

## CONFERENCE ABSTRACTS

# FIP CAPE TOWN 2024

82<sup>nd</sup> FIP World Congress of Pharmacy and Pharmaceutical Sciences in Cape Town, South Africa,  
1 to 4 September 2024

## Health and medicine information

### Assessing the benefits of a combined sports massage and physical activity programme for posture management and well-being in somatic therapists

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**Introduction:** In the domain of musculoskeletal health, Somatic therapists, practitioners skilled in massage therapy and other wellness-oriented techniques, are placing growing emphasis on posture correction. This study delves into the efficacy of sports massage and physical activity interventions for posture improvement, with a particular focus on their application by Somatic therapists. Massage therapy, a well-established practice with a wide range of applications, offers a valuable toolset, with sports massage specifically targeting the needs of athletes. Somatology, the discipline practised by Somatic therapists, embraces preventative and rehabilitative strategies to promote holistic well-being. Maintaining good posture is paramount for preventing musculoskeletal pain and ensuring optimal function, whereas poor posture can lead to a multitude of problems. Through a rigorous investigation into the effectiveness of sports massage and physical activity, this research endeavours to equip Somatic therapists with evidence-based methodologies for enhancing posture correction in their clientele.

**Objective:** This study aims to investigate the effectiveness of a combined intervention programme using sports massage and physical activity to improve posture, overall well-being and musculoskeletal health, particularly among Somatic therapists. The researchers hypothesise that this programme will lead to significant posture correction and improved overall well-being compared to no intervention. They will evaluate the programme's effectiveness through various

methods, including posture measurements, questionnaires and observations, with the goal of developing evidence-based recommendations and educational resources.

**Method:** A true experimental design will be employed with 90 Somatic therapy students. Participants will be randomly allocated to one of three groups: sports massage, physical activity or a combined intervention group. The interventions will be delivered for eight weeks. Posture will be assessed using a combination of methods, including visual observation, plumb line photography, and inclinometers. Questionnaires and an SF-36 health survey will be used to evaluate well-being and treatment outcomes. Data will be collected at baseline and post-intervention.

**Results:** The study expects a combined programme of sports massage and physical activity to significantly improve posture correction, overall well-being and musculoskeletal health, particularly for Somatic therapists. Posture improvements will be measured through various tools and observations. The study also anticipates increased overall well-being through questionnaires. Finally, somatic therapists are expected to experience improved musculoskeletal health, which is measured through assessments of pain and function. Overall, this study aims to demonstrate positive impacts across these areas, with potential variations based on individual factors.

**Conclusion:** This research aims to provide evidence-based recommendations for incorporating sports massage and physical activity into Somatic therapy practice. By improving the posture and well-being of therapists, this approach has the potential to enhance treatment delivery and benefit both therapists and their clients.

### Antimicrobial evaluation of *Hypsizygus ulmarius* (Bull. ex Fr.) Redhead extracts on infection causing pathogens

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**Introduction:** A variety of medicinal products from mushrooms may be used in cosmeceutical products applied topically, such as creams, lotions, and ointments. Cosmeceuticals incorporating mushrooms include those for skin care such as anti-ageing, antioxidants, skin revitalising, skin whitening and hair products. In some cases, topical preparations can also be prepared from the topical extraction of mushrooms. A mushroom polysaccharide has increased interest as a skincare ingredient because of its high moisture content in the epidermis and stratum corneum, as well as its ability to retain moisture. Additionally, these compounds hydrate your stratum corneum and improve the physical and chemical properties of the skin, making it smooth, soft, and moist. The species of *Hypsizygus ulmarius* possess several nutritional and medicinal properties, such as antitumor, immunomodulatory, antioxidant, anti-inflammatory, anti-allergic, hypocholesterolemia, and antimicrobial activities.

**Objective:** To evaluate the antimicrobial activity of *H. ulmarius* against selected human infectious pathogens and recommend it for the preparation of cosmetic products.

**Methods:** The powdered *H. ulmarius* mushroom was successively extracted with various solvents such as ethanol, water and 50% ethanol through an orbital shaker at 120 rpm for 12 hours. The antimicrobial activity of *H. ulmarius* was evaluated using the minimum inhibitory concentration (MIC) microdilution method against selected human pathogenic microorganisms.

**Results:** The *H. ulmarius* extracts were tested for antimicrobial activities against *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Streptococcus pyogenes* and *Candida albicans* by 96 well method at various concentrations (20mg/l to 0.078 mg/ml) of extracts. All the extracts were effectively tested against microorganisms and compared with standard antibiotics (Ciprofloxacin and Amphotericin B). All these extracts were active against all the microorganisms, and strong activity was recorded against *Candida albicans*. The maximum antimicrobial activities were obtained in water (20mg/l to 0.078 mg/ml) extract, followed by 50% ethanol and ethanol.

**Conclusion:** The present results indicated the potentiality of this mushroom extract, and this can be used as a cosmeceutical product for the control of several infectious diseases by microorganisms.

### Pharmacist's role in making medicines information understandable to the illiterate/uneducated (e.g. pictograms). A case study in Eket LGA, Akwa Ibom State-Nigeria

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**Introduction:** This study was carried out to examine pharmacist's role in making medicines information understandable to the illiterate/uneducated (e.g. pictograms) in Eket Local Government Area of Akwa Ibom State. Effective communication between healthcare providers and patients is crucial for ensuring optimal medication understanding, adherence, and improved health outcomes. However, conveying medication information to individuals with low literacy levels presents unique challenges.

**Objective:** This study aims to explore these challenges, along with potential strategies and interventions for enhancing communication in the context of Eket LGA. The study begins by formulating several hypotheses and conducting analyses to examine the relationships between various variables. The first hypothesis explores the association between current communication practices and the challenges faced by pharmacists in Eket LGA when communicating medication information to illiterate or uneducated patients. Understanding these challenges is essential for identifying areas of improvement and developing effective strategies. The second hypothesis investigates the impact of exposure to innovative communication strategies on patient medication understanding and adherence. By exploring the effectiveness of these strategies, the study aims to identify approaches that can enhance patient comprehension and promote better adherence to medication regimens. The third hypothesis delves into the influence of cultural and linguistic factors on the acceptance and usability of pictograms among diverse populations. Cultural and linguistic considerations play a significant role in patient communication, and understanding their impact is crucial for developing culturally sensitive communication materials. The fourth hypothesis examines the correlation between pharmacists' awareness, knowledge, and training needs regarding communication strategies and their use of these strategies. By assessing pharmacists' awareness and training gaps, the study aims to provide insights into areas where additional training and support may be necessary.

**Method:** Through descriptive statistics and correlation analysis methodology, the study uncovers insights into the complexities of medication communication and management.

**Results:** The findings highlight that while innovative communication strategies show promise in enhancing patient understanding and adherence, cultural and linguistic barriers pose challenges to the acceptance and usability of pictograms. Additionally, the study reveals that pharmacists' awareness and training needs play a significant role in the use of effective communication strategies. Based on these findings, the study proposes several recommendations to enhance medication communication practices. These recommendations include providing communication skills training for pharmacists to improve their ability to convey information to illiterate or uneducated patients. The development of culturally sensitive patient education materials is also recommended to address cultural and linguistic barriers. Furthermore, interdisciplinary collaboration among healthcare providers is suggested to foster comprehensive and patient-centred care. In conclusion, effective medication communication is essential for promoting patient-centred care and optimising health outcomes.

**Conclusion:** By implementing targeted interventions and strategies, healthcare organisations can strive to overcome communication barriers and foster meaningful patient-provider interactions in medication management. This study provides valuable insights into the challenges, strategies, and recommendations for enhancing medication communication in the context of Eket LGA, Akwa Ibom State.

### Correlation between South African health products regulatory authority registered medicines and burden of disease including comparison of classifications of medicines utilised in the public and private sectors in South Africa

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**Introduction:** Differences and similarities in the performance of public and private sector facilities are well documented. However, limited data is available on the differences between the sectors in low- and middle-income countries.

**Objective:** The study compared the utilisation of medicines to establish the types of diseases treated in each sector and their cost implications.

**Method:** A retrospective quantitative study was conducted. Medicines registered between 2014 and 2019 and utilised in private and public sectors between 2015 and 2019 in South Africa were analysed. Data were analysed using MS Excel. Stata v17 was used to calculate Spearman's correlation coefficient for the relationship between registered medicines and the burden of disease.

**Results:** A total of 20,329 dispensed medicines were analysed in the private sector compared to 28,761 in the public sector. Overall, medicines acting on the Nervous System were most utilised in public (19.29%) and private (18%) sectors. The volume and value of medicine sales were higher in the public sector by 74.1% and 82.71%, respectively. A positive and moderate correlation existed between registered medicines and the Burden of disease variables.  $r(12) = 0.3554$ ,  $p = 0.02124$ . On the results, the null hypothesis fails rejection.

**Conclusion:** The high burden of mental health conditions in both sectors and the high use of antibiotics in the public sector require a concerted effort from policymakers. The moderate relationship between registered medicines and the burden of disease signifies the need to invest in regular studies of this nature to ensure significant alignment.

### Pharmacological characterisation of medicinal plants used ethnobotanically for the treatment of sexually transmitted infections

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**Introduction:** Sexually transmitted infections (STIs) remain a significant global health concern, affecting millions of people and causing health complications such as infertility in women, urethritis and prostatitis in men, chronic pain, and increased HIV transmission.

Challenges, including stigma and discrimination, lack of awareness, and restricted access to testing services and treatment, necessitate the exploration of alternative treatment options. Recent research has focused on developing novel approaches to prevent and treat STIs, but medicinal plants used in traditional medicine systems offer a potential source of new therapeutic agents.

Ethnobotany is defined as the study of the traditional knowledge and uses of plants by indigenous cultures. Traditional healers have used plant-based remedies for centuries to treat a variety of conditions, including STIs. This research project investigates the pharmacological potential of a plant mixture, as identified by a traditional healer, for the treatment of STIs.

**Objective:** This research project aims to examine the efficacy of a mixture of medicinal plants in treating STIs by

determining antimicrobial activity: extracts will be tested against common STI-causing pathogens. Assessing cytotoxicity: extracts will be analysed for their potential to harm human cells and, finally, explore herb-drug interactions.

**Method:** Plant samples will be obtained from a traditional healer who believes the plant samples are effective for the treatment of STIs. Bioactive compounds will be extracted using appropriate solvents, and the extracts will be tested against strains of bacteria that cause STIs, such as *Neisseria gonorrhoeae* (gonorrhoea) and *Chlamydia trachomatis* (chlamydia). The susceptibility of these strains will be determined using standard microbiological methods:

- Zone of inhibition: Area of bacterial growth suppression by the extracts will be measured.
- Minimum inhibitory concentration (MIC): Lowest extract concentration inhibiting bacterial growth will be measured.

Cytotoxicity will be evaluated using an MTT assay to assess potential human cell toxicity. This ensures the safety of the plant extracts for human use. Commercial recombinant cytochrome P450 enzymes will be used to investigate plant extract-mediated enzyme inhibition, potentially indicating herb-drug interactions and this is crucial because some traditional medicines can interact with conventional medications, reducing their effectiveness or causing adverse effects.

### Perceptions related to doping, and athletes use of medication and supplements: A qualitative study of pharmacists in Gauteng

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**Introduction:** Sports medicine has become a prominent field of specialisation in recent years, with growing interest in appropriate medicine use in athletes. However, pharmacists appear to have little involvement in sports medicine. Pharmacists are optimally skilled in managing the medication-specific needs of patients and should play a more pertinent role in managing the use of medication in athletes. Efforts should consider the unique physiology and lifestyle of an athlete and align with World Anti-Doping Agency restrictions. Limited literature reports on the South African pharmacists' perception or interest in this field and the hindrances to potential involvement in sports medicine.

**Objective:** The aim of this study was to understand pharmacists' perceptions related to doping in sports and

medication and supplement use in athletes to better inform future actions and guidelines in South Africa.

**Method:** A qualitative research methodology was utilised to meet the aim of the study. Information was collected through interviews conducted with pharmacists, currently practicing in community pharmacies, in Gauteng. The researcher ensured that the research findings were reliable, credible, transferable, and dependable by conducting the interview using standardised questionnaires. Prolonged engagement with the data recordings and transcriptions afforded familiarity with the data to ensure credibility. Meaningful data was extracted from the responses through thematic analysis.

**Results:** Seventeen pharmacists participated in the study. The themes identified included 1) the role of the pharmacist in sports, as it relates to anti-doping and ensuring the best treatment practice amongst athletes, 2) the presence and impact of appropriate education and knowledge in sports 3) the effect of the current regulatory framework on supplement use, and the need for additional appropriate guidelines focused on pharmacists' role in sports medicine 4) barriers that have limited pharmacists' involvement in the field, including the lack of recognition of a pharmacist's potential contribution by the sports industry, as well as the pharmacist's limited involvement in supplement usage. Pharmacists have an awareness of and a positive perception towards the field of sports medicine and agree that pharmacists can have an impact on anti-doping efforts and appropriate medication use; specific limitations have hindered their involvement thus far. The most significant limiting factor to pharmacist involvement in sports medicine identified was that of pharmacists' limited knowledge, resulting in poor counselling and assistance on issues related to sports medicine. Additional limitations that have a notable impact were related to the regulation of supplements, which caused decreased involvement by pharmacists as well as the outward perception of pharmacists' potential impact. The positive response to the proposed implementation of specific local guidelines or courses related to sports medicine provides an indication of pharmacists' willingness and interest to become better educated in the field, leading to increased confidence and, thus, involvement.

**Conclusion:** The study's findings confirmed pharmacists' potential impact in sports medicine while alluding to specific problems that have hindered the involvement of pharmacists in sports medicine. With increased educational opportunities, the inclusion of appropriate resources and efforts to include pharmacists in matters related to medication use in athletes, specifically in anti-doping, are possible.

### Assessment of the indirect cost of drug-resistant tuberculosis treatment to patients in a high burden, low income setting in Mozambique

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**Introduction:** Tuberculosis (TB) is closely linked to poverty, and patients often face substantial indirect treatment costs. The complexity of treating drug-resistant tuberculosis further escalates these expenses. Notably, there is a lack of published data on the indirect costs incurred by patients with drug-resistant tuberculosis in Mozambique.

**Objective:** To assess the indirect costs incurred by patients undergoing diagnosis and treatment for Drug-Resistant Tuberculosis (DRTB) in Mozambique during their TB treatment.

**Method:** As a component of a comprehensive mixed-methods study conducted from January 2021 to April 2023, this research employed a descriptive cross-sectional approach incorporating both quantitative and qualitative methods. The overarching aim was to assess the costs borne by the national health system related to drug-resistant TB. Additionally, in examining the indirect costs faced by patients and their families throughout the treatment process, semi-structured interviews were conducted with 27 individuals currently undergoing treatment for more than six months.

**Results:** All survey participants unanimously reported a significant decline in labour productivity, with 70.3% experiencing a reduction in their monthly income. Prior to falling ill, the majority of respondents (33.3%) earned a monthly income up to \$76.92, representing the minimum earnings range, while 29.2% had an income surpassing \$230.77, the maximum range of earnings. Among those who experienced income loss, the majority (22.2%) reported a decrease of up to \$76.92, whereas 18.5% cited a loss exceeding \$230.77. Notably, patients with Drug-Resistant Tuberculosis (DRTB) have not personally bear the direct costs of the disease, as these are covered by the government.

