

CONFERENCE ABSTRACTS

FIP Pharmacy Practice Research summer meeting for PhD students, postdoctoral fellows and supervisors conference abstracts 2023

Hosted by the FIP Pharmacy Practice Research Special Interest Group (PPR SIG) and the University of Granada

15-minute presentations

Point of care testing to guide antimicrobial prescribing in primary care and its value: Findings from an expert advisory panel

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Introduction: Diagnostic point-of-care (PoC) testing has become an important part of everyday clinical practice in many areas. Due to the COVID-19 pandemic, its use gained substantial attention from the general public. However, as society moves out of the pandemic, it is unclear whether this perception will continue and, more importantly, whether healthcare systems will be more willing to fund it than before the pandemic.

Objectives: VALUE-Dx is an Innovative Medicines Initiative-funded project aiming to assess the value of diagnostics for community-acquired acute respiratory tract infections in reducing antibiotic prescribing and antimicrobial resistance (AMR). As part of the project work, the authors aimed to explore experts' views regarding the impact of the pandemic on raising awareness about PoC testing and its value among the public and health system decision-makers.

Methods: An expert advisory panel (EAP) was convened to advise the project team. Its membership comprised regulatory, health technology assessment (HTA), payer and clinical experts (n=12). In a series of three meetings, the EAP members were asked for their views about the impact of the pandemic on

perceptions around and the uptake of diagnostics and any learning from the pandemic that can be used to inform efforts to prevent AMR. The meetings were recorded, and key discussion themes were identified and summarised narratively.

Results: An exploratory analysis showed that the discussion themes could be grouped into four thematic areas. The first was about political awareness and its impact on uptake. It was the view of the EAP that the COVID-19 pandemic had raised political awareness of the importance of diagnostic tests and their impact on the economy and day to day functioning of society. This increased awareness creates an opportunity to emphasise the importance of diagnostics for combatting AMR. The second was about the extrapolation of this effect beyond the pandemic. It was the general view that the significant focus on diagnostics in COVID-19 may not necessarily translate to a similar focus in other infectious diseases and AMR unless stakeholders are engaged appropriately. The third was the importance of collaboration and coordination of efforts internationally. This applies to developing, evaluating and implementing AMR diagnostics on a European level and globally. Finally, the need for robust assessment of value regardless of circumstances. It is important to adopt a formal, standardised approach to the assessment and reimbursement of diagnostics, similar to those in place for pharmacological treatments. This ensures that only products representing value for money are reimbursed.

Conclusions: The COVID-19 pandemic has given the healthcare community an opportunity to explore and implement a system-wide approach for the development, evaluation and implementation of POC diagnostics. Learnings from this opportunity should ensure maximum value from using these diagnostics to reduce the threat of AMR.

The differential impact of a 6- versus 12-month pharmacist-led interprofessional medication adherence programme on medication adherence in patients with diabetic kidney disease: The randomised PANDIA-IRIS study

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Introduction: Forty percent of patients with diabetes will develop diabetic kidney disease (DKD) over time. This diabetes complication may be due to a history of nonadherence to their prescribed medications.

Objectives: This study aimed to evaluate the differential impact of a 6-versus 12-month pharmacist-led interprofessional medication adherence programme (IMAP) on components of adherence (i.e. implementation and discontinuation) in patients with DKD during and after the intervention.

Methods: All included patients benefited from the IMAP, which consists of face-to-face regular motivational interviews between the patient and the pharmacist based on the adherence feedback from electronic monitors (EMs), in which the prescribed treatments were delivered. Adherence reports were available to prescribers to be considered in their intervention. Patients were randomised 1:1 into two parallel arms: a 12-month IMAP intervention in group A versus a 6-month intervention in group B. Adherence was monitored continuously during 24 months post-inclusion during the consecutive intervention and follow-up phases. In the follow-up phase post-intervention, EM data were blinded. The repeated measures of daily patient medication intake outcomes (1/0) to antidiabetics, antihypertensive drugs and statins were modelled longitudinally by the generalised estimated equation in both groups and the intervention and the follow-up phases.

