder groups and explained their roles. Future stakeholder engagement could further unpack and elucidate their responsibilities in safeguarding the online sale of medicines and the operation of pharmacy websites.

Factors associated with poor adherence to Anti-Tuberculosis in patients attending at a public primary healthcare facility in South Africa

Lucky Norah Katende-kyenda

Faculty of Medicine and Pharmacology, Walter Sisulu University, Mthatha, South Africa

Background: Tuberculosis (TB) is an infectious bacterial disease caused by Mycobacterium tuberculosis, transmitted between humans through the respiratory route, like speaking, coughing, and sneezing. Only around 10% of those infected with Mycobacterium tuberculosis develop active TB disease during their lifetime; the rest of those infected successfully contain their infection. Tuberculosis remains a significant public health problem in South Africa. As with most African countries, the directly observed therapy short course strategy is the mainstay of TB control in South Africa. Despite such measures, levels of non-adherence to anti-TB treatment are of concern.

Aim: The study aimed to determine factors contributing to poor adherence to anti-TB treatment in patients attending a primary public healthcare facility in South Africa.

Method: The study was conducted using a cross-sectional study to determine the prevalence of poor adherence in 65 patients ≥18 years on anti-TB treatment and the factors contributing to the poor adherence from September 2022 to June 2023. Data were collected using a semi-structured questionnaire and patient charts. Data were analysed using SPSS and demographic variables of interest like gender, age, marital status, level of education, monthly income, and HIV status. Other factors analysed were waiting periods, comorbidities, and geographic area, which were analysed to draw conclusions based on these factors.

Results: Of the 65 patients interviewed, 63% were males and 37% females, with age range 26-35 years having the highest number of patients with 40%, singles accounted for 82%, while 18% were married, 82% had a higher educational level, 46% were HIV-positive while 54% were HIV-negative, 54% received income of < R1000 per month and 47% had waiting period of 1–2 hours at the clinic. The total number of adherent patients accounted for 69%, while 31% were non-adherent. Of these (N=30), males were adherent, while (N=11) were not. For age range 26-35 years, (N=10) were adherent, while (N=4) were not. For marital status, (N=38) singles were adherent while (N=15) were not; for educational level, (N=16) finished high school, (N=40) were adherent while (N=13) were not; for HIV status, (N=19) were adherent while (N=11) were not. For monthly income, (N=22) were adherent, while (N=13) were not. Of patients who had a long waiting period (N= 26) were adherent while (N=5) did not.

Conclusion: The study revealed a relatively moderate non-adherence rate among patients on anti-TB treatment. Level of education, socio-economic status, adverse effects, HIV co-infection and waiting period at the health care facility were factors associated with anti-TB treatment non-adherence. Although the waiting period at the facility was less likely to contribute to non-adherence, according to the study's findings, it cannot be completely ruled out. Given the factors associated with non-adherence in this study, a comprehensive treatment programme using a patient-centred model should be indicated for TB patients attending public healthcare clinics in South Africa.

Toward a framework for oncology pharmacy guidelines in South Africa

Razeeya Khan[1], Muhammed Vally[2], Ane Orchard[3]

[1]*University of the Witwatersrand Department of Pharmacy and Pharmacology, Johannesburg, South Africa*

[2]*University of the Witwatersrand Department of Pharmacy and Pharmacology, Johannesburg, South Africa*

[3]*University of the Witwatersrand Department of Pharmacy and Pharmacology, Johannesburg, South Africa*

Introduction: Oncology pharmacy practice has evolved worldwide, with pharmacists recognised as indispensable oncology healthcare team members. In 1996, the Board of Pharmaceutical Specialties in the USA approved oncology pharmacy as a speciality with the Board Certified Oncology Pharmacist (BCOP) certification. The unique and expert competencies required of an oncology pharmacist were recognised. Globally, pharmacists are guided by expert practice guidelines, standards and recommendations that serve as a framework within which they practice. There is no endorsed guideline for oncology pharmacy practice in South Africa.

Objective: To provide direction for the development of a set of standards for South African oncology pharmacy practice concerning international standards

Design and method: A descriptive, comparative, cross-sectional thematic analysis of international guidelines was undertaken to determine the priority areas for oncology pharmacy practice. Priority areas were highlighted and assimilated. The minimum standards in the Good Pharmacy Practice Guidelines were then compared to the priority areas established from the international guidelines. Endorsed standards of practice and guidelines from North America, Europe, Australia, the United Kingdom and Africa were compared and tabulated. The documents were retrieved from organisational websites or via Google Scholar.

Results: A comparative study of local and international guidelines and the priority areas for oncology pharmacy practice were extracted. Key standards were compared between each guideline to identify gaps related to the minimum standards of practice as endorsed in the Good

Pharmacy Practice guidelines of South Africa. The key focus areas compared included management, education and training, logistics, preparation and administration of chemotherapy, waste management and patient counselling. The findings may assist in formulating an all-encompassing live framework for adaptation in the Southern African region.

Conclusion: Several shortcomings in the local guidelines applicable to pharmacists practising oncology pharmacy in South Africa were noted. While it might be contemplated that international guidelines could be adapted locally, a region-specific guideline that speaks to the needs of the local pharmacy fraternity and population in line with regional policies, resources and regulatory processes is necessary. Harmonisation of practice requirements across the Southern African region is ideal.

The knowledge, attitudes and perceptions of pharmacists and prescribers in relation to electronic prescribing: A descriptive, mixed-methods study

Rubina Perveen Shaikh[1], Paula Barnard-Ashton[2], David Bayever[1], Lisa du Toit[1]

[1]University Of Witwatersrand, Johannesburg Central Rand, South Africa

[2]School of Therapeutic Sciences, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

Introduction: Recent technologies have significantly impacted healthcare delivery, with electronic prescribing (e-prescribing) emerging as a pivotal tool in pharmacy practice. E-prescribing facilitates the accurate and efficient transfer of prescriptions between prescribers and pharmacists through secure, digital means, potentially mitigating many challenges associated with handwritten prescriptions. However, the adoption and utilisation of e-prescribing systems amongst prescribers and pharmacists can be influenced by their knowledge, attitudes, and perceptions. The aim of this study was thus to explore the knowledge, attitudes, and perceptions of practising prescribers and pharmacists regarding e-prescribing and, further, to identify potential barriers and facilitators that impact the implementation of e-prescribing.

Method: This study employed a mixed methods study design using survey methodology to gauge the knowledge, attitudes and perceptions of pharmacists and prescribers. Two cohort-specific questionnaires were designed, pre-validated, and shared with participants in an online format (Google Forms). The convenience sampling method was used to recruit pharmacists and prescribers (i.e. medical doctors and dentists) who practice in the private healthcare sector of Gauteng Province, South Africa. The cross-sectional, self-administered survey included four tiers: a) demographic information, b) current dispensing/prescribing practices, c) knowledge of e-prescribing and d) attitudes and perception of e-prescribing. The survey's questions collected quantitative (close-ended responses and Likert scale ratings) and qualitative (open-ended responses) data. Domain scores for knowledge, attitudes and perceptions (with subdivision domains: perceived usefulness, improvement to practice, ease of use and fitness) were determined. Quantitative data was descriptively analysed using Statistica® software and presented as means, frequencies and percentages, while qualitative data was analysed using Braun and Clark's thematic analysis approach. A t-test was used to determine significant differences between the sums of the scores between the two cohorts.

Results: v191 (prescribers) and 386 (pharmacists) responses were collected. The average participant age was 38.54 (±13.53) years and 38.56 (±13.24) years for pharmacists and prescriber cohorts, respectively. Both pharmacist and prescriber cohorts were majority female participants (280 (72.54%) and 103 (54.50%) respectively). Pharmacists achieved a mean knowledge score of 36.1±7.9 (max=55); whilst prescribers achieved a lower mean knowledge score of 16.3±14.4 (max=35). The pharmacist cohort achieved a statistically higher knowledge score than the prescriber cohort ($p < 0.001$). Both pharmacist and prescriber cohorts demonstrated positive perceptions of e-prescribing, particularly relating to the usefulness of e-prescribing (54.71±9.1 (max=70) and 40.09±6.3 (max=50), respectively). Pharmacists and prescribers were both concerned about ease of use (33.8±5.0) (max=50) and 64.11±12.43 (max=90), respectively). Qualitative data revealed the following main themes: 1) Implications for Practice; 2) Clinical support tools; 3). Regulations relating to security and patient safety; 4) Ease of use and functionality; and 5) Infrastructure and maintenance.

Conclusion: This study demonstrated positive perceptions among pharmacists and prescribers regarding e-prescribing and highlighted "moderate" knowledge, with an overall "positive" perception of e-prescribing among the participants. While the findings of this research reflect a promising future for e-prescribing in South Africa, ongoing training and infrastructure development efforts are imperative to ensure the successful implementation of e-prescribing in practice.

Registration-related barriers and challenges experienced by primary care drug therapy pharmacists in South Africa

Busi Tshabalala, Daniel Kruger, Selente Bezuidenhout

Sefako Makgatho University, Boksburg, South Africa

Introduction: Over recent years, prescriptions have extended from traditional prescriptions by doctors to prescriptions by

other healthcare workers such as nurses and pharmacists. In South Africa (SA) pharmacist prescribing became a reality in 2011 when it was legally approved that a pharmacist who completed the Primary Care Drug Therapy (PCDT) supplementary course and obtained a Section 22A (15) permit can register the permit and practice. Although they may diagnose and prescribe, their scope of practice is predetermined and limited to specific conditions and treatment options. However, the registration process has been cumbersome and slow for many, which may be a barrier to the growing force of PCDT pharmacists in SA.

Purpose: The study aimed to determine the registration-related barriers and practice-related challenges experienced by PCDT pharmacists in SA.

Method: A descriptive quantitative study design was followed using an online self-administered questionnaire consisting of three sections: demographics, registration phases, and challenges of practising participants. The researcher designed this questionnaire with input from supervisors and relevant resources. The target population included all 464 pharmacists who registered their PCDT supplementary course with the South African Pharmacy Council; 200 participated. The data were analysed descriptively. Ethical clearance was obtained from SMUREC (SMUREC/P/250/2022:PG).

Results: The response rate was 43.1% (200/464), consisting of 116 (58%) women and 84 (42%) men, with the majority, 174 (87%), working in the private sector. Most 169(84.5%) of the participants had previously applied for a section 22A (15) permit, and 89.3% (151/169) received their permits. Nearly all (99.3%) participants who received their permits recorded the permits with SAPC. Two-thirds, 67.5% (102/151), of participants with permits were providing PCDT services, while only a few participants (12.6% (19/151) were practising as locum pharmacists. The majority, 82.8% (140/169) of the participants, experienced barriers during the section 22A (15) application process, of which lengthy process 29% and National Department of Health (NDoH) related issues (28.4%) were the most prevalent. Challenges in practice are related to patients' affordability, major difficulties when claiming from medical schemes, limited PCDT-specified conditions, and outdated Standard Treatment Guidelines (STG) and Essential Medicines List (EML).

Conclusion: According to the SAPC, there were 469 qualified PCDT pharmacists, but only 168 had permits to practice (SAPC, 2022). This study included a large representation of 89.9% (151) of the full number (168) of PCDT pharmacists with permits. Therefore, the results of this study can almost be seen as a full representation of the barriers and challenges relating to PCDT. The results of this study indicate major barriers during the registration process and challenges when practising. PCDT pharmacists can play a complementary role by increasing access to health care services; therefore, more effective and efficient processes are required from all relevant stakeholders to ensure the future of PCDT pharmacists in SA. The study used a questionnaire, which could have limited the interpretation of the study findings as the authors relied on the information the respondents provided.

French community pharmacists' attitudes towards a branded, non-medicated, over-the-counter cold therapy for the topical relief of pain, in comparison with NSAIDs

Franciele Alves, Kate Angier, Adrian Shephard

Reckitt PLC, Slough, United Kingdom

Introduction: Body pain affects 1.7 billion people worldwide and is the predominant pain type, affecting 80% of patients once yearly. Pain management comprises a significant proportion of community pharmacists' time advising patients on appropriate treatment. In France, over-the-counter (OTC) pain management recommendations broadly comprise medicated forms (such as non-steroidal anti-inflammatory drugs [NSAIDs] and paracetamol) and non-medicated forms (such as natural products, heat and cold therapies). Given the growing consumer interest in OTC, non-medicated options, it is important to understand pharmacists' attitudes and perceptions of this treatment sector.

Method: The aim was to evaluate the perception of efficacy and safety of a branded, non-medicated, OTC cold therapy or cryotherapy to relieve muscular pain or strain among French community pharmacists. Web-based quantitative and qualitative interviews with French community pharmacists (n=70) were conducted by consumer insights firm Zappi using its 'Ask Anything' methodology on December 22 -23rd, 2022. Pharmacists who never or rarely (defined as 1–5 customers per week) treated patients in pain with OTC medicines were excluded from the survey. Respondents were asked to record on a 5-point scale their agreement with statements on brand attributes, including efficacy and safety, for both a branded, non-medicated, OTC cold therapy and a branded topical NSAID product (agree strongly, agree slightly, disagree slightly, disagree strongly to don't know/ never heard of). The likelihood of pharmacists recommending a branded, non-medicated, OTC cold therapy or a branded topical NSAID product to patients was recorded on a 4-point scale (recommend, would not recommend, do not stock, never heard of brand).

Results: Of the participants, 67% worked in an independent pharmacy, 26% in a small chain/network pharmacy and 7% in a large chain pharmacy. Nearly all agreed that "some patients want natural or unmedicated treatments" (97%), and 89% believed these options would become more important in future. The majority of pharmacists aware of the branded, non-medicated, OTC cold therapy/cryotherapy believed it was safe to use regularly (85% vs. 69% for a branded topical NSAID), provided effective pain relief for early body pains

(87% vs. 94%), provided long-lasting relief of muscular pain and inflammation (77% vs. 91%), soothed and eased muscular discomfort faster than other products (76% vs. 87%), was natural and a non-medicated, scientifically-proven therapy (73% vs. 44%), provided the best combination of speed and duration (71% vs. 80%) and was convenient to use (89% vs. 94%). Overall, 69% of French community pharmacists would recommend the branded, non-medicated, OTC cold therapy vs. 81% who would recommend a branded topical NSAID for muscular strain or pain.

Conclusion: Most French community pharmacists recognise patients' growing demand and importance of non-medicated treatments. They had a favourable perception of a non-medicated OTC cold therapy brand for the topical management of muscular strain and pain. They would recommend it based on efficacy, safety and convenience.

Portuguese Pharmacies' White Book – Translating priority areas into real-world impact

Manuel Talhinhas, Liliane Pinheiro, Mariana Medeiros, Ana Rodrigues, Nuno Cardoso, Mrs Ema Paulino

ANF - National Association of Pharmacies, Lisbon, Portugal

Introduction: The Portuguese Pharmacies' White Book aims to be a crucial part of the ongoing development of pharmacies in Portugal, projecting the future of the sector and its action in the healthcare context based on a collective co-creation process. The White Book has a framework reflected in dimensions and development axes that result in different priority areas and proposals for action. The White Book is a living document and will be a never-ending tool. Its priority areas and proposals for action hold great potential for real-world impact but require ongoing development to bridge the gap between theory and practice. It is now essential to move towards the implementation, translating the White Book's strategies into tangible results and turning its vision into reality through decisive action.

Methods: The process of translating the White Book into action started with a public event with several political parties in the Portuguese Parliament to showcase the action proposals that allow to achieve a greater potential for intervention of pharmacies in the people's health journey through collaborative models with the National Health Service and other partners, the provision of proximity health care, the promotion of territorial cohesion and the sustainability of the sector. After its publication, the White Book was presented at several meetings, hearings, and events to discuss its proposals and reach agreements. A web app was also developed to inform pharmacies and society about the progress made in implementing the various proposals for action.

Results: Through all the actions developed to promote the White Book and its proposals for action, achieving some of the objectives was possible.

Priority Area 1 "Prevention and Screening of Viral Hepatitis and HIV"

Conclusion of the Proposal for Action: "Dispensing of HIV pre-exposure prophylaxis (PrEP) in community pharmacies"

Priority Area 3 "Vaccination in complementarity with the NHS"

Conclusion of the Proposal for Action: "Definitive regulatory amendment to the current law, allowing free access to seasonal vaccination in pharmacies, under the same conditions of access as in the SNS network"

Priority Area 11: "Renewal of Chronic Therapy"

Conclusion of the Proposal for Action: "Development of the pharmaceutical service for the replacement of chronic therapy, which consists of the activation of prescription lines by the physician, with a pre-established period, allowing the pharmacist to dispense medicines prescribed for chronic diseases continuously"

Priority Area 14: "Hospital-Only Medicine dispensing in Community Pharmacies"

Conclusion of the Proposal for Action: "Implementation of dispensing hospital medicines in community pharmacies through a sustainable and nationwide model"

Conclusions: The Portuguese Pharmacies' White Book is a continuously evolving resource, ensuring pharmacies and patients benefit from its advancements for years. Building on the success of the proposals of action accomplished, the Portuguese pharmacy sector remains committed to evolving and elevating pharmacy practice through this ongoing project.

Remote monitoring in the management of heart failure

Elena Mirone[1], Francesca Wirth[1], Christina Grima[2], Jeremy Fleri Soler[2], Mark A. Sammut[2], Robert G. Xuereb[2], Lilian M. Azzopardi[1]

[1]Department of Pharmacy, Faculty of Medicine and Surgery, University of Malta, Msida, Malta, Msida, Malta

[2]Department of Cardiology, Mater Dei Hospital, Msida, Malta, Msida, Malta

Background: Remote monitoring (RM) is increasingly being integrated into the management of heart failure (HF) patients with cardiac implantable electronic devices (CIEDs).

Purpose: The aim was to assess the contribution of pulmonary fluid status RM in HF patients.

Method: The study was conducted at Malta's main acute general hospital. After ethics approval, all patients (January 2015-December 2021) diagnosed with HF and with a CIED incorporating a pulmonary fluid status monitoring feature (OptiVol™ 2.0), which tracks intrathoracic impedance changes over time and has the possibility of being monitored remotely, were included in the study. An expert panel developed and validated a data collection sheet. Outcomes were assessed over one-year post-CIED implantation using hospital records.

Results: From the cohort of 45 patients assessed (35 male, 37 aged ≥61 years, mean left ventricular ejection fraction 29%, 23 classified as New York Heart Association Class II), the most common comorbidities were hypertension (n=37), dyslipidaemia (n=23), diabetes (n=22) and coronary artery disease (n=18). Pharmacotherapy for heart failure included beta-blockers (n=39), loop diuretics (n=25), angiotensin-converting enzyme inhibitors (n=24), mineralocorticoid receptor antagonists (n=22), angiotensin II receptor blockers (n=6), ivabradine (n=6), empagliflozin (n=3), sacubitril/valsartan (n=3), and digoxin (n=1).

Twenty-one patients had the RM feature switched on. Alerts were recorded in 19 of these patients, which led to no action deemed necessary (n=12) or action taken (n=7) by a cardiologist. Actions taken were an increase in the diuretic dose (n=5), hospital admission (n=3), limited fluid intake (n=1), and/or an increase in the dose of the disease-modifying drug (n=1).

Conclusions: Pulmonary fluid status RM helped assess congestion and identified patients requiring therapy optimisation in the outpatient setting or hospital admission. More than half the patients opted to have RM switched off, indicating a need for more patient awareness of the benefits of RM. It is recommended to explore reasons for patients preferring to have RM switched off. Since data was collected from hospital records, patients who opted to have RM switched off were not interviewed to identify reasons. Possible reasons for apprehension towards RM reported in the literature include anxiety due to alarms, feeling intimidated by the technology involved in RM systems, worry about the ability to understand or use the system effectively, concerns about privacy and security of health information transmitted through RM systems and some patients prefer face-to-face consultations with clinicians.

Identification and management of drug-related problems among hypertensive inpatients in Ghana

Ivan Eduku Mozu, Afia Frimpomaa Asare Marfo, Pauline Boachie-Ansah, Janet Ameyaw, Mercy Opare-Addo, Joseph Attakorah, Kofi Boamah

Department of Pharmacy Practice, Faculty of Pharmacy and Pharmaceutical Science, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Background: Cardiovascular disease-related death is on the rise, and hypertension stands out as its most crucial risk factor. Globally, only one in five persons with hypertension have it under control. In sub-Saharan Africa, the prevalence of hypertension is highest, worsening the situation. Drug therapy problems contribute to these deaths. While outpatient studies on drug-related problems among patients with hypertension are common, research on hypertensive inpatients is limited.

Purpose: To identify drug-related problems in hospitalised hypertensive patients and assess the rate of acceptance of pharmacist-led interventions.

Method: This was a prospective study in four different Ghanaian hospitals among hypertensive inpatients. Patients' hypertension management was assessed by clinical pharmacists for appropriateness and effectiveness. Efficiency was based on the adequacy of blood pressure control. Any drug-related problems identified were documented, and interventions were offered. Patients' knowledge of their drug therapy was also assessed. The European Society of Cardiology classification categorised blood pressure readings. The Pharmaceutical Care Network Europe V9.1 classification system for drug-related problems was used to group identified drug-related problems. Patients' knowledge of their drug therapy was assessed by asking them questions about the drug's name, dose, side effects, and precautionary measures. They were then graded based on the number of questions they answered, from excellent to unsatisfactory. The proportions of proposed interventions were expressed and calculated.

Results: Two hundred and sixty patients were involved in this study. A total of 131 drug-related problems were identified. Most (181, 69.5%) patients had at least one drug-related problem. The most common drug-related problems were the need for counselling (39, 29.8%), non-adherence (17, 13%), incomplete drug treatment (17, 13%), improper dosage (14, 10.7%), adverse drug reactions (11, 8.4%) and contraindications (8, 6.1%). Out of 244 comorbidities, diabetes 76 (31.4%) was the commonest. A total of 84 interventions were proposed. The largest proportion (41, 48.8%) of interventions were implemented at the patient level, 30 (35.7%) at the physician level,4 (4.8%) involving nurses and 9 (10.7%) in other aspects, including monitoring.

Out of the interventions, 53 (63.1%) were accepted, 2 (2.4%) were rejected, and 29 (34.5%) others received no feedback. The majority (140, 53.8%) of patients know their medications well.

Conclusion: The management of hypertension is complex, involving multiple medications and the potential for drug-related problems. Results from this study demonstrate that the significant presence of drug-related problems among hypertensive inpatients hinders the achievement of target blood pressure levels. Pharmacist-led interventions demonstrate their effectiveness in reducing drug-related problems and improving patient outcomes and are likely to be successfully implemented. There is a need for collaborative efforts in hypertension management, especially among hospitalised individuals.

Pharmacists reducing hypertension health disparities with remote patient monitoring

Magaly Rodriguez de Bittner, Olufunke Sokan, Folasade Osotimehin, Byron Ma, Hyunuk Seung, Charmaine Rochester-Eyeguokan, Urooba Ali

University of Maryland, School of Pharmacy, Baltimore, United States

Introduction: Hypertension is a major risk factor for cardiovascular disease (CVD).1-3 Pharmacists are trained to address barriers that result in uncontrolled blood pressure (BP), including medication non-adherence, lifestyle, limited access to care, and low health literacy.4-5 To improve blood pressure management, remote patient monitoring (RPM) technology has emerged as a promising solution compared to traditional episodic care.6 However, the extent of RPM's impact on hypertension management by pharmacists is still largely unknown. The PreventionLink programme, a 5-year initiative funded by the Center for Disease Control (CDC), was established to address CVD in Southern Maryland. The programme enlisted the University of Maryland School of Pharmacy's Center for Innovative Pharmacy Solution (CIPS) to deliver comprehensive medication management incorporating RPM for blood pressure management.

Purpose: This study aims to evaluate the effectiveness of a Pharmacist's Comprehensive Management Programme for patients with hypertension, multiple comorbidities, and health disparities, utilising remote patient monitoring.

Method: Seventy-four (74) patients with high blood pressure (>140/90 mmHg) were referred and remotely enrolled in a pharmacist-led RPM programme from April 2023 to September 2023 after a baseline BP reading was recorded during an in-person clinic visit with their primary care provider (PCP).

Patients were given wireless BP devices and instructed to measure their BP at least four times weekly at home. The pharmacist conducted a medication review at enrollment, educated patients on lifestyle management and accurate hypertension measurement, and monitored them throughout the study. The pharmacist communicated with healthcare providers to initiate therapy changes if required. Descriptive statistics analysed the characteristics of the study population. An analysis of variance compared the mean blood pressure levels across three RPM durations, while a linear mixed model examined blood pressure changes during the RPM period.

Results: The study included 66% females, with 80% of patients over 50 years. At the endpoint, 45% achieved the BP goal of <140/90mmHg. Follow-up durations varied: 34% for 6+ months, 35% of patients for >3 months, and 31% for >1 month. The mean BPs were 132/79 mmHg (6+ months), 139/83 mmHg (3-5 months), and 141/85 mmHg (1-2 months). A significant difference in mean DBP was found between RPM durations of 1-2 months and 6 months or more (p = 0.04). There were no significant BP changes during the RPM period. Only 20% of patients adhered to the BP monitoring schedule.

Conclusion: The low adoption of telemonitoring suggests that RPM may only be suitable for some. While longer pharmacist follow-ups showed a trend toward improved blood pressure, no statistically significant difference was observed. Larger sample sizes may be required for significance.

Disposal practices of unused and expired antimicrobials: The case of households in Ho, Ghana

Thelma Aku[1], Lawrencia Atsu[1], David Oteng[1], Araba Hutton-Nyameaye[1], Isaac Folitse[2], Samuel Somuah[1], Georgina Gyamfi[2]

[1]Department of Pharmacy Practice, University of Health and Allied Sciences, Ho, Ghana

[2]Ho Teaching Hospital, Ho, Ghana

Introduction: The presence of unused medicines, especially antimicrobials, in homes poses a great danger to the health of households, with children being the most affected. The improper disposal of these antimicrobials threatens the environment and contributes to antimicrobial resistance.

Proper disposal of unused antimicrobials is vital to safeguarding the environment and, most importantly, mitigating against antimicrobial resistance.

At present there is no known information on the practices in the disposal of antimicrobials in Households within Ho municipality. This study aimed to evaluate the practices for disposing of unused, leftover and expired antimicrobials among households in Ho Municipality.

Method: The study employed a cross-sectional design to collect data from Households in the Ho municipality over two weeks. Each survey consisted of statements and questions on the knowledge and practices in the disposal of unused and expired antimicrobials, which were administered to participants. The practices section consisted of methods of disposal and take-back medicine programme.

The data generated was evaluated and analysed using SPSS Version 26.

Results: A total of 310 participants completed the study. Most households were males (56.45%), with an overriding number (65.14%) possessing a Tertiary Education. A greater number of participants (87.42%) agreed that failing to complete antimicrobials could lead to resistance, similar to those (87.10%) who also agreed that improper disposal of unused antimicrobials could affect the environment, including aquatic life. A vast number (76.13%) responded that they had disposed of unused antimicrobials, and more than half (60%) disposed of these medicines into household trash. A significant number (92%) were willing to participate in a medicine take-back programme, with a little over half (51%) choosing the point of medicine return to be the community pharmacy.

Conclusion: The households disposed of their unused antimicrobials in household trash. Most participants preferred community pharmacy as the destination for the return of unused, leftover or expired antimicrobials. An awareness creation and sensitisation of an antimicrobial take-back programme could help minimise the disposal of unused antimicrobials into household trash that ends up in the environment and thus aid in the fight against antimicrobial resistance.

Virtual pharmacist interventions on abuse of over-the-counter medications during COVID-19 versus traditional pharmacist interventions

Nadia Al Mazrouei

University Of Sharjah/ President Of EMR Forum, Abu Dhabi, United Arab Emirates

Objectives: This study investigated the frequency, nature, and clinical significance of pharmacist interventions on over-the-counter (OTC) medicines with abuse potential across community pharmacies with and without virtual care.