**Conclusion:** The financial burden of Drug-Resistant Tuberculosis (DRTB) treatment, coupled with the adverse effects of income reduction resulting from DRTB, is substantial. Implementing a patient-centred, multidisciplinary, and multisectoral approach, along with robust psychosocial support, can significantly reduce the catastrophic costs incurred by DRTB patients.

### Pharmaceutical compounding: A tool to mitigate medicine shortages

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**Introduction:** In the last few years, worldwide and namely in Portugal, shortages of medicines have been more frequent, owing to several causes and intensified by the impact on pharmaceutical markets due to the COVID-19 pandemic, geopolitical events, the rise in prices of goods and services, the energy crisis and atypical demand trends of some medicines (e.g. antibiotics). These shortages have impacted not only human medicines but veterinary medicines as well.

**Objective:** This work aims to identify the main compounded medicines prepared to mitigate medicines shortages in Portugal. The present work also aims to highlight the approaches used to mitigate medicines shortages, including the tools for data collection as well as the perspective of Portuguese Community Pharmacies on this matter.

**Method:** Review of published information on this matter, including the recommendations and statements of different National Competent Authorities on pharmaceutical compounding as a mitigation measure for medicine shortages. Analysis of the database of questions & answers registered by CIMPI (Pharmaceutical Compounding Information Center at LEF). Evaluation of the panorama by online survey and/or working in a joint group, with the collaboration of Portuguese Community Pharmacies with expertise in Pharmaceutical Compounding.

**Results:** According to the database of questions & answers registered by CIMPI, Portuguese Community Pharmacies ask for information on formulations and methods of preparation of several active pharmaceutical ingredients (APIs), to obtain a compounded medicine as a tool to mitigate medicine shortages. APIs identified in these questions & answers are drugs indicated for human use, namely for the treatment of cardiovascular diseases (like potassium chloride and propranolol hydrochloride), antifungals (like miconazole), antibiotics (like amoxicillin, erythromycin and azithromycin), antivirals (like acyclovir and oseltamivir). There are also

questions related to the shortage of veterinary medicines, e.g., Telmisartan oral liquid. Although with less expression, other APIs have been identified for several indications; for instance, APIs are indicated for gastric mucosal protection (e.g. sucralfate) and for hormonal substitution therapeutic (e.g. estriol).

**Conclusion:** National Competent Authorities, globally and in European countries, as well as the European Medicines Agency (EMA) are continuously monitoring critical medicine shortages, cooperating with stakeholders and pharmaceutical companies, and coordinating actions to help prevent and manage shortages. Nevertheless, shortages are still happening and have increased globally in the last few years.

The Portuguese Community Pharmacies play an important role on sharing up-to-date information on the shortage situation, as well as promoting mitigation measures, such as compounding of medicines. Pharmaceutical Compounding have been a relevant solution to many patients, developed by several Portuguese pharmacies, making possible the patients' access to several API, for acute or chronic treatments.

Pharmaceutical Compounding is recognised as an important tool to mitigate medicine shortages. Although there is not a clear guidance to this alternative as mitigation measure on medicines shortages, nor a harmonisation of the statements of the different National Competent Authorities across Europe.

## Reporting vaccine adverse drug reactions

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**Introduction:** As with other medicinal products, vaccines have the potential to exert adverse drug reactions (ADRs), which vary in severity and frequency. An issue with vaccines is that they are, in the majority of instances, being given to prevent disease occurrence at the individual level as well as from a community and global public health perspective. ADR reporting can be done by patients and healthcare professionals (HCPs) and can shed light on ADR frequency. ADR reporting is an essential element of pharmacovigilance and helps to better understand the risk-benefit ratio. Lack of ADR reporting has a negative impact on the understanding of the risk-benefit ratio for vaccines.

**Objective:** The objectives of the study were to compare toxicity of vaccines and to identify perception, awareness, and experiences of HCPs with vaccine-related ADR reporting.

**Method:** The study was divided into three phases. First phase: A literature review on documented ADRs caused by

COVID-19, Varicella zoster and influenza vaccines was conducted. Open-access, peer-reviewed journal articles from PubMed published between 2012-2022 were used. Second phase: A questionnaire on perception, awareness and experiences with vaccine-related ADR reporting was developed and validated by an expert panel consisting of four pharmacists. The developed questionnaire consisted of 12 questions related to demographic data, ADR reporting awareness and vaccine-related ADRs. Third phase: The Questionnaire was distributed among HCPs, including pharmacists, doctors and nurses.

**Results:** Common vaccine-related ADRs reported in identified articles (n = 150) were headache (n = 40), fatigue and myalgia (n = 42). For the COVID-19 vaccines, the most commonly reported ADR was thrombosis (n = 15). A total of 274 respondents completed the questionnaire, with the majority of respondents being nurses (n = 156) and the rest including doctors (n = 45), pharmacists (n = 64), and other HCPs (n = 9). Most respondents (n = 193) were aware and confident with the process of ADR reporting. However, when respondents were asked whether they believed there were any barriers to ADR reporting, 118 respondents said yes and 111 respondents were unsure. Respondents believe that lack of awareness of the procedure for ADR reporting (n = 102) and time constraints (n = 63) are barriers. Forty-five respondents believe that there are no barriers to ADR reporting. Respondents (n = 145) identified muscle and joint pain as the most common vaccine-related ADR.

**Conclusion:** HCPs have the knowledge and confidence to report an ADR, however, still feel that there are barriers preventing them from reporting. ADR reporting is important to ensure safety of the product and identify the severity and frequency of an ADR. It is important to highlight the importance of reporting appropriately among HCPs.

## Advancing pharmacovigilance practices: a collaborative approach through education

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**Introduction:** Amidst rapid technological advancements and evolving healthcare landscapes, pharmaceutical professionals encounter a myriad of complex challenges. Fostering patient-centric approaches is crucial in many practices – pharmacovigilance being a vivid example. In response to the diverse needs of the pharmaceutical ecosystem, the Malta Medicines Authority (MMA) established an academy within its auspices to support a

culture of continuous professional development beyond mere policy adherence. The rationale is to explore the role of innovative educational interventions for enhancing collaboration among stakeholders in navigating regulatory practices such as pharmacovigilance.

**Method:** In April 2023, the MMA Academy for Patient-Centered Excellence and Innovation in Regulatory Sciences was licensed as a Further and Higher Educational Institution by the Malta Further and Higher Education Authority (MFHEA). The MMA Academy developed a 25-hour face-to-face programme leading to an "Award in Pharmacovigilance", accredited by the MFHEA at Level 6 of the Malta/European Qualifications Framework. The course was launched in January 2024, with the engagement of local and international expert speakers, offering a comprehensive understanding of pharmacovigilance legislation, guidance, and practical considerations for ensuring medicinal product safety. Feedback was collected through an evaluation form, including a five-point psychometric Likert scale, completed by several course participants.

**Results:** The course attracted full enrolment and successful completion by thirty-four ( $n = 34$ ) participants from diverse entities (22 private and 12 public). All evaluation form respondents ( $n = 22$ ) expressed satisfaction with course content and willingness to consider attending future educational initiatives. Notably, 19 respondents (86.4 percent) found the information presented relevant to their practice, anticipating performance improvement.

**Conclusion:** The keen interest observed at registration stage, positive course outcomes and encouraging feedback underscore the exigency and applicability of such educational initiatives. Collaborative synergy between national competent authorities and practicing professionals portends potential for streamlining processes and addressing gaps across industry, public and regulatory settings, for the ultimate benefit of patients.

## Fenamic acid derivatives reduce cardiovascular disease in patients with diabetes

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**Introduction:** Diabetes is often accompanied by inflammation, which can lead to cardiovascular disease (CVD). According to the World Health Organisation, by 2025, approximately 422 million people around the world will be suffering from diabetes, most of whom live in low- and middle-income countries, and 1.5 million people will die directly from diabetes every year. CVD is the leading cause of death in people with diabetes. This study focuses on fenamic acid derivatives, which can reduce the incidence of CVD in patients with diabetes.

**Methods:** The authors used the National Health Insurance Research Database of Taiwan's Ministry of Health and Welfare to identify a total of 30,873 people suffering from diabetes in 2004 and calculated the incidence of CVD complications from 2004 to 2013. During this period, patients with severe comorbidities and other medications were excluded, and eligible individuals were divided into treated and matched untreated groups. Participants were followed for acute coronary syndrome (ACS) and CVD after receiving the fenamic acid derivative or the corresponding calendar date. Results were finally presented using Cox proportional hazards models, Kaplan-Meier survival curves and Cumulative disease incidence curves.

**Results:** People with diabetes are at higher risk for CVD due to inflammation after using fenamic acid derivatives.

**Discussion:** Cox models were adjusted for age, sex, comorbidities, and medication. The incidence of ACS was reduced by 60.9% (HR=0.391; CI=0.203 to 0.753;  $P = 0.005$ ), and CVD was reduced by 24.3% (HR=0.757; CI=0.574 to 0.999;  $P = 0.049$ ). However, the authors do not know the patient's compliance and lifestyle habits in the data collected in the study, and the results may be biased.

**Conclusion:** Fenamic acid derivatives can reduce the incidence of ACS and CVD in patients with diabetes. The combined use of fenac derivatives and hypoglycemic drugs may become a new therapeutic strategy.

### Evaluating side effects among Wegovy users to enhance counselling provided by pharmacy staff

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**Introduction:** Since Wegovy, a new weight loss medication, was launched in pharmacies in December 2022, there has been a significant increase in both sales and demand among the Danish population. Wegovy users form a new, insufficiently studied group of patients. To better assist pharmacy staff in advising these users, it is important to understand the challenges experienced with using this medication in this new patient group.

**Objective:** To identify side effects experienced by Wegovy users and investigate correlations between these side effects and the following factors: Age, gender, other diseases, and drug dosage. Additionally, the study examines how users who experience side effects manage these side effects to enhance counselling provided by pharmacy staff.

**Method:** A qualitative study based on interviews with 20 Wegovy users has been conducted with the aim of identifying the challenges associated with the use of this medication. The results from these interviews have indicated that side effects are a primary concern for users. Therefore, it is selected as the focus of this project. Based on the same user interviews, a questionnaire has been developed for use at the pharmacy counter, where users who redeem a prescription for Wegovy are encouraged to participate (from March to June). Inclusion Criteria: must have been in treatment for at least two weeks. The study is conducted at Aabyhøj Pharmacy and Odder Pharmacy and their branches (nine pharmacies total). Quantitative data is obtained by counting the number of completed questionnaires. Questions were asked regarding (1) age, gender, other diseases, and duration of use of Wegovy; (2) experiences with side effects; (3) dose-dependent side effects; (4) solutions/relief for side effects. Furthermore, a prepared brochure was distributed with suggestions for methods to alleviate the side effects of Wegovy.

**Results:** Within the first two weeks of March 2024, 67 questionnaires completed by Wegovy users aged 21-73 years were collected so far. Out of these questionnaires, 20.90% (n = 14) had reported no side effects, while 79.10% (n = 53)

experienced side effects. Among those, 43.4% had transient side effects initially, and 56.6% continued to experience them. Additionally, 11.3% reported worsening side effects during dose adjustment. 3.7% had to taper down treatment due to side effects. Among users experiencing side effects, only 35.8% had suggestions for alleviation. The most common methods included purchasing over-the-counter medication 34%, changing lifestyle/diet 22.6%, and taking supplements 13.2%. However, 30.2% were unaware of methods to alleviate their side effects. The primary side effects reported were nausea 54.7%, diarrhoea 35.8%, and constipation 9.4%.

**Conclusion:** The study provides an initial overview of individuals' experiences with Wegovy. While numerous participants reported side effects such as nausea, diarrhoea, and constipation, there was a notable lack of knowledge regarding their management. Wegovy users emphasise the need for improved guidance and support from pharmacies to ensure safe usage of Wegovy. However, it's important to note that these findings are preliminary results since the study is still ongoing.

### An overview of the approach to promoting health literacy through pharmacies

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**Introduction:** Health Literacy is paramount as a health promotion instrument. Defined by the World Health Organisation as the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health, Health Literacy means more than being able to read pamphlets. By increasing people's access to health information and their capacity to use it effectively, health literacy is critical to empowering people. Pharmacies are strategically positioned to improve and positively impact the population's health literacy. When exploring current practices and innovative initiatives, the commitment to content production stands out, using clear language and adapted graphic strategies.

**Objective:** This work aims to provide a comprehensive review of the strategies used to improve health literacy promotion initiatives by Portuguese pharmacies.

**Method:** Writing for the public involves five steps: know the audience to tailor information; write simpler, easier-to-read text; organise information to facilitate understanding and retention; pay attention to the formatting and design to

ensure usability; and test before publishing it. Considering this, patient education brochures (iSaúde) were redesigned so that information can be organised and highlighted according to its importance. These resources were also colour-coded to allow easy identification of their thematic scope – purple for those about medicines, yellow for those about diseases and health conditions, and green for the ones which addressed health promotion. Additionally, to promote the availability and use of iSaúde in daily pharmacy practice, they were included in the dispensing pharmacies' software (Sifarma®) and linked to the medicine or health product to which they relate. This way, they are readily available to the pharmacy team when dispensing the medicine or health product and can be printed out and delivered by hand or sent by e-mail. Another strategy used to promote health literacy was to regularly develop health content for ANF's social media, which pharmacies could also use on their own. These resources were designed to be informative, accessible, and engaging and aimed to empower individuals with practical knowledge to make better health choices. In collaboration with some pharmacies, articles on health topics were also written for local newspapers, and resources were produced to support community presentations to which pharmacies were invited as speakers.

**Results:** Since the beginning of this process, in May 2022, we've published 185 iSaúde in the new layout, 50 of which correspond to new topics, some on the safe use of medicines, such as several medicines undergoing additional monitoring, different oral anticoagulants and on the safe use of distinct fentanyl presentations, others on the promotion of SRV, pneumococcal, COVID-19 and flu vaccination, to name a few. Since then, we've also produced content for ANF's social media on 60 topics.

**Conclusion:** Community pharmacies play a key role in promoting health literacy, due to their accessibility and reliability. Supporting them in their mission with useful and accessible information is crucial, as they are ideally placed to educate and empower patients in the pursuit of better health decisions and achieve better health outcomes.

### Educational strategies to promote patient safety when using insulin pens in Brazil

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**Introduction:** Insulin is among the five drugs that cause the most harm to adult and paediatric patients, which confirms the need to develop strategies to prevent medication errors involving this drug. Insulin injection pens became available in

the Unified Health System in 2017 as an easy-to-use alternative. After their incorporation, some barriers to the use of this technology were observed, such as doubts about storage and procedures for using the pen, habitual and preferential use of the vial and syringe and lack of knowledge about the criteria for using the pens. To overcome these barriers, it was necessary to establish education strategies to promote its proper use and reduce medication errors.

**Objective:** The authors aim to describe a national training programme for health professionals on the rational and safe use of insulin pens conducted in Brazil.