Results: EM data of 72 patients were analysed (34 in group A, 38 in group B). Patient implementation of antidiabetics and antihypertensive drugs increased during the IMAP

intervention phase and decreased progressively during the follow-up period. At 12 months, implementation to antidiabetics in group A versus B was respectively 93.8% and 86.8% ($\Delta 7.0\%$, 95% CI 5.7%; 8.3%); implementation to antihypertensive drugs was respectively of 97.9% and 92.1% ($\Delta 5.8\%$, 95% CI 4.8%; 6.7%). At 24 months, implementation to antidiabetics in group A versus B was respectively 88.6% and 85.6% ($\Delta 3.0\%$, 95% CI 1.7%; 4.4%); implementation to antihypertensive drugs was respectively of 94.4% and 85.9% ($\Delta 8.5\%$, 95% CI 6.6%; 10.7%). Implementation of statins was comparable at each time point between groups. Three patients discontinued at least one treatment; they were all in group B.

Conclusions: The IMAP supports adherence to chronic medications in patients with DKD. The longer the patients benefit from the intervention, the more the implementation increases over time, and the more the effect lasts after the end of the intervention. A 12-month rather than a 6-month programme should be provided as a standard of care to support medication adherence in this population. The impact on clinical outcomes is currently being investigated.

Counselling first hand: Understanding the customer and yourself through mentalising— Promising results from the evaluation of an education programme for the pharmacy workforce to support patient-centred counselling

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Introduction: One of the core activities at community pharmacies is counselling patients on medication to support correct use and to contribute to health promotion. Dialogue is key to ensuring patient-centred counselling. However, studies show that the pharmacy workforce rarely includes patients' perspectives in counselling, especially if they sense that the patient or they will be emotionally affected.

A theory-driven education programme was developed to increase the pharmacy workforce's mentalising abilities and enable them to be aware of and navigate their own and patients' emotions in a counselling situation. The topics in the programme include the mentalising mindset, mentalising communication and pharmacy practice. The 2.5 ECTS programme was developed in Denmark and tested in Denmark and the Netherlands. The programme was developed with a user-driven workshop format that included perspectives from patients, the pharmacy workforce and proprietors.

Objectives: The aim was to evaluate participants' knowledge of mentalising in a pharmacy practice context and their competencies and benefits of transferring this to knowledge about how to act and communicate in mentalising ways in pharmacy encounters, with the potential of establishing patient-centred counselling.

Methods: In Denmark, 28 participants from 11 community pharmacies participated. A mixed methods design based on the Kirkpatrick levels of evaluation inspired the evaluation. Data comprised written reports with 36 qualitative questions answered by participants upon completing the programme, as well as quantitative measurement of their level of emotional awareness, their job satisfaction measure before and after the programme and a course experience questionnaire after the programme.

Results: The qualitative evaluation revealed three themes: 1) "Awareness of emotions and communication skills is an important element when mentalising is the goal"; 2) "It's far more than just a dispensing situation—I now tune into the patient"; and 3) "Don't have to hide behind the screen any longer". The quantitative evaluation showed: 1) A significant increase in awareness of mental states ($p < 0.001$); 2) A significant improvement in job satisfaction regarding salary ($p = 0.01$), prospects ($p = 0.04$) and standards of care ($p = 0.004$); and 3) That most participants agreed (48.8%) and strongly agreed (39.1%) that they were satisfied with the education programme.

Conclusions: The education programme promoted the participants' awareness of mental states and mentalising communication skills, enabling them to centre the interaction around the patients' perspectives. The results promise to support the pharmacy workforce to be patient-centred in counselling desk meetings and prevent or reduce job-related stress and burnout.

Tool for designing targeted implementation strategies to overcome barriers in community pharmacy

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Introduction: There is considerable evidence to suggest that implementing evidence-based practices is complex, with multiple implementation factors (i.e. barriers and their causes that can hinder the process). Though facilitating implementation through targeted implementation strategies (TIS) has been suggested to be effective, research linking

implementation factors to TIS for community pharmacy services is yet to be studied. This research is being undertaken as part of a study to evaluate the implementation of a minor ailments service in Spanish community pharmacies (CPs).

Objectives: To develop a visual tool that links barriers, their underlying causes, and TIS using advanced analytical techniques.

Methods: Implementation facilitators collected data using an IT (Information technology) system during the implementation process of a pragmatic study with a hybrid effectiveness-implementation type 3 design. Analysis was undertaken to visualise flow segments of varying bandwidths depicted by Sankey diagrams using the following variables: barriers, their causes, and TIS. Each flow segment of these diagrams depicts the behaviour chain for identifying barriers and their causes and TIS employed. These variables were coded using the consolidated framework for implementation research (CFIR) menu of constructs and Doherty's compilation of discrete, practical facilitation activities.