Methods: In this prospective observational study, a trained research team observed the dispensary teams of 12 community pharmacies in the United Arab Emirates (UAE), 6 of which we're operating virtual pharmacy care. A standardised data collection form was used to include information about dispensing OTC medicines and pharmacist interventions on those with abuse/misuse potential. A multidisciplinary committee evaluated the clinical significance of the interventions.

Results: The frequency of pharmacist interventions on OTC medicines with abuse potential across pharmacies with and without virtual services was 83.2% versus 91.0%, respectively, whereas the frequency of pharmacist interventions on OTC medicines with misuse potential across pharmacies with and without virtual services was 79.8% versus 41.2%, respectively. The proportions of clinically significant interventions across pharmacies with and without virtual services were 19.7% versus 10.5%. Cough medicines were dispensed significantly more across pharmacies with virtual care than those without virtual care (25.6% vs. 9.7%, respectively; P ¼ 0.04). Asking the patient to seek the advice of an addiction specialist (adjusted odds ratio ¼4.11; P ¼ 0.001) versus refusing to sell the drug was more likely to be associated with pharmacies with virtual services than with pharmacies operating traditional pharmacy services.

Conclusion: Virtual pharmaceutical care is a potential approach to reducing the abuse/misuse of OTC medicines, but it needs some improvements regarding detecting these cases. The UAE is the first country in the region to implement and regulate virtual pharmacy practice.

Cost-effectiveness of virtual anticoagulant clinics in specialised Cardiac Center

Monirah Albabtain, Zaid alanazi, nawaf almutairi, Bashayer Alhussien, Latifa aldukkan, Abdulaziz altwaijiri

Prince Sultan Cardiac Center, Riyadh, Saudi Arabia

Background: A virtual clinic is a digital technology that permits remote and real-time interaction between doctors and patients through the telephone and other technological means for examination, diagnosis, and medical assessment. In Saudi Arabia, virtual clinics are delivered through several methods, including the Sehhaty mobile application. This approach effectively monitors patients with high risk to increase the quality and accessibility of healthcare with a reduced overall cost. In this study, the authors aim To compare the cost-effectiveness of virtual and conventional clinics among patients on VKA requiring INR monitoring.

Method: This chart review study was conducted between March 2020 and August 2021 at Prince Sultan Cardiac Center, Riyadh. Two hundred patients aged> 18 were prescribed vitamin K antagonists and had at least ten INR values in the in-person clinic, followed bya minimum of three INR values in the virtual clinic. Patient data were collected during in-person clinic appointments and used as the first group. In contrast, their data after implementing the virtual clinic during the

pandemic quarantine was used as the second group. The data were collected through patients' medical records, including their demographics, clinical outcomes, and all information related to cost, including the cost of medications, laboratory tests, medication shipping, and consultation. This data was transferred to a RedCap software sheet and used as input for an economic model to evaluate the cost-effectiveness of a virtual anticoagulant clinic (VAC) compared to standard care.

The incremental cost-effectiveness ratio was used to calculate the total costs and therapeutic effect differences. The bootstrapping method was performed to produce confidence intervals and cost-effectiveness quadrants.

Results: The study analysis shows that the average difference in the number of patients in target INR can be around 90□30.6 patients in 5 years, with an expected reduction in cost of 2,142,134.61□2,992,277. This results with an assumption that virtual clinics will maintain the same efficacy seen in the study for five years. Suppose the efficacy of the virtual study is not sustainable. In that case, the difference in the number of patients in target INR can be around 460□29.9 patients in 5 years, with the same cost reduction seen in the base case scenario.

Conclusion: These results show that telemedicine care is cost-effective in managing VKA patients requiring INR monitoring. Consequently, telemedicine care can be further expanded and incorporated into routine anticoagulant care.

Exploring the desirable attributes of clinical preceptors: A scoping review of the available instruments

Haneen Alrawashdeh[1], Banan Mukhalalati[1], Ahmed Awaisu[1], Ahsan Sethi[2]

[1]College of Pharmacy, QU Health, Qatar University, Doha, Qatar

[2]College of Health Sciences, QU Health, Qatar University, Doha, Qatar

Background: Experiential learning is an important component of most health professional education programmes because it allows students to apply what they have learnt in real life through practice before becoming licensed practitioners. Preceptors (i.e., clinical educators) play a vital role in developing students' professional practice skills and competencies and shaping their attitudes during clinical training rotations. Ensuring the quality and preparedness of the preceptors is considered a key aspect of students' experiential learning due to the important impact of the provided training on the quality of the student's experiential training experience. In the Gulf region, specifically in Qatar, there is a knowledge gap regarding the desired attributes of pharmacy preceptors, highlighting the opportunity to tailor the training and development of preceptors.

Purpose: This scoping review aims to identify the available tools in the literature to explore the desirable attributes of pharmacy preceptors as clinical educators.

Methods: A scoping review was designed to identify the relevant original research articles, which are published in the English language, utilising CINAHL, ERIC, ProQuest, and PubMed databases. The key concepts used were preceptorship, attributes, pharmacy, and tools. Quantitative and mixed-methods study designs were included. The articles included were summarised according to their design, setting, population, and outcomes. In addition, the validity of the instruments used in these studies was reported and summarised.

Results: Out of twenty-three articles that reached the full-text screening stage, only six studies were included in the review. The other articles were excluded because of one of the following reasons: different settings, different outcomes, and different study designs. All the tools identified by the pharmacy profession need modifications to help explore the desirable attributes of pharmacy preceptors as clinical educators. One of the studies included a framework that was too general to be used as an instrument. The other studies' tools included sections that are not applicable to all experiential rotation settings.

Conclusions: The results of this review demonstrated a lack of well-designed and validated tools in the pharmacy profession that can explore the desirable attributes of pharmacy preceptors as clinical educators. This necessitates further research to develop and validate a new appropriate tool to ultimately understand pharmacy preceptors' perceptions of these attributes.

Interprofessional collaboration between pharmacists and community health workers: a scoping review

Carole Bandiera[1], Sabuj Kanti Mistry[2,3], Elizabeth Harris[2], Mark Harris[2], Parisa Aslani[1]

[1]School of Pharmacy, University of Sydney, Sydney, New South Wales, Australia

[2]Centre for Primary Health Care and Equity, University of New South Wales, Sydney, New South Wales, Australia

[3]School of Population Health, University of New South Wales, Sydney, New South Wales, Australia

Introduction: Community health workers (CHWs), having specific knowledge of the culture, communication and history of the community, aim to bridge the gap between health services and the communities they serve. Most of the research and interventions involving CHWs have reported

that CHWs working with health professionals, such as physicians, nurses and social workers, effectively improve patients' health outcomes. However, little is known about the specific collaboration between CHWs and pharmacists.

This scoping review aimed to describe the interprofessional collaboration between CHWs and pharmacists as part of the interventions, programmes and models of care implemented globally and to describe the types of interventions they deliver.

Method: The English language scientific literature was published in seven databases, and the grey literature was searched without a restriction on the publication date. Inclusion criteria were that the research i) involves pharmacists and CHWs working collaboratively and ii) is an intervention, programme or model of care. One researcher screened and selected the article using the research software Covidence®, and two others screened 6% of articles (20/338) assessed for eligibility. After the discrepancies had been discussed, data from the selected articles were extracted using a customised template, and a narrative analysis was performed.

Results: The literature search was done in November 2023. Forty-nine studies met the inclusion criteria. Most studies (35 of 49, 71%) were conducted in the USA and were published in the last five years (53% after 2019). The study's main population included patients with hypertension or diabetes (22%). Studies reported that CHWs mainly collaborated with clinical pharmacists (49%), followed by community pharmacists (29%) and pharmacy technicians (8%). One-third of the studies (35%) comprehensively described the interprofessional collaboration between CHWs and pharmacists.

CHWs were reported to collaborate with community pharmacists in an intervention either by providing separate services (i.e., CHWs provided the intervention at the patients' home, facilitated the meeting of the patient with the pharmacists who would continue the intervention at the community pharmacy), or they delivered the intervention together (i.e., CHWs were embedded in the community pharmacy).

At hospital discharge, CHWs would help patients schedule the first follow-up appointments with the general practitioner, connect with the community pharmacy, or assist the community pharmacist in obtaining the patient's accurate medication list.

Within hospitals and ambulatory centres, CHWs met with the healthcare team, including the clinical pharmacist, to discuss patients' cases.

Mutual training was sometimes reported: CHWs trained pharmacists or pharmacists supervised CHWs. In four studies, pharmacy technicians were trained in an expanded role as CHWs.

Conclusion: The interprofessional collaboration between pharmacists and CHWs within interventions, programmes, and models of care exists globally but is still in its infancy. Their collaborations and specific roles are rarely well described in the scientific literature. However, research on this topic has raised more interest over the last 5 years. Further work should explore the impact of the interprofessional interventions between CHWs and pharmacists on patients' health outcomes.

The access to long-acting insulin glargine in public and private sector pharmacies in South Africa

Samirah Bayat[1], Fatima Suleman[2], Velisha Ann Perumal-Pillay[2]

[1]Discipline of Pharmaceutical Sciences, University of KwaZulu-Natal, Durban, South Africa

[2]School of Health Sciences, University of KwaZulu-Natal, Durban, South Africa

Background: In 2021, the World Health Organisation's Essential Medicines List (EML) was updated to include long-acting insulin analogues. Differences exist between this list and national EMLs since countries face varying challenges relating to costs, drug effectiveness, and rationality of prescribing.

Adding long-acting insulin to the 2020 edition of the South African Standard Treatment Guidelines (STG) and EML atthe primary Healthcare Level is fairly recent, with long-acting insulin reserved as a second-line treatment for uncontrolled Type 2 diabetes. Glargine was the only long-acting insulin in the National Department of Health's Master Health Product list.

Purpose: This study aimed to evaluate the current access to and pricing of glargine in both public and private healthcare sectors in South Africa and to identify the potential barriers to diabetic prevention and treatment from a pharmaceutical perspective. This study aimed to determine the availability, price and affordability of glargine in South Africa.

Method: This was a quantitative, descriptive, cross-sectional study conducted during March 2023 in South Africa. The internationally validated WHO/HAI tool was adapted to an online survey and utilised for data collection on the availability and prices of glargine in public and private sector pharmacies in South Africa. A total of 254 pharmacies consented to participate, above the required sample size of 234 for a 5% error, 95% confidence interval and an 80% response distribution. The price of insulin is the actual price paid by the patient or the government procurement price (GPP). The prices of glargine from a basket of countries were also collected to allow for an international price comparison. Availability was reported as the percentage of pharmacies in which glargine was found. Affordability was estimated using the daily wage of the lowest-paid unskilled government

worker (LPGW) by determining the number of days' wages required to purchase one month's supply of glargine.

Results: Responses from the private sector (75.99%) were almost three times higher than those of the public sector (24.01%). Respondents in the public sector claimed there was a low availability of glargine (29.41%), with the public hospital sector having only 8.7% availability. Whilst the public sector showed a low availability of glargine, the private sector showed a good to fairly high availability. Private sector community pharmacies had 77.23% of Optisulin. The results of this study show that glargine costs 2.98 days of an LPGW's wage for a month's supply. It also costs the government 49.73% more than regular insulin. Overall, insulin prices in South Africa were lower than in all other countries studied except Australia.

Conclusion: Whilst the older human insulins are considerably cheaper than newer analogue insulins and South Africa faces many cost constraints, other important variables in favour of including newer insulins, such as ease of use, long-term outcomes, and value, amongst other factors, should be considered when the Standard Treatment Guidelines (STG) is updated.

Evaluating the acceptability of pharmacist-led PrEP prescribing by community pharmacists in Canada

Kathleen Bergin, Kyle John Wilby

College of Pharmacy, Faculty of Health, Dalhousie University, Halifax, Canada

Background: Pre-exposure prophylaxis (PrEP) is a highly effective way to prevent newly acquired HIV (human immunodeficiency virus) infections. With the shortage of primary care providers in Canada, pharmacists are uniquely positioned to provide extended care to patients. The PrEP-Rx study, conducted in Nova Scotia, Canada, was a pilot project involving pharmacists across ten community pharmacy sites to prescribe and monitor PrEP for HIV prevention to 50 patients across the province. To add this prescribing practice to the scope of pharmacists in Nova Scotia, the acceptability of this practice by pharmacists must be evaluated to properly implement this expanded scope of practice within community pharmacy settings.

Purpose: To identify how pharmacist-led community pharmacists accept PrEP prescribing and to determine the facilitators and barriers to implementing this practice in Nova Scotia from the perspective of community pharmacists.

Methods: This qualitative case study used interviews with pharmacists who participated in the PrEP-Rx study. The interview questions aligned with the eight constructs of the Theoretical Framework of Acceptability (TFA) (affective attitude, burden, ethicality, opportunity costs, intervention coherence, perceived effectiveness, self-efficacy, and perceived safety) to assess how the expanded scope aligns with their perceived scope of practice, their own beliefs, and the costs and benefits they observed by participating in this study. Interviews were audio-recorded and transcribed verbatim. Transcripts were deductively coded according to the TFA and then inductively coded to identify border themes using a reflexive thematic analysis.

Results: A total of 8 pharmacists participated in the study procedures (80% of eligible participants). The main findings related to self-efficacy and the perceived effectiveness of the intervention were both positively received by pharmacists. This study found that pharmacists accept implementing PrEP prescribing into their practice and determined that it aligns with their perceived scope of practice. Adequate planning and uptake of education and training on PrEP prescribing were identified as strategies to reduce any increased service burden within practice settings.

Conclusion: Pharmacists were accepting of PrEP prescribing according to all TFA constructs. Pharmacists were willing to be held accountable for the increase in responsibility. However, strategies may need to be implemented to reduce the burden and increase buy-in from those with limited experience prescribing and managing PrEP.

Prevalence of prediabetes and its risk factors in young adult population, India: A cross-sectional study

Veera Bitra[1], Deepthi Rapaka[2], Paul Adiukwu[2]

[1]*School of Pharmacy, Faculty of Health Sciences, University of Botswana, Gaborone, Botswana*

[2]*DDT College of Pharmacy, Gaborone, Botswana*

Introduction: The goal of prediabetes is to identify asymptomatic people who have a higher risk of developing diabetes and to stop or postpone this process. to determine the prevalence of prediabetes and its risk factors in young adults (18 to 35 years old) at Andhra University in Visakhapatnam, India, with a focus on biochemical markers.

Methods: This cross-sectional survey was conducted in 1949 with subjects using fasting plasma glucose for diagnosis of prediabetes. In phase 1, prediabetes prevalence and the associated factors were analysed. In phase 2, two subgroups of prediabetes (n=200), age and BMI-matched controls (n=100) were selected for biochemical parameters estimation. Baseline characteristics, Pearson correlation for

continuous variables and logistic regression analysis were used to correlate the risk factors to prediabetes.

Results: 200 prediabetes and seven diabetes were identified. The mean blood glucose for the prediabetes subjects is 117.92 mg/dL. The age group 23 -27 years (130, 65%) has the highest prevalence of prediabetes. Prediabetes subjects' lipid profile, SGOT, GGT, potassium and RBC ($p \leq 0.05$) are significant compared to the normal subjects.

Conclusions: Prediabetes and diabetes were present in 10.3% and 0.4% of people, respectively. Age, body weight, waist/hip ratio, hip/waist circumference, and blood pressure were all positively significant. SGOT, GGT, lipid profile, potassium, and RBC were statistically significant compared to normal participants.

Methods, benefits and challenges in Data Management Practices (DMP) amongst hospital pharmacists in Ghana

Pauline Boachie-Ansah, Afia Frimpomaa Asare Marfo, Mercy Opare-Addo, Kofi Boamah Mensah, Janet Ameyaw, Asiamah Morrison, Benard Obeng Appiah

Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana

Background: Effective data management practices (DMP) within hospital pharmacy settings play a crucial role in enhancing patient safety, privacy and operational efficiency, all while ensuring adherence to regulatory standards. In hospitals across Ghana, data storage methods primarily consist of manual (paper-based folders), electronic systems, or a combination of both. With the continuous development of innovative information technologies, healthcare institutions are stepping up their electronic information management system. There are plenty of data management issues in healthcare; hence, effective DMP are essential for ensuring patient safety. Research in these areas can identify vulnerabilities and risks associated with data handling, storage and exchange.

Purpose: To determine the methods of data storage, documentation processes, utilisation of data, perceived effectiveness of current practices and identification of challenges faced in optimising DMP.

Method: A cross-sectional survey was employed to collect data from hospital pharmacists in the Kumasi metropolis of Ghana between June and July 2023. Leaders of the Ghana and Hospital Pharmacists Association (GHOSPA) in the region gave informed consent and were assured confidentiality before the study. All hospital pharmacists who met the inclusion criteria were sampled. The data was collected using a structured questionnaire. Data obtained were entered into excel and imported into stata version 14 for analysis.

Results: A total of 20 hospital pharmacists took part in the survey. The study showed that hospital pharmacists recorded and stored data electronically only 10 (50%), through manual documentation in a designated logbook only 8 (42.1%) or both 19 (95%). The Electronic Health record system (EHR) was the common data management tool. In their data management process, they assessed the appropriateness of prescriptions 18 (90%), kept the prescriptions in the pharmacy for at least 2 years 10 (50%), recorded details of drugs served 11 (55%) and handled expired medications according to the Food and Drugs Authority (FDA) policy 12 (60%). These data helped them in identifying medication utilisation trends 18 (90%), analysing medication costs, optimising inventory management 18 (90%) and assessing medication safety and efficacy 8 (40%). Hence, they rated their data management practices as good 13 (65%). Major challenges faced in optimising DMP were lack of regular technical training on the use of electronic data systems 19 (95%), inadequate backups and disaster recovery plans 14 (70%), and difficulties in reconciling manual and digital records 16 (80%).

Conclusion: Most hospital pharmacists in the survey employ digital methods for managing data, which greatly aids the convenient assessment of patient medication data and inventory information. Nevertheless, challenges persist, primarily around technical training, backup strategies and record reconciliation. Recommendations for addressing these challenges include enhancements in data security, access capabilities and integration with different systems, which could substantially augment the benefits of DMP in hospital pharmacy practice.

The future of pharmacy - Pharmacist prescribing in Great Britain

Laura Wilson, Elen Jones

Royal Pharmaceutical Society, London, United Kingdom

Background: Pharmacists are experts in medicines and have a vital role in medicines management to ensure the optimisation of pharmacological interventions for patients.

Prescribing is a relatively new role for pharmacists but has developed quickly over the last 20 years in Great Britain. These roles are becoming more clinically focused, with prescribing being an integral part of them.

Pharmacists are prescribing in all settings and are being supported to do so by RPS.

Purpose: To show how different settings have utilised the prescribing skills of pharmacists and how they have become

embedded into the multidisciplinary team as experts in medicine.

To look at the support for prescriptions being offered by RPS. The authors' tools, guides and resources enable the profession to advance their roles as prescribers.

Method: The authors described the roles pharmacists undertake in settings including hospitals, primary care and specialist areas and describe the work undertaken daily to ensure medicines are optimised and used safely. The authors examined how pharmacist prescribing has been embedded into these roles and the impact on the wider team. The authors explored how changing roles have impacted the pharmacists themselves and how they have developed their roles to include prescribing.

Results: As of 31st May 2023, just under 26% of pharmacists registered with the General Pharmaceutical Council (GPhC) were annotated as prescribers.

The split by country is England 13,082, Scotland 1986 and Wales 879. Data available in each country on prescribing activity varies.

In Scotland, data shows that almost 80% of pharmacists in acute and primary care are prescribers or training to be, and of those, 97% are actively prescribing. In the community, over a quarter (26%) are trained or in training and of those, 87% are actively prescribing.

Data from Wales demonstrates the increasing numbers of community prescribers over the past 4 years, going from less than 10 in 2019 to over 125 in 2023. The same is true in primary care, with numbers going from 10 to 180 active prescribers. Prescribing activity has also significantly increased in both sectors, going from virtually 0 to around 5000 items per month in the community and 100,000 in GP practices.

RPS resources and support hub provide all the information a prescriber will need to ensure they can carry out their role confidently and competently. https://www.rpharms.com/prescribing

Conclusion: The development of pharmacist prescribing and utilisation of those skills means the authors have seen a change to the traditional roles of pharmacists in Great Britain. Pharmacists are now providing clinical services directly to patients in all settings and leading the safe and effective use of medicines to benefit patients and improve health outcomes.

As the professional leadership body, the authors support pharmacists in all settings and constantly review what the authors offer to ensure the authors are keeping pharmacists at the forefront of healthcare as medicine experts.

Factors associated with non-adherence after initiation of cardiovascular medications

Sara Bremer[1], Karine Wabø Ruud[1], Ane Gedde-Dahl[2]

[1]*Apokus, National Centre for Development of Pharmacy Practice, Oslo, Norway*

[2]*Faculty of Health Sciences, Oslo Metropolitan University, Oslo, Norway*

Introduction: Medisinstart is a Norwegian pharmacist-led follow-up service available in pharmacies for patients starting on new cardiovascular medications. The service consists of two consultations to improve adherence and reduce medication-related problems. Importantly, the medication-related problems identified and the patients' need for advice and counselling vary considerably between Medisinstart consultations.

This study aimed to assess the prevalence of non-adherence detected through Medisinstart consultations following the initiation of new cardiovascular medications. Additionally, it sought to identify factors associated with non-adherence among these patients.

Method: Structured information was retrieved anonymously from 54,157 patient records from Medisinstart consultations between 2019 and 2022. The data included age, gender, the new cardiovascular medication (active ingredient and strength), the communication form of the consultation (telephone or face-to-face) and non-adherence (defined as missed doses or self-discontinuation). The data were analysed by descriptive statistics and regression analyses in SPSS.

Results: Non-adherence was reported among 12% and 10% of patients at consultation 1 and 2, respectively. Notably, 78% of patients reporting missed doses at consultation 1 did not report non-adherence at consultation 2. Factors influencing non-adherence detection included younger age, use of cholesterol-lowering drugs, loop diuretics, or verapamil, prior history of non-adherence, and face-to-face consultation.

Conclusion: Non-adherence following initiation of new cardiovascular medications is linked to specific patient and consultation-related factors. Understanding these factors is crucial to individualise and optimise a pharmacy service like Medisinstart for various patient groups.

Prescribing patterns of antibiotics in the management of upper respiratory tract infections in the pediatric department of a quaternary hospital in Ghana

Fareeda Serwaa Brobbey[1], Daniel Freeman Owusu Ansah[1], Andrews Asamoah[2]

[1]*University of Ghana Medical Centre, Accra, Ghana*

[2]*Coalition of NGOs in Health, Accra, Ghana*

Background: Upper respiratory tract infections (URTIs) are common irritations and inflammations of the upper airways, causing symptoms like cough, but typically not associated with pneumonia or other underlying conditions. While these infections are usually mild and resolve independently, they are burdensome. Many URTIs are viral and don't need antibiotics, yet around 50% of inappropriate antibiotic prescriptions are attributed to them, making them a leading reason for antibiotic misuse.

Aim: This study seeks to evaluate antibiotic prescribing patterns for pediatric upper respiratory tract infections (URTIs) at the University of Ghana Medical Center (UGMC).

Methods: Using a retrospective cross-sectional approach, medical records of pediatric patients aged 0-5 years. diagnosed with URTIs and who received antibiotic prescriptions from May 2022 to May 2023 will be reviewed to identify the common antibiotics used, assess guideline adherence, and identify inappropriate prescription practices.

Results: In terms of age distribution, the majority of patients fall within the 0-11 months and 12-23 months categories, accounting for 35.4% and 29.7%, respectively, with smaller proportions in older age groups. The sex distribution shows a slight predominance of males at 55.4%. The study found that most cases were seen at the Pediatric OPD (Outpatient Department), constituting 87.1% of cases. The Pediatric Emergency and Ward services catered to 9.7% and 2.9% of the cases, respectively. In terms of the inpatient/outpatient ratio, outpatient visits significantly outnumber inpatient admissions, comprising 89.2% of cases. Antibiotic usage was prevalent, with 69.29% of patients receiving antibiotics and 5.5% (n = 21) receiving two antibiotics. The most predominantly prescribed antibiotics were Amoxicillin/clavulanate (53.9%) and Cefuroxime (21.5%). Penicillins (127, 55.7%) were the most common antibiotic class prescribed, with Cephalosporins (54, 23.7%) and Macrolides (47, 20.6%) employed in the management of these patients as well. Notably, of the proportion that received antibiotics, 70.83% (n = 197) had unremarkable biomarker (C-Reactive Protein & Full Blood Count) results, which heavily suggests symptomatic treatment. Patient outcomes show that the majority (86.9%) were seen at the OPD and discharged the same day, while a small percentage (2.4%) were admitted and later discharged.

Conclusion: Antibiotic usage in managing upper respiratory tract infections in pediatric populations is prevalent at UGMC. Penicillins, particularly Amoxicillin/clavulanate, were the most commonly prescribed antibiotics in managing these patients, with generally positive outcomes.

Exploring the concept and definition of scope of practice in pharmacy

Mitchell Budden[1], Shalom Benrimoj[2], Sarah Dineen-Griffin[1]

[1]*School of Biomedical Sciences and Pharmacy, University of Newcastle, Newcastle, Australia*

[2]*Pharmaceutical Care Research Group, Faculty of Pharmacy, University of Granada, Granada, Spain*

Background: In recent years, the term 'scope of practice' has become increasingly used within the pharmacy profession. There are various and diverse understandings and definitions of 'scope of practice' for pharmacists. There is a lack of consensus at a national and international level, specifically in policy, vision, and strategy reports. The lack of a standardised definition makes it challenging to have a common understanding, generate internal debates, and promulgate the concept to external stakeholders and research. To further obfuscate, adjectives such as "current", "*full*", and "*expanded*" are added to the term 'scope of practice', complicating comprehension of the term. Additionally, one might theorise that pharmacists 'scope of Practice' is inherently dynamic and subject to many influences, including external factors.

Purpose: To identify and define the scope of practice for pharmacy and develop a universal definition that can be utilised and applied locally, nationally and internationally.

Method: A systematic review was conducted to understand the fragmentation in dialogue surrounding definitions relating to the scope of practice in the context of the pharmacy sector. PubMed, Scopus and Web of Science were searched until February 2024. The authors also explored the grey literature using Google Scholar and Overton, as many of the reports are not peer-reviewed and do not appear in the published literature. Study details were recorded in a data extraction form. Cochrane methodology for systematic reviews was followed, and the methodology developed by Godin et al. was used for searching grey literature. The search was limited to studies published in English. Reference lists of included papers were searched to identify any relevant publications. Studies were included in the review if they were a systematic review, review or original papers reporting on the scope of practice in pharmacy. Publications were screened by title and abstract, being over-inclusive by one researcher (MB). Selected papers were then formally subjected to the inclusion and exclusion criteria. Two

additional reviewers (SDG, SB) provided input if there was uncertainty about any publication and after discussion, consensus was reached.

Results: A total of 2468 records were initially retrieved. After eliminating duplicates, 1273 unique records underwent screening based on their titles and abstracts. After a comprehensive review of the full texts, 33 publications met the criteria for inclusion in the systematic review. An additional eight publications were identified through citation searches within the included studies. A further 12 publications were identified through the grey literature search. The various terms used to describe the scope of practice were identified. They included the terms 'scope of practice', 'full scope of practice', 'enhanced scope of practice', 'advanced scope of practice', 'expanded scope of practice', and 'extended scope of practice'. The analysis is ongoing.

Conclusion: The results indicate a justifiable need for increased clarity and international consensus for a definition and descriptors of the term 'scope of practice' to ensure consistency of meaning.

Exploring the attitudes knowledge and perceptions of pharmacists' on AMS participation and the discord between pharmacy education and clinical practice in South Africa.