**Method:** The programme consisted of virtual meetings with health managers and professionals from 20 Brazilian state health departments and member municipalities. Each meeting lasted 4four hours and covered a conceptual view of diabetes, the characteristics of insulin pens and issues related to patient safety. The meetings were recorded and made available to those registered by the state via the Moodle® INAFF EAD platform. Prior to the meetings, the registered professionals received a form containing a situational diagnosis of the main problems in the use of insulin pens in the states to guide the training sessions. In addition, professionals were provided with recorded videos with practical guidance on the main points for using insulin pens correctly. These videos were also made available on the EAD platform. At the end, participants were asked to evaluate the course in terms of its objectives. This training programme was developed by the National Institute of Pharmaceutical Assistance and Pharmacoeconomics (INAFF) through a technical cooperation agreement with the Brazilian Ministry of Health and with the support of the state and municipal health secretariats.

**Results:** The training sessions were held between November 3, 2021, and February 25th, 2022 and involved 8,540 registered health professionals and managers from twenty states. Health professionals from 4,786 municipalities in the five regions of the country took part. The survey was answered by 1,087 participants, 970 professionals and 115 managers. The course evaluation was answered by 628 participants. The percentage of respondents who rated the course as excellent was above 80 percent in all the questions presented. The professionals emphasised the importance of the course in providing qualified information on the use of insulin pens, helping to promote patient safety.

**Conclusion:** The training on the use of insulin pens with the methodology adopted made it possible to reach many professionals from different municipalities in the country, promoting a learning environment on the safe and rational use of insulin pens and overcoming barriers to their use.

## Traditional, medicinal plants from South African muthi markets: Integrative medicine approaches to infectious diseases

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**Introduction:** The World Health Organisation, in its Traditional Medicine Strategy, highlighted integrative medicine as central to achieving extended patient healthcare in low-to-middle-income countries, which is yet to be achieved in South Africa. Integrative medicine presents promising potential to address this strategy. However, interactions between traditional and conventional medicines pose concerns. To address this, a two-phase study was designed. Phase 1 aimed at investigating the prevalence of the use of a combination of traditional and conventional medicines amongst patients at two large public hospitals in South Africa, namely Charlotte Maxeke Johannesburg Academic Hospital (CMJAH) in Johannesburg (JHB) and King Edward Hospital VIII (KEH) in KwaZulu-Natal (KZN). Phase 2 aimed to determine the *in vitro* interactive profiles of conventional antimicrobials in combination with the most popular traditional medicinal plants for infectious diseases, purchased from major muthi markets in South Africa (Warwick market in KZN and Faraday market in JHB).

**Method:** Phase 1 - A descriptive, self-administered, quantitative survey consisting of demographic and traditional medicine use information was undertaken. Data analysis included quantitative frequencies and percentages with pivot table correlations. Ethical clearance (M190534) was obtained for the study. Phase 2 - Plant material collected from the muthi markets was botanically identified, and thereafter, minimum inhibitory concentration (MIC) assays were conducted, with the sum of the fractional inhibitory concentration ( $\Sigma$ FIC) calculated for interaction classification. A total of 1,632 antibiotic-plant combinations were tested against ESKAPE (*Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter cloacae*) pathogens. Furthermore, 272 antifungal-plant combinations were tested against two yeasts (*Candida albicans* and *Candida glabrata*).

**Results:** Phase 1 - A far higher prevalence of traditional medicine use was found amongst participants in KZN (94.1% of n = 307), as opposed to JHB (76.8%, of n = 263), with participants from both sites indicating a combination use of traditional and conventional medicine of 31.6% and 11.0%, respectively. Furthermore, medicinal plants were revealed as the most common source of traditional remedies (KZN 88.3%; JHB 49.1%), with KZN (26.4%) and JHB (34.6%) participants using these medicinal plants for infections. Phase 2 -

Antibiotic-plant combinations against ESKAPE pathogens exhibited synergistic (5.6%), antagonistic (49.6%), additive (7.5%) and non-interactive (37.3%) profiles. Furthermore, antifungal-plant combinations against two yeasts demonstrated synergistic (0.7%), antagonistic (60.8%), additive (3.5%) and non-interactive (35.0%) profiles. *Senecio serratuloides* (purchased from the KZN muthi market), in combination with ciprofloxacin that was tested against *K. pneumoniae*, proved most antagonistic ( $\Sigma$ FIC 139.86). Conversely, *Hypoxis hemerocallidea* (purchased from the JHB muthi market) reflected the most synergistic interaction ( $\Sigma$ FIC 0.06) when tested in combination with azithromycin against *E. faecium*.

**Conclusion:** Considering the high prevalence of traditional medicinal plant use in South Africa (KZN - 94.1%; JHB - 76.8%), and potential combination use, integrative medicine strategies are to be considered seriously, to ensure holistic and safe treatment outcomes for patients. Noteworthy interactions of antagonism and synergy provide foundational knowledge for larger expansion, potentially allowing for future clinical translations.

## Contemporary evidence for the on-screen display of medicines information: A systematic review of the literature

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**Introduction:** Medication safety remains a global priority in the healthcare sector. Medication-related harms contribute to unnecessary deaths and billions of dollars worth of healthcare expenditures annually. Although the advancement of digital health technology has the potential to improve the safe use of medicines throughout the medication use process, poor design of digital health tools contributes to medication-related harms. It is, therefore, necessary to investigate the evidence on what constitutes a safe and appropriate design of digital health technologies supporting the use of medicines for healthcare providers and consumers, including the on-screen display of medicine information. Therefore, this systematic review aimed to identify and collate contemporary evidence relating to the safe and appropriate on-screen display of information on medicines.

**Method:** A systematic search of three databases (Scopus, Embase, and MEDLINE) was conducted. A search strategy consisting of search terms and synonyms relating to the key

concepts “medication” AND “system” AND “presentation” AND “delivery mechanism” was developed with the assistance of an academic librarian. English language and publication date (1st January 2013 to 27th June 2023) limits were applied. Results (n = 3,422) were de-duplicated and screened by title and abstract (n = 2,797). Following initial screening, 126 records underwent full-text screening. Records were eligible for inclusion if they reported findings relevant to the information on the on-screen display of medicines. Brief conference abstracts were excluded. Reference lists of included review articles were hand-searched for potentially relevant empirical studies. Relevant details and study findings were extracted and synthesised narratively.

**Results:** Thirty records met the eligibility criteria and were included. A total of 25 records were empirical studies, most conducted in the United States (n = 8). The remaining five studies were reviewed. The studies that were included predominately examined healthcare professional-facing systems, such as e-prescribing, medication order entry, and medication management systems. Common sources of safety-related issues were both software and user-related and included a truncated display of information, auto-complete functionalities, free-text entry, inadequate training and workflow considerations, and inadequate differentiation between similar medicines. Poor interoperability between medication management systems was also identified as a source of medication error. Proposed solutions to minimise the risk of error included adequate user testing prior to implementation, increasing the font size, using mixed-case (Tallman) lettering to distinguish similar medicines, and reducing the need to scroll and switch between screens. Studies exploring consumer-facing information (n = 6) focused on usability and consumers’ design preferences. The need for consistent terminology, large fonts with adequate contrast, interfaces that are perceived to be ‘easy’ to use, and a preference for larger-screen tablets over smartphones were identified.

**Conclusion:** This review provided an overview of the current evidence regarding the safe and appropriate on-screen display of information on medicines in digital health technologies. The design and implementation of these technologies must align with human capabilities and limitations (i.e. human factors) for successful use and uptake. To facilitate translation into practice, it is necessary for software developers, regulators, and advisory bodies to incorporate contemporary evidence into relevant policy and guidance.

### Evaluation of the real-world impact on HbA1c and weight with once-weekly dulaglutide and semaglutide subcutaneous therapy in an urban clinic in the United States

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**Introduction:** Two once-weekly glucagon-like peptide-1 receptor agonists (GLP-1 RAs), dulaglutide and semaglutide subcutaneous (SC), are recommended first-line in United States’ therapeutic guidelines for Type 2 diabetes (T2DM). Real-world evidence on the glycemic and weight loss impact of these agents, when taken  $\geq 26$  weeks, is limited. The primary outcome of this study was a change in glycated haemoglobin A1c (HbA1c) and weight from baseline. Secondary outcomes were a change in HbA1c and weight between low- vs high-dose therapy and characteristics of average responders (AR) vs above average responders (AAR) to treatment. Low-dose therapy was defined as dulaglutide 0.75mg and 1.5mg SC weekly and semaglutide 0.25mg and 0.5mg SC weekly. High-dose therapy was defined as dulaglutide 3mg and 4.5mg SC weekly and semaglutide 1mg and 2mg SC weekly. AR were patients with  $< -1.5$ -point reduction in HbA1c from baseline; ARR were patients with  $\geq -1.5$ -point reduction in HbA1c from baseline.

**Method:** A retrospective chart review was conducted on a random sample of patients with a documented diagnosis of T2DM and a prescription for dulaglutide or semaglutide SC, written between Jan. 1, 2020 – Jun. 30, 2023. An electronic health record report, unique numbering assignment, and random number generator were utilised to identify 200 patient charts for review. Patients  $\geq 19$  years of age who received GLP-1 RA treatment  $\geq 26$  weeks and had an HbA1c and weight recorded within one month of GLP-1 RA initiation and at the final clinic encounter were included. Patients with a lapse in GLP-1 RA therapy  $\geq$  four weeks or those with a major addition to therapy, defined as the addition of either a basal insulin or a sodium-glucose co-transporter two inhibitor after GLP-1 RA initiation, were excluded.

**Results:** Ninety-one patients met the inclusion criteria. Most patients were female and African American (67.0% and 85.7%, respectively). The mean age was 56.4 $\pm$ 8.6 years. The mean (SD) duration of GLP-1 RA treatment was 14.9 (7.8) months. Mean (SD) reduction in HbA1c, %, from baseline was -2.39 (2.40),  $p < 0.001$ . Mean (SD) reduction in weight, kg, was -4.76 (10.48),  $p < 0.001$ . Patients on high-dose dulaglutide experienced a significant reduction in HbA1c from baseline vs. low-dose dulaglutide ( $p = 0.023$ ). No significant change was noted between high- and low-dose semaglutide SC. AAR had a significantly higher baseline HbA1c in comparison with

AR ( $p < 0.001$ ). There were no significant differences noted in age at initiation, gender, duration of therapy, use of low- vs. high-dose GLP-1 RA therapy, or use of concomitant glucose-lowering drugs among AR and AAR.

**Conclusion:** A significant reduction in HbA1c and weight from baseline was noted with dulaglutide and semaglutide SC weekly. Factors influencing average vs. above average response to these two GLP-1 RA agents warrant further exploration.

### The knowledge and perceptions of pharmacy students regarding tetanus and its prevention at a South African university in Tshwane

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**Introduction:** Tetanus is a category two notifiable infectious disease and a medical emergency caused by spores of the bacterium *Clostridium tetani*. This gram-positive, exotoxin-producing pathogen is widespread in the environment, e.g. in soil, intestinal tracts and faeces of animals, rusty elements, etc. *C. Tetani* cannot be eradicated. Infection with *C. tetani* does not provide immunity, while vaccination-acquired immunity wanes with age and should be maintained with booster doses.

**Objective:** This study aimed to establish pharmacy students' knowledge and perception regarding tetanus as a vaccine-preventable disease. Furthermore, the purpose of the study was to create awareness regarding this fatal yet preventable disease and the importance of receiving booster doses.

**Method:** A quantitative descriptive study was conducted prospectively amongst Bachelor of Pharmacy students at a South African university in the Tshwane District, Gauteng. The BPharm curriculum at this institution follows a modular, problem-based learning approach, and the target population included all registered BPharm degree students ( $n = 256$ ) for the 2021 academic year.

A required minimum sample size of 153 was determined using a two-sided 95% confidence level, with a 50% proportion and a  $\pm 5\%$  margin of error. Stratified random sampling was applied: 37, 37, 35, and 44 students from BPharm-1 to BPharm-4, respectively. An email invitation included a link to an online Google Forms® questionnaire (04/10/2021 to 15/10/2021) and was sent to all the BPharm class representatives for dissemination among the four-year

groups. Each participant could only access and complete the questionnaire once. Data were exported to Microsoft Excel®, followed by statistical analysis using BlueSky Statistics version 10.2.0. Ethical clearance was obtained, and respondents provided informed consent.

**Results:** The majority (80.77%;  $n = 156$ ) of participants knew about tetanus and its causative agent (70.97%;  $n = 155$ ). Only 52.90% ( $n = 155$ ) knew that *C. tetani* can be found in the soil. 65.54% ( $n = 148$ ) selected the incorrect EPI vaccination schedule, while 23.13% ( $n = 147$ ) knew that tetanus vaccination requires a booster dose. 49.35% ( $n = 154$ ) of participants incorrectly believed that a completed tetanus vaccination schedule ensures lifelong protection. 60.39% ( $n = 154$ ) were unsure whether the tetanus toxoid vaccine could trigger the disease. 47.40% ( $n = 154$ ) did not know if the vaccine can be administered to pregnant women, and 25.97% ( $n = 154$ ) said the vaccine is teratogenic. 36.77% ( $n = 155$ ) of participants received all the tetanus vaccinations as per the EPI schedule. Only 10.32% ( $n = 155$ ) had received a booster dose within the previous ten years.

**Conclusion:** Event though tetanus disease is being taught in BPharm-1 and BPharm-3, this study found a noticeable knowledge gap regarding the disease and its management across all year groups. This is worrisome as pharmacists are often a trusted source of health information and health services and the inconsistencies in knowledge about the disease could potentially increase the risk of tetanus in the population.

### Dynamics and correlates of depression, anxiety and stress among pharmacy and nursing students in a Nigerian university

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**Introduction:** There is evidence that university students are at higher risk of psychological problems that may affect their emotional, psychosocial and physical health. Many studies have revealed that students' performance in school is

affected by symptoms of depression, anxiety and stress, which may negatively impact their academic achievements, lead to poor relationships and affect future employment and career.

**Objective:** This study investigated the correlates of depression, anxiety and stress among pharmacy and nursing students in a university in south-south Nigeria and explored the relationship between academic demands and mental health.

**Method:** The study was an online-based cross-sectional descriptive study carried out among only year two to year five pharmacy and nursing students from July to September 2023. Students who met the selection criteria were recruited via their class social media groups, and a link to a Google Form was provided for those who agreed to participate in the study. The students were assessed using the Depression Anxiety Stress Scale-21 (DASS-21). One-way ANOVA and independent T-test were used to evaluate the difference in depression scores between groups. P-values below 0.05 were considered significant.

**Results:** A total of 413 pharmacy and nursing students participated in this study, resulting in a response rate of 20.3%. There was a significant negative correlation between academic demand and the levels of depression, anxiety and stress with  $r = -0.724$  and  $p = 0.000 < 0.01$ . The R-square statistic of 0.525 shows that 52.5% of the changes or variations (reduction) in academic performance can be traced to or explained by the levels of depression, anxiety and stress.

**Conclusion:** The respondents' academic performance varied in the opposite direction with the levels of depression, anxiety, and stress. Most of the changes or variations (reduction) in academic performance between the two groups can be traced to or explained by the levels of depression, anxiety and stress. They both have a high level of mild anxiety, depression and stress in the clinical phase of their training, which was greater among the nursing students. Most of the respondents agree with the fact that their overall quality of life has been impacted by depression, anxiety and stress. There was no statistically significant relationship or correlation between the DAS-21 scores and the respondents' socio-demographic and personal characteristics.

## Dynamics of self-medication among expectant mothers in a city in Southeast Nigeria

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**Introduction:** Despite global discouragement of the practice of self-medication in pregnancy, available data shows that the practice still thrives in many parts of the world, especially the developing, middle, and low-income countries. Despite the major associated risk of potential harm to the mother and her foetus, self-mediation is believed to be a major driving force behind the increasing burden of anti-microbial resistance. In some parts of Nigeria, like Awka, self-medication in pregnancy is not well understood due to the lack of a comprehensive review study, hence the motivation behind this study.

**Objective:** This study assessed the practice, and risk perception, of self-medication among pregnant women residing in Awka Nigeria.

**Method:** A prospective, cross-sectional study was conducted across Awka city using the following locations: one hospital's antenatal clinic, a town hall, and a church hall for data collection. The data was collected when pregnant women gathered on the selected days at these locations. On each site, data was collected with a set of pretested, interviewer-administered, structured questionnaires. Following the return of the questionnaires, data analysis was done using IBM SPSS version 20. The level of statistical significance was set at  $p < 0.05$ .

**Results:** Self-medication practice was very high during pregnancy. Most of the women (69.7%) admitted to having self-medication during pregnancy. Overall, 61.9% perceived self-medication in pregnancy as a good practice with little or no associated risks. A significant percentage (31.5%) of them reasoned that self-medication in pregnancy could be risky only to women who become pregnant for the first time (primigravida). Similarly, more than half of the participants opined that herbal remedies are very safe in pregnancy and hardly cause harm to the foetus or the mother. Over seventy percent (70.7%) admitted that self-medication in pregnancy saves time and money and should be promoted. Among the participants who admitted practising self-medication in pregnancy, the medications reported to be commonly used include antibiotics (30.7%), antimalarials (83.6%), herbal remedies (21.8%), anti-emetics (61.1%), antipyretics and analgesics (90.2%), vitamins & minerals (95.5%), cold & allergy remedies (56.0%). The major correlates for the

practice of self-medication in pregnancy were pregnancy number ( $P = 0.018$ ), educational qualification ( $P = 0.009$ ), and occupation of the respondents ( $P = 0.007$ ).

**Conclusion:** Self-medication practice among pregnant women was high, with a low level of risk perception.

### Application of the new HTA Methods Guide in evolving methodology and processes for the selection of Essential Medicines in South Africa

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**Introduction:** Medicines selection is a fundamental part of a sustainable healthcare system and will play an important role in achieving universal health coverage. As healthcare needs change and new medicines enter the market, careful consideration is needed when making changes to the essential medicine list (EML), particularly in a resourced-constrained environment. South Africa (SA) has moved from an era of subjective round table decision-making by opinion leaders to the application of a robust Health Technology Assessment (HTA) methodology, which prioritises topics for assessment and provides clear guidance on the methods for gathering, producing and reporting evidence on clinical efficacy, safety, cost-effectiveness and affordability, as well as factors like equity, feasibility and acceptability.

**Objective:** To assess the evolution of the application of HTA methodologies to strengthen the EML review process and create consistency in decision-making in SA.

**Method:** The Reviewer's Manual was historically the primary document that guided the process for reviewing disorders in the Standard Treatment Guidelines (STGs) and EML. The HTA Methods Guide was developed to provide guidance on the standardised methods to follow when considering new medical technologies to include in the EML. It additionally guides processes such as topic prioritisation, selection of appropriate analyses, and reporting findings.

Aspects of the HTA Methods Guide started to be incorporated into the medicine review process from the end of 2021; this included the use of topic prioritisation, the use of standardised templates for reporting, the use of appropriate appraisal tools in the evaluation of clinical efficacy, and appropriate costing assessments. An assessment of the reviews conducted from the end of 2021 to the end of 2023 was undertaken and compared to the preceding 2-year period.

**Results:** Over a 2-year period (end of 2021 to end of 2023), the review documents capturing decisions around medicine recommendations improved in quality, consistency, and robustness. All work was guided by an appropriate research question (PICO: population, intervention, comparator, outcome), the formal literature search was conducted, appropriate evidence synthesis, and appraisal tools were used (introduction to the utilisation of Cochrane GRADE and Risk of Bias 2 assessment), appropriate cost considerations were utilised in all documents (varying from cost comparisons to budget impacts to cost-effectiveness models), and evidence to decision-making framework was used in all review documents and medicine recommendations.

This contrasted with the preceding two-year period where, although all documents were guided by a PICO, rigor of literature search and evidence synthesis was inconsistent (formal quality assessment and systematic search of literature not routinely conducted/reported). Cost assessments varied highly in rigor and the evidence to decision-making framework while utilised was completed and considered comprehensively.

**Conclusion:** The application of the HTA Methods Guide strengthened the review and decision-making process, informing the national EML. This guide provided for consistency and comparability in gathering and reporting information, allowing for a highly reproducible process. As SA moves towards more formalised HTA, piloting and refining processes within current contexts and limited resources can provide valuable system strengthening and guide appropriate paths to achieving better quality, standardisation, and transparency in decision-making processes.

### Interventions and strategies to increase uptake of intermittent preventive treatment of malaria in pregnancy (IPTp): a scoping review

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**Introduction:** The uptake of Intermittent Preventive Treatment of malaria in pregnancy (IPTp) using sulfadoxine-pyrimethamine remains low, with more than two-thirds of pregnant women in sub-Saharan Africa unable to access the three or more doses recommended by the World Health Organisation. IPTp coverage remains low in many countries due to factors such as gender norms and expectations. Yet

interventions to optimise IPTp uptake, especially in malaria-endemic regions, have shown a decline of malaria in pregnancy episodes, maternal and neonatal mortality, low birth weight, and placental parasitaemia. This scoping review aimed to synthesise evidence on the interventions related to the increase in accessibility, knowledge, uptake and effectiveness of IPTp uptake with a particular emphasis on gender-related strategies.

**Method:** A systematic literature search of studies on interventions that aimed to increase IPTp uptake at the individual, healthcare, or community level was conducted. The framework by Levac et al. and the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR) checklist were adopted for this review. Titles and abstracts of the publications were independently screened using the review management software Rayyan. Data were extracted using the RE-AIM framework and summarised based on study the setting, IPTp interventions, gender-related concerns and other factors that affect IPTp uptake, and outcome of the interventions.

**Results:** Components of gender interventions that showed significant increase in IPTp uptake focused on pregnant women being aware of IPTp, reminders to optimise uptake and empowerment to take IPTp treatment. Some successful interventions also focused on community-based participatory approaches using trained community leaders and volunteer peer educators to support the uptake on IPTp through information sharing. Training of health workers including community health workers in providing community level education on IPTp, providing reminders and observing IPTp uptake and encouraging and empowering pregnant women also improved IPTp uptake.

**Conclusion:** IPTp strategies improved its utilisation and gender-related interventions including empowering pregnant women to have agency in decisions about their health were important factors highlighted in this review to increase IPTp uptake.

### A study analysing digital health quotient of India with a special reference to pharmaceutical organisations, patients, hospitals & healthcare providers

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**Introduction:** In the rapidly evolving landscape of healthcare, infusion of digital technologies has become integral in shaping the delivery, accessibility, and management of health services. This study endeavours to scrutinise the Digital Health Quotient (DHQ) of India, with a particular emphasis on

key stakeholders such as pharmaceutical organisations, patients, hospitals, and healthcare providers. As India undergoes a transformative phase in healthcare, understanding the digital maturity and readiness across these sectors is imperative for shaping the future of healthcare delivery. The concept of DHQ encompasses a comprehensive evaluation of the integration and maturity of digital technologies within a healthcare ecosystem. It encapsulates not only the technological infrastructure but also assimilation of digital tools into healthcare practices, aiming to enhance overall health outcomes. The DHQ provides a nuanced perspective, ranging from technological infrastructure to seamless integration of digital solutions into daily healthcare operations.

**Objective:** This study will analyse the extent to which pharmaceutical organisations, Healthcare professionals, Hospitals and patients in India are harnessing digital technologies to manage their health better.

**Method:** Pharmaceutical entities stand at the forefront of healthcare, contributing to drug development, production, and distribution. Insights from this analysis will shed light on the transformative potential of digital tools in enhancing efficiency and innovation within the pharmaceutical sector. Empowerment of patients through digital health tools is a pivotal aspect of the evolving healthcare landscape. This research will investigate how patients in India are leveraging digital platforms for health information access, remote consultations, and management of personal health records. Understanding digital health practices of patients is essential for tailoring healthcare solutions to meet the evolving expectations and needs of the Indian populace.

Hospitals too are undergoing significant digital transformations. The study will explore adoption and impact of electronic health records, telemedicine, and other digital solutions within Indian hospitals. By evaluating integration of digital technologies, the research aims to identify opportunities for enhancing patient care, improving efficiency, and addressing potential challenges in the digital transformation journey of healthcare institutions. Integration of digital tools is pivotal for healthcare providers, including doctors and nurses, in enhancing diagnostics, treatment planning, and communication with patients. This research will delve into how healthcare professionals in India are adapting to and utilising digital tools. Insights from this aspect of the study will contribute to a better understanding of challenges and opportunities faced by healthcare providers in the digital era.

**Conclusion:** As this study navigates through the nuances of India's digital health quotient, it aims to provide insights that can inform policies, strategies, and innovations in the Indian healthcare landscape. By comprehensively assessing current state and challenges, this research aspires to pave the way for a more digitally resilient and patient-centric healthcare system. Through this exploration, this study anticipates contributing to the ongoing discourse on the role of digital technologies in shaping the future of healthcare delivery in India.

## A quantitative medicine utilisation review of unlicensed and off-label medicines use in children aged 0-2 years in the private sector in South Africa: Extent, challenges and implications

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**Introduction:** The lack of suitable formulations for young children globally leads to the off-label and unlicensed use of medicines with a high risk of adverse effects. Understanding the extent of such use in national contexts can help guide interventions to promote access to suitable formulations and improve health outcomes.

**Objective:** This study aims to measure the prevalence of off-label and unlicensed medicines use among young children in the private sector in South Africa.

**Method:** The study design was a medicine use review using a point prevalence methodology. The study population consisted of children aged 0-2 years enrolled in a purposively selected pharmaceutical benefits management company and prescribed medicine between January and June 2022 in South Africa. A 90% confidence interval, a 50% prevalence rate, and a 5% error margin were used to calculate the sample size, yielding 1055 prescriptions. A systematic random selection approach was used for the sampling procedure, choosing every seventh entry out of 91,973 total entries; this resulted in a final sample size of 13,139 entries. Data extracted were patient age, number of medicines prescribed, medicines characteristics by ATC codes, quantity, and indications as ICD10 codes. Medicines were categorised as unlicensed if not registered by the South African Medicines Regulatory Authority, and off-label if used outside the scope of its license. The prevalence of unlicensed and off-label medicines use was analysed by descriptive statistics and the top ten medicines, therapeutic class categories, and ICD10 codes, expressed as frequencies and percentages.

**Results:** The sample contained 13,139 prescribed medicines. 40% (5,246) were used off-label or unlicensed, while 60% (7,893) were used on-label. Of the off-label/unlicensed, 16.85% (2,214) were unlicensed, and 23.08% (3,032) were used off-label. The most used off-label medicines were methylprednisolone (4%), cetirizine syrup (3%), and fluticasone propionate spray (3%). The most used unlicensed medicines were probiotics (10%), multivitamin syrup (7%), and Hedera helix (5.0%). Cough and cold preparations (18%) were the most dispensed WHO ATC category, followed by corticosteroids and dermatological preparations (10%). Z76.9

is the most common diagnosis (ICD10 code) linked to the use of prescription drugs off-label and unlicensed.

**Conclusion:** This study showed that two out of every fifth child (40%) aged 0-2 years was prescribed unlicensed or off-label medicines in the private healthcare sector between January and June 2022 in South Africa. This points to a possible pervasive practice of off-label or unlicensed prescription in paediatric treatment in South African private healthcare settings. It is recommended that an evidence-based approach be adopted when prescribing such medications and further research into their safety and effectiveness be conducted. Additionally, careful thought should be given to choosing the safest medicines for this fragile age group.

## Knowledge, attitudes, and practice regarding early premotor symptoms of Parkinson's disease among healthcare professionals: A cross-sectional study in Jordan

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**Introduction:** Motor symptoms such as tremors, rigidity, and slow movement can significantly affect the quality of life (QoL) of patients with Parkinson's disease (PD). Previous studies revealed that several factors (e.g. aging, genetics) are potential risks for developing this neurodegenerative disorder. Although familial cases of PD are uncommon, recognising at-risk individuals at an early stage and initiating proper treatment may slow disease progression and boost QoL.

**Objective:** This study aimed to assess Jordanian healthcare professionals' (HCPs) knowledge, attitudes, and practice about early premotor symptoms of PD that could be experienced by potential patients.

**Method:** A cross-sectional survey was conducted to collect data from Jordanian healthcare providers (i.e. physicians and pharmacists). General practitioners, residents, specialists, and consultants who work in public or private hospitals, private clinics, and health centres were invited to participate in the current study. Pharmacists, however, were recruited from both community and hospital pharmacies. An online questionnaire was developed following a thorough review of relevant literature. Before utilising the questionnaire, face and content validations as well as pilot testing were performed with a group of pharmacists and physicians to

evaluate the relevance and reliability of the survey items. The self-administered online survey along with the snowball sampling approach were used to recruit eligible participants. Data analysis was performed using IBM® SPSS®, employing various statistical tests to assess differences among HCPs' responses, with a significance level set at  $p < 0.05$ .

**Results:** The study included 443 physicians and clinical pharmacists, among whom 57.1% demonstrated insufficient understanding of premotor symptoms of PD, while 54.6% exhibited favourable attitudes. Surprisingly, 58.5% of respondents claimed awareness of practices applicable to treating early-stage PD. Only 47.1% of physicians and 88.1% of pharmacists believed in the benefits of initiating levodopa treatment as soon as possible for Parkinson's patients. Furthermore, only 23% of pharmacists and 26% of doctors expressed a preference for immediately initiating Rasagiline treatment for Parkinson's patients. Regression analysis revealed that younger pharmacists with a higher education level were more aware of the early prodromal symptoms of PD compared to their counterparts. Notably, pharmacists' attitudes correlated with higher knowledge scores ( $p < 0.05$ ). Despite variations in socioeconomic status, physicians tended to share similar beliefs and attitudes, influenced by concerns about early medication adverse effects and possible misdiagnosis. Finally, both clinicians and pharmacists demonstrated a lack of awareness regarding the availability of Monoamine oxidase-B (MAO-B) Inhibitors such as Rasagiline (a neuroprotective medication) and Selegiline as viable therapeutic options for individuals at risk of developing PD before diagnosis.