Devina Preabruth Chetty

University of Witwatersrand, Johannesburg, South Africa

Introduction: Antimicrobial Resistance (AMR) poses a major threat to the health of populations worldwide, puts achievements in medical advancements at risk and increases morbidity, mortality and global economic burden (WHO, 2020). Antimicrobial stewardship (AMS) is a critical global intervention to optimise antimicrobial use and decrease antimicrobial resistance (AMR). At an institutional level, the AMS team must be multidisciplinary, consisting of a physician, pharmacist, microbiologist, infection control representative and epidemiologist, with pharmacists playing a pivotal role within these teams. Education, training, and development of pharmacists and other disciplines that form part of the AMS team are crucial to achieving AMS objectives and reducing AMR. However, AMS is not comprehensively taught in South Africa's pharmacy curricula, and little is known about the relevance of pharmacists' training in meeting AMS needs in the country.

Aim: To determine the attitudes, knowledge and perceptions of pharmacists working in clinical roles towards AMS participation and training in South Africa. This was achieved by determining their role and participation in AMS and exploring their perception of the relevance of pharmacy training in pharmacy practice with regards to AMS.

Methods: A self-administered quantitative cross-sectional research design was selected for this study. Categorical variables were analysed using simple descriptive statistics. Mann-Whitney and Kruskal-Wallis tests were applied to determine differences between variables. A p-value of less than 0.05 was considered statistically significant. The reliability coefficient was tested, with Cronbach's alpha score of 0.90 for perceptions, 0.91 for participation and 0.91 for factors affecting participation. This study was conducted among clinically practising pharmacists in the public and private healthcare sectors in South Africa. It included institutional pharmacists involved in clinical functions and AMS in public and private institutional sectors. The South African Society of Clinical Pharmacy (SASOCP) was approached to distribute the survey to its members.

Results: Pharmacists demonstrated a good attitude, knowledge and perception towards AMS (median 4.3). There were statistically significant differences in AMS participation between different years of experience (P = 0.005), sector of employment (P = 0.01), position of employment (P = 0.015) and the presence of AMS programmes (P = 0.004). Pharmacists indicated that undergraduate studies inadequately prepared them for their role in AMS (median 4.3).

Conclusion:

This study found that pharmacists involved in clinical work and AMS in South Africa show positive attitudes, knowledge, and perceptions towards AMS. Pharmacists of all positions of employment participate in AMS, with pharmacists employed as clinical and ward pharmacists showing greater levels of participation. Pharmacists employed at an institution with an AMS committee show higher levels of participation in AMS activities. Education and training in AMS principles is obtained through Master's programmes, short courses, Continued Professional Development (CPDs) and workshops. It is insufficiently incorporated in undergraduate programmes. Pharmacists believe that an undergraduate AMS programme will be most beneficial in bridging the current gap between education and practice.

Two spirit peoples' experiences accessing and receiving care in community pharmacies

Jaris Swidrovich[1], Marissa Pirlot[2]

Leslie Dan Faculty of Pharmacy, Toronto, Canada, [2]University of Saskatchewan, Saskatoon, Canada

Introduction: Two Spirit people face unique challenges in accessing and receiving healthcare in Canada. The Canadian

healthcare system is embedded with homophobia, transphobia, heteronormativity, and racism due to colonisation which impedes appropriate care for Two Spirit peoples. Coupled with a lack of representation and programming, these issues have resulted in a lack of awareness and understanding of the obstacles Two Spirit individuals face in the Canadian healthcare system face.

Method: This CIHR-funded project set out to gain knowledge about the experiences of Two Spirit peoples in accessing and receiving care in community pharmacy settings in Canada. A total of 21 Two Spirit participants were asked to share their stories in focus group settings. Four different focus groups were held in various geographic locations (Vancouver, Edmonton, Saskatoon, Toronto). Informed by Indigenous methodologies, data was recorded via audiorecordings of the various focus groups. The audio was then transcribed and analysed for themes using the Voice-Centred Relational method.

Results: All gifted stories shared had connections to at least one of the following three structural systems: white supremacy, heteronormativity, and capitalism. These structural processes presented themselves as racism, lack of time and greed, lack of knowledge, and homophobia/transphobia. Participants expressed positive experiences when they felt the pharmacist and themselves had a relationship, their Traditional Medicines were valued, or when they were white-passing or straight-passing. The participants also emphasised avoiding pharmacies due to past poor experiences with healthcare professionals (physicians, nurses, pharmacists). Many suggestions to improve experiences in pharmacies were shared.

Conclusion: Two Spirit Peoples face barriers to accessing and receiving care in community pharmacies due to various structural processes in this country. This has resulted in many Two Spirit individuals avoiding healthcare to save themselves from unsafe and uncomfortable interactions.

Disposal practice and factors associated with unused medicines in Malaysia: a cross-sectional study

Zamri Chik[1], Leong Seng Wang[1,2], Zoriah Aziz[3]

[1]Dept. of Pharmacology, Faculty of Medicine, Universiti Malaya, Kuala Lumpur, Malaysia

[2]School of Pharmacy, Monash University, Bandar Sunway, Selangor, Malaysia

[3]Faculty of Pharmacy, MAHSA University, Selangor, Malaysia

Background: Improper disposal of unused medicines has wide-ranging environmental, economic, and health implications. Unused medicines can contaminate water sources, harm wildlife, and contribute to antimicrobial resistance. Additionally, improper storage of unused medicines poses a risk of accidental poisoning, particularly for children. This study aimed to investigate the prevalence of unused medicines in the Malaysian population, identify disposal practices, and determine factors associated with participants possessing unused medicines. The authors hypothesised that many Malaysians would possess unused medicines and engage in improper disposal practices. Furthermore, the authors hypothesised that factors such as the type of medication used, payment method, and awareness of proper disposal methods would be associated with having unused medicines.

Method: A cross-sectional study design was employed, utilising face-to-face interviews with a structured questionnaire. Data were collected from 1,184 participants in Kuala Lumpur and Selangor, Malaysia, representing a broad demographic within urban and suburban areas. Convenience sampling was used due to the practical challenges of employing more robust sampling methods in public spaces. The questionnaire addressed demographic information, health data, and knowledge and attitudes. Descriptive statistics described the characteristics of the sample and the prevalence of unused medicines. Chi-square tests assessed associations between categorical variables, while logistic regression analysis identified independent predictors for having unused medicines.

Results: The authors interviewed 1184 participants, with a 96% response rate. Of the respondents, 995 (84%) reported having unused medicines. Around a quarter of respondents kept unused medicines in their cabinets, while another quarter disposed of them in the bin or toilet. Only half of the respondents using medicines for chronic illnesses had unused medicines compared to approximately 90% of respondents using medicines for acute illnesses. The primary reason for having unused medicines among those using medicines for chronic illnesses was non-adherence (69%, $p < 0.05$). Only 27% of these respondents returned unused medicines under the Medicine Return Programme (MRP). The other group using medicines for acute illnesses had unused medicines because their health conditions improved. Consequently, most unused medicines will ultimately end up in household waste. A multivariate logistic regression analysis identified respondents who used medicines for acute illnesses as the strongest predictor of having unused medicines (Odds Ratio [OR] = 29.8; $p < 0.001$), followed by those who paid for their medicines (OR = 6.0; $p < 0.001$) and those willing to participate in the MRP (OR = 2.5; $p = 0.009$).

Conclusion: The prevalence of unused medicines and improper disposal was high in Malaysia. Unused medicines were associated with individuals using medicines for acute illnesses, paying for their medication, and expressing a willingness to participate in an MRP. Rational prescribing and optimal dispensing practices, alongside broader coverage of MRP facilities, could reduce the possession of unused medicines. By addressing these issues, Malaysia can promote responsible use, storage, and disposal practices for

medicines, contributing to a healthier environment and improved public health outcomes.

Drug-related emergency department visits in Qatar: A prospective observational cohort study

Maguy El Hajj[1], Ashraf El Malik[2], Farah Zahrah[2], Sara Mahmoud[3], Moza Al Hail[2], Zeana Alkudsi[2], Alla El Awaisi[1], Ahmed Awaisu[1], Ziyad Mahfoud[4]

[1]*Qatar University QU Health College of Pharmacy, Doha, Qatar*

[2]*Hamad Medical Corporation, Doha, Qatar*

[3]*University of the Pacific, California, United States*

[4]*Weill Cornell Medicine-Qatar, Doha, Qatar*

Background: Medications are the most common interventions in healthcare for the prevention and treatment of medical conditions. Their increased use is associated with increased harm, risks, and adverse effects. The term adverse drug event (ADE) is defined as any harm resulting from medical intervention involving a drug. ADEs comprise the largest category of preventable adverse events in healthcare. They impose a large burden on healthcare systems, as they are associated with increased rates of hospitalisation, emergency department (ED) visits, prolongation of hospital stay, morbidity, and mortality.

Purpose: The study's main objectives are to determine the incidence, severity, and preventability of drug-related visits to the emergency department of two of the largest governmental hospitals in Qatar.

Methods: This prospective observational cohort study was conducted in Hamad General Hospital's and Alwakra Hospital's ED (Two Main Governmental hospitals in Qatar). A systematic random selection was adapted for eligible participants presenting to the ED. Data was collected from an electronic healthcare record system and through patient interviews. ED pharmacists and physicians independently reviewed the selected visits to determine whether the patient's visit was due to an ADE using predesigned and tested tools.

Results: A total of 1000 cases were collected from November 2020 to January 2022. The results indicated that 178 patients were admitted to the ED (17.8% of ED visits) due to ADEs. These ADEs were caused by 187 drug therapy problems (DTPs). The most common DTPs responsible for these ADEs were non-compliance with prescribed drug therapy (77; 41.17%), additional drug therapy needed to treat or prevent a medical condition in the patient (38; 20.3%), and the drug not effective at achieving the required response in the patient (35; 18.7%). Over 50% of ADEs were of moderate severity (98; 55.1%), followed by mild (76; 42.7%). The majority of ADEs were preventable (154; 86.5%). Medication classes were mostly responsible for the 178 cases of ADEs were: calcium channel blockers (n=28, 15.7%), drugs used in diabetes (n=25, 14.0%), beta-blockers (n=21, 11.8%), drugs affecting renin-angiotensin system (n=18, 10.1%) and anti-inflammatory and anti-rheumatic drugs (n=13, 7.3%).

Conclusion: Adverse drug events have been recognised as significant contributors to ED visits in Qatar. The study revealed that the majority of DTPs-related ED visits were preventable. The most common DTP was patient non-compliance. There is, therefore, a need for interventions to improve patient adherence. Additionally, more studies are needed in Qatar to assess emergency room visits related to definite medication classes and propose solutions to minimise specific DTPs.

Efficacy and safety of cisapride and prucalopride in pediatric patients: a systematic review

Norm Fenn[1,2], Kevin Baumgartner[2], Heather Nichols[3]

[1]*Manchester University College of Health Sciences & Pharmacy, Fort Wayne, United States*

[2]*Parkview Regional Medical Center, Fort Wayne, United States*

[3]*Children's Hospital Colorado, Aurora, United States*

Introduction: Prokinetic agents are commonly used in pediatric patients with functional gastrointestinal disorders (FGID), an overarching diagnosis of a combination of chronic or recurrent gastrointestinal symptoms that do not have a defined pathology. Traditional prokinetic agents include antibiotics such as erythromycin, azithromycin, amoxicillin/clavulanate, and metoclopramide.

Cisapride is a prokinetic agent approved in the early 1990s and is indicated for GERD and gastrointestinal dysmotility for both paediatrics and adults. However, cisapride was withdrawn from the market in July 2000 due to the potential of serious cardiac adverse events, notably arrhythmias. Prucalopride is a newer agent highly selective 5-HT4 receptor agonist typically found in the gastrointestinal system.

The primary objective of this review is to provide a comprehensive evaluation of the use of cisapride and prucalopride as prokinetic agents in pediatric patients and determine their role in therapy in this population, if any.

Method: A literature review was conducted using PubMed, Google Scholar, EMBASE, ProQuest, CINAHL, and Cochrane Review. The search terms used were “prokinetic OR promotility” AND “paediatric OR paediatrics AND “cisapride OR prucalopride” Study eligibility criteria included clinical trials and case reports with patients less than 18 years of age that used cisapride or prucalopride as a promotility agent. All other studies were excluded.

Results: A total of 173 articles were retrieved. After the initial review, 158 articles were excluded according to the exclusion criteria, leaving 14 studies included. Most of the studies that were obtained evaluated cisapride in children. At doses of 0.6 to 1.2 milligram/kilogram/day, cisapride caused a mean QTc prolongation in children of approximately +10ms in retrieved studies compared to placebo. Incidences of extended QTc prolongation were more commonly described in patients who were on concomitant medications known to cause QTc prolongation or had an underlying cardiac defect. Cisapride was also evaluated and shown to be effective in treating FGID. In limited studies, prucalopride showed favourable improvement in treating FGID at doses of 0.03-0.04 milligrams/kilogram/day in pediatric patients. Adverse effects were minimal and transient.

Conclusion: Cisapride's removal from the US market due to cardiac dysrhythmias and cardiac death was justified and timely. However, most of these outcomes were observed in adults. Subsequent information has shown it can be a feasible option in paediatric patients who have failed multiple medications for FGID, are not taking concurrent medications that interact with cisapride, or have an underlying cardiac condition. Prucalopride is a newer prokinetic agent with limited though favourable data in pediatric populations and may have a greater role as new evidence is produced.

Prevalence of work-related stress and non-pharmacological management strategies amongst pharmacists in the Volta Region of Ghana

Gabriel Kwesi Nimo Essilfie-Essel, Afia F A Marfo, Thelma A Aku, Steffi A Kumashie, John K A Korbuvi, Varsha Bangalee

Pharmacy Council of Ghana, Ho, Ghana

Introduction: High stress levels among pharmacists have the potential to impact their mental health and potentially lead to negative consequences for the healthcare system. Available studies in Ghana focused on the stress of healthcare workers in general, with a single study investigating stress in pharmacy students. Distance travel, heavy workloads, age, gender, marital status, and educational level have been associated with occupational stress and burnout among healthcare workers, including pharmacists. Life-threatening dispensing errors have been linked to the delivery of pharmaceutical services under uncontrolled and sustained stressful conditions. Evidence suggests healthcare workers have successfully managed stress with strategies such as listening to music, engaging in sports, watching movies, and going on safaris. The absence of robust studies on the prevalence of stress amongst Ghanaian pharmacists and potential stress management strategies remains a major concern for the pharmaceutical sector. Hence, the novelty of this study.

Method: A prospective cross-sectional study design was employed in administering the Perceived Stress Scale (PSS) to the 94 registered pharmacists working in the Volta Region. The PSS was piloted amongst 7 pharmacists in the Oti Region due to the similarities that exist between pharmacists in the Oti and Volta Regions. The pharmacists responded to the web-based PSS after informed consent was obtained per ethical standards (approval number: CHRPE/AP/932/23). The data was analysed with SPSS version 25. Descriptive data was presented in tables. Using binary logistic regression, associations were measured with odds ratios. Statistical tests were set at 95% confidence intervals and *p*-values set at 5% significance.

Results: Fifty pharmacists responded to the survey, indicating a response rate of 53.19%. The prevalence of stress was 68% (n = 34) with a mean PSS of 17.40. Although not statistically significant (p = 0.2430), male pharmacists had a 2.11 higher PSS score and were 2.50 (95% CI: 0.536 - 11.651) times at risk of stress compared to female pharmacists. Married pharmacists had a 0.95 reduction in PSS score (OR = 0.296, 95% CI: 0.080 - 1.106) compared to single pharmacists. Pharmacists with small family sizes had higher PSS scores than those with larger (>7) family sizes. There were no statistically significant associations between gender, years of practice, family size, religion, marital status, and stress. Walking (n = 19; 38.0%), sitting meditation (n = 9; 18.0%) and walking meditation (n = 6; 12.0%) were the top three non-pharmacologic stress management strategies of pharmacists in the Volta Region of Ghana.

Conclusion: There is a high prevalence of stress among pharmacists in the Volta Region. Male pharmacists perceived higher stress than females. Walking was the most popular non-pharmacologic approach to stress managing stress. It is recommended that the effectiveness of these coping strategies must be investigated to inform policy.

Community pharmacists' management of diabetic foot ulcers: A training opportunity

Cosette Greyling[1], Ilse Truter[2], Janet Barry[1]

[1]*Department of Pharmacy, Nelson Mandela University, Gqeberha, South Africa*

[2]*Drug Utilization Research Unit (DURU), Department of Pharmacy, Nelson Mandela University, Gqeberha, South Africa*

Introduction: Diabetic patients can experience various complications, one of which is diabetic foot ulcers (DFUs). These patients are often from a lower socioeconomic or income group and cannot afford consultations with a medical practitioner or specialist. Community pharmacists, however, can assist patients with DFUs. It is noted that there are few guidelines for pharmacists on the treatment of DFUs. Wound

care training is a very small part of the undergraduate curriculum programme for the pharmacy degree. With adequate training and knowledge, community pharmacists can help manage DFUs correctly, leading to shorter healing times and lower costs.

Objective: The primary aim was to identify the advanced wound care training received by community pharmacists in South Africa, the commonly used resources, and possible shortcomings in the current training of pharmacists with respect to diabetic foot ulcer management.

Method: An online questionnaire survey was conducted under a sample of community pharmacists in South Africa in March 2023. The response rate was 18.95%. Quantitative data was collected and analysed using Microsoft Excel®. Ethical approval was obtained from the university's ethical research ethics committee.

Results: On average, respondents (n=114) reported that 38.17% of the patients in their pharmacy were diabetic if both rural and urban areas were combined. Diabetic foot ulcers were more regularly seen in rural and urban areas. Chronic wounds that were encountered occasionally in pharmacies were bed sores (n=81; 76.42%), diabetic ulcers (n=79; 74.53%), pressure ulcers (n=55; 56.12%), and surgical wounds (n=58; 55.24%). More than half of the respondents (n=60) indicated that a pharmacist is the first contact person when a patient with a DFU visits the pharmacy in rural and urban areas. It was interesting to note that the majority (n=60) of respondents from both rural and urban areas said that they do not offer wound care services at their pharmacies. This could be due to the lack of training pharmacists have regarding wound care training. Most respondents from both rural and urban areas (n=71) indicated that they had not attended any additional training regarding the management of DFUs. Most respondents (n=92) indicated that patients do not return to the pharmacy for dressing changes. It was noted that most of the respondents in rural and urban areas used other healthcare professionals as information resources.

Conclusion: Diabetic foot ulcers can cause significant financial strain on the already stretched healthcare system of South Africa. Community pharmacists can help to prevent and decrease the incidence of DFUs. Community pharmacists indicated that they would like to receive more wound care training.

Pharmacists, physicians, and policymakers' perspectives on the contribution of community pharmacies to local health policies: A qualitative study using interviews and Web-Delphi in Portugal

Cátia Sousa Marques[1], Suzete Costa[2,3], Adalberto Campos Fernandes[1]

[1]Escola Nacional de Saúde Pública (ENSP), Universidade NOVA de Lisboa, Lisboa, Portugal

[2]Institute for Evidence-Based Health (ISBE), Lisboa, Portugal

[3]Faculdade de Medicina, Universidade de Lisboa, Lisboa, Portugal

Introduction: Local healthcare competencies and policies are increasingly being shifted to Portuguese municipalities. There is some evidence of the contribution of community pharmacies to local health policies in several countries, including Portugal. However, little is known about pharmacists, physicians, and policymakers' perspectives on such a contribution model. This study aims to synthesise scientific evidence, understand pharmacists, physicians, and policymakers' perspectives, and generate a consensus on the contribution of community pharmacies to local health policies.

Methods: A three-stage qualitative study was conducted comprising a literature review, semi-structured interviews, and a 3-round web-Delphi expert panel consisting of pharmacists, physicians, and policymakers. The synthesised evidence was used as the basis for the interview guide. Interviews were underpinned by content analysis to draft the initial statements for the web Delphi. The authors used the Consolidated Criteria for Reporting Qualitative Research (COREQ) and guidance for Delphi studies.

Results: The authors included 46 publications. Semi-structured interviews were conducted with nine experts. Following three web-Delphi rounds, the authors ended up with 24 statements, with consensus achieved for 22 statements (16 with full agreement and 6 with partial agreement), reinforcing the positive contribution of pharmacies to local health policies. The main barriers were the lack of funding, poor public-private culture, scarce multidisciplinary coordination between health and community teams, absence of integrated information systems between healthcare providers, and little awareness of the clinical services provided by pharmacies. Facilitators included the recognised competence of teams and the personalised relationship between pharmacists and the population. Priority intervention areas include disease prevention, early detection, management, and monitoring of chronic patients, and health promotion. Examples include vaccination services, health and digital literacy to empower citizens, management and therapeutic monitoring of chronic disease patients, and rapid diagnostic point-of-care tests under agreed protocols with other healthcare providers.

These findings align with similar barriers and facilitators found in the literature. The priority areas derive from professional experience, knowledge, and unmet health needs.

Conclusion: This study produced the first consensus of pharmacists, physicians, and policymakers in Portugal on how pharmacies can positively contribute to local health policies, which can be used as guidance on opportunities and recommendations for future local strategies.

Patient-reported outcomes, experiences, and use of healthcare resources in COVID and influenza vaccinations in pharmacies: a cross-sectional study in season 2023/24

Suzete Costa[1,2,3], João Pedro Aguiar[1], Mónica Gomes[2], Francisco Rodrigues[2], Susana Neves[3], Andreia Leal[3], Inês Antunes[4], Marta Felgueiras[4], Catarina Brites[4], Ineida Gomes[5], Catarina Figueiredo[5], Maria Alexandra Félix[6], Ana Maria Candeias[6], Ana Casais[7], Cristina Dias[7], Leonardo Oliveira[7], Manuela Jesus[7], Filipa Antunes[8], Joana Pinto[9], Sofia Afonso[9], Anucha Mangi[10], Catarina Guerreiro[10], Joana Peralta[10], Ana Viana[11], Carlos Nunes[11], Joana Ferreira[11], Soraia Costa[3], Maria João Duarte[2,3]

[1]*Institute for Evidence-Based Health (ISBE), Lisboa, Portugal*

[2]*Farmácia Estácio Xabregas, Lisboa, Portugal*

[3]*Farmácia Estácio, Lisboa, Portugal*

[4]*Farmácia Largo do Rato, Lisboa, Portugal*

[5]*Farmácia Central da Amora, Lisboa, Portugal*

[6]*Farmácia Nova do Dafundo, Cruz Quebrada, Portugal*

[7]*Farmácia Ronil, Lisboa, Portugal*

[8]*Farmácia Nova de Tomar, Tomar, Portugal*

[9]*Farmácia Amparo Alcântara, Lisboa, Portugal*

[10]*Farmácia Nova da Sobreda, Almada, Portugal*

[11]*Farmácia Garantia, Lisboa, Portugal*

Introduction: Portuguese community pharmacies have provided influenza vaccinations and contributed to vaccination coverage in the last 15 years. Since 2018, pharmacists have recorded the vaccination in the software system, which then communicates with the NHS system. COVID-19 vaccination was provided for the first time in season 2023/24 (in addition to the usual influenza vaccination). The study aims: 1) to explore the contribution of pharmacies in a real-world patient-centred research study nested in a vaccination service provided in a group of pharmacies; 2) to describe patient characteristics, previous vaccination history, patient-reported outcomes, use of health care resources, and experience with COVID and influenza vaccinations in pharmacies.

Methods: A cross-sectional study was conducted in ten pharmacies during influenza and COVID-19 vaccination in season 2023/24. Pharmacists were instructed to interview adult patients during the post-vaccination observation period. Patient anonymous real-world data were collected using an online survey. At the time of this submission, data collection has been ongoing since the end of the vaccination season, which is due on 31 March 2024.

Results: Preliminary results show 2,556 (87%) of vaccinated patients approached accepted to be interviewed (54.7% female; age range 18-99; 38.4% completed 4-9 years education, 25.8% 10-12 years education, 30.1% completed higher education; 46% have at least one chronic disease condition and/or are health care providers). Most patients (71.9%) were administered both COVID-19 and flu vaccines. NHS records accessed by pharmacists with patients' permission indicate no record of previous vaccination for COVID-19 (5.6%), flu (16.7%), and pneumococcal vaccination (97.9%). The last flu vaccination occurred at the primary care unit (67%), at the pharmacy (27.4%), and at their workplace (5.6%). Nearly 83% received a previous SMS on their cell phone from the pharmacy to remind them to schedule their vaccination. Patients reported flu/COVID-like symptoms in the previous 12 months (10.6%); positive test for COVID in the previous 12 months (7.1%); previous vaccination against COVID (99.5%) with four boosters for 58.3%; work/school absenteeism due to flu (0.8%) / COVID (2.1%) in the previous 12 months; emergency room visit or hospital admission due to flu (1.8%) / COVID (1.7%) in the previous 12 months. Satisfaction with vaccination experience at the pharmacy was assessed for items: operation hours, access/proximity, waiting time, convenience of appointment, physical premises, trust in pharmacist, pharmacist competence, injection technique, vaccine information provided, and overall satisfaction. On the overall satisfaction with vaccination experience at the pharmacy, patients reported they were extremely satisfied (87%) and satisfied (13%). No patient reported lower levels of satisfaction.

Conclusion: Preliminary findings seem to confirm conducting a real-world patient-centred research study nested in a vaccination service in these ten pharmacies is feasible. The authors will report the final results at the conference following database closure.

Stewardship across the antimicrobial lifecycle: The pharmacists' role

Sabiha Essack[1], Lesley Ogilvie[2], Erin Duffy[3]

[1]*Antimicrobial Research Unit, University of KwaZulu-Natal, Durban, South Africa*

[2]*Global Antimicrobial Resistance Research and Development Hub, Berlin, Germany*

[3]*Combating Antibiotic Resistant Bacteria Biopharmaceutical Accelerator, Boston, United States*

Introduction: Antimicrobial resistance (AMR) is high on the global public health agenda and disproportionately affects LMICs. AMR in LMICs is exacerbated by poor access to existing and new antimicrobials, fragile supply chains for essential antimicrobial and other medicines, sub-optimal political and professional leadership in antimicrobial stewardship and uncontrolled disposal of antimicrobials into aquatic and soil environments in the main. AMR is a complex and wicked problem that requires broader stewardship across the antimicrobial value chain at local and global levels that encompasses the stewardship of innovation, access, appropriate use, and the stewardship of responsible disposal of antimicrobials.

Results: The stewardship of innovation addresses the research and development (R&D) aspect of the antimicrobial lifecycle and would advance the development of target product profiles (TPPs) for therapeutics, diagnostics and preventives (vaccines) based on the infectious disease and AMR burdens in LMICs. Push and pull incentives to encourage R&D of antimicrobials are key stewardship levers. The stewardship of access addresses the (1) production, (2) registration evaluation, market authorisation and post-marketing surveillance, and (3) selection, procurement and supply aspects of the antimicrobial lifecycle. Equity of access would be advanced by (1) increasing local production capability and capacity by licensing and technology transfer and/or voluntary licensing and patent pooling through the Medicines Patent Pool, (2) in-country registration facilitated by the WHO pre-qualification process, and (3) pooled procurement and antimicrobial subscription models that would ensure uninterrupted supply chains. The stewardship of appropriate use emphasises diagnostics/ microbiology-informed treatment of infections. This is the traditional antimicrobial stewardship (AMS) and relates to the 5 Ds, where the right drug is given at the right dose in the right dosage form/route with timely de-escalation for the right duration. The stewardship of responsible disposal would ensure minimal contamination of aquatic environments. Emission limits for pharmaceutical manufacturers and best available technologies (BAT) for reducing antimicrobial emissions from manufacturing plants and healthcare facilities, amongst other interventions, would be explored for this terminal aspect of the antimicrobial lifecycle.

Conclusion: These aspects, individually and collectively, will maintain the efficacy of existing and new antimicrobials for the optimal management and prevention of infections while protecting the environment. The pharmacist is critical to stewardship across the antimicrobial value chain.