**Conclusion:** HCPs engaged with Parkinson's patients exhibited a lack of awareness regarding early premotor symptoms of PD, despite maintaining optimistic attitudes and displaying reasonable conduct. Core competencies related to early premotor PD should be prioritised in educational curricula and medical school training.

### The budget impact analysis of a smoking cessation programme at a psychiatric hospital in South Africa

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**Introduction:** One of the biggest barriers when it comes to public health care is tobacco use, which remains a leading global cause of death. People with mental health issues have a lower life expectancy and a higher prevalence of tobacco product use. Evidence has shown that there are numerous interventions available to help people quit smoking, such as

nicotine replacement therapy (NRT), intensive behavioural support and combination therapies. The World Health Organisation (WHO) has set a specific target to reduce the prevalence of current tobacco use by 30% relative to the baseline by 2025.

**Objectives:** The purpose of this study was to investigate the estimated cost of implementing a smoking cessation policy/programme in a South African psychiatric hospital. This study investigated the cost of implementing a smoking cessation policy/programme in a psychiatric hospital in Pretoria, South Africa. As well as this, the study wanted to identify the percentage of heavy and light smokers in the inpatient mental health care user (MHCU) population, calculate the cost components of a smoking cessation program, and estimate the time required to implement the smoking cessation policy/programme from the payer's perspective.

**Method:** A retrospective, cross-sectional, and quantitative economic evaluation was conducted. Convenient sampling was used to select patient files from a tertiary psychiatric hospital in Pretoria, South Africa. Data retrieved from medical records from 19<sup>th</sup> May to 18<sup>th</sup> August 2023 included the number of cigarettes that patients smoked, categorising adult MHCUs as either light or heavy smokers, sociodemographic details, and diagnosis. Data were analysed using the Statistical Package for Social Sciences (SPSS) Version 29.0. Using primary and secondary data, an ingredient costing approach was used to estimate the direct treatment costs of smoking cessation practices at a psychiatric hospital. Economic evaluation was conducted from the payer's perspective, and no discounting was conducted. Probabilistic Sensitivity analyses were conducted.

**Results:** The study showed that study participants at the psychiatric hospital were mostly black, male, unemployed, single, light smokers (69.16%), and diagnosed with schizophrenia. Implementing the smoking cessation programme would result in an expenditure of R1 463 648.72, contributing an additional 0.15% to the total hospital budget and 6.09% to the hospital pharmacy budget.

**Conclusion:** Despite the contribution of public health advocacy and legislation to smoking regulations in public spaces and the initiation of smoking cessation programs, more attention is needed to decrease smoking among the mentally ill, particularly male African patients with schizophrenia, in the psychiatric hospital setting. A substantial investment would be required to implement a smoking cessation programme for the mentally ill at a psychiatric hospital.

## Pictograms in pain assessment - the process of designing and assessing pictograms

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**Introduction:** Pain is a subjective feeling, extremely difficult to express and objectively assess. Therefore, pain assessment is a challenge for both patients and physicians. Pictograms - graphic signs - can be an extremely important tool that facilitates the assessment of pain.

**Objective:** The team developed and tested pharmaceutical pictograms describing various pain characteristics to facilitate the assessment of patients' pain.

**Method:** To assess pain characteristics, the authors have developed 22 pictograms, which are included in the short form of the McGill Pain Competition Questionnaire, version 2 (SF-MPQ-2). In 2021-2022, an online data matching survey was conducted, distributed across and through social media.

**Results:** An overall match between the pictogram and pain feature descriptors of 66% or greater was considered a valid match. The study was conducted internationally (men = 57, age = 41 years ± 16; women = 155, age = 41 years ± 17) and in Poland (men = 49, age = 35 years ± 17; women = 164, age = 35 years ± 16). For 14 pictograms, no match of 66% was achieved in any country. Eight pictograms in total in all subgroups (English and Polish study) obtained a matching score of ≥ 66% regardless of geographical location, gender, income or education level. These pictograms depicted: freezing pain, burning pain, cramping pain, severe pain, electric shock pain, nauseous pain, exhausting pain, gnawing pain, and itching pain. These pictograms can be used clinically after being redrawn to improve consistency.

**Conclusion:** Future research on the design of pictograms representing pain characteristics in the SF-MPQ-2 should focus on design improvements for the remaining 14 pain characteristics that are poorly understood.

## Reliability and safety of medication counselling through generative artificial intelligence

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**Introduction:** The study investigates whether the utilisation of artificial intelligence (AI)-generated responses or Chatbots presents a reliable option for patients seeking individualised information about their medications. Given the prevalence of patients turning to online platforms for medication-related inquiries, concerns arise regarding information accuracy, overload, and subsequent non-adherence stemming from lay case reports and rare side effects. With the availability of platforms such as ChatGPT 3.5, clinicians must acknowledge the likelihood of patients seeking guidance from generative AI platforms and not necessarily consulting healthcare professionals. While generative AI platforms may bridge the gap between patients and healthcare providers, they are not intended to supplant expert advice but rather complement the patient-provider interaction.

**Method:** Thirty medications from different classes were selected from the top 300 most frequently prescribed drugs in the United States, prioritising hazardous medications identified by the Institute for Safe Medication Practices (ISMP) and those associated with severe adverse reactions. Eight standardised prompts were formulated to test the safety and efficacy of patient counseling using five generative AI tools (ChatGPT 3.5, ChatGPT 4.0, Ferret, Gemini, and Bing generative AI), with the drug names as the sole variable. Three additional prompts were used to assess the ability of the generative AI platforms to give appropriate advice in response to simulated side effects and medication affordability concerns. The results for efficacy and safety considerations were evaluated using a rubric based on ten criteria: accuracy of information, completeness of response, safety advice, side effect management interventions, missing dose of medication interventions, empathy, black box warnings, recommendation for affordability challenges, referral advice, and overall effectiveness of advice given. Each of the ten categories was scored from 1 (least effective response) to 4 (most effective response) for a total of 40 points. Cronbach's alpha was used to assess the internal consistency of the test items.

**Results:** Evaluation of medication counselling across all five generative AI platforms revealed a tendency to present responses in patient-friendly language devoid of medical terminology. Responses tended towards a narrative format, succinctly addressing pertinent drug-related information while providing guidance on missed doses and managing adverse reactions. However, inconsistencies were noted, including the absence of specified medication dosages in certain tools and the listing of indications not approved by the FDA. To exemplify the quantitative findings, the respective ChatGPT3.5, Gemini, and BARD scores using the study's rubric were 38, 39, and 36 for naproxen and 33, 38, and 35 for alprazolam. The scores for alprazolam were lower due to emphasis on insomnia and recommending diphenhydramine as an over-the-counter alternative.

**Conclusion:** Generative AI platforms offer patients a convenient resource for obtaining an overview of their medications, potentially streamlining information retrieval, and minimising reliance on multiple browser searches. While these platforms enhance patient accessibility to reliable information, their imperfections underscore the need to identify the most accurate platform for patient recommendations with guided prompts. However, medication-related advice from generative AI platforms should still be verified by a pharmacist or other healthcare professional.

### Characterisation of the activities developed by the Medicines Information Centre of the Portuguese Pharmaceutical Society

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**Introduction:** The Centro de Informação do Medicamento (CIM) is the medicines information centre of the Portuguese Pharmaceutical Society (PPS). CIM has been providing evidence-based information about medicines to Portuguese pharmacists since 1984.

**Objective:** To perform a descriptive study of the activities developed by CIM, with a special focus on recent years.

**Method:** The details of the information requests received between January 2018 and December 2023 were analysed. The active information activities developed within that time frame were also described.

**Results:** Since its inception in 1984 until the end of December 2023, CIM has received 47.323 inquiries. From the 3.148 inquiries received between January 2018 and December 2023, the following parameters were analysed: category of the requests, pharmacists' professional activity, time required to elaborate the response and response communication time frame. Most of the inquiries regarded medicine's adverse reactions, interactions, or contraindications (14,9%) and came almost equally from hospital (37.4%) and community (36.7%) pharmacists. Elaborating the response required more than one hour's work in 56% of the inquiries, and in 87.7% of the requests the response was provided within 24 hours.

Active information is accomplished by editing a drug information Bulletin and producing different types of articles and documents, published on a dedicated area of the PPS website. In 2023, the Centre developed a patient-directed micro website, with the purpose of educating patients about the safe use of medicines and health-promoting strategies.

**Conclusion:** Keeping in mind the core function of answering medicines information requests, CIM has also been increasing its active information activities, to support the growing intervention of Portuguese pharmacists in the healthcare system. These activities have also expanded to the creation of patient-specific contents, to promote patient safety and improve health literacy within the population.

### Antibiotic use and respiratory illnesses: a quantitative snapshot from South Africa

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**Introduction:** Acute respiratory illnesses present substantial healthcare challenges, attributable to the difficulty in distinguishing between viral and bacterial aetiologies resulting in the inappropriate prescription of antibiotics for viral infections. This study provides a snapshot of how respiratory illness and symptoms were managed based on respondents' attitudes towards antibiotics for respiratory infections in South Africa.

**Method:** A cross-sectional, observational study employing a structured questionnaire was deployed in a cohort of South African adults (n = 1000) in May 2022 reporting symptoms consistent with acute respiratory tract infection (RTI) within the past six months to gather data on antibiotic utilisation,

perspectives on antibiotic therapy, respiratory symptom management, and awareness of antimicrobial resistance.

**Results:** The flu was identified as the most recent respiratory ailment by 47% of participants, followed by colds (18%), sinusitis (14%), and COVID-19 (8%). The most common symptoms were headache (58%), blocked nose (49%), sneezing (47%) and sore throat (42%). 52% of the respondents sought advice or treatment from pharmacists. 63% of the respondents had taken at least one course of antibiotics for RTIs in the past six months, and 77% of respondents agreed that antibiotics quickly relieve symptoms. 77% believed that antibiotics were effective against colds and the flu or quickly relieve symptoms. Despite the high usage of antibiotics, 65% agreed that people are contributing to antibiotic resistance every time they take an antibiotic.

**Conclusion:** The symptomatology described by participants is typical of viral aetiology for which antibiotics are not indicated. While many seek advice from trusted pharmacists, the misuse of antibiotics indicates a gap in the system necessitating an integrated strategy encompassing the empowerment of pharmacists as pivotal educators in enhancing public health literacy. Policies must actualise global AMR mandates, while public health drives should bolster community engagement in judicious antibiotic use and more appropriate symptomatic alternatives.

### Challenges faced by drug and toxicology information centres in developing countries: a case study of Zimbabwe and the role of artificial intelligence

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**Introduction:** This study addresses the challenges encountered by Drug and Toxicology Information Centers (DTICs) in developing countries, focusing on the establishment and maintenance of these centers in resource-limited settings. It also explores the potential of utilising artificial intelligence (AI) to overcome these challenges and enhance Drug and Toxicological Information services. The case study of Zimbabwe provides insights into the specific context and experiences of a developing country.

**Method:** The challenges faced by DTICs in developing countries were identified through a comprehensive review of existing literature, case studies, and reports. Specific attention was given to the case study of Zimbabwe to understand the unique challenges faced by DTICs in a resource-limited setting. Additionally, the potential of

artificial intelligence in addressing these challenges was examined through a review of relevant studies and technological advancements in the field.

**Results:** The establishment and maintenance of DTICs in developing countries are hindered by several challenges, including limited financial resources, inadequate infrastructure, scarcity of trained personnel, and difficulties in accessing up-to-date information resources. The case study of Zimbabwe highlighted the specific challenges faced by DTICs in a developing country context, such as financial constraints, limited access to technological resources, and a shortage of skilled personnel.

The integration of artificial intelligence presents opportunities to enhance DTICs in developing countries. AI can automate information retrieval processes, assist in data analysis, and provide decision support tools for healthcare professionals. By leveraging machine learning algorithms, AI can improve the accuracy and efficiency of drug and toxicology information services, even in resource-limited settings.

**Conclusion:** Drug and Toxicology Information Centers in developing countries face significant challenges in their establishment and maintenance, hampering the provision of accurate and timely information. The case study of Zimbabwe highlights the specific hurdles encountered in a resource-limited setting. The integration of artificial intelligence offers opportunities to overcome these challenges and enhance the capabilities of DTICs. By leveraging AI technologies, DTICs can improve information retrieval, data analysis, and decision support processes, ultimately benefiting healthcare professionals, researchers, and the public. However, careful planning, capacity building, and ethical considerations are crucial for the successful implementation of AI in DTICs in developing countries.

### The use of contraceptives among youth and the effect of modern-day contraceptives on women's health

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**Introduction:** Sexuality and contraceptives are still a topic of interest in the 21st century due to the rise in the incidence and prevalence of unsafe sexual behaviours. The need to educate the youth concerning contraceptives is of utmost importance as the use of contraceptives is essential in preventing unwanted pregnancies, unsafe abortions, and abortion-related complications that expose youth to health-

related risks such as infertility and sometimes death. High rates of adolescent pregnancy remain a challenge for health care providers. For most sexually active adolescents, pregnancy is unintended. Emergency contraception, also called the "morning-after-pill or postcoital contraception, is a way to prevent pregnancy after unprotected intercourse. However, issues have arisen with a high percentage failure rate with the use of this method of contraception due to its incorrect use and abuse. Contraceptive accidents create the need to assess the knowledge the youth have concerning the use of contraceptives and find ways to bridge the knowledge gap.

**Objective:** Globally, sexually transmitted infections (STIs) remain a major public health problem especially among youth. University students tend to practice unsafe sex which predisposes them to STIs, unwanted pregnancies, and unsafe abortions. Therefore, this study aims to assess the preferred type of contraceptives used among students in the Kwame Nkrumah University of Science and Technology, Ghana, and to find out the effects of the use of modern methods of contraceptives on health, the level of awareness and knowledge of contraceptives among students, and to know the sources of contraceptives available for students.

**Method:** This study was a cross-sectional survey. Data collection was done using structured self-administered questionnaires with closed-ended questions and few open-ended questions. The interview guide was developed using a google form. The link to the questionnaire was sent to the participants and it was answered online. The collected quantitative data was coded using Microsoft excel office 2019 software, and then exported to statistical package for social sciences (SPSS) Version 20.00 software for descriptive analysis.

**Results:** Majority of the respondents (62.00 %) indicated that they had never had sexual intercourse, and a minority of the respondents (38.00 %) indicated that they have been sexually active. Of the 38.00%, 122 respondents indicated that they use contraceptives, while the rest (25 respondents) indicated that they do not practice contraception. The most preferred contraceptive used by students were condoms and emergency contraceptive pills. The internet and friends were found to be the sources of contraceptive information for students. Majority of the female students stated that they experienced negative health implications due to contraceptive use.

**Conclusion:** In conclusion, students lack comprehensive knowledge about the use of contraceptives. It was seen that modern day methods of contraception have a higher negative effect on females. This means that students need to be educated on safe sex practices and the various types of contraception options available, so that they can make well informed decisions concerning their sexual health. The results have generated new ideas on how best issues of unsafe sexual practices can be curbed and how to meet the unmet need for contraceptives amongst youth.

## Drug abuse, is there more that we can do as Pharmacists?

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**Introduction:** Substance use refers to the use of selected substances such as tobacco products, alcohol, cocaine, marijuana and other substances that can be consumed, inhaled, injected, or otherwise absorbed into the body with possible dependence and other detrimental effects. Substance use continues to be high worldwide, in fact there was a 23 percent increase of drug users from 2011 to 2021. In 2021, one person in every 17 people aged between 15 to 64 years in the world, had used a drug in the past 12 months. The estimated number of users grew from 240 million people in 2011 to 296 million people in 2021.

Cannabis continues to be the most used drug, with an estimated 219 million users (4.3 per cent of the global adult population) in the year 2021. It is estimated that in 2021, 36 million people had used amphetamines, 22 million people had used cocaine, and 20 million people had used "ecstasy"-type substances in the past year. Opioids continue to be the main group of substances with the highest contribution to severe drug-related harm, including fatal overdoses. An estimation of 60 million people engaged in non-medical opioid use in the year 2021, 31.5 million of those people used opiates (mainly heroin).

Currently pharmacists all over the world are working in different health institutes and trying to manage the detrimental effects of substance misuse. In research and pharmaceutical manufacturing industry, pharmacists are developing novel treatments that work as antidotes for substance overdose. In hospitals, pharmacists are involved in the medical teams that are giving empirical pharmacological therapy to patients admitted due to substance misuse. In the communities, community pharmacists are constantly raising awareness on the dangers of drug abuse to the clients that visit community pharmacies.

Different substances pose different burdens on health and health-care systems. Hence there is need for us pharmacists to act in this rising global health threat. An estimated 39.5 million people worldwide were suffering from drug use disorders in 2021, but only one in five people with drug use disorders received drug treatment. Deaths related to the use of substances were estimated to be about 500,000 in 2019, 17.5 percent more than in 2009. Liver diseases attributed to hepatitis C are a major cause of drug-related deaths, which accounts for more than half of the total number of deaths caused using substances. Drug overdoses account for a quarter of drug-related deaths.

In line with the theme for 2024, "Innovating for the future of healthcare", an innovative way to curb drug abuse is necessary. At this year's congress an interactive panel discussion is needed to talk about drug abuse.

### Development and validation of an app for sexual education of the youth in Kenya

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**Introduction:** The state of sexual health among Kenyan youth is currently concerning. High rates of pregnancy, low condom use, and a significantly increasing rate of HIV infections among youth aged 15 - 24 years highlight the urgent need for accurate and accessible sexual education. Considering this, a web app is designed to provide a platform for the youth to access free, credible and up-to-date sexual health information, as well as ask questions anonymously, with the reception of credible feedback.

**Objective:** The aims of this innovation are to empower the youth with sexual health knowledge, address their sexual-related concerns anonymously, and consequently improve the state of sexual health in Kenya.

**Methods:** Information on the current state of sexual health in Kenya was obtained through secondary research of already published studies and reports by organisations such as United Nations Educational, Scientific and Cultural Organisation (UNESCO), National Aids Control Council, and the Journal of Adolescent Health. The web app provides accurate information on critical sexual health topics such as contraceptive methods, Human Immunodeficiency Virus (HIV) infections, Sexually Transmitted Infections (STIs) and sexual abuse. It also features an anonymous question box and a regularly updated blog addressing emergent issues relevant to sexual health.

**Results:** The expected outcomes of the app are a more sexually educated youth, with an attendant decrease in the prevalence of Sexually Transmitted Infections, teenage pregnancies, and Human Immunodeficiency Virus infections among youth aged 15 - 24 years.

**Conclusion:** This innovation represents a significant step towards improving the state of the youth's sexual health in Kenya, where it remains a pressing issue. The web app, built on research from credible sources, provides a platform for them to access accurate and up-to-date sexual health information and addressing concerns anonymously. The expected outcomes are a more sexually educated and empowered youth, with an accompanying decrease in the prevalence of STIs, teenage pregnancies, and HIV infections. This resultantly promotes equitable sexual health for everyone.

### Substandard and falsified medicines in Sub Saharan Africa: a systematic review

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**Introduction:** Substandard and counterfeit medicines are on the increase around the world, particularly in less developed countries. These low-quality products often involve drugs that are in high demand for the prevention and treatment of highly prevalent diseases.

**Objective:** The aim of the review is to know the prevalence of substandard or falsified medicines in Sub-Saharan Africa.

**Method:** Primary studies which reported on substandard and falsified medicines within Sub-Saharan African countries were reviewed. Specifically, papers with relevant information available for analysis, and papers written in English only.

**Results:** The 63 primary studies reviewed provided data on 13,893 samples of 233 medicines from 25 Sub Saharan African Countries with Nigeria being the country with most studies conducted (16/63). Sixteen broad classes of medicines were identified and antimalarials topped the chart with Artemether-Lumefantrine being studied the most (12/233). Forty-seven medicines analysed had all their samples being of 100% good quality.

**Conclusion:** Two classes of drugs that are most affected by substandard and falsified medicines are anti-malarials and antibiotics. This is a threat to antimicrobial resistance, adding to the worrying trend of medicines losing their power to treat. Even one single case of counterfeit medicine is not acceptable because, in addition to putting patients at risk and undermining the public confidence in their medicines, it also betrays the vulnerability of the pharmaceutical supply system and jeopardizes the credibility of national authorities (health and enforcement alike).

### Investigating the effects of COVID-19 main protease on glucose handling in C2C12 skeletal muscle cell lines and hepatic cell lines, in vitro

Praise Tatenda Nhau

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**Introduction:** The SARS-CoV-2 virus has affected various organ systems in the body and thus has raised concerns regarding its long-term impact. Skeletal muscle cells play an important role in maintaining glucose homeostasis. Insulin

resistance throughout the body is driven by skeletal muscles. It is sufficient to restore whole-body glucose balance by resolving insulin resistance in skeletal muscle alone. Research conducted has shown that Mpro affects brain function. It becomes crucial to understand the effects of viral proteins, such as the main protease (Mpro), in the context of diabetes mellitus to enable us to comprehend any disease pathogenesis that may result.

**Objective:** In this study, the authors aim to elucidate the effects of COVID-19 Mpro on skeletal muscle cell lines and examine the association between protease activity and glucose handling.

**Method:** Cytotoxic profile of Mpro was examined through the MTT assay in a 96-well plate. For glucose utilisation experiments, the author exposed differentiated skeletal muscle cell (C2C12) lines to varying concentrations of 2.5, 5, 10, 20, 40, 80 and 160nm/ml of COVID-19 Mpro in 24 well plates. An in-cell ELISA was conducted to measure AKT and GLUT 4 expression by conducting a comparison experiment between Mpro administration only and an insulin-Mpro co-administration.

**Results:** Mpro exposure to the C2C12 cell line showed no cytotoxic effect as per the MTT assay therefore these concentrations were utilised. The in-cell ELISA results indicated an increase in GLUT 4 expression in both the insulin and Mpro coadministration and the Mpro-only assay. However, exposure of Mpro to the C2C12 cell line resulted in a lower expression of AKT in both the Mpro plus insulin coadministration and in the Mpro-only administration as demonstrated by a steady decline as the concentration of Mpro in both experimental set-ups.

**Conclusion:** In conclusion, this study highlights the possible disruption in the insulin signalling pathway in skeletal muscle cell lines and reveals the possibility of a disturbance in glucose metabolism. More research needs to be conducted to elucidate other pathways by which this protein can alter glucose handling and subsequently assess if Type 1 diabetic patients' insulin doses need to be revised. This work is a part of a bigger piece of research as I am looking into glucose handling in other key insulin-sensitive cell lines to try to establish if Mpro is behind the post-COVID-19 hyperglycaemia and if the Mpro causes damages that may cause a significant decrease in the efficacy of anti-hyperglycaemic drugs.

## Enhancing access to essential medicines in the South Pacific: A comprehensive study using WHO/HAI methodology

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**Introduction:** Medications are vital in modern healthcare for disease prevention, diagnosis, and symptom management, significantly improving life quality. However, inadequate access to essential medications exacerbates health disparities, particularly among marginalised groups, creating financial burdens and healthcare inequities. Ensuring medicine access remains a challenge due to factors like high costs, healthcare infrastructure, supply chain issues, and regulatory hurdles, especially in low- and middle-income countries. The disparity in global medicine availability is stark, with some regions facing critical shortages and accessibility barriers, impacting disadvantaged populations severely. This study aims to address the gap in understanding medicine availability, affordability, and pricing in the South Pacific Region (SPR), a region with unique challenges such as geographical dispersion, economic constraints, and limited healthcare infrastructure.

**Objective:** The objective of this study is to fill the existing gap in data regarding the availability, affordability, and pricing of essential medicines in the South Pacific by employing the World Health Organisation (WHO) and Health Action International (HAI) standardised methodology. This research seeks to provide foundational insights for strategies to improve medicine access, enhance healthcare quality, and ultimately, better health outcomes in the SPR.

**Method:** The study was conducted across public and private healthcare facilities in New Caledonia, Fiji, Wallis and Futuna, French Polynesia, Vanuatu, and the Solomon Islands, capturing the diverse demographic of the SPR. Availability, affordability, and pricing data for 14 core and 30 supplementary medicines were collected from February to October 2023, using the WHO/HAI methodology.

**Results:** Preliminary findings indicate varied medicine availability across countries, with higher availability in more affluent countries like New Caledonia and French Polynesia, and poorer availability in lower-income countries like Vanuatu and the Solomon Islands. The study highlights the significant disparities in medicine access within the SPR, providing essential data to inform policy decisions and healthcare strategies.

**Conclusion:** This study reveals the current gaps in essential medicine access across the South Pacific, attributing

disparities to factors such as economic status and healthcare infrastructure. It suggests that adopting the WHO/HAI methodology provides a reliable framework for assessing medicine availability and affordability, guiding targeted interventions. Future work should focus on expanding this research to include more islands within the SPR, exploring the impact of cultural preferences on pharmaceutical use, and developing strategies to improve medicine access and healthcare outcomes.

### Research to improve drug safety through international harmonisation of electronic standard for e-labelling with ensuring interoperability on of electronic standard for e-labelling with ensuring interoperability

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**Introduction:** In Japan, the revision of the Pharmaceutical and Medical Devices Act has made it mandatory to digitise prescription drug labeling (e-labeling) from August 2021 and the paper labeling that was traditionally attached to (packed with) products has been abolished. Healthcare professionals (HCPs) can now obtain drug information for HCPs and drug guides for patients through Pharmaceuticals and Medical Devices Agency (PMDA) website or a smartphone app (TENBUN-NABI). Currently each product provider is required to submit its e-labeling for HCPs in the XML format specified by PMDA (i.e. custom XML).

**Method:** Investigation of the introduction of FHIR e-labeling in Japan from the custom XML which is currently required in Japan. The objective of this research is to enhance the interoperability of electronic product information and to investigate e-labeling that is easy to access and understand by HCPs and patients, to increase convenience and contribute to the safety for drugs and patients. Based on the FHIR International Implementation Guide for e-labeling a draft guidance of the Japanese FHIR e-labeling version should be prepared. According to the draft guidance, FHIR version of Japan e-labeling should be prepared. Since it is expected that the Japan custom XML is converted to the internationally harmonised FHIR e-labeling, Japan FHIR e-labeling will be considered.

**Results:** Introducing FHIR, an international standard for health care information, to e-labeling will enable the digitised product information to be easily exchanged between systems and shared via electronic devices such as tablets and smart phones by using the popular web technology. By technology.

In the future, since FHIR e-labeling is expected to be highly interoperable rather than the custom XML, by linking e-labeling, including electronic attachments, with other personal health and medical care data, it will be possible to provide personalised information to individual patients when healthcare professionals provide medication guidance or when patients themselves obtain e-labeling. This will lead to improved health management, medication compliance, and understanding of treatment for patients. In addition, in the medical field, e-labeling could be managed in a standardised manner and used to automate the dispensing process, thereby contributing to improved drug and patient safety.

### Herb -drug interactions between antihypertensive drugs and traditional Chinese medicine: pharmacokinetics and pharmacodynamics assessment

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**Introduction:** With the increasing popularity of traditional Chinese medicines (TCM) to treat or serve as adjuvants in hypertension therapy in East Asia, the risks of herb-drug interactions caused by concomitant use of TCM and antihypertensive drugs poses concerns on efficacy as well as safety.

**Objective:** This study aimed to assess herb-drug interactions for the management of hypertension. The interaction of the most prescribed antihypertensive drugs, amlodipine, and the eight most used Chinese herbal formula (CHF) products were evaluated. Both the pharmacokinetics (PK) and pharmacodynamics (PD) of amlodipine were assessed in spontaneously hypertensive rats (SHR) with and without oral treatment with CHF products treatment orally.

**Results:** The results indicated that the antihypertensive effect of amlodipine could be enhanced by some CHF products after oral administered for up to two weeks. The possible mechanisms involved in herb-amlodipine interactions include enhancing the gastric emptying rate, faster drug equilibration with the site of action, and changing the sensitivity of the drug at the site of action caused by the CHF product. PK/PD modeling could provide useful information to illustrate the complex mechanisms of herb-drug interactions.

## Strengthening public sector primary health care immunisation standard treatment guidelines through multidisciplinary evidence-based collaboration

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**Introduction:** Following publication of the immunisation chapter of the South African Primary Health Care (PHC) standard treatment guidelines (STGs) in March 2023, the National Essential Medicines List Committee (NEMLC) received an appeal, from a specialist interest group, to remove severe egg allergy as an absolute contraindication for influenza vaccine. NEMLC requested a review of the evidence regarding the safety of inactivated influenza vaccines when administered to egg-allergic individuals. The request was triggered in accordance with the NEMLC's appeals policy.

**Method:** A multidisciplinary team drawn from the NEMLC PHC expert review committee reviewed published primary clinical evidence and international clinical practice guidelines (CPGs) regarding the safety of inactivated influenza vaccines when administered to egg-allergic individuals and evaluated the quality and relevance of the identified literature. Using a

web-based search strategy, relevant CPGs were extracted from the literature and well-known advisory sources. CPGs were ranked in terms of credibility (based on the AGREE II score) and timeliness (likelihood of being up to date) for reviewers to focus on the most trustworthy guidance available. In updating the STG, the Committee considered the context of the PHC setting for vaccine administration, low prevalence of severe egg allergy, and potential concerns of parents/guardians.

**Results:** This scoping review found that international CPGs from both public health institutions and immunology societies recommend inactivated egg-derived influenza vaccination administration to egg-allergic individuals. The recommendation is primarily based on the understanding that available influenza vaccines now contain very low quantities of ovalbumin (< 1mcg/ml). The PHC STG has therefore recommended that individuals reporting a history of severe egg allergy are vaccinated in a setting equipped to manage allergic reactions.

**Conclusion:** The NEMLC appeals process allowed for stakeholder feedback, and led to timely and thorough review of relevant evidence, and an update of the PHC STG.