Classification of drug interactions involving oral anticoagulants and their clinical relevance for the clinic

Claire Coumau[1,2], Frederic Gaspar[1,2], Jean Terrier[3,4,5], Angela Schulthess-Lisibach[6], Monika Lutters[7], Chantal Csajka[1,2,8]

[1]*Centre for Research and Innovation in Clinical Pharmaceutical Sciences/ University of Lausanne, Lausanne, Switzerland*

[2]*School of Pharmaceutical Sciences/ University of Geneva, Geneva, Switzerland*

[3]*Division of General Internal Medicine/ Geneva University Hospitals, Geneva, Switzerland*

[4]*Geneva Platelet Group/ Faculty of Medicine, University of Geneva, Geneva, Switzerland*

[5]*Clinical Pharmacology and Toxicology Division/ Anesthesiology, Pharmacology, Intensive Care and Emergency Medicine Department, Geneva University Hospitals, Geneva, Switzerland*

[6]*stitute of Primary Health Care (BIHAM), Faculty of Medicine, University of Bern, Bern, Switzerland*

[7]*Clinical pharmacy/ Cantonal Hospital Aarau, Aarau, Switzerland*

[8]*Institute of Pharmaceutical Sciences of Western Switzerland/ University of Geneva, University of Lausanne, Geneva, Switzerland*

Introduction: Vitamin K antagonists (VKAs) and direct oral anticoagulants (DOACs) are associated with an increased risk of adverse events, potentially due to drug-drug interactions (DDIs). While the impact of a DDI involving VKAs can be monitored by the International Normalised Ratio (INR), there is no routine equivalent biomarker for DOACs, making the influence of DDIs more difficult to quantify. In clinical practice, the use of databases to screen DDIs is common. Yet, studies comparing different databases revealed significant discrepancies in the identification and risk classification of DDIs. Such observations highlight the need to focus on DDIs at clinically significant risk and formulate recommendations to improve the clinical management of these high-risk drugs.

Purpose: The study aims to compare the concordance of DDI information of four DOACs and two VKAs collected from three major DDI databases used in Switzerland to classify DDIs according to their risk for adverse events and to elaborate clinical recommendations.

Method: DDI involving acenocoumarol, phenprocoumon, rivaroxaban, apixaban, dabigatran and edoxaban were extracted from the three databases Lexi-Interact®, Pharmavista® and MediQ®. The concordance rate regarding

differences in severity rating systems was calculated using a Fleiss' kappa. A modified Delphi method was used to classify these DDIs into 3 risk levels: 'severe', 'moderate' and 'low', and to provide clinical recommendations. Pharmacodynamic interactions (PD) were classified according to the potential bleeding or thromboembolic risk associated with a therapeutic class. The potency of the interactor, as assessed by the change in area under the curve (AUC) according to Food and Drug Administration guidelines, was used to assess the magnitude of the pharmacokinetic (PK) interactions and the subsequent bleeding or thromboembolic risk.

Results: Only 13.2% of the DDIs classifications were common to all three databases, with a slight concordance rate (Fleiss' kappa= 0.131). 48% and 32% of DDIs for DOACs and VKAs were classified as severe, 25% and 35% as moderate and 27% and 32% as low-risk of interactions. The authors classified 30 therapeutic classes with a high risk of PD interactions. Concerning PK interactions, 23.7% and 27.1% were classified as potent CYP and/or PgP inhibitors and 16.4% and 15.1% as potent CYP/PgP inducers for DOACs and VKAs, respectively. For the high-risk DDIs, the authors recommend switching to an alternative drug with the same indication or to a VKA or low molecular weight heparin (LMWH). For moderate-risk DDIs, the authors recommend close monitoring of INR with VKAs and remaining vigilant for bleeding symptoms with DOACs. For DOACs, in the presence of creatinine clearance < 60mL/min, body weight < 60kg, and advanced age (> 80 years), switching to an alternative drug in the same indication or to a VKA or an LMWH should be preferred.

Conclusion: Differences in DDI risk categorisation between databases highlight the need for a uniform DDI classification system, particularly for oral anticoagulants. This study identified a significant number of high-risk DDIs, highlighting the importance of being aware of DDIs that require a change in co-treatment or close monitoring. This study's findings will allow the development of a future web-based detection tool dedicated to oral anticoagulants.

Assessment of knowledge, attitude, and practices regarding medicine disposal among healthcare professionals in a teaching hospital in Ghana

Jonathan Jato[1], Araba Hutton-Nyameaye[1], David Oteng[1], David McArthur[2], Derrick Kumi[2], Samuel Owusu Somuah[1], Thelma Mpoku Alalbila-Aku[1]

[1]School of Pharmacy, University of Health and Allied Sciences, Ho, Ghana

[2]Department of Pharmacy, Ho Teaching Hospital, Ho, Ghana

Background: Unsafe disposal of medicines has a huge burden on public health and a long-term environmental impact. For instance, improper disposal of antimicrobial agents has been attributed to increased drug resistance. With a better understanding of the situation, healthcare professionals (HCP) are well-placed to educate the public regarding medicines and general medical waste disposal. Even though a national policy exists regarding the disposal of medicines, there is not enough data on whether those in the healthcare sector have sufficient knowledge and adhere to these guidelines. This study sought to evaluate the level of knowledge, attitudes and practices of HCP in the Ho Teaching Hospital regarding the disposal of unused or expired medicines.

Method: A cross-sectional study was conducted from March to May 2022 among 123 healthcare professionals in the Ho Teaching Hospital, including physicians (n=11), physician assistants (n=3), nurses and midwives (n=40), pharmacists (n=19), pharmacy technicians (n=6), and biomedical scientists (n=44). The participants were recruited through a convenience sampling approach and assessed, using paper-based semi-structured questionnaires, on their knowledge, attitude and practices regarding medicine disposal. Descriptive and inferential data analysis was conducted using Statistical Package for Social Scientists (SPSS) (version 26.0, USA).

Results: The study revealed that about 73.1% of the respondent have satisfactory knowledge of medicine disposal even though the majority (78.9%, n=96) admittedly kept unused medicines in their homes until expiry. Most (64.2%, n=79) of these participants often dispose of their unused or expired medicines in household bins. Other practices, such as medicine sharing, were common among the HCP, with about half (50.4%, n=62) willing to share leftover medicines with others. About 66.7% (n=82) of participants were aware of the national policy on medical waste disposal. However, none of them had access to this document. It was again observed that about 91.8% (n=45 out of 49) of the staff below 5 years in practice were unaware of any guidelines on medicine disposal. Finally, about 87.3% of all participants were willing to participate in medicine takeback programmes within the hospital. Factors such as gender, age, level of education and profession did not directly correlate with the level of knowledge, attitude or practices of these HCP.

Conclusion: The findings from this study reveal that healthcare professionals within the Ho Teaching Hospital have adequate knowledge about the proper ways of medicine disposal. However, most adopted unsafe means to dispose of unused/expired medicines. It also highlights significant gaps in attitude and practice among HCP regarding medicine disposal. There is a need for interventions such as increased access to policy documents, education, and implementation of medicine takeback programmes within the hospital.

Pharmacists' perspectives of early-stage implementation of a novel adult life-course vaccine review service (VaxCheck) in community pharmacy

Elizabeth Vernon-Wilson, Nancy Waite, Sherilyn Houle

School of Pharmacy, University of Waterloo, Waterloo, Canada

Introduction: Identifying unimmunised or under-immunised individuals is an important public health strategy for preventing disease. The accessibility of community pharmacies and the expertise of pharmacy staff make them well-placed to deliver vaccination services, including proactive vaccination reviews and tailored recommendations. This study aimed to explore the experiences of community pharmacists who provided the VaxCheck life-course vaccination review service as part of a feasibility study.

Method: Semi-structured interviews were performed virtually with pharmacist staff from the nine community pharmacies participating in the study. Interviews were conducted at baseline and following three rapid plan-do-study-act quality improvement cycles. An inductive thematic analysis of transcripts was performed to identify dominant themes and subthemes. The described activities correlated with the Consolidated Framework for Implementation Research (CFIR).

Results: Pharmacists described three core activities involved in a VaxCheck: (1) Promotion/offering of the service, (2) Completing the consultation, and (3) Enacting recommendations and follow-up. Themes guiding VaxCheck adoption included aligning VaxCheck with workflow through flexible integration, enabling patient-oriented vaccination services, and a desire to contribute to community healthcare provision. Data aligned with all CFIR domains with strengths noted in constructs from the "Innovation characteristics" and "Individuals" domains. Barriers to implementation were identified in the "Inner setting", "Outer setting," and "Process" domains, such as pharmacy workflow capacity, availability of vaccine records, and interactions with other healthcare providers. Perceived patient barriers included knowledge of vaccination benefits and safety, cost, and confusion about the roles of different vaccine providers. Perceived benefits included giving structure to vaccine consultations and impacting patient awareness of the significance and value of vaccination.

Conclusion: VaxCheck offers a methodical, accessible service that patients receive well. VaxCheck was compatible with pharmacy workflow, but additional resources are needed to ensure sustainability and promote the service to stakeholders.

Analysing the willingness of pharmacists in Taiwan to attend international pharmaceutical conferences

Yi-Ni Hsieh, Chen-Sheng Chen

[1]*Federation of Taiwan Pharmacists Associations, Taipei, Taiwan*

[2]*Taichung City Pharmacists Association, Taichung, Taiwan*

[3]*Pharmacy Department, Hong En Hospital, Taichung, Taiwan*

Background and Objectives: To examine the motivation and obstacles that Taiwanese pharmacists face when trying to attend major international conferences like the International Pharmaceutical Federation (FIP) and the Federation of Asian Pharmaceutical Association (FAPA). A survey analysis was conducted to enhance Taiwanese pharmacists' awareness of international pharmaceutical conferences and gain insight into their willingness to participate and the barriers they encounter. This aims to utilise the results to plan relevant training courses to increase pharmacist participation.

Methods: An online survey was conducted and distributed through the Taichung City Pharmacists Association's social media platforms. Factors hindering participation, such as financial costs, time constraints, and language barriers, were collected and statistically analysed based on practice category, professional title, gender, age, education level, willingness to participate, previous experience, and reasons for non-participation.

Results and Discussion: Among 147 respondents, the majority were female pharmacists (96). Practice categories included clinics (32%), hospitals (30.6%), community (27.2%), others (8.8%), and industrial (1.4%). Most respondents were general pharmacists (133), followed by directors (7) and clinical pharmacists (4). 85.7% had not attended international conferences, while 78.2% were aware of the Federation of Asian Pharmaceutical Association (FAPA). Reasons for non-participation included high costs (38.1%), difficulty obtaining leave (34.7%), lack of preparation time (28.6%), and doesn't know how to prepare (27.9%). Female pharmacists' higher participation reflects their increased interest in academic exchange and professional development. Different work environments impact the willingness and capacity to attend conferences.

Conclusion: Based on the above, plans include providing subsidies for international pharmaceutical conferences to ease financial burdens, early promotion to facilitate preparation and planning, and addressing uncertainty through courses in research, writing, resource sharing, and professional guidance. To improve the willingness and ability of pharmacists to attend international conferences, thus improving their professional development in the pharmacy field.

Pharmacist interns' perspectives on legislative requirements for pharmacy internship in South Africa

Avril Lewis[1], Yolandi Heymans[2], Sue Burton[3], Rianda Joubert[1], Martie Lubbe[1]

[1]*Medicine Usage in South Africa (MUSA), Faculty of Health Sciences, North-West University, Potchefstroom, South Africa*

[2]*Centre for Health Profession Education, Faculty of Health Sciences, North-West University, Potchefstroom, South Africa*

[3]*Faculty of Pharmacy, Rhodes University, Makhanda, South Africa*

Background: South African Bachelor of Pharmacy (BPharm) graduates must undertake a 12-month internship in an approved pharmacy under the direct supervision of an approved tutor and be competent in prescribed assessments before registering to practice as pharmacists. This is so they can apply theoretical knowledge to solve practical problems at work. This study evaluates the opinions of pharmacist interns on the legislative requirements for the pharmacy internship programme in South Africa.

Method: A descriptive, cross-sectional survey was implemented using self-administered online questionnaires distributed to 853 pharmacist interns in 2023. Respondent demographics and perceptions about internship legal requirements were collected. Ethics approval was obtained (NWU-00077-22-S1).

Results: A total of 122 (14.3%) pharmacist interns completed the survey. They completed their internship mainly in public institutional pharmacies (n = 52, 42.6%), community pharmacies (n = 26, 21.3%) and private institutional pharmacies (n = 24, 19.7%). Most pharmacist interns (> 98%) believed traditional internship sites, such as community pharmacies and public and private institutional pharmacies, should be allowed to train pharmacist interns. 84.4% (n = 103) indicated academic institutions and 92.6% (n = 113) indicated manufacturers. Most interns (> 70%) believed to a large/very large extent that a mixture of pharmacy sectors provides the best learning experience to develop the competencies of a pharmacist, for example, the community with private/public institutional pharmacy (n =104, 86.7%), academia with private/public institutional pharmacy (n = 84, 70.0%) and manufacturing with private/public institutional pharmacy (n = 87, 72.5%). Although 84.2% (n = 101) indicated that private/public institutional pharmacies provide adequate practice experience alone to a large/very large extent, only 51.7% (n = 62) feel the same about the community pharmacy sector.

While 43 (35.3%) pharmacist interns still preferred the status quo of a one-year internship in one sector after completing the undergraduate study under the responsibility of the SAPC, the majority preferred internships administered by pharmacy schools within or in continuation of the undergraduate study (n = 70, 57.4%) and achievement of a master's degree (n = 64, 52.5%). Most pharmacist interns (n = 98, 82.4%) found that 12 months were acceptable for internship training.

Conclusions: Interns prefer a pharmacy internship that integrates or continues from undergraduate study under the responsibility of educational institutions and the possible achievement of a master's degree. They prefer exposure to a mixture of pharmacy sectors for adequate experience.

Evaluating methods of assessing medication adherence in interventions targeting patients with coexisting diabetes and hypertension.

Pauline Maniki, Parisa Aslani, Betty Chaar

The University of Sydney, Sydney, Australia

Background: Improving medication adherence has been a subject of interest in healthcare. However, measuring medication adherence remains challenging as there is no gold standard. Many tools are not valid or reliable; often, they are not appropriate for the aspect of adherence being evaluated, and there is inconsistency between researchers about the tools used. Using valid, reliable, and appropriate methods and tools to assess medication adherence is crucial for identifying barriers to adherence and developing effective interventions.

Purpose: This review aimed to evaluate the methods used for assessing medication adherence in interventions targeting patients with coexisting diabetes and hypertension. Method: The authors conducted an electronic search of three databases (PubMed, EMBASE and CINAHL) and screened for eligible articles. Studies published in English from June 2012 to March 2023 that analysed interventions addressing medication adherence to therapeutic medicines in coexisting diabetes and hypertension were included. Details of methods for assessing adherence were extracted. The validity and reliability of identified methods were assessed together with conclusions drawn on adherence and outcomes in the study.

Results: Seven studies were included. Most (n=6) used indirect methods of measuring adherence, such as questionnaires, due to low cost and easy applicability. All studies (n=4) that used subjective methods used patient questionnaires. Only two studies conducted a stratified analysis of medication adherence, analysing the two conditions separately. There was no consistency in the target behaviour assessed as outcomes measured by different patient questionnaires varied from barriers to adherence, medication-taking behaviour, beliefs associated with adherence, or a mixture of these outcomes.

Conclusion: The most commonly used methods identified relied on self-reported information and are considered

imprecise. This can underestimate the intervention's impact or overestimate the adherence level. Further research is required to develop a method that provides a rigorous assessment of adherence in multimorbid patients while focusing on each medication that the patient is taking rather than grouping medication into one adherence measure.

Impact of medication adherence interventions targeting patients with coexisting diabetes and hypertension on clinical and patient-centered outcomes

Pauline Maniki, Parisa Aslani, Betty B Chaar

The University of Sydney, Sydney, Australia

Background: Optimal medication adherence is crucial for enhancing patient outcomes, particularly in the case of chronic diseases. Poor medication adherence can lead to worse clinical outcomes and higher rates of mortality and morbidity.

Purpose: This systematic review aimed to determine the impact of interventions to improve medication adherence in patients with coexisting diabetes and hypertension on clinical and patient-centred outcomes.

Method: The authors conducted an electronic search of three databases (PubMed, EMBASE, and CINAHL) and screened for eligible articles. Studies published in English from June 2012 to March 2023 that analysed interventions addressing medication adherence to therapeutic medicines in coexisting diabetes and hypertension were included. Details of additional outcomes assessed in these studies were extracted.

Results: Out of the seven studies identified, six assessed additional outcomes such as blood pressure, blood glucose level, and patient knowledge. Five studies assessed blood pressure, and four distinguished between systolic and diastolic blood pressure. In all four studies, systolic blood pressure decreased significantly. All four studies that assessed blood glucose reported a significant decrease post-intervention. Two studies assessed the safety of intervention regarding the risk of overdosing and adverse drug reactions, and none were reported in the intervention group. Still, five adverse events were reported in the control group.

Conclusion: Significant improvements in clinical and patient-centered outcomes were observed after medication adherence interventions.

Detection of Adverse Medicine Events (AMEs) by pharmacists in residential aged care facilities: A secondary analysis of data from the ReMInDAR trial

Abebe Mekuria, Renly Lim, Andre Andrade, Debra Rowett, Elizabeth Roughead1

Quality Use of Medicines and Pharmacy Research Centre, UniSA Clinical and Health Sciences, University of South Australia, Adelaide, Australia

Background: Pharmacists often identify symptoms during medication review which may or may not be Adverse Medicine Events (AMEs). The type and extent to which these symptoms represent AME or disease progression have not been quantified. Therefore, this study aimed to quantify the extent and types of symptoms or AMEs recorded by pharmacists in aged care facilities.

Method: A secondary analysis of data from the Reducing Medicine-Induced Deterioration and Adverse Reactions (ReMInDAR) trial was conducted. Patient symptoms recorded by pharmacists were extracted from pharmacists' notes. The frequency of symptoms and their Medicine Likeliness Ratio (probability of being medicine-related) were determined. A gold standard subset of adverse events existed that had been adjudicated as medicine-related events by a clinical panel. The extent of AMEs detected by pharmacists was determined by matching symptoms extracted from pharmacists' notes with the gold standard of AMEs. A descriptive comparison was conducted between all AMEs (frequency ≥ 1% and medicine-likeness ratio ≥ 40.0%) recorded by pharmacists and those in the PHArmacotherapeutical Symptom Evaluation, 20 questions (PHASE-20), and the Patient Reported Outcome Measure, Inquiry into Side Effects (PROMISE).

Result: Pharmacists recorded 3.1 symptoms per person; 68.8% of the symptoms had a medicine-likeness ratio ≥ 40.0%, suggesting they were related to medicines (AMEs). The most prevalent adverse events with medicine-likeness ratios above 40% included falls (13.6%), swelling (7.1%), constipation (5.4%), nocturia (4.2%), shortness of breath (4.0%), bleeding (4.0%), nausea/vomiting (3.1%), dizziness (2.8%), drowsiness (2.3%) and rash (2.0%). Of 273 gold standard AMEs, the majority (85.3%) were not recorded by pharmacists. The most frequently detected medicine-related symptoms recorded by pharmacists were in PROMISE and PHASE-20 tools.

Conclusion: While pharmacists recorded a notable number and variety of adverse events or symptoms, under-reporting was still observed. Considering that the symptoms listed in the assessment tools matched with most events, further research is warranted to determine if these tools can help pharmacists improve the detection and monitoring of AMEs.

Vaccine dispensing in a section of the private healthcare sector in South Africa: A pharmacoepidemiologic study from 2017 to 2021

Ilse Truter[1], Johan Hugo[2], Hank Smith[3], Shailav Bansal[4], Alykhan Vira[3]

[1]*Drug Utilization Research Unit (DURU), Department of Pharmacy, Nelson Mandela University, Gqeberha, South Africa*

[2]*Department of Statistics, Nelson Mandela University, Gqeberha, South Africa*

[3]*Quantium Health South Africa, Johannesburg, South Africa*

[4]*Quantium Health India, Hyderabad, India*

Introduction: The coronavirus disease 2019 (COVID-19) pandemic has put a renewed focus on the value of vaccines in combatting potentially life-threatening diseases. The pandemic is also reported to have influenced the vaccination patterns of other existing non-COVID-19 vaccines. Pharmacoepidemiology is the study of the use and effects of medicines in large groups of people. These studies not only quantify the number and types of vaccines but can also provide epidemiological data to understand disease outbreaks and implement preventative measures. There is a paucity of published studies on vaccine dispensing on large databases in South Africa.

Objective: The primary aim was to conduct a longitudinal pharmacoepidemiological study over five years (2017 to 2021) on the dispensing patterns of vaccines in a section of the private healthcare sector in South Africa.

Method: A retrospective, descriptive, cross-sectional pharmacoepidemiological study on South African health insurance data covering five years (2017 to 2021) was conducted. The Anatomical Therapeutic Chemical (ATC) Classification System was used to analyse all vaccine records (ATC Group J07). The study population consisted of approximately 3.8 million individuals. Descriptive statistics were calculated. Data was de-identified. Ethical approval for the study was obtained from the university's ethics committee.

Results: Vaccine dispensing patterns were distinctly different in 2021 compared to the preceding four years. The COVID-19 vaccine was introduced in 2021 in South Africa. Although the total number of medical insurance scheme members stayed relatively constant, vaccine claims increased approximately 7-fold in 2021 compared to the average for the preceding four years (2017 to 2020). Overall, viral vaccines accounted for most vaccines dispensed, followed by bacterial and the combination of bacterial and viral vaccines. On average, over the five years, 68.61% of vaccines were dispensed by pharmacies, followed by general practitioners (15.53%). The tetanus and pneumococcal vaccines were the most dispensed bacterial vaccines, while the influenza and COVID-19 vaccines were the most dispensed viral ones. COVID-19 vaccines accounted for 55.74% of all vaccines dispensed over the 5 years and 85.70% in 2021. There was an increase in the number of bacterial vaccines dispensed towards the middle of 2020, which can be attributed to the pneumococcal vaccine promoted and administered during the COVID-19 pandemic to prevent morbidity and mortality from co-/secondary infections and superinfections. No clear lapses in childhood vaccines were observed.

Conclusion: Vaccine claims increased considerably in 2021, compared to 2017 to 2020, with COVID-19 vaccines accounting for 85.70% of all vaccines dispensed in 2021. Follow-up studies on more recent data will be important to monitor vaccine dispensing patterns in the post-COVID-19 era.

Pharmaceutical services provided in different pharmacy categories in South Africa

Ziyanda Mfuku[1], Panjasaram (Vassie) Naidoo[2], Martie Lubbe[3]

[1]*South African Pharmacy Council, Pretoria, South Africa*

[2]*Discipline of Pharmaceutical Sciences, UKZN, Durban, South Africa*

[3]*Medicine Usage in South Africa, NWU, Potchefstroom, South Africa*

Background: In South Africa, pharmaceutical services that may be provided in various categories of pharmacies are legislated according to the Regulations relating to the Practice of Pharmacy. Pharmacies may provide one or more of these services by the licence issued by the Director-General of Health in South Africa. This study aims to determine the type of pharmaceutical services offered in different categories of pharmacies in South Africa.

Methods: A cross-sectional survey was conducted from 1 July 2022 to 30 November 2022, using an online self-administered questionnaire sent to all responsible pharmacists (N = 4 334) of pharmacies in the different categories registered according to the Pharmacy Act 53 of 1974. (namely, community, public, and private institutional, wholesale, manufacturing and consultant pharmacies). Community pharmacies were divided into independent and corporate community pharmacies.

Results: A total of 236 responses were received, with a response rate of 5,42%. Most (> 90%) community and institutional pharmacies offered services related to patients' pharmaceutical care needs (evaluating patients' medication-related needs, dispensing, educating and providing health information). A strong association was found between the pharmacy sector and the provision of support services for pharmaceutical care, such as determining patient compliance (p = 0.0001; Cramers' V = 0.3761), follow-up (p = 0.0001; Cramers' V = 0.4019) and the provision of pharmacist-

initiated therapy (p = 0.0001; Cramers' V = 0.7302) was found. More than 90% of community (independent and corporate) and less than 75% of private institutional pharmacies provided these services. However, patient compliance is determined in 80% of public institution pharmacies. Less than 40% of independent and corporate community pharmacies provide primary healthcare therapy with prior authorisation from the SAPC. Public health services (such as screening tests and immunisation) are provided primarily in independent and corporate community pharmacies. (p = 0.0001; Cramers' V > 0.3000). Over 80% of manufacturing and wholesale pharmacies performed services as allowed in current legislation.

Conclusion: Despite the low response rate, the study shows that most pharmacies, especially community and institutional, do not offer all the services they may offer as allowed by law. The reason should be further investigated as an opportunity to offer comprehensive services in pharmacies, especially primary healthcare services.

Pharmaceutical services provided in pharmacies in South Africa during the COVID-19 pandemic

Ziyanda Mfuku[1], Panjasaram (Vassie) Naidoo[2], Martie Lubbe[3]

[1]*South African Pharmacy Council, Pretoria, South Africa*

[2]*Discipline of Pharmaceutical Sciences, UKZN, Durban, South Africa*

[3]*Medicine Usage in South Africa, NWU, Potchefstroom, South Africa*

Introduction: Since the start of the Coronavirus Disease 2019 (COVID-19) outbreak in December 2019, pharmacists worldwide have played a pivotal role in healthcare systems by being creative and innovative in preventive strategies and continued delivery of pharmaceutical services during the pandemic. This study aims to identify pharmaceutical services offered in South African pharmacies during the COVID-19 pandemic and those that pharmacists consider offering in the future.

Methods: A cross-sectional survey was implemented using self-administered online questionnaires distributed to 4 334 responsible pharmacists of pharmacies, pharmacists (N = 11 919), and pharmacist assistants (post-basic) (N = 15 512) registered with the South African Pharmacy Council in 2022.

Results: A total of 236 (5,42%) responsible pharmacists, 410 (3,44%) pharmacists, and 681 (4,39%) post-basic pharmacist assistants responded. Most pharmacists (n = 124, 65%) and post-basic pharmacist assistants (n = 186; 79%) indicated that they participated in managing the pandemic. More than 25% of responsible pharmacists indicated that the following services were provided in their pharmacies: i) Disease prevention and infection control (26.81%); ii) purchase (29,36%), storage (27,66%) and distribution (28,09%) of medications and personal protective equipment; iii) provision of medication information (26,38%); and iv) patient care services (28,09%). More pharmacies in urban than rural areas provide disease prevention and infection control services (p = 0.0500, Cramers' V = 0.131). Private and public institutional pharmacies and manufacturers participated primarily in developing protocols and guidelines to manage COVID-19 (p = 0.0035, Cramers' V = 0.2997). Specifically, pharmacists from public institutional pharmacies participated in local working groups to prepare for immunisation (p = 0.0155, Cramers' V = 0.2695). Responsible pharmacists indicated that they would, in future, be more involved in the clinical evaluation of patients and primary healthcare services, COVID-19 testing and screening and vaccination services, health promotion and education and homecare services.

Conclusion: In conclusion, the results show the important role pharmacists and pharmacist assistants played in community and institutional pharmacies during the pandemic in South Africa. The main services provided included disease prevention, supply of medicines and protective equipment, and provision of information. However, the study also highlighted that there may be services that are part of the scope of practice of a pharmacist that may not have been offered before the pandemic. Further consideration may be made of new approaches to improve access to pharmaceutical services and additional services.

Adherence levels of women with advanced breast cancer on CDK4/6 inhibitors compared to other oral anticancer medications

Matea Baković[1], Tajana Silovski[2], Lucija Benić[3], Magdalena Krajinović[3], Natalija Dedić Plavetić[2], Maja Ortner Hadžiabdić[3], Miranda Sertić[3]

[1]*PrimeVigilance, Zagreb, Croatia*

[2]*University Hospital Centre Zagreb, Zagreb, Croatia*

[3]*University of Zagreb Faculty of Pharmacy and Biochemistry, Zagreb, Croatia*

Background: Medication adherence is a critical factor for the successful outcome of therapy, and its association with clinical parameters, healthcare costs, and health-related quality of life has been extensively studied. However, limited data is available on the medication adherence of patients with advanced breast cancer, particularly those receiving newer therapeutic options such as CDK4/6 inhibitors (CDKIs). This study aimed to determine the prevalence of adherent patients with advanced breast cancer and compare their adherence levels depending on the prescribed therapy (CDKIs with endocrine therapy (ET) or other oral anticancer medications (OAMs)).