## Have medication safety alerts reflected on the use of JAK inhibitors? – Retrospective nationwide register-based study in 2017–2023

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**Introduction:** The use of JAK inhibitors in rheumatic diseases and ulcerative colitis has become more common due to their oral administration route, extensions of indications and their potential treatment benefits. In Finland, four JAK inhibitors have been included to reimbursement scheme since 2017: baricitinib, filgotinib, tofacitinib and upadacitinib. However, adverse effects of these medicines have raised concerns. Medication safety alerts related to tofacitinib were first published by the European Medicines Agency (EMA) in 2019 and 2021. These adverse effects include venous thromboembolism, cardiovascular events, infections and cancer and they were interpreted as a class effect in 2022.

**Objective:** The aim was to study the use of JAK inhibitors in Finland before and after the publication of EMA medication safety alerts. Furthermore, use of JAK inhibitors according to certain demographic (age) or disease-specific factors (diabetes medication, coronary heart disease and other cardiovascular diseases) that have been acknowledged as risk factors by the medication safety alerts, were studied.

**Method:** Retrospective nationwide register study on all the patients receiving reimbursements on JAK inhibitors and patients initiating treatment with JAK inhibitors in Finland during 2017–2023. Data were collected from the Dispensations reimbursable under the National Health Insurance (NHI) Scheme register maintained by Kela in February 2024. Medication safety alerts were collected from the EMA web pages. Data were analysed with descriptive statistics and by appropriate statistical methods.

**Results:** The annual number of patients initiating JAK inhibitor treatment increased from 94 patients in 2017 to 722 patients in 2023. Cumulative number of patients receiving reimbursements of JAK inhibitors increased from 94 patients in 2017 to 2 428 patients in 2023, indicating that treatment initiations were 29.7% of all use in 2023. The most used JAK inhibitors were tofacitinib and baricitinib. The median age of patients on JAK treatment has decreased from 53 years in 2017 to 39 years in 2023. This change was mainly driven by proportional increase of ulcerative colitis patients (no users in 2017 vs. 27.7 % in 2023) who are younger (median age of 39 years in 2023), while median age of rheumatic disease patients (all users in 2017 vs. 71.7 % of in 2023) slightly increased during observation period (52.5 years in 2017 vs. 57 years in 2023). The absolute number of JAK inhibitor initiators with diabetes medication or cardiovascular disease other than coronary heart disease has slightly increased over time. However, the absolute number of JAK inhibitor initiators with coronary heart disease, the most severe risk factor according to EMA, has first increased (five patients, 5.3% of all initiations in 2017 vs. 77 patients, 5.7% in 2020), but then decreased from 2021 onwards (72 patients, 4.2% in 2021 vs. 63 patients, 2.6% in 2023).

**Conclusion:** The absolute number of patients receiving JAK inhibitors in Finland has increased over 20-fold during the observation period. The use of JAK inhibitors has proportionally shifted towards younger ulcerative colitis patients. However, prescribing for patients with high risk due to their coronary heart disease seems to have decreased after the medication safety alerts.

### Analgesic misuse in chronic musculoskeletal pain management: A chiropractic insight into self-medication trends and the vital role of chiropractor-pharmacist collaboration

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**Introduction:** Chronic musculoskeletal pain (CMSP) is a pervasive health issue, and analgesic self-medication is a common coping strategy. However, misuse and dependency on these drugs pose significant international public health challenges. Self-administration of analgesics can be harmful,

either through misuse or by masking underlying health issues, delaying appropriate medical attention. In developing nations, limited access to healthcare personnel prompts patients to resort to self-medication with various analgesics, raising concerns about misuse due to inadequate knowledge. Research on analgesic misuse in South Africa, particularly among CMSP sufferers, is limited.

**Objective:** This study aimed to explore the potential misuse of self-administered analgesics among patients with CMSP. The authors investigated several factors related to self-administration with analgesics. Here the authors report on some of the objectives which the authors investigated. These include patterns of use, including duration and frequency, sources of obtaining analgesics, knowledge about usage, and overall satisfaction with them as well as the collaborative potential between pharmacists and chiropractors to mitigate analgesic misuse.

**Method:** This quantitative, descriptive cross-sectional study surveyed 302 participants with musculoskeletal pain (MSP) at a South African tertiary chiropractic clinic over a three-month period in 2022. The focus was on those reporting CMSP. Statistical analysis utilised appropriate software and methods, including Chi-square and non-parametric tests.

**Results:** This study uncovered significant trends in self-administered analgesic use, revealing an overall prevalence of nearly 80%. Interestingly, black participants exhibited the lowest rates of self-medication compared to other racial groups in the study. The frequency of self-administered analgesic usage varied: over 40% used them weekly but not daily, while 27% reported daily use. Among daily users, more than 40% took them twice daily. Additionally, almost 60% reported concurrent use of multiple analgesics. An overwhelming majority (> 90%) obtained analgesics from pharmacies without prescriptions, with over 30% acquiring them from family and friends. Despite this, more than half of participants followed pharmacist advice, while half relied on past experiences. Fewer than 40% referred to information leaflets for usage guidance. Nearly 40% engaged in self-medication for over a year before seeking chiropractic treatment for additional pain relief, indicating prolonged use. Satisfaction with OTC analgesics was notably low, with only 10% reporting satisfaction, and a third experiencing side effects.

**Conclusion:** The high prevalence of analgesic self-medication shed light on the extent of self-administered analgesic use for CMSP. The combination of multiple analgesic use, low satisfaction rates and relatively high prevalence of side effects suggests potential misuse. This raises concerns as prolonged use, increased doses, simultaneous use of multiple types of analgesics, and lack of knowledge regarding indications or contraindications all elevate the risk of adverse effects or drug interactions. These results emphasise the need for collaborative efforts between chiropractors and pharmacists to enhance patient education, mitigating self-medication risks in CMSP management.

## An assessment of the knowledge of Substandard and Falsified Medicines as a baseline for building capacity and capability among health care workers in eight African countries

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**Introduction:** Substandard and Falsified Medicines (SFMs) are a growing threat to the public health of nations, with an estimated 1:10 medicines in low/middle-income countries (LMICs) to be substandard or a fake. In addition, different studies have shown that SFMs are potential drivers and have a role in the development of antimicrobial resistance. SFMs data across African countries is limited, although WHO alerts are increasingly suggesting that these medicines are available across the region. Increased awareness at all health care levels, including health care workers' (HCWs) ability to identify SFMs, is therefore crucial to optimise access to quality and effective medicines in line with FIP DG17-19.

**Objective:** This study focussed on investigating HCWs' knowledge of SFMs in eight African countries, to identify the gaps and build capacity among HCWs through educational interventions.

**Method:** A cross-sectional survey was sent out to HCWs from eight Commonwealth Partnerships for Antimicrobial Stewardship (CwPAMS) in African countries: Kenya, Uganda, Tanzania, Malawi, Nigeria, Sierra Leone, Ghana and Zambia. The survey was structured into three sections: socio-demographics, knowledge and awareness of SFMs (including a short knowledge quiz), and educational needs to upskill in SFMs. All the data was entered into excel and analysed using descriptive statistics.

**Results:** A total of 113 responses were received from HCWs from across the eight health partnership countries, with a mix of professional backgrounds including pharmacy (43%), medicine (36%), nursing (9%), laboratory (6%), and midwifery (4%). Most respondents (87%) worked in the public sector. With regards to knowledge and awareness of SFMs, only 41% scored 100% in the knowledge quiz, and 13% were able to differentiate between substandard and falsified medicines. When asked about the educational support that they required, most HCWs highlighted the need to be able to detect (99%) and report (76%) SFMs, as well as to manage patients who have taken SFMs (73%). HCWs preferred educational support delivery through face-to-face training (86%), webinars (66%), online self-directed learning (63%), case studies (56%), articles (53%), and video graphics (52%).

**Conclusion:** This study suggests that HCWs in Africa have limited knowledge of SFMs and identifying this gap has been

key in understanding educational needs to further develop effective interventions. These include a webinar series and the development of an online self-directed Continuous Professional Development course, which is currently ongoing and anticipated to be delivered and evaluated in late 2024.

## Content analysis of direct-to-consumer videos of prescription medicine Orlistat

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**Introduction:** In many countries, the anti-obesity agent, Orlistat 60mg is available as an OTC medication, while Orlistat 120mg is available only on prescription. Orlistat is a prescription-only medicine in India for both potencies - 60mg and 120mg. Unfortunately, prescription medicines are often available over the counter at retail pharmacies. Self-medication with prescription medicines can be inappropriate and cause adverse effects. Due to the lack of authentic medicine information sources like patient information leaflets intended for users, consumers may tend to check on the internet, follow the advice suggested by a colleague or friend, or may be tempted to follow inputs given by advertisements or YouTubers who may not necessarily be experts. Direct-to-consumer (DTC) promotion of pharmaceuticals, particularly via online platforms like YouTube, has become increasingly prevalent, raising concerns about the promotion of irresponsible medication use. The study aimed to locate and analyse promotional, advisory or testimonial videos made by YouTubers for consumers on Orlistat. Then, through a systematic content analysis, the ethical implications surrounding the promotion of Orlistat, a prescription medication, were examined.

**Objective:** The lack of clear-cut regulations for OTC medicines in India may confuse consumers viewing such advertisements. The exploratory study sought to look at the informational content and persuasive techniques of DTC advertisements (YouTube videos) of Orlistat in India, in English and Hindi. It sought to understand message strategies adopted by self-proclaimed advisors to persuade consumers to use Orlistat for weight loss.

**Method:** Around 25 brands of Orlistat are marketed in India. In the present study, an extensive search was made on Orlistat on YouTube.com for promotional videos for Indian consumers. A convenience sample of 25 YouTube videos in Hindi and English was selected and downloaded. The videos were analysed in terms of likes, dislikes, number of views, time duration, background and qualifications of the presenter, product information provided, like uses, mechanism, dosing, cautions, side effects, presentation of benefits and risks, emotional or rational appeals, etc. were scrutinised to understand how Orlistat is marketed to

potential consumers. The advertisements were coded for various variables, including the six segments in Taylor's model. The data was put into an MS Excel sheet and analysed.

**Results:** The videos were of varying duration. The qualifications and affiliations of the presenter were not always identifiable, though they had many subscribers. The presenters used a combination approach, using voice, photos, and illustrations to present the information. They provided viewers with information to varying degrees related to obesity, weight reduction, dosing of the drug, pricing, cautions to take, side effects, dietary guidance while taking the medication, etc. They also appealed to the viewers' ego-related needs and desires.

**Conclusion:** The study's findings suggest looking into the educational value of the promotion of prescription medicines directly to consumers. It is also important to consider having some restrictions on direct-to-consumer advertisements. Inappropriate promotions constantly threaten consumers, leading to increased confusion and inappropriate self-medication. Policymakers and regulatory agencies must define institutional guidelines to protect consumers from irresponsible advertising and, thus, subsequent adverse events.

### The effect of dolutegravir-based therapy on weight in female patients in the Cape Town metropole

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**Introduction:** The prevalence of obesity is increasing globally and 73% of adult women in the Western Cape province of South Africa have a BMI  $\geq 25$  kg/m<sup>2</sup>. Weight gain, especially in females, initiated on dolutegravir (DTG)-based regimens have been reported. This can negatively impact inappropriate antiretroviral switching, adherence, and the management of obesity.

**Objective:** This study aims to investigate this relationship in a female cohort in Cape Town.

**Method:** This is an ongoing retro- and prospective observational study focuses on the change in weight in women (> 18 years) initiating on DTG-based combinations at

two selected public facilities (a clinic and an outpatient department of a hospital). Weight, BMI, waist-, hip circumference (mostly paired-samples t-tests for the analysis between time-points), clinically relevant laboratory results, self-reported dietary and lifestyle factors were collected at baseline (time of DTG initiation), three, six and 12-month follow-up visits using a validated data collection tool.

**Results:** This study recruited 93 women (38  $\pm$  9 years). An increase in weight was significant over all three observed time-points. The mean ( $\pm$ SD) baseline weight was 74.44  $\pm$  17.36 kg (n = 93) and it increased to 76.55  $\pm$  17.20 kg (n = 72), 79.95  $\pm$  16.66 kg (n = 79) and 82.03  $\pm$  16.25 kg (n = 64) after 3, 6 and 12 months respectively ( $p < 0.001$ ). The average BMI (kg/m<sup>2</sup>) increased from 28.94  $\pm$  6.34 (n = 93) at baseline to 29.77  $\pm$  6.54 (n = 72) after 3 months, 31.14  $\pm$  6.14 (n = 79) and 31.83  $\pm$  6.09 (n = 64) after six and 12 months respectively ( $p < 0.001$ ). Obesity (BMI  $\geq 35$  kg/m<sup>2</sup>) increased from 36.56% (n = 34/93) at baseline to 54.43% (n = 43/79) and 54.69% (n=35/64) after six and 12 months respectively. Most of the participants were inactive (64.50%; n = 60/93) at baseline and maintained this sedentary behaviour throughout the follow-up period.

**Conclusion:** The ongoing study results suggest a significant weight gain trend in women at 12 months post initiation or switching to DTG-based treatment. This is concerning and metabolic screening should be implemented and exclude the return-to-health phenomenon.

### Breast cancer misinformation on Facebook and Twitter: A bilingual analysis

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**Introduction:** Internet users increasingly use social media to seek and share health information. However, the use of these platforms comes with the risk of misinformation. There is particular concern for misinformation related to breast cancer prevention and treatment as it can potentially cause treatment delay and non-adherence. Various studies have been conducted on misinformation in social media, but the majority focused on the analysis of English content, with insufficient research in Malay language, the national language of Malaysia. Therefore, the objective of this study is to compare the prevalence and types of misinformation related

to breast cancer prevention and treatment in English and Malay posts on Facebook and Twitter.

**Method:** This was a qualitative-quantitative study examining public posts on Facebook and Twitter. In total, 6596 posts related to breast cancer posted between 2018 and 2022 were collected. The posts were analysed to identify misinformation and to categorise the content based on the presence of misinformation, language, timing in relation to COVID-19 and breast cancer awareness month, association with sellers' promotions, and social media platforms. Chi-square analysis was used to identify the association between the variables, and binary logistic regression was conducted to identify determinants of misinformation.

**Results:** A total of 932 posts contain information related to breast cancer prevention and treatment. From these, 55.7% (n = 519) contain misinformation, consisting of various topics, including alternative treatment, food and lifestyle, and supplements. There was significantly more misinformation in Malay compared to English posts (OR = 4.91, 95%CI:3.00–8.02,  $p < 0.001$ ), with significantly more posts associated with sellers' promotion in Malay (n = 218, 88.3%) compared to English posts (n = 29, 11.7%) ( $p < 0.001$ ). Other predictors of misinformation were posts associated with sellers' promotion (OR = 7.46, 95%CI:3.74–14.91,  $p < 0.001$ ), posted before the COVID-19 pandemic (OR = 1.93, 95%CI:1.10–3.41,  $p = 0.023$ ), and posted on the Twitter platform (OR = 4.92, 95%CI:2.61–9.29,  $p < 0.001$ ). Among the posts in Malay that contain misinformation, 39.6% (n = 163) were advocates for alternative cancer treatment compared to only 16.8% (n = 18) in the English posts.