Methods: The authors conducted an observational cross-sectional study at the Department of Oncology and Radiotherapy at the University Hospital Centre Zagreb, Croatia, where data was collected through a questionnaire comprising sociodemographic and clinical parameters, as well as the Medication Adherence Report Scale-5 (MARS-5). MARS-5 scale consists of five items rated on a five-point scale, with total scores ranging from 5 points to 25 points; higher scores indicate better adherence.

Results: A total of 89 women were included in the study (median age was 60 (IQR 47-70) years; median duration of breast cancer since diagnosis was 6 (IQR 2.63-11.38) years; and a median number of total prescribed medications was 5 (IQR 3-6)). Of the participants, 60.9% received a combination of CDKIs and ET, while 39.1% received other OAMs. The most frequently prescribed CDKI and ET combination was fulvestrant and palbociclib (14.9%), followed by letrozole and ribociclib (13.8%) and fulvestrant and ribociclib (10.3%). The most frequently prescribed other OAMs were capecitabine (5.62%), followed by ibandronate acid (4.49%) and letrozole (3.37%). The majority of the participants, 60 (67.4%), had a MARS-5 score of a maximum of 25 points (high-adherent group), while 29 women (32.6%) had a MARS-5 score of 24 points or less (medium/low-adherent group). A statistically significant difference was observed between patients who received a combination of CDKI with ET and those who received other OAMs (p = 0.018), suggesting that patients on CDKI therapy were more adherent to their medications.

Conclusions: This study showed a high degree of adherence among patients with advanced breast cancer, particularly among those receiving CDKI therapy in combination with ET

Pharmacists as community health allies: Boosting vaccination rates and public health

Raquel Mateus, Catarina Ruivo, Mafalda Monterrozo, Marisa Moreira, Helder Mota Filipe

Ordem dos Farmacêuticos (Portuguese Pharmaceutical Society), Lisboa, Portugal

Background: The Portuguese Pharmaceutical Society (PPS) recognises and certifies the competencies of pharmacists, considering their professional responsibility, which translates into their contribution to improving the health of citizens in many aspects.

According to the regulation for the recognition of competency in administering vaccines and injectable drugs in community pharmacies, the assignment of the respective competency depends on the conclusion of the administration of vaccines and injectable drugs course and basic life support training. The competency is valid for 5 years.

In September, the Directorate General of Health (DGS) published 005/2023 and 006/2023 Norms about the Autumn-Winter 2023-2024 seasonal vaccination campaign, which included, for the first time, the administration of influenza and COVID-19 vaccines in community pharmacies, making it possible to expand access to the Portuguese population, particularly to citizens who are part of the priority groups for vaccination. To this end, the PPS provided online training to update pharmacists' knowledge of the new COVID-19 vaccine, completed by 5664 pharmacists.

Purpose: The main purpose is to analyse the increase in the number of pharmacists who are competent in administering vaccines and injectable drugs and the number of pharmacies with competent pharmacists as part of the seasonal vaccination campaign in Portugal.

Method: The PPS database was analysed between July 2023 and March 2024, specifically the data of pharmacists with competency in administering vaccines and injectable drugs.

Results: In March 2024, about two weeks before the end of the vaccination campaign, 7049 pharmacists have an active competency in the administration of vaccines and injectable drugs, of which 81% are female, 19% are male, 70% work in the community pharmacies and have an average age of 39 years. These pharmacists are spread across all of Portugal's districts.

This represents a 15% increase in pharmacists who can administer vaccines and injectable drugs compared to July 2023.

Additionally, there are currently 2578 pharmacies with pharmacists with an active competency, 222 more than in July 2023.

Conclusion: Considering the study carried out by the National Association of Pharmacies, 94.8% of the population vaccinated in community pharmacies say they agree with the choice of the government of these locations for administering vaccines, with more than 60% of participants indicating accessibility, namely due to issues such as proximity and brevity, as the main reason for choosing a community pharmacy.

This new approach allowed the number of vaccination points in Portugal used in the 2022/2023 seasonal vaccination campaign to increase from around 700 to over 3000, with community pharmacists playing a key role in achieving this goal.

Pharmacists are trusted by the public, leading to increased flu vaccination rates. This trust and increased vaccination uptake highlight their crucial role in public health.

Knowledge, likelihood of use, and accessibility of oral post exposure prophylaxis (PEP) among young adults in Zimbabwe

Nicodimus Tinashe Mucherera

Department of Pharmacy and Pharmaceutical Sciences, University of Zimbabwe, Harare, Zimbabwe

Introduction: This cross-sectional study aimed to evaluate the knowledge, likelihood of use, and accessibility of oral Post Exposure Prophylaxis (PEP) among young adults enrolled in the University of Zimbabwe Faculty of Medicine and Health Sciences in Harare, Zimbabwe. PEP is a medication used to prevent the spread of HIV within 72 hours of unprotected sexual intercourse with a high-risk individual. Understanding the attitudes of young adults towards oral PEP is crucial for improving HIV prevention strategies.

Method: A self-administered questionnaire was used to interview 120 young adults (mean age: 22 years) at the University of Zimbabwe. The questionnaire assessed participants' knowledge of, likelihood of using, and accessibility to oral PEP. Participants were asked about their sources of information regarding PEP, and their responses were analysed to determine the impact of knowledge on the likelihood of PEP use. The questionnaire also explored potential challenges to accessing and taking PEP.

Results: Among the participants, 83.1% (n = 100) reported having heard about PEP, with the majority (75%) obtaining information from lectures/classes and 21% from hospitals/clinics. Only 4% of participants learned about PEP from peer educators and friends. Knowledge about PEP positively correlated with the likelihood of its use. Stigma was identified as the primary challenge to accessing and taking PEP, with 94.2% of participants acknowledging its potential impact. Cost was a concern for 74.2% of participants, while the location of service providers was a challenge for 53.3%. Side effects of the pill were considered a barrier by only 25.8% of participants and mistrust of medical institutions and practitioners by 10%.

Conclusion: The study found that overall knowledge about oral PEP among the students was good, but there is a need for targeted education for those unaware of PEP. To enhance PEP uptake, further educational interventions should be implemented. Programmes should also address the specific concerns of student groups less likely to use PEP, and encourage their participation in awareness training. Addressing stigma, reducing costs, and improving the accessibility of PEP services are crucial for successful implementation.

Role of clinical pharmacists on optimising the post-operative pain management

Erdenetuya Myagmarsuren[1], Khulan Altangerel[2], Delgermaa Tsegeen[2], Khulan Myangan[2], Orgilmaa Tsolmonbaatar[2], Nomin-Erdene Tsolmon[2], Nina Muratkhan[1], Narangarav Nyamdag[2], Naranpurev Mendsaikhan[2]

[1]*School of Pharmacy of MNUMS, Ulaanbaatar, Mongolia*

[2]*Mongolia-Japan Hospital of MNUMS, Ulaanbaatar, Mongolia*

Background: Postoperative pain management is essential for patient recovery following surgery. However, suboptimal selection of analgesics and inadequate monitoring of treatment can hinder patient outcomes and incidence of medication-related problems.

Purpose: This study aims to investigate medication usage patterns in postoperative pain management across different surgical procedures.

Methods: A retrospective analysis was conducted on the medication charts of 898 patients who underwent surgical interventions for acute appendicitis, cholelithiasis, hernia, and hepatocellular carcinoma at the Department of Surgery, Mongolia-Japan Hospital of the Mongolian National University of Medical Sciences (MNUMS) between 2022 and 2023. Data on patient demographics, diagnosis, length of hospital stay, and medications used for postoperative pain management were collected from medical records.

Results: Of the 898 patients included in the study, 301 (33.5%) were male, while 597 (66.5%) were female. Analgesics were administered selectively according to pain severity: 84.8% (n=2224) for mild pain, 4.9% (n=129) for moderate pain, and 0.1% (n=2) for severe pain. Notably, pain assessment was not conducted in 10.3% of cases. Analgesics were utilised in various combinations, totalling 12 combinations across 51 types. Diclofenac (n=1226) and Ketoprofen (n=650) were the most frequently administered individual medications. The most common combinations included Acetaminophen+Diclofenac (n=199), Diclofenac+Ketoprofen (n=119), and Acetaminophen+Ketoprofen (n=102). Despite pain assessment, inappropriate analgesic choices were made in 132 instances, and drug combinations with potential interactions were observed in 154 cases.

Regression analysis revealed significant associations between surgical procedures and medication usage. NSAIDs were 0.26 times more likely to be administered during open surgeries (r = 0.26; p = 0.001), while Acetaminophen and opioids were 2.04 times (r = 2.04; p = 0.000) and 4.71 times (r = 4.07; p = 0.000) more likely, respectively. Additionally, planned surgeries exhibited a 1.71 times greater likelihood of Acetaminophen usage (r = 1.71; p = 0.007) and a 1.70 times greater likelihood of opioid usage (r = 1.7; p = 0.036).

Clinical Pharmacist Interventions: Clinical pharmacists provided 156 suggestions and recommendations regarding analgesic usage for 132 patients. These suggestions predominantly focused on dosage adjustments, drug record management, drug administration, and drug interactions. Diclofenac (n=72), Ketoprofen (n=54), and Fentanyl (n=20) received the highest number of suggestions.

Conclusion: While analgesic selection is generally based on pain severity, inappropriate drug combinations and choices highlight the need for enhanced clinical pharmacist care in postoperative pain management.

Patient-centered pharmaceutical care: Practice of cardiovascular specialty pharmaceutical clinic based on medication therapy management model

Wang Na, Qian Yan, Lei Xiaomei, Qiu Sha, Sun Wenqing

The Second Affiliated Hospital of Chongqing Medical University, Chongqing, China

Background: Cardiovascular disease has been the main cause of death globally and should be prevented or treated with safe and effective interventions. Standardised drug therapy and outpatient follow-up are essential to improve and enhance the quality of life. The physician–pharmacist collaborative clinics(PPCCs) have been established at the institution since September 2016. The authors found that compared with atrial fibrillation patients in general clinics, patients in PPCCs were found to have a significantly increased mean TTR level (48.4% ± 25.7% vs. 38.0% ± 27.6%, p = 0.014). Therefore, the institution launched a Cardiovascular Specialty Pharmaceutical Clinic(CSPC) in November 2019 to solve various medication problems of patients with chronic diseases, hoping to improve patient adherence.

Objective: This article introduces the service mode and content of the CSPC based on the MTM, and discusses the experience and effectiveness of clinical pharmacists in cardiovascular disease through quantitative indicators such as the number of outpatient and returning patients, drug-related problems, patient compliance, and the control rate of blood pressure and anticoagulation treatment.

Methods： Collect patient data who visited the CSPC from January 1, 2020, to January 1, 2024, including patient basic information, consultation content, drug-related problems classified according to the PCNE-DRP V9.1 classification system, and improvement after clinic management for statistical analysis.

Results： Over the past four years, the CSPC has treated 861 patients. Among them, 516 patients visited it only once, while 85 patients received MTM service and visited at least twice, with a revisit rate of 14.14%. 19 patients visited more than 5 times, with the most visits reaching 20 times. The most common diseases among patients were hypertension (75.49%), atrial fibrillation (24.16%), and heart valve disease (16.84%). Consultation topics mainly focused on drug usage and dosage, lifestyle, blood pressure measurement methods, adverse drug reactions, and drug purposes. A total of 1723 drug-related problems were identified, with the most common issue being treatment effectiveness (58.8%). Patient-related reasons mainly included insufficient dosage or non-compliance, lack of or inadequate efficacy monitoring, and incorrect drug usage. After CSPC management, systolic blood pressure (146.56±16.59 vs. 131.18±12.17, P = 0.00) and diastolic blood pressure (88.00±17.16 vs. 81.48±10.78, P = 0.04) of hypertensive patients decreased; and time in therapeutic range (TTR) of warfarin users increased after CSPC management, respectively, with values of 35.15±27.12 and 57.26±24.23, P = 0.00.

Conclusion： Relying on the department of cardiovascular medicine and based on the MTM , the clinical pharmacists of cardiovascular specialty in this hospital have established a standardised service model of CSPC. The services mainly include assessing drug treatment plans and drug-related problems, educating patients on drug use and lifestyle, answering patients' consultation questions, and formulating individualised treatment goals and follow-up plans. It can comprehensively and effectively solve the problems encountered or potential problems in the process of medication for patients, help patients use medication in a safe, effective and rational way, improve the treatment effect, and carry out humanistic care throughout the whole process of medical consultation, which reflects the value of pharmacists.

Continuous glucose monitoring outcomes in low-income populations within the United States: A scoping review

Martha Ndungu[1], Funto Babalola[2], Ravi Patel[1]

[1]*University of Pittsburgh School of Pharmacy, Pittsburgh, PA, United States*

[2]*University of North Texas Health Science Center College of Pharmacy, Fort Worth, TX, United States*

Introduction: Diabetes prevalence has increased significantly in the United States, with the highest rates and impact having a significantly disparate effect on adults living below the federal poverty level (FPL). Continuous glucose monitoring (CGM) has revolutionised diabetes management, improving glycemic control and quality of life. However, despite guideline recommendations, the use of CGM approaches and related devices remains low among low-income and minority populations due to a constellation of barriers including, but

not limited to, high device cost and limited access. This scoping review aims to synthesise the existing evidence on the use and impact of CGM on health outcomes in low-income populations with diabetes.

Method: This review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Relevant studies were identified through searches in electronic databases such as PubMed, Embase, and CINAHL. Eligibility criteria include studies conducted in the United States involving adults (≥18 years) with type 2 diabetes who are low-income or treated in underserved settings (e.g., free clinics, Federally Qualified Health Centers) using a CGM device. Studies were excluded if they did not provide diabetes-related clinical outcomes (HbA1c, self-monitoring blood glucose, symptoms) before and after CGM. Low income was defined as the author or patient's self-identification of income below 400% of the FPL; when income was not reported, studies were included if most participants were uninsured or had government-subsidised insurance (Medicare/Medicaid) and less than 20% had commercial insurance, to consider the significant population in the United States who are underinsured. Two reviewers will perform study selection, data extraction, and quality assessment independently. The primary interest lies in diabetes-related clinical outcomes correlated with the use of CGM devices. Secondary outcomes will include patient satisfaction, quality of life, and broader health outcomes such as hospitalisations and diabetes-related complications.

Results: Thus far, out of 278 studies evaluated, three studies were found to meet the criteria. One study that evaluated fifty-five patients who fell below 200% of the FPL found a reduction in mean HbA1c from 9.09 to 8.46% and a 17.65 mg/dL reduction in average glucose. In a study with forty-four patients, 98% uninsured or on Medicare/Medicaid, there was a 4.1% reduction in hypoglycemic events after utilising a CGM device. The third study, emphasising the impact of pharmacists, evaluated forty-one patients who faced device cost barriers and saw a mean decrease in HbA1c of 2.5% when the CGM was managed by a clinical pharmacist and –0.8% for those who were not. Any additional studies identified will be included upon completion of the scoping review, which is anticipated in May 2024.

Conclusion: The results of this scoping review will identify gaps in the literature and provide insights into the potential role of CGM in addressing diabetes disparities among low-income populations. Based on currently reviewed studies, using CGM devices in low-income patients has shown an improvement in diabetes-related clinical outcomes. These findings may inform future research and interventions to improve access and implementation of CGM in underserved populations, ultimately promoting health equity and better outcomes.

Enhancing medication safety: The impact of clinical pharmacists on prescription errors

Tsolmon Nomin-Erdene[1], Myangan Khulan[1], Tsolmonbaatar Orgilmaa[1], Tsegeen Delgermaa[1], Altangerel Khulan[1], Nyamdag Narangarav[1], Muratkhan Nina[2], Ganbat Dulguun[2], Mrs Myagmarsuren Erdenetuya[2]

[1]*Mongolia-Japan Hospital of MNUMS, Ulaanbaatar, Mongolia*

[2]*School of pharmacy, MNUMS, Ulaanbaatar, Mongolia*

Background: Clinical pharmacy services were introduced 60 years ago in North America and 20 years ago in Iran, proving the important role of pharmacists in the early detection and prevention of risks related to drug therapy.

In Mongolia, the patient and clinical pharmacy-oriented pharmacy curriculum is relatively new, and the national competency framework for Mongolian pharmacy professionals has not yet been fully mandated. In addition, the teaching hospital of the Mongolia-Japan Hospital of MNUMS has been operating for only 3 years and has initiated and implemented clinical pharmacy services in Mongolia. This study aims to explore the impact of clinical pharmacists on choosing the medication of the prescription and collaborating with doctors to ensure improving the medication's safety and efficacy.

Methods: Retrospective analysis was conducted on the medication charts of 3648 patients of Mongolia-Japan Hospital of the Mongolian National University of Medical Sciences (MNUMS) between 2022 and 2023. The authors selected and studied the 142 cases in which clinical pharmacists' recommendations concerning appropriate drug selections out of 1041 drug-related problems. Data on patient demographics, diagnosis, length of hospital stay, and medications used for postoperative pain management were collected from medical records.

Results: Based on the prescription review, 142 (100%) pharmacist recommendations were made regarding medication selection. The majority, 37.7% (n=54), suggested discontinuing the medication, while 33.6% (n=48) recommended changing the medication. Additionally, 10.5% (n=15) proposed altering the forms of medication, 9.8% (n=14) offered to adjust the frequency of medication usage, and 8.4% (n=12) advocated initiating a new medication.

The physician received the highest percentage of proposals (76.9%) from the aforementioned category to start a new medication.

57.4% (n=31) of the total 54 suggestions to terminate the medication were accepted by the physician. Upon analysing the reasons for medication discontinuation, there were 7 contraindicated medicines and 13 duplicate drugs. Furthermore, 3 cases prevented the occurrence of adverse drug reactions and medication errors, and 6 cases of medications are contraindicated for the age and diagnosis of the patient (for example, use of ketoprofen in children, use of

NSAIDs in patients with asthma, etc.), and 3 cases related to drug stocks.

59.8% (n=85) of the total 142 suggestions were accepted by physicians, leading to modifications in therapeutic management.

Pharmacists voted 63.3% (n=90) for the selection of antimicrobial drugs, while 16.9% (n=24) for NSAIDs, and 6.3% (n=9) for the group of high-risk medications and alimentary tract medication. From the previously mentioned category, the attending physician garnered the highest votes, 66.6%, for selecting high-risk drugs.

Conclusion: Clinical pharmacists actively mitigate risks associated with drug selection through prescription monitoring. Moving forward, it is essential for the clinical team to.

Enhancing the governance of pharmaceutical services for equitable medicine access: The role of district and sub-district pharmacists in South Africa

Ida Okeyo

School of Pharmacy, University of the Western Cape, Cape Town, South Africa

Background: South Africa's National Health Insurance (NHI) represents a transformative endeavour to enable health equity and access to care. At its core lies a significant focus on re-engineering primary healthcare services, including establishing contracting units at the sub-district level. These units are envisioned as governance structures responsible for managing health services at the grassroots level, thereby decentralising governance functionalities from the provincial to the district or sub-district level.

Amidst this healthcare reform landscape, pharmacists' role has emerged as increasingly pivotal, particularly concerning medicine supply management. While the South African Department of Health currently formulates pharmaceutical policies and allocates resources at the national level, the impending NHI implementation necessitates a shift in governance dynamics, focusing on enhancing pharmacy engagement at the district and sub-district levels.

However, a critical gap exists in understanding district and sub-district pharmacists' specific roles, challenges, and contributions within this evolving governance framework. Prior research has highlighted frontline challenges in ensuring medicine availability and access in low and middle-income countries, including South Africa. Yet, limited attention has been directed towards exploring the nuanced experiences of district and sub-district pharmacists, particularly in the context of NHI implementation and the governance challenges they face in ensuring adequate medicine distribution and monitoring usage at the facility level.

Purpose: To address this gap, this poster presentation aims to illuminate the real-life experiences of district and sub-district pharmacists through a narrative inquiry approach. Drawing upon the narratives of five community service pharmacists who spent a year in a South African district medical store between 2021 and 2023, the presentation will provide firsthand exposure to pharmacy practice at the district level. After completing their internship, South African pharmacists are mandated to complete a year of community service within a public sector facility in South Africa, providing them with firsthand exposure to pharmacy practice at the district level.

Results: The narratives of practice from these pharmacists' experiences offer valuable insights into the unique challenges and opportunities encountered by district and sub-district pharmacists in South Africa. Specifically, this presentation will shed light on the multifaceted roles assumed by district pharmacists as intermediaries between provincial and facility levels. Furthermore, the various challenges pharmacists face will be explored, including resource constraints, stock availability issues, and their interactions with nurses responsible for managing health facilities in the absence of pharmacists.

Conclusion: By reflecting on practice experiences within the context of the COVID-19 pandemic, this presentation aims to provide nuanced insights into the governance needs and opportunities for strengthening pharmacy engagement in NHI implementation. As South Africa strives to achieve equitable medicine access and advance universal health coverage, the experiences of district and sub-district pharmacists will be instrumental in identifying governance gaps and informing strategies to optimise pharmacy contributions within the evolving healthcare landscape.

Assessment of adherence to the World Health Organisation's prescribing indicators at the family medicine clinic of a tertiary healthcare facility in Ghana

Daniel Freeman Owusu Ansah[1], Nana Ama Buadiba Osei[1], Kofi Bedu Tetteh[2], Angela Appiah Kuffuor[1]

[1]*University of Ghana Medical Centre, Accra, Ghana*

[2]*Trust Hospital Limited, Accra, Ghana*

Introduction: Using medications rationally reduces adverse reactions and the chances of drug resistance while ensuring optimal health outcomes. Drug utilisation studies are used periodically to ensure the rational use of medicines. These studies help to evaluate the quality of drugs and make clinical care cost-effective. Using the World Health Organisation (WHO) drug use indicators, this study assessed the prescription patterns at the family medicine clinic of the

University of Ghana Medical Centre (UGMC) using the WHO core prescribing indicators.

Aim: To assess drug prescribing patterns using the WHO rational use of medicines prescribing indicators at the family medicine clinic of the University of Ghana Medical Centre.

Method: A cross-sectional survey design was used for this study. Using a systematic random sampling method, patients seen at the family medicine clinic from January 2022 to May 2023 were selected. Data was extracted from prescriptions in the electronic medical records of participants. Also, prescribers in the family medicine clinic were given questionnaires to assess the factors associated with the rational use of medicines. STATA version 17 was used to analyse the data. Frequencies and percentages were used to describe the characteristics of the respondents and prescribers. Further analysis, including the Zero-inflated Poisson and logistic regression, was used to assess the magnitude of the association between the outcome and independent variables at a 95% confidence interval.

Results: Out of the 600 medical records analysed, 367 (61.17%) and 233 (38.83%) were male and female respectively with 10 prescribers interviewed (3 males and 7 females). The mean number of medicines prescribed per patient encounter was 1.4 (n=840). The percentage of patients encountered with antibiotics was 12.74% (n=107) with injections being 4.17% (n=35). The percentage of medicines prescribed generically was 34.88% (n=293) and from the Essential Medicines List (EML) 72.38% (n=608). Prescriptions with a record of diagnosis were 50.83% (n=305). Patients without comorbidities were 65.4% less likely to have polypharmacy than those with comorbidities [AOR 0.346 (95%, C.I; 0.053-0.640), p-value=0.021]. Females were 46.4% less likely to have an antibiotic in their prescription than males [AOR 0.536 (95%, C.I; 0.329-0.874), p-value=0.012]. Participants with chronic conditions were twice as likely to have a prescribed antibiotic as those without chronic conditions [AOR 1.932 (95%, C.I; 1.088-3.428), p-value=0.025]. Participants with a chronic condition were 74.4% more likely to have their drugs prescribed from the EML compared to those without a chronic condition [AOR 0.256 (95%, C.I; 0.002-0.511), p-value=0.048].

Conclusion: There was moderate adherence to rational prescribing as most of the prescribing indicators fell within the WHO/INRUD standards. Three parameters out of six met the WHO reference standards: the average number of medicines per encounter, the percentage of encounters with an injectable prescribed, and the percentage of encounters with antibiotics.

Assessing the needs of lifelong learning for young Portuguese pharmacists: A nationwide modified Delphi consensus

Ana Francisca Morais, Duarte Pinto, Francisca Gonçalves, Ms Sandra Vieira, Ana Rita Rodrigues, Diogo Almeida, Andreia Moreira, Carolina Simão, José Miguel Neves, Tiago Rodrigues, Lucas Chambel, Renato Ferreira-da-Silva

APJF - Portuguese Association of Young Pharmacists, Lisbon, Portugal

Background: The Portuguese Association of Young Pharmacists plays a crucial role in spearheading the ongoing advancement of the pharmaceutical profession within the country. Early-career pharmacists are pivotal in the pharmaceutical landscape, particularly in distribution, community, and hospital settings. Ensuring their competency is crucial for the safe and efficient delivery of pharmaceutical services.

Purpose: This study aimed to assess and establish the competencies of early-career pharmacists in pharmaceutical distribution, community pharmacy, and hospital pharmacy settings. It intends to present the study to the Portuguese Pharmaceutical Society (PPS) and the Portuguese Pharmaceutical Faculties, aiming to develop new strategies to better prepare young pharmacists for their competencies.

Methods: This study employed a consensus-driven evaluation through the modified Delphi method, engaging a panel of expert pharmacists in Portugal. Recruitment was based on criteria including (i) registration with the PPS, (ii) a degree in Pharmaceutical Sciences, and (iii) current professional practice in the relevant area. A pilot test was conducted to refine the questionnaire. Experts were selected through non-probabilistic convenience sampling and responded to items using a 5-point Likert scale, ensuring comprehensive and accurate data collection. Consensus was defined as ≥75% of participants agreeing/strongly agreeing (4 or 5) or disagreeing/strongly disagreeing (2 or 1) with a statement.

Results: Findings revealed a strong consensus on essential competencies across all three sectors. In the community pharmacy group, initially including 22 pharmacists, there was agreement on 30 of the 46 proposed competency items, with a consensus of 69.6%. Proficiencies in patient counselling, medication management, and adherence promotion were deemed fundamental. The hospital pharmacy group, comprising 22 pharmacists, reached a significant consensus of 93.8%, agreeing on 30 of the 32 items. This sector highlighted medication therapy management, sterile compounding, and interdisciplinary collaboration. In pharmaceutical distribution involving 15 pharmacists, a 69.8% consensus was achieved, agreeing to include 30 of the 43 proposed items. Unanimous agreement was seen in data management, environmental sustainability, and regulatory

compliance. Notably, competencies such as innovation and sustainability were relevant across all sectors.

Limitations: Participant attrition across Delphi rounds and the use of non-probabilistic sampling for panel selection might have impacted the consensus strength and representativeness of the findings.

Conclusion: This study provides comprehensive insights into the competencies required by early-career pharmacists in three different settings. The identified competencies guide curriculum development, training programmes, and competency assessment initiatives, ensuring that pharmacists are equipped with the necessary skills to meet the evolving demands of their respective roles.

Revolutionising chronic medicine access: Mobile pick-up points in KwaZulu-Natal, South Africa

Roma Ramphal

Health Systems Trust, Durban, South Africa

Background: The Central Chronic Medicines Dispensing and Distribution programme, initiated by the South African National Department of Health in 2014, aims to enhance chronic medication access for clinically stable patients. In 2020, Health Systems Trust partnered with the KwaZulu-Natal Provincial Department of Health to introduce a mobile pick-up point model for underserviced communities. Implemented originally as a pilot project and expanded to four districts in 2021, these vans provide close-to-home deliveries until fixed pick-up points are established or patients transition to a long-term solution such as smart lockers.

Method: Ten vans featuring distinctive branding were transformed into mobile dispensing units with temperature-regulated interiors, pull-out awnings, secure medicine storage, and electronic records devices. Each van's trained driver-issuers served two daily or 15 weekly park-and-issue locations. Collaborative efforts with local stakeholders secured approved sites in communities lacking conventional pick-up points.

Data were gathered from the service provider's monthly dashboard in January, March, June, October 2022/2023, and January 2024. Patient retention was calculated by dividing those active within differentiated care by total registrations. Data trends and variations were visualised in Microsoft Excel to assess the van pick-up point model's performance relative to large conventional pick-up point corporates and other innovations.

Results: The van pick-up point model has demonstrated consistent retention of registered patients from January 2022 to January 2024, with a retention rate of 67%, outperforming retention rates of two conventional pharmacy pick-up point chains (60% and 54%) and three other innovative pick-up point models (65%, 61% and 57%).

Conclusion: The van pick-up point model offers a flexible, patient-friendly solution to medication access challenges. While the model shows promise in retaining patients, a more in-depth evaluation is recommended to assess its sustained impact and effectiveness.

Real-world non-adherence treatment rates of patients with migraine in the United States: A targeted literature review

Nazia Rashid, Gail Orum

Keck Graduate Institute, School of Pharmacy and Applied Sciences, Claremont, United States

Introduction: Migraine is a complex neurobiological disorder associated with direct and indirect costs and affects ~39 million people in the US and 1 billion people worldwide. Triptans have long been the gold standard of care (SOC) for acute migraine relief. Medication non-adherence (NA) is common in migraine patients using triptans and significantly increases the risk of migraine recurrence, severity and overall cost to the payer and patient. Prior studies have evaluated medication NA. However, there is a lack of comparing/contrasting real-world data to better understand the significant factors associated with medication NA in migraine patients.

Methods: To summarise the rates and the rationale associated with medication NA in patients with migraine in the US, a targeted literature review (TLR) was conducted from 2000 to 2022 utilising databases such as MEDLINE via PubMed, Web of Science and Scopus. MeSH terms used included migraine treatment, triptan, adherence, medication discontinuation, persistence, switching, side effects, inefficacy and medication overuse. The TLR included retrospective, observational, case-control, and systematic review studies. Two reviewers assessed the publications to alleviate duplicative research; if there were any discrepancies, a third reviewer alleviated the findings. The PICO and PRISMA methodologies were followed to ensure the review was conducted within the referenced guidelines.

Results: A total of 20 studies were identified, and 16 were included in the final review. Data from a US pharmacy claims database identified that approximately 38% to 54% of patients did not refill their initial index triptan. Of this subset, 25% discontinued prescription migraine therapy, 7.4% switched to a different triptan, and 67.1% switched to a non-triptan migraine medication at the time of their first refill. The proportion of patients that remained persistent up to six refills of their index triptan ranged from 3.2% to 12.6%. The 1-year probability of discontinuation among triptan users

(not limited to treatment-naive patients) ranged between 30% to 60%. The route of administration also played a role in discontinuation rates, as 81% of patients discontinued injectable triptans, 66.5% discontinued nasal sprays, and 55.2% discontinued oral triptans. Other factors related to NA are safety and side effect tolerability (13.5% to 24.9%), general concerns regarding triptans (20.1% to 65.6%), financial concerns (19.4%), recurrence of pain after initial relief (24.1% to 50%) and switching to non-prescription treatment (45.5%).

Conclusion: Medication NA rates remain high among patients with migraines in the US. Understanding these viable factors can help healthcare decision-makers establish effective interventions or programmes to alleviate the potential economic impact. Although triptan therapy is the current gold SOC, newer therapies could provide better efficacy and side effect profiles, improving adherence rates.

Using AI to support professional interventions in community pharmacies

Joana Pinto[1], Rúben D. Pereira[2], Cristina Nunes[1], António Rodrigues[1,2,3,4]

[1]Centre for Medicines Information and Health Interventions/Infosaúde, National Association of Pharmacies (CEDIME/IF, ANF), Lisboa, Portugal

[2]Centre for Health Evaluation & Research/Infosaúde, National Association of Pharmacies (CEFAR/IF, ANF), Lisboa, Portugal

[3]Life and Health Sciences Research Institute [ICVS], School of Medicine, University of Minho, Braga, Portugal

[4]ICVS/3B's-PT Government Associate Laboratory, Braga/Guimarães, Portugal

Community pharmacists' professional intervention when dispensing medicines is sometimes hampered by the demands of service provided over the counter, pressure from other people waiting to be attended to, and the individual's expectations of quick and unhindered service from the pharmacy.

Nonetheless, it is increasingly important to broaden the scope of intervention to promote the safety and effective use of medicines. Therefore, the ease of clarifying issues in this context and the ability to respond quickly, objectively and robustly to client questions are crucial.

Relevant knowledge sources, such as summaries of product characteristics (SPCs) and databases of medicines, are available to assist community pharmacists in providing further value to the customer. However, searching through the national repositories is time-consuming, and the service is significantly impacted when several documents need to be assessed, rendering the task impossible in real-time. The emergence of AI, particularly text-generative models, allows users to interact and make sense of substantial amounts of knowledge by using plain text prompts as a dialogue.

Purpose: This work aims to make it viable for pharmacy practitioners to search through the data from the Portuguese repository of SPC documents in real-time, in dialogue with an AI tool that is specialised in this documentation.

Documents from the national repository of SPCs were downloaded from the Portuguese regulatory entity for medicines' website. Each file was parsed using a simple string search based on the standard structure of this type of document, and a tabular structure with columnar information about each section of each document was created. The file was then uploaded to create a GPT based on the selected information.

Preliminary results have shown that the tool can accurately answer the questions based only on the files selected. The answers consist of the text in the section to which the question concerns, delivered as a dialogue and containing general health safety warnings, such as seeking physician opinion when relevant, as instructed by the team.

Questions that would require consulting at least a dozen files (e.g., "Which medicines containing the INN Atorvastatin do not contain lactose in the excipients?") are answered in one prompt, provided that the information is in the file.

However, questions requiring the tool to search through blocks of text in each document section are time-consuming and often unproductive. This led to the addition of more structures to the tabular file, such as "medicine name" and "INN," to facilitate search and help direct the questions/prompts.

Using this AI in community pharmacies empowers the practitioner and enriches customer experience since dialogues can be engaged in a Q&A fashion in real-time. Nevertheless, strategies to download information from the repositories and structure remain the bottleneck for adopting these types of approaches, thus requiring further development.

Interprofessional communication between community pharmacy and physicians

Charlotte Verner Rossing, Trine Graabæk, Cecilia Schulenburg, Liza Al-Muhanna, Lotte Stig Nørgaard, Ulla Hedegaard

Pharmakon, Danish College of Pharmacy Practice, Hilleroed, Danmark

Background: Medication errors and adverse events are often a result of insufficient or inaccurate communication between healthcare professionals. At the community pharmacy, incorrections or ambiguities in prescriptions must be discussed with the prescribing physician. However, not much is known about the communication between pharmacy and physicians.

Purpose: The objectives were to identify the content and frequency of communication between community pharmacies and physicians.

Method: An electronic survey was sent to 26 Danish pharmacies. For one week, the pharmacies documented all interprofessional communication between the pharmacy and physicians and the communication with customers referred to the physician (indirect communication).

Results: In total, 1118 registrations were completed, ranging from four to 123 registrations per pharmacy. Most of the registrations were customers' referrals to physicians (n=816, 73%), primarily because of missing prescriptions (n=655, 59 %). The pharmacy contacted the physician 248 times, primarily about drug shortages (n=77, 31%), clinical corrections of the prescription (n=32, 13%), and missing prescriptions (n=42, 17%). The physician contacted the pharmacy 54 times, the main reasons being dose dispensing (n=17, 31%), drug shortages (n=7, 13%), and missing prescriptions (n=6, 11%). Most pharmacies' 302 physician contacts were with general practitioners (n=243,80%). The pharmacies described several challenges with contacting the physician; however, most were satisfied with the communication overall.

Conclusions: At the pharmacies, customers are frequently referred to GPs. The pharmacies contact the GPs more frequently than the GPs contact the pharmacies. Most communication between pharmacies and GPs concerns prescriptions due to missing prescriptions, drug shortages, or corrections.

Strengthening pharmaceutical systems: Lessons learned from COVID-19 vaccine introduction in South Africa

Marione Schonfeldt[2], Rosemary J Burnett[1,3], Johanna C Meyer[1,3]

[1]Department of Public Health Pharmacy and Management, School of Pharmacy, Sefako Makgatho Health Sciences University, Pretoria, South Africa

[2]Sector Wide Procurement, National Department of Health, Pretoria, South Africa

[3]South African Vaccination and Immunisation Centre, Sefako Makgatho Health Sciences University, Pretoria, South Africa

Background: In 2021, South Africa introduced COVID-19 vaccines to mitigate the economic impact and public health risks associated with the pandemic. Pharmaceutical services are provided within the health system, and various changes to the core functions within the pharmaceutical management framework (PMF) were required during the introduction of the COVID-19 vaccine.

Purpose: To describe how pharmaceutical systems were influenced by COVID-19 vaccine introduction utilising the World Health Organisation's health systems building blocks; To explore whether the required interventions to enable COVID-19 vaccine introduction strengthened the overall health system and were sustainable; To describe the lessons learned for future pandemic preparedness.

Method: A qualitative, exploratory study based on a theoretical framework. In-depth interviews were conducted with 13 key informants, identified based on extensive involvement, knowledge and experience with COVID-19 vaccine introduction in South Africa. Participants included pharmaceutical policy specialists, pharmaceutical services managers, supply chain experts, regulatory pharmacists and other key role players functioning within pharmaceutical services at the national level. Interviews were recorded, transcribed verbatim and coded using NVivo12®. A step-wise thematic analysis was conducted, and themes were interpreted within the theoretical framework. Ethics clearance and written informed consent were obtained.

Results: Several key lessons learned from the COVID-19 vaccine introduction about pharmaceutical services were identified from the data. Various regulatory mechanisms were utilised to ensure access to COVID-19 vaccines under emergency use listing, including Sections 21, 22(A), 15 and 36 of the Medicines and Related Substances Act (101 of 1965). Core functions within pharmaceutical services were altered, including central vaccine procurement and distribution, influencing the vaccine service delivery model. The vaccine presentation greatly influenced the immunisation supply chain design due to storage requirements and minimum order quantities, which determined vaccine access. Health information systems (HIS) were updated or developed to facilitate various activities, including pharmacovigilance, monitoring, and evaluation, allowing for an adaptive response during the introduction of the COVID-19 vaccine. Some continued challenges within the health system were highlighted, especially human resource capacity, training and supervision.

Conclusions: Pharmaceutical services are essential to the health system, playing a critical role in vaccine introduction. While certain processes within the PMF, e.g. procurement and distribution, were strengthened, vaccine introduction also highlighted some health system challenges. HISs were designed to aid healthcare workers. However, virtual training of healthcare workers and supervisory support remained a challenge. Hence, continuous training is necessary to ensure future pandemic preparedness. HIS strengthened the pharmaceutical management of COVID-19 vaccines with varying degrees of success and enabled the pharmaceutical pandemic response regarding vaccine allocation, distribution and safety monitoring. The study findings can guide pharmacy practice, enabling future pandemic preparedness.

Knowledge, perception, prevalence and practices of students in Tertiary Institutions in Lagos State about Halitosis

Arinola Joda, Eniola Aina, Kehinde Umeizudike

Department of Clinical Pharmacy and Biopharmacy, Faculty of Pharmacy, University of Lagos, Idiaraba Campus, Idiaraba, Lagos, Nigeria

Background: Halitosis, also known as bad breath, is one of the most common oral conditions affecting 20-50% of the population. Halitosis is a Latin word derived from halitus (breathed air) and osis (pathological alteration). It describes an unpleasant or offensive odour emanating from the mouth or breath. Fetor oris, oral malodour, and mouth odour are other terms used to characterise halitosis. The prevalence of halitosis has been reported in other previous studies to range from 23.6% in Asia through 30% in the Middle East to 23% to 50% in Africa. In Nigeria, few studies have been documented on the prevalence of halitosis ranging from 13 to 14.8%. The impact and associated personal discomfort of halitosis on affected persons often lead to the abuse of mouthwashes, rinses, sprays, and chewing gum to mask the odour. Thus, halitosis is an oral problem worth paying attention to by healthcare providers and society at large. While halitosis is a common oral health issue, there is a dearth of research specifically focused on the student population within the tertiary educational system of Lagos State. The lack of empirical data hinders the development of effective preventive and management strategies for halitosis in this demographic.

Purpose: To determine tertiary institution students' knowledge, prevalence, and perception of halitosis in Lagos State.

Methods: A cross-sectional study design was employed in three purposively selected tertiary institutions in Lagos state, namely: University of Lagos (UNILAG), Lagos State University (LASU) and Yaba College of Technology (YCT) among three seventy-seven (377) conveniently selected students. Data collection utilised an online semi-structured pre-tested questionnaire and a subjective diagnostic assessment using the wrist lick test. The collected data were analysed descriptively using SPSS Version 25.0. Ethical approval was obtained from the Health Research Ethics Committee of the Lagos University Teaching Hospital (LUTH), Idi-Araba, Lagos, Nigeria.

Results: A percentage recovery of 101.1% was obtained (YCT, n=39; LASU, n=138%; UNILAG, n=204). Most of the respondents were female (54.1%), single (98%), Christian (74%) and of the Yoruba tribe (78%). The mean age of the respondents was 21.49±3.23. Overall, the majority of the respondents (66.1%) had poor knowledge about halitosis (YCT-89.7%; LASU-78.3%; UNILAG-53.4%), though perception about it was positive (62.2%) (YCT-41.0%; LASU-51.4%; UNILAG-73.5%). Most respondents had neither treated themselves (95.8%) nor received professional treatment (97.1%) for halitosis. 7.6% believe they have halitosis (YCT-20.5; LASU-6.5, UNILAG-5.9%). Using the subjective diagnostic scale, 8.6%-LASU, 7.9%-UNILAG, and 25.6%-YCT perceived moderate to strong odour indicative of positive halitosis cases.

Conclusion: It can be concluded that the students in the selected tertiary institutions have poor knowledge about halitosis. Although the students have a good perception of halitosis, their practice towards its prevention is not satisfactory. Halitosis prevalence was low among the students. The findings underscore the importance of targeted oral health education and interventions to improve this population's knowledge and oral hygiene practices.

Assessment of pharmacists' involvement and capacity in prevention and management of cardiovascular disease in Ghana

Olihe Okoro[1], Akua Appiah-Num Safo[2], Omolayo Umaru[2]

[1]*University of Minnesota, College of Pharmacy, Duluth, MN, United States*

[2]*University of Minnesota, College of Pharmacy, Minneapolis-St. Paul, MN, United States*

Introduction: Chronic management and prevention of non-communicable conditions like hypertension are challenges faced globally, but more so for Low-Middle Income Countries (LMICs) such as Ghana. One of the global goals of the World Health Organisation (WHO) is to reduce the prevalence of cardiovascular disease (CVD) by 25% from 2010-2025. The HEARTS technical package (Healthy lifestyle counselling, Evidence-based treatment protocols, Access to essential medicines and technology, Team-based care, and Systems for monitoring) was recommended to enhance the prevention and management of CVD, including hypertension. The study objectives were to (1.) assess pharmacists' involvement and capacity in the prevention and chronic management of hypertension and (2.) identify training gaps and/or skill deficiencies that may be limitations to further engagement.

Methods: A cross-sectional, web-based survey was administered to a convenience sample of pharmacists currently licensed and practising in Ghana. The survey items were developed from the WHO HEARTS technical package. Eight sections of the survey focused on demographics, treatment of cardiovascular disease, healthy lifestyle, evidence-based treatment protocols, access to essential medicines and technology, risk-based management, task sharing and team-based care, and system monitoring, respectively. In a descriptive analysis, frequencies, proportions, and measures of central tendency were used to summarise and characterise the data.

Results: One hundred and twenty-six pharmacists completed the survey, with 88.9% practising in an urban area. Most respondents' primary practice sites were hospitals (54.8%) and community/retail pharmacies (38.9%). Up to 70.6% saw patients with CVD symptoms daily, and 80% indicated having a referral system – mostly calling a specialist physician directly to schedule an appointment for patients. While 56.3% reported having a facility-based clinical standard protocol for assessing and managing CVD, 66.7% were concerned about medication shortages at their primary practice site. Respondents were more likely to counsel patients on physical activity and diet versus tobacco use and alcohol consumption. Approximately four out of every five respondents indicated they were 'confident' or 'very confident' in identifying CVD risk factors (83.3%) and defining the appropriate threshold for treatment and referral (80.2%). Most respondents (81.7%) expressed confidence in their ability to effectively develop a system to monitor patients diagnosed with hypertension. However, only 25.4% indicated feeling fully supported by the relevant resources.

Conclusion: Pharmacists are participating in the WHO Global Hearts Initiative and contributing to achieving the goal of reducing the prevalence of hypertension in Ghana. The study demonstrates the evolution of pharmacy practice and highlights the roles and relevance of pharmacists in patient care and healthcare delivery in LMICs. These preliminary findings clearly show the extent of pharmacists' involvement and capacity to contribute to hypertension prevention and chronic management. While there is a lot of potential for further engagement of pharmacists in direct patient care and prevention efforts around CVD, inadequate support and training gaps in counselling skills are some of the attendant barriers.

A strategy to improve the enrolment of pharmacists in doctoral programmes

Carolina Simão[1,2], Bruna Romoaldo[1,2], Laura Moura[1,2], Camilo Rebelo[1,2], João Rijo[1,2], Ana Charneca[1,2], Manuel Talhinhas[1,2], Cátia Caneiras[1,2,3,4,5], Luís Lourenço[1,2]

[1]*Portuguese Pharmaceutical Society, Lisbon, Portugal*

[2]*Centre of studies for the pharmacy profession, Portuguese Pharmaceutical Society, Lisbon, Portugal*

[3]*Microbiology Laboratory in Environmental Health, Institute of Environmental Health, Associate Laboratory TERRA, Faculty of Medicine, University of Lisbon, Lisbon, Portugal*

[4]*Egas Moniz Center for Interdisciplinary Research (CiiEM), Egas Moniz School of Health and Science, Lisbon, Portugal*

[5]*Institute of Preventive Medicine and Public Health, Faculty of Medicine, University of Lisbon, Lisbon, Portugal*

Introduction: Data from The World Bank show that, between 2014 and 2020, the number of doctoral people in Portugal increased significantly, by 69%. [1]

The South and Autonomous Regions Branch (SARB) of the Portuguese Pharmaceutical Society (PPS) recognises the importance of encouraging pharmacists to specialise through doctoral programmes.

Purpose: To characterise the pharmaceutical workforce in Portugal in terms of PhD pharmacists and PhD students with a previous degree in pharmaceutical sciences, to identify their main difficulties and motivations during the doctoral programme and to understand the actions that should be taken by PPS to encourage more pharmacists to attend doctoral programmes.

Method: An online survey was launched by the SARB for the PhD pharmacists and PhD students. The survey was disseminated through social media and for pharmacists collaborating with Higher Education Institutions (HEI). Responses from PhD students without a pharmacy degree were excluded.

Results: In total, 52 responses were analysed. Of these, 83% (n=43) mentioned intellectual development and 56% (n=29) career progression as the main reasons for attending a doctoral programme. 69% (n=36) cited reconciliation of work and personal commitments as the main difficulty during their PhD. The important role of the PPS in motivating pharmacists to participate in doctoral programmes by providing financial and logistical support was mentioned by 81% (n=42), and the role in promoting the value of PhD students in higher education was mentioned by 79% (n=41).

Conclusion: PPS and HEIs can play a crucial role in the specialisation of the pharmaceutical workforce through doctoral programmes. This study reinforces the importance of a joint strategy in this area.

Management of hypertension through pharmacist intervention in the Indian outpatient setting – a randomised controlled study

M Chandra Sekar[1], Satheesh S. Gottipati[2]

[1]*University of Findlay, Findlay, United States*

[2]*Vignan Pharmacy College, Vadlamudi, India*

Background: This randomised controlled study of a pharmacist-implemented intervention to manage hypertension was carried out to demonstrate the value pharmacists could bring in improving patients' health.

Methods: Setting – Outpatient pharmacy of a tertiary care hospital in South India. Research approval was obtained.

Participants - Patients with known and de-novo diagnoses of hypertension using at least one antihypertensive drug were included in this study.

Method: Study Protocol – Patients providing written consent were put into either Control [C] or Intervention [I] using computer-generated random codes. For the control group, patients were given their prescribed drug(s) with simple instructions on how often to take it. In the intervention group, PharmD residents counselled each patient in private, educating them on lifestyle modifications that help control blood pressure and various long-term consequences of uncontrolled blood pressure. Patients were also provided with information sheets; their filled prescriptions had auxiliary labels. Patients were again seen monthly for the following three months by Pharmacy Residents, and blood pressure was measured for all patients in both groups. In addition, each visit in the intervention group provided the pharmacist with the opportunity to assess medication adherence, counsel, and reinforce the importance of blood pressure control.

Results: The number of patients enrolled was 180 - of which 71 were female [F] and 109 males [M], with 90 patients each in the intervention [I] and control [C] groups. Following randomisation, [C] and [I] had the following characteristics. Gender distribution of [C/I]: [30F, 60M / 41F, 49M]. Age (yrs) – [61.3±10.8 / 62.1±10.1]. At the initial visit, the median (IQR) of SBP and DBP in control were 145 (139, 155) and 87 (80, 90). The corresponding values for the intervention group were 140 (130, 150) and 80 (80, 90). The measurements at the first visit were not significantly different between the control and intervention, with a *p*-value of 0.06 for SBP and 0.57 for DBP

Based on BP, patients are classified as – Normotensive [N], pre-hypertensive [PH] and hypertensive [H]. Visit represented by [V#].

Normotensive patients during [V1/V4] in the [C] group were [1/1] and in the [I] group—[3/13]. The number of pre-hypertensive [V1/V2/V3/V4] in [C] reminded [2/4/3/1], while the number steadily increased with each visit in the [I] group—[6/19/36/52].

Comparison of SBP and DBP between [C] and [I] at each subsequent visit was done using the Wilcoxon rank-sum test. The differences between [C] and [I] at each of the visits 2, 3, and 4 compared to the first visit were highly significant ($p < .001$) for both SBP and DBP.

Conclusions: These results demonstrate the value pharmacists bring in managing hypertension. While 88 of the 89 patients in the control group were still hypertensive after 4 months, only 25 of the patients were hypertensive in the intervention group, with sustained improvement observed over each consecutive visit.

Improving the pharmaceutical value chain in the drug resistant tuberculosis programme

Nirupa Misra

King Dinuzulu Hospital Complex, Durban, South Africa

Introduction: The World Health Organisation recommends a short-course oral regimen of new and repurposed medicine to treat drug-resistant tuberculosis (DR TB) to improve treatment outcomes. South Africa adopted the new guidelines with a vision to END TB by 2035. Optimising clinical management and active drug safety monitoring and management(aDSM) is critical for success and provides an opportunity to improve the pharmaceutical value chain. Pharmacists require access to clinical information to implement their scope of practice as part of the interdisciplinary team.

Rapid changes in guidelines and limited knowledge of and experience with new medicine increase the risk of prescribing errors or inappropriate regimens being prescribed and dispensed. Gaps in

DR-TB programmatic clinical stationary in respect of a legal prescription, poor access to clinical information by pharmacists and low reporting of adverse events were identified as barriers to conducting clinical pharmacy. It was noted that loose prescriptions were being sent to the pharmacist for dispensing that did not contain information to monitor the duration of exposure of the TB medicine or baseline and repeat laboratory and clinical data to assess safety. Separate prescriptions were also being used for TB, HIV and non-communicable diseases (NCDS) increasing the risk of drug-drug interactions.

A review of the adverse drug reaction universal reporting form highlighted flaws in the design of the form for the DR-TB programme that may be contributing to the low reporting rates.

This threatened to erode the perceived benefits envisaged by the use of safer, less toxic and better treatment regimens.

Intervention

Lack of integration and access to key clinical information was addressed by developing an integrated TB/HIV/NCD prescription book preprinted with names of TB and ARV medicine and doses, fields to prescribe NCD medicine and dedicated fields to verify safety parameters before dispensing. The prescription captured the full duration of treatment and enabled the pharmacist to track exposure times and doses dispensed for inpatients and outpatients. The book also contained information on the new regimen, side effects, causative agents and weight-based doses as a quick reference guide.

A dedicated preprinted aDSM reporting form was developed, including tick boxes for medicine and side effects, baseline and subsequent laboratory results and minimum information needed to report. The new tool included the Naranjo Causality Assessment Scale as a training tool.

Results: The integrated pre-printed prescription book was found to be user-friendly and guided pharmacists on appropriate treatment regimens, doses, and side effects to assess the appropriate, safe use of the medicine. It improved pharmacists' ability to conduct medicine utilisation reviews, monitor drug-drug interactions, and adhere to clinical guidelines, and it encouraged a " One-Stop Shop" prescribing and dispensing model.

The new aDSM tool was printed as booklets and distributed to all initiating sites. It was well received, and the reporting of adverse events in grades 3 and above was improved.

Conclusion: A pharmacist-led initiative to improve patient clinical management was successful and well-received by the multidisciplinary team.

Evaluation of the side effects of COVID-19 vaccines among general population in Jordan

Syed Sikandar Shah[1], Essam Nairoukh[2]

[1]Department of Clinical Pharmacy and Pharmacology, Rak College of Pharmacy, Ras al Khaimah Medical and Health Sciences University, Ras Al Khaimah, United Arab Emirates

[2]Department of Clinical Pharmacy, European University of Lefke, Lefke, Turkey

Background: The COVID-19 pandemic has spurred the rapid global development and distribution of vaccines to combat its spread. While vaccines offer significant benefits, concerns persist regarding their potential side effects. Understanding the prevalence and nature of these side effects is crucial for assessing vaccine safety and informing public health strategies. This study aimed to evaluate the side effects of COVID-19 vaccines among the general population in Jordan.

Purpose: The primary objective of this study was to assess the side effects experienced by individuals vaccinated against COVID-19 in Jordan. By conducting a descriptive study, the research aimed to provide insights into the safety profile of different COVID-19 vaccines used in the country.

Method: A descriptive study was conducted in Jordan from December 2022 to March 2023. A total of 405 validated questionnaires were distributed among vaccinated individuals, of which 355 met the inclusion criteria and were included in the analysis. Descriptive statistics were used to analyse the data, utilising both SPSS version 25 and Google Sheets software.

Result: Among the participants, 68.1% reported experiencing post-vaccination side effects. Most (79.8%) reported minor side effects, 12.0% experienced major side effects, and 8.2% reported both minor and major side effects. Pfizer-BioNTech and Oxford-AstraZeneca vaccines were the most commonly administered, with the majority of participants reporting major side effects receiving these vaccines. Common minor side effects included injection site pain (45.8%), fatigue (42.7%), joint pain (40.1%), low-grade fever (below 39°C) (36.7%), and myalgia (23.7%). Major side effects included anaphylaxis (respiratory failure) and dyspnea (shortness of breath) (both 10.7%), anxiety (9.3%), and high-grade fever (above 39°C) (8.5%).

Conclusion: The study concluded that most vaccinated individuals in Jordan experienced minor side effects, while major side effects were less common. These findings support the overall safety profile of COVID-19 vaccines and provide valuable insights for monitoring and enhancing vaccination strategies in Jordan.