**Conclusion:** Misinformation on breast cancer prevention and treatment is prevalent on social media. There was significantly more misinformation in Malay compared to English posts, which may be attributed to the presence of misleading promotions by product sellers. There is a need to improve the quality of health information in other languages to improve health literacy for non-English speakers, and patients need to be educated on digital health literacy with emphasis on critical evaluation of promotional materials that may contain misleading information. Stricter monitoring of online advertisements related to health products needs to be advocated to ensure patients' safety.

### Daily oral lamivudine/tenofovir disoproxil fumarate acceptability as HIV/AIDS Prophylaxis among high-risk individuals in Nigeria

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**Introduction:** Despite years of effort to have HIV/AIDS infection epidemic control, the high-risk individuals called the Key Population record about three-quarters of the 1.5 million new HIV infections globally in 2021 alone. The key population include men who have sex with men (MSM), female sex workers (FSW), persons who inject drugs (PWIDs), and transgender (TG). Others are prisoners and people living in confined settlements. High prevalence among these KPs could be attributed to poor preventive measures such as unsafe sex practices and, ultimately, low acceptability of currently used daily oral Pre-exposure prophylaxis (PrEP). This study aimed to determine the prevalence and some of the predictors of PrEP acceptability among KPs networks.

**Method:** This retrospective study used collated data from community outreaches and one stop shop visits and uploaded on the electronic medical records managed by the Society for family Health's HIV/AIDS KP-CARE 2 project funded by United State Agency for International Development (USAID), implemented for KPs in Zamfara State, Nigeria. The data from November 2021 to September 2022 were generated in EXCEL sheet and imported into the analytical tool (IBM SPSS version 24). Descriptive statistics and multiple logistic regression analysis were conducted. While descriptive statistics described the prevalence of the KPs oral HIV/AIDS PrEP acceptability, Multiple Logistic Regression analysed some of the determinants for acceptability.

**Results:** Out of 19,619 persons among the high-risk target group screened and offered oral PrEP and a total of 2674(14%) accepted. Acceptance was more in males (67.5%) than females (32.5%). The PWIDs accepted PrEP more 1005 (37.6%) followed by FSW 595 (22.3%) and MSM and TG 363 (13.6%), others are prisoners and sexual partners. About 1420 (53.1%) are literate with secondary level education, but with 80% unemployment rate. The predictors of PrEP acceptance were the target groups (adjusted odds ratio [OR] 0.95; 95% confidence interval [CI], 0.85-1.06), HIV service point (adjusted odds ratio [OR] 0.29; 95% confidence interval [CI], 1.73-3.02), Age group (adjusted odds ratio [OR] 0.21; 95% confidence interval [CI], 0.15-0.29), and Sex (adjusted odds ratio [OR] 0.21; 95% confidence interval [CI], 0.15-0.29).

**Conclusion:** Despite free provision of the PrEP, the ability to negotiate its acceptance and usage through peer education

must be improved among females, younger age groups, MSM and TG population. Stigma, misconceptions and discrimination on oral PrEP must be addressed by programs through improved healthcare provider model to a more KP stigma free model at community level, friendly set up and MSM interactions could produce a positive effect on acceptance. The implementation of long acting injectable cabotegravir (CAB-LA) HIV/AIDS PrEP will curb stigma and non-adherence of the Oral PrEP. Injectable long-acting prophylaxis will do away with challenges of stigma and poor adherence, cost effectiveness and availability CAB-LA in developing nations will be crucial in having epidemic control.

### Digital Innovation in 3-Piece Set: An overlapping 3-Phase 3D Animated Interactive Streaming Set for outpatient counselling techniques for practitioners

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**Introduction:** Digital Health is elevating and enhancing the clinical care and skills of pharmacists and healthcare practitioners. Clinical practice and digitalisation have become pivotal stages within the professions of patient care. Likewise, practicing pharmacists in the workforce continue to need tools of innovation to aid ease patient care. Additionally, patient-centric collaborative care is warranted to make the patients front and centre for the optimisation of their care. With the influx of digital intelligence in healthcare, caution is warranted to select and engage pertinent tools in patient care. In this digital world, every opportunity is secured to enlighten and excel within the discipline. The field of Animation has flooded the entertainment industry for years taking its' height in recent years with other disciplines such as marketing, advertisement, and robust research. If so, then why not reinvent the wheel in pharmacy practice for patient care? To date, literature is limited on such advancement paving the way to creativity and innovation in the animated world with the pharmacy patient counselling model.

**Objective:** To illustrate the feasibility and usability of the 3-Piece Set 3-D Animated Patient Counselling Model in clinical in-patient and outpatient settings.

**Method:** Three standardised patient counselling tools were retrieved from the literature. These tools were merged using concept mapping, mind-mapping, and Word Art Clouds to generate a fine diversified model. Animated techniques and technology were infused to create a 3-D interactive animated video clip designed for the patient-centric collaborative model tool for pharmacists and the entire interprofessional collaborative practitioners. This is the thing of the century aimed to revolutionise interprofessional practice.

**Results:** This live PODIUM presentation will emphasise this re-engineered tool and its translation into an interactive user-friendly Animated streaming clip with a LIVE Patient-Provider demonstration; providing an opportunity to compare and contrast its impact with current intelligence Applications.

**Conclusion:** This interactive animated tool is aimed to ease and equip students and practitioners at large to enhance their patient counselling skills.

### Factors affecting Influenza-vaccine acceptance, hesitancy, and refusal in the 2023/2024 seasonal campaign

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**Introduction:** According to the World Health Organisation, vaccine hesitancy stands as a significant concern within the realm of global public health, ranking among the top ten threats. Despite Portugal's historical propensity towards vaccination, the burgeoning global prevalence of this phenomenon requires careful consideration. The anticipated decline in vaccination coverage for the seasonal vaccination campaign against Influenza and COVID-19 urges for the identification and better understanding of factors and causes associated with vaccine hesitancy. Better knowledge on this topic allows for the development of strategies and interventions that mitigate the impact of this phenomenon on public health through the promotion of more robust and adequate vaccination campaigns.

**Objective:** This research aims to assess the factors affecting Influenza vaccine acceptance, hesitancy, and refusal during the 2023/2024 season among individuals aged 60 years or older.

**Method:** Prospective cohort-nested cross-sectional study regarding the 2023/2024 seasonal vaccination campaign (Influenza and COVID-19). Data used in this study was retrieved from the first of two telephone questionnaires (CATI methodology), which was administered before the beginning of the campaign (September 2023). A cohort of

1,400 individuals representative of the Portuguese population aged 60 years or over, residing in mainland Portugal was randomly sampled. Dimensions assessed included sociodemographic, health status, and past experiences with vaccines. Intention regarding Influenza vaccine uptake during the 2023/2024 campaign was assessed using a score from 0 to 10 (0 to 2: vaccine refusal; 3 to 7: hesitancy; 8 to 10: acceptance). An exploratory analysis was performed using a multinomial logistic regression to identify factors associated with Influenza vaccine uptake intention.

**Results:** Individuals aged 65 and over presented a lower risk for refusal (OR=0.183, CI95%:0.095-0.350) and hesitancy (OR=0.608, CI95%: 0.408-0.907) compared to those aged 60-64 years.

Among those with chronic disease, individuals with diabetes had the highest proportion of refusal (9.2%) and cardiovascular disease had the highest proportion of hesitancy (14.8%). Individuals with respiratory disease and renal and/or hepatic disease were the ones presenting the highest proportion of acceptance (86.8% and 88.0%, respectively). Living in the north region of Portugal is associated with lower hesitancy.

Males report lower hesitancy compared to females. The highest education level presented a higher proportion of refusal, while the least educated group showed the highest hesitancy ( $p > 0.05$ ).

**Conclusions:** A significant number of individuals with chronic disease reporting refusal and/or hesitancy can translate as perceptions of low susceptibility for Influenza or as this disease not being perceived as severe. Individuals aged from 60 to 64 years old are more hesitant towards Influenza vaccination. This was the first campaign where this group was eligible for free-of-charge vaccination. Higher hesitancy in this group could be due to lower risk perception or unawareness of the possibility of free vaccination. For future campaigns, it would be of interest to develop strategies to promote vaccination targeting specific age and region subpopulations.

### Factors affecting COVID-19-vaccine hesitancy, acceptance and refusal in the 2023/2024 seasonal campaign

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**Introduction:** According to the World Health Organisation, vaccine hesitancy stands as a significant concern within the realm of global public health, ranking among the top ten threats. Despite Portugal's historical propensity towards vaccination, the burgeoning global prevalence of this phenomenon requires careful consideration. The anticipated decline in vaccination coverage for the seasonal vaccination campaign against Influenza and COVID-19 urges for the identification and better understanding of factors and causes associated with vaccine hesitancy. Better knowledge on this topic allows for the development of strategies and interventions that mitigate the impact of this phenomenon on public health through the promotion of more robust and adequate vaccination campaigns.

**Objective:** This research aims to assess the factors affecting COVID-19 vaccine acceptance, hesitancy, and refusal during the 2023/2024 season among individuals aged 60 years or older.

**Methods:** Prospective cohort-nested cross-sectional study regarding the 2023/2024 seasonal vaccination campaign (Influenza and COVID-19). Data used in this study is retrieved from the first of two telephone questionnaires (CATI methodology), which was administered before the beginning of the campaign (September 2023). A cohort of 1400 individuals' representative of the Portuguese population 60 years or over, residing in mainland Portugal was randomly sampled. Dimensions assessed included sociodemographic, health status, and past experiences with vaccines. Intention of COVID-19 vaccine uptake during the 2023/2024 campaign was assessed using a score from 0 to 10 (0 to 2: vaccine refusal; 3 to 7: hesitancy; 8 to 10: acceptance). An exploratory analysis was performed using a multinomial logistic regression to identify factors associated with COVID-19 vaccine uptake intention.

Results: Individuals aged 65 and over represent a lower risk for refusal (OR=0.234, CI95%: 0.152-0.360) and hesitancy (OR=0.419, CI95%: 0.310-0.565) compared to those aged 60-64 years. Males report lower hesitancy compared to females. Individuals with diabetes had the highest proportion of refusal (8.50%) and hesitancy (17.0%). Individuals with renal and/or hepatic disease were the ones presenting a higher proportion of acceptance (93.5%). Living in the north region of Portugal is associated with lower hesitancy. The highest education level presented a higher proportion of vaccine refusal ( $p > 0.05$ ). Individuals with no previous SARS-CoV-2 infection report higher acceptance towards COVID-19 vaccination.

**Conclusions:** Individuals aged from 60 to 64 years old are more hesitant towards COVID-19 vaccination than those aged 65 years or older. Higher hesitancy in this group could be due to lower risk perception or COVID-19 vaccine fatigue. For the next campaigns, it would be of interest to target and promote vaccination in this age population. This effort should be national but also adapted to each region. Noteworthy, individuals with higher education and, therefore, presumably with higher health literacy are the ones reporting lower acceptance.

### Global medicine availability, affordability, and pricing: WHO/HAI methodology systematic review across 57 countries

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**Introduction:** Essential medicines are fundamental for addressing health needs and achieving high levels of health equity and access worldwide. The World Health Organisation (WHO) and Health Action International (HAI) have developed a methodology to survey medicine prices, availability, and affordability across low-income and middle-income countries. This systematic review updates the global perspective on medicine access using this methodology, providing insights critical for policymaking and healthcare planning.

**Objective:** This study aims to systematically synthesise and update data on the availability, affordability, and pricing of medicines across 57 countries using the WHO/HAI methodology. By comparing these updated findings with previous data, the study seeks to highlight progress and identify ongoing challenges in global health, informing strategies to enhance medicine accessibility and affordability.

**Method:** A comprehensive search across the HAI Essential Medicines Access Database and four academic databases was conducted to identify studies employing the WHO/HAI methodology. A total of 74 surveys spanning 57 countries

were included, covering a period from 2003 to 2023. Data extraction focused on availability, affordability, and pricing for a core list of medicines. Meta-analysis was performed on these medicines to compare across different regions and income levels.

**Results:** Preliminary findings, yet to be announced, are expected to reveal significant insights into the current state of medicine availability, affordability, and pricing on a global scale. These results will likely underscore the stark disparities in medicine access between regions and income levels, providing a detailed analysis of progress made and highlighting persistent gaps in global health equity.

**Conclusion:** This study provides an essential update on the global status of medicine accessibility, showcasing the WHO/HAI methodology's role in informing healthcare policies and practices. By identifying areas of improvement and persisting challenges, the research underscores the need for targeted interventions to ensure equitable access to essential medicines worldwide. Future directions include refining data collection methods, expanding survey coverage, and enhancing the affordability and availability of medicines in underserved regions.

### Developing a digital unified global patient-centric-counseling model from a pilot study: Comparative analysis of the global patient-centered care models across four continents

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**Background:** In 2014, the Joint Commission of Pharmacy Practice launched a patient-centred care model, the Pharmacists' Patient Care Process (PPCP), to standardise patient education and counselling for practitioners across the USA in response to a mandate from an accrediting body calling on all pharmacy practitioners to adopt a consistent pattern to educate patients. Prior, the Self-Care Interest Group launched the QuEST SCHOLAR-MAC, another unique model aiding pharmacy practitioners in outpatient settings to counsel patients. QuEST-(Quickly assess, Establish, Suggest, Talk), SCHOLAR-MAC (Symptoms, Characteristics, History, Onset, Location, Remitting factors, Medication, Allergies, Conditions). These models have gained recognition and success as the GOLD STANDARD across the nation through Pharmacy Colleges and Practice Settings. In the digital

informational world, the sharing and dissemination of concepts are pivotal in healthcare practice. An evidence-based literature search from its debut till current was conducted with limited published data on the use of these models compared to others across the globe. This warranted the need to investigate how other countries are impacting patients' well-being through counselling and education models. Four countries were randomly selected for this Pilot Study projected to build a unified model suitable for different geographical areas.

**Objective:** To evaluate the impact of the use of Global Patient-Counsel Models as compared to the national PPCP and QuEST SCHOLAR MAC aiding to implement a Unified Patient-Centric Model.

**Methods:** Four (4) multi-centre Pharmacy Sites (Academia, Hospital, Health Center, Outpatient Pharmacy) from India, Ghana, New Zealand & USA were randomly selected to be included in this pilot study. Cross-sectional research was conducted through Zoom, WhatsApp video Conferencing, Teleconferencing, and a site visit also captured in a short Digital Animated Video Clip. A mixed research method (qualitative and quantitative) was utilised to collect the data. A portion of the qualitative data was converted to quantitative data for full cycle assessment, data analysis, and reporting. A unified model was designed from the data along with key critical excerpts from each model selected for incorporation into the model. Due to abstract word count restriction, the full data and the unified model -GLOBAL Patient-Centric Collaborative (PCC) Counseling SCHOLAR model will be presented at the conference.

**Result:** The Innovative short Digital Animated Video Clip will be played at the PODIUM Presentation for real-time experience. The full result will portray the dimensions of various models along with their comparative analysis. The newly developed unified model suitable for different geographical areas will be showcased.

**Conclusion:** The newly developed unified patient-centric collaborative model is projected for adoption by various Global Pharmacy Practice Settings with a follow-up study to assess its global use and impact in the prospective year(s).