Knowledge, attitude and practice of epilepsy among school teachers: A regional analysis

Syed Sikandar Shah[1], Khayal Muhammad[2]

[1]Department of Clinical Pharmacy and Pharmacology, Rak Medical and Health Sciences University, Ras Al Khaimah, United Arab Emirates

[2]Department of Clinical Pharmacy, European University of Lefke, Lefke, Turkey

Globally, epilepsy is a prevalent disease, and countries are still facing challenges in its management in children. Lack of knowledge and negative attitudes and practices among school teachers cause discrimination and stigmatisation. A cross-sectional study was conducted among 311 school faculty members in all the regions of Lahore. The study questionnaire contained fifteen questions of knowledge, attitude, and practice (KAP) regarding epilepsy. The collected data of 311 participants were encoded in SPSS version 20 for final analysis. Male faculty members dominate the cohort, with 53.4% males and 46.6% females. The data revealed that 29.6% assumed that it was a chronic disease, while 77.5% read or heard of epilepsy. Most participants had good knowledge (57.9%), 42.1 had poor knowledge, 67.7% had a negative attitude, 32.3 had a positive attitude, 71.7 had negative practice, and 28.3 had positive practice for epilepsy. Furthermore, only 25.4% of teachers performed first aid seizure management, 59.2% had performed only first aid management, and 27.7% didn't know how to manage seizures properly. There is a need for awareness and educational training to have good knowledge, adequate attitude, and positive practice in handling epileptic children. This will help to address the existing biases and improve the quality of life in educational institutes.

Adherence management opens new revenue streams for pharmacies: Could other funders such as Insurers, in life and health, become pharmacy revenue streams

Cassie Schutte, Jacques Snyman

Health Window, Pretoria, South Africa, 2Private, Pretoria, South Africa

Introduction: Patients routinely do not adhere to prescribed medicines, and adherence rates below 50% are common and associated with little clinical benefit. Low adherence is costly as it drives disease-specific event rates and death. The WHO data demonstrated no change in adherence behaviour in 21 years.

Clinicians fail to follow up on patients due to missed visits and do not have evidence of non-adherence to address patient behaviour. Pharmacists also do not proactively drive adherence and fail to monitor missed script fills and failure to reach patient-specific treatment goals. The cost to the funding industry is high, and providers of care lose out on income, whereas life insurers bear the brunt of higher than want can be achieved claims ratios for dreaded disease progression and or death. The aim of this research was to demonstrate the impact of driving adherence by using a specific behaviour model nudging patients to visit selected pharmacies proactively. This study explores the benefits of adherence management.

Method: Pharmacies subscribing to a specific adherence programme supported by data informing the call centre at Health Window (Pty) Ltd. Patients were enrolled into a programme investigating the impact of adherence on survival and or risk of disease severity. Adherence was calculated, and non-adherence risk was linked to the current and future risk of disease progression and/or death. Data received was simple claims data enabling identification of the individual, medicine, diagnosis and biometric data obtained via clinics in pharmacies or call centres. Patients received digital and telephonic support services to improve the script fill rate, and pharmacies pro-actively made filling a script easy by pre-packaging for convenient collection.

Results: Data demonstrated that the adherence rate increases from just below 50% to above 86%.

The pharmacies involved further leveraged Health Window's analytics, management insight, operations management, and customer engagement platforms, integrated into their SAP, dispensing, and loyalty platforms and environments, to address the adherence issue, create hyper-relevance in terms of product and service recommendations, and run customer journey management processes that yielded returns. This resulted in higher sales and lives saved.

Discussion: This data enables future risk prediction, which can be used for underwriting purposes, allowing lower premiums to those adhering to prescriptions and maintaining adherence over time. The pharmacy is a partner in health care delivery and in modifying behaviour when assisted with the correct information at the right time to enable a medicine possession ratio. It impacts the pharmacy's profitability and the customer's positive experience. Funders, insurance companies, and the pharmaceutical industry all benefit from simply driving adherence to medicine possession in retail pharmacies. Going to a pharmacy to collect a prescription demonstrates the desire to adhere, which indicates behaviour change.

Assessment of health-related quality of life of patients receiving antidepressant medications

Sathvik Sridhar, Hend Humaid Mohammed, Javedh Shareef, Talaat Matar Tadross

RAK Medical and Health Sciences University, Ras Al Khaimah, United Arab Emirates

Introduction: Health-related Quality of Life (HRQoL) is known to impair in patients having depression and anxiety. The research aims to assess the HRQoL of patients receiving antidepressant medications and identify the sociodemographic, illness, and treatment-related factors associated with the HRQoL.

Method: This prospective longitudinal study was conducted in the psychiatry outpatient settings of secondary and tertiary care hospitals. The QOL of patients prescribed antidepressant medications was assessed using the WHOQOL-BREF questionnaire at baseline and eight weeks after the medication initiation. The QOL of the study population was also compared with that of the healthy general population.

Results: A total of 122 patients were recruited. With a mean age of 38.5 + 11.8 years, the majority [66(54 %)] were females. Most study participants [74(61%)] were UAE nationals and were receiving two antidepressants [51(42 %)]. A statistically significant ($p < 0.05$) improvement in the QOL scores of the study population was documented at week eight in all the domains except social relationships. The QOL of the healthy general population was significantly higher ($p < 0.05$). It revealed that variables such as gender [F (10, 111) = 2.027, p = 0.037, R2 = 0.154] and the number of co-morbidities [F (10, 111) = 2.027, p = 0.037, R2 =0.154] statistically significantly predicted the physical health dimension of QoL. The female gender and more than one co-morbidity predicted lower physical QoL. Suicidal history was the significant predictor ($p < 0.05$) of psychological [F (10, 111) = 1.484, p = 0.155, R2 = 0.118] social relationship [F (10, 111) = 1.586, p = 0.120, R2 = 0.125] and total quality of life [F (10, 111) = 1.880, p = 0.05, R2 = 0.145].

Conclusion: These findings confirmed the impairment of HRQoL in all physical, psychological, social, and environmental domains among depression and anxiety patients before treatment. However, in all QOL domains except social relationships, a significant improvement in QOL scores was observed eight weeks after the start of antidepressants.

Enhancing pharmacovigilance in Botswana: revealing pharmacists' awareness regarding adverse drug reaction reporting in the public sector

Idah Seepo[1,2], Martha Lubbe[1], Fransina van Niekerk[1], Hanlie Steyn[1]

[1]Medicine Usage in South Africa (MUSA), Faculty of Health Sciences, North-West University, Potchefstroom, South Africa

[2]Ministry of Health, Gaborone, Botswana

Introduction: It is critical that healthcare professionals, such as pharmacists, have adequate knowledge and skills in adverse drug reaction (ADR) reporting to allow rapid identification and timely reporting. Underreporting of ADRs has been identified as a problem in Botswana. Consequently, it becomes crucial to determine pharmacists' awareness of the PV system and ADR reporting.

Purpose: The study aimed to determine pharmacists' awareness of the pharmacovigilance (PV) system and reporting of ADRs in public healthcare facilities in Botswana.

Method: A quantitative, descriptive, cross-sectional study was conducted using an online structured questionnaire distributed between 6 June and 24 August 2022. The 110 pharmacists employed in Botswana's public health sector facilities were invited to participate. An awareness score, with a maximum possible score of 45 was calculated for each participant based on their responses. Data were analysed using both descriptive and inferential statistics. Due to the small number of observations in each category and violating the assumption of normality, the authors performed nonparametric statistics. Independent-sample median tests were used to test for differences in the median scores between different groups according to age, sex, number of years in practice, facility of practice, and the current positions of the pharmacist. Statistical significance was set at ≤ 0.05.

Results: Thirty-eight pharmacists responded, representing a 34.5% response rate, but only 33 completed all the required questions. Most pharmacists provided a correct definition of PV (n = 28) and were aware that physicians, pharmacists, and nurses should report ADRs (n = 33). Most pharmacists know the different types of ADRs that should be reported. Most pharmacists knew that Botswana has a national PV centre (n = 26) and that the Botswana Medicines Regulatory Authority (BoMRA) oversees PV and drug safety monitoring (n = 32). The highest awareness score was 43, and the lowest was 28. The median awareness scores did not differ statistically significantly between groups according to age, sex, number of years in practice, facility of practice, and the current positions of the pharmacist (p-values > 0.05).

Conclusion: This study identified that pharmacists are mostly aware of Botswana's PV system and ADR reporting. Awareness was the same regardless of sex, age, position, years of practice, and facility of practice. Several measures are recommended to improve pharmacists' awareness of ADR reporting.

Evaluation of the outcomes of a risk-based approach to pharmacy inspections in South Africa

Vincent Mpoye Tlala[1], Martha S. Lubbe[2]

[1]South African Pharmacy Council, Pretoria, South Africa

[2]Medicine Usage in South Africa (MUSA), Faculty of Health Sciences, North-West University, Potchefstroom, South Africa

Background: In the interest of patient safety, it is therefore vital to continuously monitor the compliance of pharmacies with Good Pharmacy Practice (GPP) standards. The South African Pharmacy Council (SAPC) does this through a risk-based approach to pharmacy inspections, introduced in 2014, which ascribes a grading outcome of A, B or C following the inspection of a pharmacy. The grading determines the pharmacy's subsequent inspection intervals between yearly, biennial, or triennial. This methodology was reviewed in 2020 to introduce the weight and the minimum compliance score per section in the inspection questionnaire and 10 non-negotiable critical questions.

Purpose: This study aimed to evaluate the impact of the previous and current grading methodologies used to assess South African pharmacies' compliance with GPP standards on inspection grading outcomes.

Methods: Both longitudinal and cross-sectional research designs were used to analyse the inspection results of pharmacies from 2014 to 2019 (2014 grading methodology) (N=12 376 inspections in 5 289 pharmacies) and from 2020 to 2023 (2020 grading methodology) (N=7 853 inspections in 5 366 pharmacies). Both grading methodologies were also applied to the 2019 inspection results (N=2 189) to identify the influence of each grading methodology on grading statuses.

Results: The percentage of inspections in all categories of pharmacies that resulted in a grading outcome A or C grading

was statistically significantly higher for the period 2020-2023 (65.0%, n=5 110; 26.0%, n=2 043 respectively) when the current/revised grading methodology was applied compared to the period 2014-2019 (47.4 %, n=5 866; 16.6%, n=2 058 respectively) when the previous grading methodology (p < 0.0001, Cramer's V=0.3143) was applied. The opposite was observed with the percentages of B- and D-grade pharmacies.

When both the previous and current grading methodologies were applied to the 2019 inspection data (N=2 189 inspections), 83.5% (n=1 011) of the pharmacies that obtained an A-grade with the previous grading methodology (n=1 199) also achieved an A-grade with the current grading methodology, while 16.5% (n=198) of these attained a C-grade (Fisher's Exact Test; p < 0.0001). None of the pharmacies inspected obtained a B-grade using the current grading methodology.

Conclusions: The results indicate that applying the revised risk-based inspection methodology impacts inspection grading outcomes, and when applied to the 2019 inspection data, it resulted in a statistically significant difference in the grading outcomes from those attained through the 2014 inspection grading methodology. This indicates that the 2020 revision of the grading methodology ensured the mitigation of the risk of noncompliance.

Exploring the knowledge, attitudes, and self-reported practices in relation to generic medicine substitution among pharmacists in South Africa

Kenneth Koshy[1], Yasmine Van Heerden[1], Rubina Shaikh[2]

[1]*School of Pharmacy, University of the Western Cape, Bellville, South Africa*

[2]*Department of Pharmacy and Pharmacology, University of the Witwatersrand, Johannesburg, South Africa*

Introduction: Generic substitution is dispensing a generic medicine instead of a prescribed branded medicine. It has become an integral dispensing practice in South Africa, improving access to affordable medicines. However, pharmacists must have clinical and regulatory knowledge for rational generic substitution. This is the first known study to investigate South African pharmacists' knowledge, attitudes, and practices regarding generic medicine substitution.

Purpose: This study aimed to explore the knowledge, attitudes, and self-reported practices concerning generic medicine substitution among pharmacists in South Africa.

Method: A cross-sectional survey was employed to collect data. The survey was validated by employing a pilot study among a suitable population. The survey collected primarily quantitative data with a few embedded qualitative components. The study population included all practising pharmacists registered with the South African Pharmacy Council. The online survey was distributed to all registered pharmacists in South Africa. A sample size of 270 pharmacists was achieved following a convenience sampling approach.

The survey consisted of demographic information, knowledge of generic medicines and generic substitution, and attitudes and self-reported practices regarding generic substitution. The results were exported to IBM SPSS Version 28 for statistical analysis. Thematic analysis was utilised to analyse open-ended question responses.

Results: The mean knowledge score of all participants (n=270) was 37.37 ± 1.06 (maximum score of 55). Participants responded well to questions regarding what constitutes a generic medicine. For example, 82.95% of participants responded correctly when asked if generic medicine must have the same dosage form as branded medicine. Questions relating to the regulatory requirements for generic substitution were not answered.

A subgroup analysis was performed to investigate the impact of qualification and sector of practice on knowledge scores. The mean knowledge scores did not vary significantly within the retail pharmacists' subgroup or the pharmacists possessing postgraduate qualifications subgroup (p = 0.9103).

Only 13% of participants did not support generic medicine substitution, and only 6% of participants believed that generic medicine substitution could result in therapeutic failure. These low values provide context into the South African pharmacist's generally positive attitude to generic medicine substitution and their trust in generic medicines. The most influential motivator (87.03%) for participants to support generic substitution was the cost-saving that generic medicines offer patients.

Qualitative data revealed barriers experienced by participants when generically substituting medicines. The barriers identified included clinical, financial and interprofessional collaboration matters.

Conclusion: This study found that pharmacists in South Africa were knowledgeable regarding the qualifying factors of a generic medicine but less knowledgeable regarding regulatory requirements for generic substitution. Participants expressed positive attitudes towards generic medicine substitution with self-reported practices in line with legislative requirements for generic medicine substitution in South Africa.

The study highlighted the need for improved education and resource availability on generic substitution to improve patient counselling and engagement with prescribers regarding generic substitution.

A research study on navigating medication risks through MFRS (Medication Fall Risk Score and Evaluation Tool) and DART (Drug Associated Risk Tool) among patients with polypharmacy

Boguda Vishwanath Anantharamaiah

Aditya Bangalore Institute of Pharmacy Education and Research, Karnataka, India

Background: The advancements in medical science continue, but the safety of medication usage is still a question mark and has become a crucial area for researchers to focus on. In the need of the above, various scoring systems and tools have been developed in pharmacy practice research. Before the present work, the authors did a systematic review and meta-analysis. They identified two such tools: The medication Fall Risk Score and Evaluation Tool (MFRS) and the Drug Associated Risk Tool (DART) for effective evaluation of risks and prevention of drug-related problems, but the literature regarding their usage is very limited in Indian medical practice, which serves as a major gap.

Purpose: To analyse the impact and outcomes of MFRS (Medication Fall Risk Score and Evaluation Tool) and DART (Drug Associated Risk Tool) in evaluating drug safety and in navigating and minimising Medication Risks and drug-related problems.

Method: The present study is a Prospective cohort study carried out for 12 months from January 2023 to January 2024 in the General Medicine, Obstetrics and Gynaecology departments of Akash Hospital, Bangalore, Karnataka, India, all the in-patients admitted with various diseases/disorders with polypharmacy were included and patients not willing to participate in the study were excluded, the data was collected through the personal interviews, case sheets and prescriptions with polypharmacy has been evaluated by using the Medication Risks through MFRS (Medication Fall Risk Score and Evaluation Tool) and DART (Drug Associated Risk Tool) to identify and prevent the risk of drug-related problems and risk factors involved with it, for statistical analysis Prismgraph Pad software version10.2.1 was used.

Results: Out of 200 individuals, 45 (22.5%) reported medication allergies, while 52 (26%) acknowledged taking more than three medications daily. Psychological disorders were prevalent in 38 (19%) of the population, with gestational diabetes and anaemia during gestation reported by 12 (6%) and 14 (7%) of female participants, respectively. Respiratory diseases were noted in 26 (13%) individuals, while fall history within the last six months was documented in 40 (20%) cases. The application of MFRS and DART tools facilitated comprehensive risk assessment. MFRS identified potential fall risks in 66 (33%) of the population, with recent medication changes documented in 32 (16%) cases. Antihypertensive drugs were commonly prescribed, with 70 (35%) of participants using them. Additionally, 22 (11%) reported an intake of antithyroid drugs. The DART analysis highlighted medication-related concerns, with 40 (20%) participants using seven or more prescription medicines regularly. 26 (13%) individuals reported recent medication initiation within the last four weeks. Symptoms such as drowsiness, high blood pressure, and confusion were prevalent among the population, prompting further evaluation. Furthermore, 28 (14%) of participants were using medications with a narrow therapeutic index, necessitating regular monitoring.

Conclusion: This research promotes the significance of medication risk assessment tools in promoting the safety of special populations, emphasising the need for personalised interventions to optimise therapeutic outcomes while minimising adverse effects.

Integrating mental health services in LMICs: the role of healthcare teams in primary care – A scoping review

Kim Ward, Chipiwa Marimwe, Mariam Parker, Tanyaradzwa Dube

University of the Western Cape, Belville, Cape Town, South Africa

Background: The significant mental health treatment gap in low- and middle-income countries (LMICs) can be partly attributed to a shortage of mental health specialists and the inadequate integration of services at the primary healthcare level. Establishing multidisciplinary health teams comprising non-specialist healthcare workers has emerged as a crucial strategy for integrating mental healthcare into primary healthcare services, thereby enhancing access across diverse communities.

Aim: This scoping review investigates how such teams are organised and supported within primary care environments in LMICs, focusing on their role in the detection, treatment, and referral of mental health conditions. The study is anchored in the "Innovative Care for Chronic Conditions" (ICCC) Framework

Methods: The methodology encompassed defining research questions, identifying and selecting pertinent literature, and extracting and synthesising data. The search for English-language studies and reports spanned from 2008 to 2023, and database searches comprised PubMed, CINAHL, Cochrane Library, PsycARTICLES, Scopus, Web of Science, and the World Health Organisation (WHO) website.

Results: The preliminary findings of the scoping review will be shared, highlighting key statistics and thematic insights grounded in the ICCC framework. Specifically, this presentation will focus on a subset of health team

implementation strategies that involve pharmacists and pharmacy support staff.

A descriptive survey of healthcare professionals on traditional, complementary, and alternative medicine integration in public hospitals in Gauteng, South Africa.

Mulanga Mathoho, Rubina Shaikh, Stephanie Leigh-de Rapper, Zelna Booth

University of the Witwatersrand, Johannesburg, South Africa

Introduction: The World Health Organisation (WHO) estimates that 80% of the African population relies on traditional, complementary, and alternative medicine (TCAM) as a source of healthcare. Despite the high estimated prevalence of TCAM use in South Africa and concerns for interactions with conventional medicines, medical history-taking inclusive of TCAM use is still largely excluded by healthcare professionals (HCPs). Therefore, this study aimed to explore the knowledge, attitudes, perceptions, and practices (KAP) of authorised prescribing and dispensing HCPs on TCAM use among the patient population in three public academic hospitals in Gauteng.

Methods: A self-administered, cross-sectional survey was carried out among prescribing and dispensing HCPs working at Chris Hani Baragwanath Academic Hospital (CHBAH) in Soweto, Helen Joseph Hospital in Auckland Park and Charlotte Maxeke Johannesburg Academic Hospital (CMJAH) in Johannesburg, South Africa. The cross-sectional, self-administered survey included four tiers (participant demographic information, knowledge of TCAM, attitudes and perceptions of TCAM and current practices related to TCAM). Quantitative data was collected through close-ended responses and Likert scale ratings, with results presented as means and percentage frequencies. An average of the total achieved score determined domain scores for knowledge, attitudes, perceptions and practices. An independent Mann-Whitney statistical analysis, chi-square test, Spearman rank correlation, and a multiple linear regression model were used to analyse the data. All analysis was performed using STATA version 14 (StataCorp, USA), and statistical significance was determined at the 5% significance level.

Results: A total of 233 participants were surveyed (calculated sample size of n = 226). However, upon analysis, only 188 responses met the inclusion criteria, of which most participants were between 18 and 30 (58.9%) years of age and female (58.9%). The study identified HCP's poor knowledge (69%) of TCAM but positive attitudes (90%) toward TCAM use in their patients. Most participants (55.3%) reported awareness of the prevalence of TCAM use by their patients, but only 51.1% stated that they were unaware of the potential interactions between TCAM and conventional medicines. Participants showed a positive attitude towards TCAM incorporation in the medical curriculum (69.4%) and believed that TCAM incorporation into the conventional healthcare system would enhance patient care (62.4%). Concerning practice, a few (43%) HCPs would enquire about TCAM use during history-taking with their patients. The Spearman rank correlation revealed significant positive linear correlations between knowledge-attitudes ($p < 0.01$), knowledge-practices ($p < 0.05$), and attitudes-practices ($p < 0.05$).

Conclusion: Healthcare professionals have poor knowledge of, but positive attitudes towards, TCAM and its use by their patients attended to in the conventional healthcare setting. There is a need for interventions to ensure that HCPs are equipped with the necessary knowledge, skills, and frameworks for integrative medicine approaches, to encourage the inclusion of TCAM in history-taking procedures and to prevent the occurrence of harmful interactions amongst those patients making use of both conventional and TCAM treatments.

Impact of COVID-19 on antibacterial utilisation in the Mozambican private healthcare sector: A longitudinal analysis from 2018 to 2022

Roger Wiseman[1], Prof Ilse Truter[1], Vanda Muchangos[2]

[1]*Nelson Mandela University, Gqeberha, South Africa*

[2]*Eduardo Mondlane University, Maputo,*

Background: Antimicrobial resistance (AMR) is one of the most significant public health threats of the 21st century. Infectious diseases represent a significant burden in developing countries and are exacerbated by limited access to and availability of antimicrobial medicines required to treat infections caused by resistant organisms. However, low- and middle-income countries (LMICs) encounter several challenges in implementing AMR surveillance programmes, including underutilisation of available data and poor dissemination of information to regulatory authorities.

Despite a low prevalence of bacterial co-infection in patients with COVID-19 (less than 10%), antibacterial prescribing in this patient cohort is high. The intersection of COVID-19 and AMR has thus heightened the need for appropriate antimicrobial use to ensure optimal patient outcomes while reducing the risk of adverse effects, promoting cost-effectiveness and reducing resistance levels. Understanding the patterns of antibacterial utilisation in these circumstances can assist in identifying opportunities for targeted antimicrobial stewardship interventions to improve the quality and safety of antibacterial use.

Purpose: The study's purpose was to determine the impact of COVID-19 on antibacterial utilisation in the Mozambican

private healthcare sector by conducting a longitudinal analysis of de-identified prescription data from 2018 to 2022.

Method: A retrospective drug utilisation review was conducted on de-identified prescription data of 34 961 privately insured patients who received at least one antibacterial medicine over a 5-year period from January 2018 to December 2022. Analysis was performed using Microsoft Excel®, and ethics approval was obtained from Nelson Mandela University, Gqeberha, South Africa, and Eduardo Mondlane University, Maputo, Mozambique. The Republic of Mozambique Ministry of Health (MISAU) also authorised the study.

Results: A total of 34 961 patients received a cumulative total of 184 006 antibacterial medicines over the study period (average age = 21.84 ± 15.51 years; male = 51.93%). Between January 2018 and January 2022, antibacterial utilisation increased by 46.72%. Azithromycin was the most frequently prescribed antibacterial, accounting for 18.56% of the total antibacterial prescriptions. Regarding COVID-19, antibacterial utilisation initially decreased by 45.21% between March and April 2020. Subsequently, azithromycin utilisation increased substantially, coinciding with the three main COVID-19 waves recorded in Mozambique between March 2020 and October 2022.

Conclusion: This study demonstrated an increased use of antibacterial medicines in the Mozambican private healthcare sector over the study period. It further demonstrated the potential irrational use of antibacterial medicines on account of COVID-19, particularly azithromycin, where there is a lack of evidence to support its efficacy in this indication. The study has emphasised the importance of antimicrobial stewardship initiatives in Mozambique and the incorporation of the private sector in such initiatives.

Assessment of appropriate prescribing in patients undergoing chronic haemodialysis at dialysis centres in Windhoek, Namibia

Martha Kampanza

University of Namibia, Windhoek, Namibia

Background: Patients with End Stage Renal Disease (ESRD) undergoing haemodialysis commonly have multimorbidity, including pre-existing conditions and complications of their kidney disease, which in turn leads to polypharmacy. However, the renal failure state puts limitations on the type of drugs that can be used and how they should be dosed. This commonly results in either under-prescribing and under-dosing or over-prescribing and over-dosing in patients with ESRD. Although in Namibia, chronic kidney disease is reported as a major determinant of poor health outcomes for common non-communicable diseases, there is currently no published data on the appropriateness of prescribing and dosing of medicines in these patients.

Purpose: The study aimed to investigate the appropriateness of drug therapy among patients with ESRD undergoing regular haemodialysis at two dialysis centres in Windhoek, Namibia's capital.

Method: This was a cross-sectional study involving the review of clinical records of all patients with ESRD attending regular haemodialysis at the two centres from July 2022 to December 2022. This study defined regular haemodialysis as receiving dialysis at least weekly for three months or more. The data of all eligible patients were collected using a manual data collection tool, entered into Microsoft Excel and exported to SPSS® for analysis. Data was analysed using descriptive statistics. The University of Namibia and the Ministry of Health and Social Services approved this study ethically.

Results: A total of 147 patients' clinical records were reviewed and included in this study. Slightly over half were males (n=79, 53.7%). The mean age of the participants was 47.3±15.1 years. Most patients (44.8%) had either 3 or 4 comorbidities, with the most common co-morbid condition being hypertension. An average of 11.5 (±3.5) medicines were prescribed per patient. Medications were appropriately selected in 80.3% (n=118) of the patients, while the remaining 19.7% (n=29) had at least one or more inappropriately selected drugs. Of the medicines, 15.6% (n=263) required renal dosage adjustment, and slightly under half (n=128, 48.7%) were appropriately adjusted. For the inappropriately adjusted medicines, 21 (15.6%) were under-dosed, 111 (82.2%) were overdosed, and treatment duration was inappropriately long for 3 (2.2%) medicines. Only 18% of the patients had all of their medications appropriately renally adjusted, while 82.0% had at least one or more inappropriately renally adjusted drugs. The number of drugs prescribed was significantly associated with medication choice errors (OR: 0.792, 95%CI 0.677-0.926, p = 0.001), while increasing age unexpectedly increased the likelihood of appropriate dosage adjustment (OR: 1.035, 95%CI 1.002-1.035, p = 0.035).

Conclusion: As anticipated, patients with ESRD on haemodialysis were being managed with many medicines. Although the medicines were often appropriately selected, the renal dosage adjustment could be improved. Clinical pharmacy services would, therefore, be of great value in the care of haemodialysis patients as they could optimise drug therapy and improve patient clinical outcomes.

Interprofessional care for patients with mental disorders in a university pharmacy in Brazil

Thamara de Oliveira Matos[2], Camila Gurgel Dantas de Paula[2], Mr Wallace Entringer Bottacin[1], Cinthia Caldas Rios[3], Ernani Vieira Vasconcelos Filho[4], Josélia Cintya Quintão Pena Frade[5], Ana Carolina Melchiors[1], Thais Teles de Souza[6], Walleri Christini Torelli Reis[6]

[1]Postgraduate Programme in Pharmaceutical Sciences, Curitiba, Brazil

[2]School of Pharmacy, Federal University of Paraíba, João Pessoa, Brazil

[3]Postgraduate Programme in Pharmaceutical Sciences, Federal University of Sergipe, Sergipe, Brazil

[4]Department of Health Promotion, Center for Medical Sciences, Federal University of Paraíba, João Pessoa, Brazil

[5]Brazilian Federal Board of Pharmacy, Brasília, Brazil

[6]Department of Pharmaceutical Sciences, Health Sciences Center, Federal University of Paraíba, João Pessoa, Brazil

Background: Mental disorders are considered syndromes that alter brain function and significantly affect an individual's morbidity. Pharmacists can contribute to health improvement and assist in the better use of medications, ideally in conjunction with a care team. Studies show that interprofessional work improves patient clinical outcomes and enhances the quality of the service.

Purpose: The present study aimed to evaluate the clinical impact of interprofessional care involving medical doctors and pharmacists on patients' signs and symptoms of mental illness.

Method: The study was conducted at a university pharmacy's pharmaceutical care outpatient clinic in northeastern Brazil. The service process was conducted through an initial consultation by the pharmacist and later, professionally, between the medical doctor and pharmacist. Data were collected from the medical records of patients admitted from August 2019 to July 2022. The analysed data included sociodemographic factors, main diagnoses, lifestyle habits, pharmaceutical interventions, and scores on validated scales for screening and monitoring depression and anxiety, namely the Patient Health Questionnaire-9 (PHQ-9) and the Beck Anxiety Inventory (BAI), respectively. Scores were collected at the first and after the second, third, and fourth consultations. The data were analysed using the JAMOVI software. The research ethics committee approved the study under the number CAAE 97906118.3.0000.5188.

Results: A total of 153 patients were included, 102 women (66.7%), with an average age of 28 (24-36) years. The most prevalent mental disorders were anxiety (66%) and depression (12.4%). Most patients arrived at the outpatient clinic already using some medication (60.1%) and did not have associated comorbidities (75.8%). Whites (49%) were the majority in the sample, as well as singles (74.2%), unemployed (20.2%), those with an income of up to one minimum wage (62%), and those with incomplete higher education (40.5%). Regarding lifestyle habits, most reported not drinking (88.3%), smoking (66%), exercising (66%), and living in João Pessoa (51.3%). For depression, a significant reduction in PHQ9 scores was observed from the second assessment, dropping from an average of 17 (13-22) to 10 (7-16) ($p < 0.05$), and for anxiety, this reduction was from 31 (20-39) to 17 (7-28) according to the BAI scale, with an average of 5 consultations per patient. Regarding pharmaceutical interventions, those related to dosage or duration of treatment prevailed, along with health education, which is standard during consultations. Regarding the medication use profile, it was found that the main class of drugs used was Selective Serotonin Reuptake Inhibitors (SSRIs), in line with studies that place them as the first treatment option for depression and anxiety, the most prevalent conditions in the service. Furthermore, there was a significant reduction in the use of benzodiazepines during the care process (from 17% to 5%, $p < 0.05$).

Conclusion: Thus, it is possible to infer that the application of the interprofessional care practice model, with the pharmacist's participation, improved the patient's clinical condition and optimised their pharmacotherapy.

Pioneering clinical pharmacy in Brazil: Qualification for service implementation and pharmacists' education

Aline de Fátima Bonetti[2], Cinthia Caldas Rios[3], Josélia Cintya Quintão Pena Frade[4], Thais Teles de Souza[5], Valmir De Santi[3], Wallace Entringer Bottacin[1], Walleri Christini Torelli Reis[5], Walter da Silva Jorge João[3]

[1]Postgraduate Programme in Pharmaceutical Services and Policies, Federal University of Paraná, Curitiba, Brazil

[2]Clinical Hospital Complex, Federal University of Paraná, Curitiba, Brazil

[3]Postgraduate Programme in Pharmaceutical Sciences, Federal University of Sergipe, Sergipe, Brazil

[4]Brazilian Federal Board of Pharmacy, Brasília, Brazil

[5]Department of Pharmaceutical Sciences, Health Sciences Center, Federal University of Paraíba, João Pessoa, Brazil

Background: The evolution of Clinical Pharmacy in Brazil represents a significant leap toward enhancing healthcare outcomes through improved pharmaceutical services and pharmacist education. Since 2017, the Brazilian Federal Board of Pharmacy (BFBP) has been investing in the training of pharmacists nationwide and providing the qualification for implementing clinical services in both private and public sectors. This initiative marks a pivotal shift in the healthcare

landscape, acknowledging the crucial role of pharmacists in the multidisciplinary healthcare team. By enhancing pharmacists' clinical skills and competencies, Brazil aims to improve patient care quality, ensure medication safety, and increase the accessibility of healthcare services. The BFBP's commitment to advancing clinical pharmacy has led to the development of comprehensive training programmes and establishment standards for clinical service implementation, reflecting a nationwide effort to elevate the pharmacy profession and optimise healthcare delivery in Brazil.

Purpose: This study intends to thoroughly evaluate and record the progression of Brazil's "Pharmaceutical Care" and "*Pharmacists as Prescribers*" courses promoted by the BFBP. Specifically, the authors aim to examine the reach of these pioneering national courses over seven years and report their resilience during a global pandemic.

Method: A cross-sectional study scrutinised the most recent metrics of the "Pharmaceutical Care" and "Pharmacists as Prescribers" courses promoted by the BFBP. This involved a comparative analysis with previously published results from 2018 to gauge progress and developments.

Results: The study revealed a comprehensive national reach, with all 26 Brazilian states and the Federal District receiving the "Pharmaceutical Care" and "Pharmacists as Prescribers" courses. A total of 6945 pharmacists completed these courses, with 3829 (55.13%) for "Pharmaceutical Care" and 3116 (44.87%) for "Pharmacists as Prescribers." Furthermore, 87 strategic cities hosted the courses, ensuring nationwide accessibility. When compared with the 2017 data, significant growth is evident. Initially, only 14 hubs across 12 states were selected for the project, engaging approximately 806 pharmacists. The present expansion represents a quantitative increase and a strategic enhancement in the educational outreach and practical implementation of clinical pharmacy services nationwide.

Conclusion: Brazil's "Pharmaceutical Care" and "Pharmacists as Prescribers" courses have achieved remarkable national dissemination, indicating the BFBP's successful promotion of Clinical Pharmacy education. The completion of these courses by 6945 pharmacists, reaching all states and the Federal District, underscores a significant stride in pharmacist education and healthcare service provision since 2017. This expansion, from 14 hubs to 87 cities, reflects an increase in the number of trained professionals and an improvement in the delivery of pharmaceutical care nationwide. The progress made, particularly challenged during the COVID-19 global pandemic, emphasises the resilience and adaptability of the programmes. This work is an integral component of a larger strategy aimed at reinforcing the role of pharmacists in Brazil's healthcare framework.

Telehealth and pharmaceutical care for smoking cessation: An experience report

Cinthia Caldas Rios[2], Mr Wallace Entringer Bottacin[1], Josélia Cintya Quintão Pena Frade[5], Ernani Vieira Vasconcelos Filho[4], Thais Teles de Souza[3], Walleri Christini Torelli Reis[3], Francilene da Silva Amaral[2]

[1]*Postgraduate Programme in Pharmaceutical Services and Policies, Federal University of Paraná, Curitiba, Brazil*

[2]*Postgraduate Programme in Pharmaceutical Sciences, Federal University of Sergipe, Aracaju, Brazil*

[3]*Department of Pharmaceutical Sciences, Health Sciences Center, Federal University of Paraíba, João Pessoa, Brazil*

[4]*Department of Health Promotion, Center for Medical Sciences, Federal University of Paraíba, João Pessoa, Brazil*

[5]*Brazilian Federal Board of Pharmacy, Brasília, Brazil*

Background: Smoking is considered by the World Health Organisation (WHO) as a major epidemic and the leading cause of preventable death and illness in the world. Smoking causes approximately 8 million deaths per year worldwide. It is presumed that half of all smokers will die from conditions related to the process of cigarette use, impacting an average reduction of 10 years in life compared to non-smokers. The WHO advocates that providing access to a variety of treatment options for smokers is one of the main strategies to impact the reduction of smoking worldwide. In Brazil, there is the National Tobacco Control Programme (PNCT) of the Unified Health System, which offers free treatment for smoking cessation conducted by health professionals from primary health care (PHC) units. Despite advances, the challenges of PNCT's scope are directly related to in-person services, limited by the number of professionals trained and available among the other activities carried out by PHC professionals. In the global scenario, international research points to promising investments in complementary actions for smoking cessation, such as interventions and health services through digital technologies.

Purpose: This work aims to report pharmacists' experience implementing a smoking cessation protocol through telepharmacy.

Method: The general modelling of the service was developed following the Framework for the Implementation of Services in Pharmacy (FISpH). The clinical protocol was established considering the integrative review of the main national and international guidelines and conducting an overview of validated pharmacological and behavioural methods offered as digital or in-person interventions. The proposal was registered with the research ethics committee under CAAE 97906118.3.0000.5188. The entire service implementation process was developed in the interprofessional care outpatient clinic of the Federal University of João Pessoa and began in August 2022.

Results: Three pharmacists were selected for the service, all qualified to perform the service following the structured protocol. The initial validation was carried out by a committee of experts who contributed to the modelling, followed by pilot services. The established protocol included a three-month follow-up for the smoking cessation stage, with ten meetings, followed by a maintenance stage that provides monthly follow-up until completing 12 months of abstinence. Currently, pharmaceutical care for smoking cessation is in the operational phase, and a continuous evaluation and improvement process is part of the services provided by the interdisciplinary care outpatient clinic.

Conclusion: The pharmaceutical care protocol for smoking cessation through telehealth has been institutionalised and is currently in the operational phase and in a continuous process of evaluation and improvement. This experience corroborates that pharmacists' clinical activity through telepharmacy is an important complementary resource for healthcare policies and smoking management, inspiring new proposals and advancements in addressing the world's largest epidemic.

10,310 kilometres/ 6,406 miles: International mentoring collaboration

Ms Yimika Karunwi[1,2], Ally Deringanderson[3], Bisi Bright[1,2,4], Mfonobong Ekpoh[1,2,4]

[1]Agathe Wehrli Mentoring Chair (AWMC), Lagos, Nigeria

[2]Livewell Initiative (LWI), Lagos, Nigeria

[3]University of Nebraska College of Pharmacy, Omaha, Nebraska, United States

[4]Global Public Health University, Lagos, Nigeria

Introduction: Leadership skills and professional excellence work with academic knowledge to build confidence in practice. Students and young graduates experience difficulty navigating their career paths for their desired impact due to a deficit in these skills or career know-how. To contribute to the wholesomeness of today's young professional, Agathe Wehrli, Mentoring Chair (AWMC), a platform under the auspices of Livewell Initiative (LWI), partnered with faculty members of the University of Nebraska College of Pharmacy. This initiative mentoring programme envisions a confident and resilient workforce with well-rounded skills for healthcare service delivery. It sought to exchange information about medical and public health best practices to improve health outcomes in both countries and to equip young pharmacy students and early career professionals with competencies and leadership tools for progressive careers.

Methods: Pharmacy students and recent graduates were eligible to apply. From September 2023 to March 2024, two cohorts of 20 and 38 participants participated in a 13-week session. A survey provided insight into the mentorship drivers for participants. With scheduled communication and virtual meetings, assigned weekly mentors facilitated discussions concerning leadership and management, priority setting, associations, self-care, volunteerism, and professional resilience. Post-induction, the participants in both cohorts evaluated the activities. Data collected included ratings of different aspects of the programme, measured using a 5-point Likert scale, descriptive accounts, and personal reflections.

Results: For 25% of participants, this was their first attendance at a mentoring programme. The top reasons for mentorship for younger professionals included the desire to gain direction, to have a legacy of personal knowledge, insight, and experience and for professional enhancement, higher visibility, and prestige. The weekly discussions were met with enthusiasm and were relevant to over two-thirds of the participants. More than 80% agreed that the sessions met their expectations and applied to them. Impressions from the mentors are equally positive.

Conclusion: Over 90% of participants acknowledged that they would recommend this programme to their colleagues. Words such as 'insightful', 'excellent', and 'life-changing' connote the relevance of this initiative to the students and recent graduates and provide positive affirmations on the capabilities of this initiative upon enhanced collaboration. The support resulted in some participants achieving international leadership roles, getting redirections to apply for their advanced studies, prioritising life-work balance, and starting businesses. In a fast-paced profession like ours, offering mentorship opportunities is a practical way to bridge the gap between current career realities and future expectations. This underscores the importance of establishing structured programmes specific to the needs of these budding professionals.

Pharmacist prescribing in community pharmacy practice

Abigail Buttigieg, Lillian M. Azzopardi, Anthony Serracino-Inglott

Department of Pharmacy, Faculty of Medicine and Surgery, University of Malta, Msida, Malta

Background: In a community pharmacy setting, pharmacists are key players in the healthcare ecosystem, ensuring equitable access to appropriate, quality, and safe medication use that specifically meets the individual patient's needs. Pharmacist prescribing, within a collaborative practice context, facilitates timely patient access to healthcare services while ensuring the safe and rational use of medicines.

Purpose: To investigate concerns and benefits of pharmacist prescribing by analysing different pharmacist interventions within the community and identifying scenarios in which pharmacist prescribing should occur.

Method: Patients were recruited within a community pharmacy and divided into two groups based on the presenting complaint. Group A patients were given a pharmacist intervention and/or a pharmacist-recommended non-prescription medication. Group B patients were referred to a general practitioner (GP), and the resulting intervention was compared to clinical decision and hypothetical pharmacist-recommended medication if the pharmacist could have prescribing rights. All patients were followed up after at least a week through a telephone interview, where the therapeutic outcome was determined.

Results: One hundred patients (49F; 51M) with an age range between 25 to 34 years were included in the study: 56 patients (Group A) accepted a pharmacist-recommended medication, and 44 patients (Group B) were referred to a GP. Of the Group A patients, 46 reported symptomatic relief within the week. Of the ten patients without symptomatic relief, 7 requested a doctor's appointment, while three opted not to follow up. Following the doctor's recommendation, twenty-seven patients from Group B reported symptomatic relief. Of the 17 patients with unresolved presenting symptoms, 12 patients opted for a specialist consultation, three were admitted to the hospital, and two opted not to follow up. In 29 cases out of the 44 Group B patients, the pharmacist would have prescribed the same medication as that prescribed by the GP. The 15 cases where prescribing differences between GP and pharmacist occurred consisted of 10 cases where minor ailments were treated with a broad-spectrum antibiotic by the medical prescriber, which was not recommended as first-line treatment, 2 cases of contraindications specifically in patients with cardiovascular diseases and 3 cases where a topical glucocorticoid was recommended but had no clinical indication.

Conclusion: The outcome of this study indicates concordance in clinical decision-making and pharmacotherapy recommendation for prescription medication in 66% of the cases between the medical prescriber and the community pharmacist. Signals, where pharmacist prescribing frameworks should consider additional patient safeguards, include co-morbidities and risks of medications being recommended.

The role of artificial intelligence (AI) in preventing misdiagnoses: A pharmacist's perspective

Ezinne V. C Onwuekwe

Nova Scotia Health, Halifax, Canada

Introduction: Misdiagnoses significantly impact patient safety. The increasing complexity of medication regimens and the rise of chronic diseases highlight the critical need for innovative solutions to ensure medication safety. Pharmacists play a vital role in medication safety. Still, limited access to patient data and fragmented information exchange create challenges in identifying misdiagnoses. Advancements in Artificial Intelligence (AI) hold promise for mitigating such errors. However, existing research on AI and misdiagnosis prevention often focuses on developing and evaluating AI tools for general medical diagnosis. There remains a gap in understanding the pharmacist's perspective on integrating AI into clinical decision-making processes.

Purpose: This study explores AI's potential to prevent misdiagnoses from a pharmacist's viewpoint. It does this by filling the gap in knowledge regarding the practical implementation and impact of AI in pharmacy practice. By focusing on the pharmacist's perspective, this work contributes to developing and implementing AI tools tailored to the specific needs of pharmacy practice.

Methods: This research will employ a multifaceted approach.

1. Literature review: Exploring existing research on misdiagnoses, pharmacist challenges, AI-powered tools for medication safety, and AI integration in healthcare. Scientific databases like Google Scholar, PubMed, Scopus, and CINAHL were used to identify relevant peer-reviewed studies and articles.
2. Expert Interviews: Semi-structured interviews with practising pharmacists to gather real-world insights on their experiences, perceptions of AI, and potential concerns with AI integration. Pharmacists from diverse practice settings (e.g., hospitals and community pharmacies) were recruited to ensure a broader perspective. Data were analysed using thematic analysis to identify key themes and patterns.

Results: The literature review revealed the prevalence and impact of misdiagnoses and pharmacists' challenges. Existing research on AI tools and their potential benefits in healthcare workflows was identified. Pharmacists highlighted AI's utility in enhancing diagnostic accuracy, streamlining workflow, and improving patient outcomes. Key findings include the importance of AI-human collaboration, the need for user-friendly AI interfaces tailored to pharmacy settings, and the significance of ongoing training and support for pharmacists utilising AI tools.

Conclusion: The findings underscore the potential of AI to revolutionise diagnostic processes in pharmacy practice. It offers valuable insights into the pharmacist's role in leveraging AI technologies to prevent misdiagnoses. The proposed approach fosters a collaborative pharmacist-AI partnership, maximising pharmacist expertise while leveraging AI's data analysis capabilities. Future research should focus on refining AI algorithms, addressing ethical and legal considerations, and fostering collaborative efforts to optimise AI integration in pharmacy settings. This work contributes to a broader strategy for advancing patient safety and healthcare quality through the strategic implementation of AI in pharmacy practice. It contributes significantly to the field of AI in pharmacy by bridging the gap between existing research and the practical needs of pharmacists.

You've got all this knowledge, but if you can't help that person understand, then what's the point? Community pharmacists' views on their role in achieving Pacific heart health equity in Aotearoa, New Zealand

Jess Lagaluga Hutchings, Corina Grey, Karen Brewer, Trudi Aspden

Faculty of Medical and Health Sciences, The University of Auckland

Background: Over several decades, there has been increasing recognition of the need to address inequitable health outcomes among ethnic populations. Attempts to address these inequities have included strategic plans targeted at specific ethnic populations and professional practice guidelines.

In Aotearoa, New Zealand (NZ), community pharmacists are progressively involved in disease management support, particularly for chronic conditions and screening services. However, their role in supporting equitable heart health outcomes for Pacific people is poorly understood.

Objectives: This research explored the experiences of community pharmacists working in Pacific communities regarding their role in reducing inequities in heart health and their contributions to reducing them. It also aimed to understand how pharmacists support Pacific patients with cardiovascular disease and how this could be improved.

Method: Interviews were conducted using a semi-structured topic guide. The research was framed by interpretive description, grounded in Pacific principles, and generated themes using template analysis.

Results: Twelve community pharmacists were interviewed. Five themes were identified: (i) pharmacists' perceptions of their role in heart health equity, (ii) tensions between culturally and clinically safe practices, (iii) pharmacists' role in multi-disciplinary teams in primary healthcare, (iv) the inconsistent and confusing healthcare system, (v) inequitable care exacerbated by an inflexible and inequitable system. Suggestions to improve pharmacists' support included flexible funding models, upskilling of staff and more pharmacist involvement in multidisciplinary teams.

Conclusion: Community pharmacists believe they contribute towards achieving Pacific heart health equity. Influenced by other healthcare professionals and the healthcare system, these roles were primarily described as medicine experts and providers, counselling, education, and safety netting for the public and GPs. With a changing healthcare environment and a shift towards preventive care, there was a strong desire for future improvements, all contributing to a more equitable heart healthcare space for Pacific people in Aotearoa, NZ.

Pharmacists and pharmacogenomic testing in the United States and its economic value proposition within the healthcare system

Nazia Rashid, Gail Orum

Keck Graduate Institute, School of Pharmacy and Applied Sciences, Claremont, United States

Introduction: During the last decade, testing patients' genomes (Pharmacogenetic Testing [PGT]) has played an important role in maximising the benefits of medications and preventing adverse drug reactions (ADRs). Before PGT, the traditional approach of prescribing medication involved selecting a drug, identifying the appropriate dose regimen, and observing if the regimen would be the best treatment for the patient. Advancements in technology with the combination of genomic information have provided new opportunities to facilitate optimal treatment for patients and alleviate errors in prescribing. Pharmacists are the most accessible healthcare professionals, so pharmacists can integrate these genetic tests into their services. It is valuable to discuss the current benefits and barriers of PGT in the United States from a pharmacist's perspective; additionally, it presents the economic value proposition of this testing from the perspective of the pharmacy profession.

Method: Initially, a systematic literature review (SLR) was conducted using databases, such as PubMed and Google Scholar, to identify and highlight the use of PGT in the pharmacy setting. Pharmacogenetics in a pharmacy setting includes testing and analysing a patient's genetic characteristics to allow for customisation in their therapeutic regimen. Articles related to pharmacogenetics in non-pharmacy settings were excluded from the study. Secondly, utilising the data extracted from the SLR, a cost-offset model was created focusing on PGT being used within oncology. Oncology was chosen since it is highly associated with precision medicine, and identifying genetic markers earlier

can support better therapy outcomes. Chemotherapy has been the standard of care therapy; however, newer therapies can target the clinical pathway and alleviate the toxic side adverse events and metastatic stages if detected earlier. The cost of oncology therapies is high. Thus, PGT is needed more, especially if pharmacists can test for these markers.

Results: Literature articles provided background on the most common roles of PGT, which were lowering the risk of ADRs, increasing medication adherence, and improving patient healthcare outcomes. Furthermore, it was found that the most common opportunities that PGT presented to the pharmacy profession were consulting services, point-of-care testing, and interdisciplinary collaboration to facilitate clinical treatment decisions. A cost-offset model with a decision tree analysis compared pharmacists conducting PGT vs no PGT within patients with CYP2C19 gene mutation (i.e. breast, lung, liver, and stomach cancers). It has shown that providing this test could have a more impactful effect on therapy outcomes. It was shown that a patient with a CYP2C19 mutation who received the PGT from a pharmacist experienced fewer inpatient days, fewer emergency department visits, and more outpatient visits than did the No-PGT group. CYP2C19 genotyping was cost-effective or cost-saving for the healthcare system when evaluated for 12 months and 24 months for those that survived.

Conclusions: PGT has significant benefits for reducing the incidence of ADRs, improving therapeutic efficacy, and reducing various healthcare costs. A pharmacist is the most accessible healthcare provider for patients, and integrating this valuable testing can change the clinical and economic landscape of treatment for many patients.

An integrated immunisation programme for the elderly in South Africa: Experts and stakeholders' views

Mncengeli Sibanda[1], Johanna C Meyer[2], Rosemary Burnett[2]

[1]Department of Public Health Pharmacy and Management, School of Pharmacy, Sefako Makgatho Health Sciences University, Ga-Rankuwa, Pretoria, South Africa

[2]South African Vaccination and Immunisation Centre, Sefako Makgatho Health Sciences University, Ga-Rankuwa, Pretoria, South Africa

Background: Globally, including in South Africa, the elderly population is rapidly growing due to advancements in health and living standards. Vaccination is increasingly recognised as a key strategy for healthy ageing, and several high-income countries have vaccination programmes for the elderly. Despite overwhelming evidence of the cost-effectiveness and benefits of vaccination for the elderly, South Africa does not have a formal policy, programme or schedule for vaccination.

Purpose: To explore the opinions, experiences, and recommendations of experts and key opinion leaders in vaccines and health management of elderly South Africans regarding vaccines for the elderly.

Method: Qualitative in-depth interviews were conducted between November 2022 and January 2023 with 16 experts, including vaccinologists, infectious disease specialists, policymakers, geriatricians and epidemiologists. Interviews were conducted virtually, using MS Teams® and a semi-structured interview guide. Recorded interviews were transcribed verbatim and coded into categories and sub-categories using NVivo 12.0TM software. A thematic analysis was used to develop a framework of themes and sub-themes. Ethics approval and informed consent were obtained.

Results: Participants unanimously agreed that a vaccine programme for the elderly is warranted, which was the overarching theme. Aligned to this were the following themes and sub-themes: A. National immunisation schedule for the elderly: (i) Rationale for immunisation schedule for the elderly; (ii) Vaccination strategies. B. Health system readiness for an immunisation programme for the elderly: (i) Programmatic considerations and strategies for vaccine introduction; (ii) Feasibility and funding of an immunisation programme for the elderly; (iii) Lessons learnt from EPI-SA and influenza vaccine programme; (iv) Achievements of the COVID-19 vaccine roll-out programme. C. Strategies to ensure adequate uptake of vaccines by the elderly: (i) Communication, public awareness campaigns and education; (ii) Role of healthcare workers in promoting vaccines for the elderly; (iii) Addressing vaccine hesitancy; (iv) Increase access to vaccines. Experts recommended a coordinated immunisation programme for the elderly, which could build on the success of the Expanded Programme on Immunisation in South Africa (EPI-SA) and the achievements of the recent COVID-19 vaccination programme. This programme should ideally be integrated into the existing programmes for the elderly within the primary healthcare system. At the same time, initiatives are needed to increase vaccine access and reduce vaccine hesitancy amongst this vulnerable group.

Conclusion: An immunisation programme for the South African elderly needs to be economically evaluated, prioritised, understood, communicated, and implemented. This should be accompanied by the requisite logistical and financial support for such a programme and interventions to increase access to and demand for these vaccines. The findings of this study will be used to prepare a policy brief on vaccines for the elderly, aimed at informing healthcare professionals, policymakers in relevant ministries, healthcare managers, organisations and academics involved in research, education and health service delivery for older adults on vaccines for the elderly.

Considering health technology assessment in pharmacy curriculum: A Sub-Saharan Africa study

Emily Ditari Sika[1], Haruna Abdulmajid[2], Victory Samuel Ufedo[3], Youmna Atef[4], Asmaa Khaleed ElShenawy[5], Anesu Brighton Venge[6], Israel Iyanuoluwa Ogundeyi[7], Yaw Asamoah Mfoafo[8], Godsgift Chinemelum Iwendi[1]

[1]*Faculty of Pharmaceutical Sciences, University of Port Harcourt, Rivers State, Nigeria*

[2]*Faculty of Pharmaceutical Sciences, Ahmadu Bello University, Kaduna State, Nigeria*

[3]*Faculty of Pharmaceutical Sciences, University of Jos, Plateau State, Nigeria*

[4]*Faculty of Pharmacy, Cairo University, Cairo, Egypt*

[5]*Faculty of Pharmacy, Delta University, Kafr el Sheik, Egypt*

[6]*School of Pharmacy, University of Zimbabwe, Harare, Zimbabwe*

[7]*Faculty of Pharmacy, University of Ibadan, Oyo State, Nigeria*

[8]*Kwame Nkrumah University of Science and Technology, Kumasi, Ghana*

Introduction: Health Technology Assessment (HTA) is a multidisciplinary process that assesses the adaptability of a health innovation against other alternatives for use in standard health practice. It is important in evaluating new health technologies such as pharmaceuticals, medicines, and medical devices. This research aimed to highlight the benefits of HTA in the undergraduate programme curriculum, as well as possible challenges and recommendations.

Method: The methodology for this research work involved a literature review of 54 articles from online literature, which included studies focusing on health technology assessment as part of pharmacy curriculum or training, studies centred on health Technology, digital health, or any keyword related to technology, publications based on health Technology or digital health within ten years of publication, Bachelor of Pharmacy (B. Pharm) and Doctor of Pharmacy (PharmD) undergraduate curricular in accredited pharmacy schools with a track record of research work and regardless of ownership in Sub-Saharan African countries.

Result: It was observed that while health technology assessment is a widely used tool in developed countries for assessing new health innovations, this practice is rarely seen in Sub-Saharan Africa, including in various pharmacy schools. Some benefits of HTA in the undergraduate pharmacy program were providing foundational knowledge on proper evaluation of cost, quality, and access to care, the use of developed clinical guidelines, and actions involved in the judicious use of medicines to deliver positive health outcomes in health institutions. Insufficient data regarding health technology assessment in the Sub-Saharan region was also observed. Some challenges identified were a lack of institutionalised HTA mechanism, funding, and limited human resources. Most of the private and government pharmacy schools in this region have yet to implement the PharmD curriculum comprising HTA.

Conclusion: In conclusion, it is recommended that Sub-Saharan African nations develop their expertise and adopt health technology assessment as a systematic health decision-making tool. Equally, HTA adoption should not be restricted to only the macro level but should begin with a curriculum review and its implementation in pharmacy education.