Results: Overall, 3697 Barrier-Cause-TIS relationships were recorded. Subsequently, these relationships were categorised into 79 discrete groups. The analysis revealed that the most common relationship group involved a barrier coded as "Intervention characteristics", its cause coded as "Characteristics of the individuals involved", and a strategy coded as "Other" (walkthrough, technical assistance, other benefits...) (n=913, 24.7 %). Another frequent group included a barrier coded as "Intervention characteristics", its cause also coded as "Intervention characteristics", and a strategy coded as "Other" (walkthrough, technical assistance, other benefits...) (n=346, 9.36 %). Additionally, a third prevalent relationship group involved a barrier coded as "Process of implementation", a cause coded as "Characteristics of the individuals involved", and a strategy coded as "Planning for change" (n=316, 8.55 %).

Conclusions: By allowing the viewer to understand flow and proportions visually, Sankey diagrams can be useful for addressing data interpretation challenges when implementing evidence-based practice in CP. They provide an intuitive method for visualising the links between barriers and TIS, which could be vital in improving these TIS's selection, combination, and effectiveness. The ongoing study will provide additional data to facilitate the development of improved diagrams with TIS outcomes, which can aid in rapidly acquiring information for making informed decisions, thus enhancing implementation practice behaviour.

Mapping the concept of integration using a lexicographical analysis of literature

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Introduction: Healthcare systems are evolving to overcome some of the major challenges they face, such as an increasing demand post-pandemic, an ageing population and the increase of chronic diseases. Integrating health systems and providing integrated care emerge as possible solutions. Nevertheless, the terminology used in policy debates and rhetoric for defining integration is ambiguous and polysemic. It seems necessary to map the concept of integration since the literature is used interchangeably with terms such as coordination, collaboration or integrated care.

Objectives: The objective of the present study was to identify the topics comprising this field to map the terms used in the literature regarding the integration of healthcare systems.

Methods: A lexicographical analysis of literature indexed in PubMed about integration and its associated terms was conducted. Literature was searched by merging ten different systematic searches: four searches using only National Library of Medicine (NLM) Medical Subject Headings (MeSH) ("Systems integration" [MH], "Intersectoral collaboration" [MH], "Delivery of healthcare, Integrated" [MH], "Cooperative behaviour" [MH]) and six additional searches using only keywords ("Collaboration", "Integration", "Integrated care", "Coordination", "Cooperation", "Interprofessional care"). Data topic analysis was undertaken using R/RStudio and IRaMuTeQ 0.7 alpha 2 (Lerass, Toulouse).

Results: The searches yielded a total of 42,479 distinct articles. Lexicographical analysis of the text corpus of the titles and abstracts (when available) resulted in seven topics, defined as: 1) Evidence and implementation, 2) Quantitative research; 3) Professional education; 4) Qualitative research; 5) Governance and leadership; 6) Clinical research; and 7) Financial resources. Most of the searches demonstrated no association with any of the topics.

The lack of standardisation of the term could result from the journal dispersion. More than 4,000 journals from different areas and scopes were used to publish the 42,000 articles, with few highly dominant journals. The absence of standardised terminology creates an additional difficulty to the synthesis gathering exercises by complicating systematic searches.

Observing the literature, 12 relevant keywords were identified around integration (integration, collaboration, integrated care, coordination, communication, relationship, cooperation, consensus, trust, interprofessional care, colocation and connectivity) and their use frequency was measured. Articles containing the word "integration" were the most prevalent and experienced a drastic increase in 1993, leading to the creation of the MeSH "Delivery of Healthcare, Integrated" by NLM in 1995, the MeSH with the highest prevalence. Based on these findings and the definitions that describe integration as a continuum of different stages where collaboration and coordination are some of its stages, it seems that integration could be the preferred term.

Conclusions: Using a lexicographical analysis, health integration was mapped, showing a seven-factor structure. The term "Integration" and the MeSH "Delivery of healthcare, Integrated" better represent the concept and should be used as the preferred terms in literature.

Exploring pharmacists' lived experiences working during the COVID-19 pandemic using photovoice

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Introduction: Pharmacists' pivotal role during the COVID-19 pandemic has been widely recognised as they adapted to provide an even higher level of care to their patients.

Objectives: This study sought to understand frontline pharmacists' lived experiences of the COVID-19 pandemic and its impact on their roles and professional identity (what they do and what it means to them).

Methods: This study used the method of Photovoice, a visual research method that uses participant-generated photographs to articulate their experiences, and semi-structured interviews. This approach allowed us to explore the subjectivity of professional identity from the pharmacists' lived experiences. Participants were asked to provide 3–5 photos reflecting how they see themselves as a pharmacist and/or represent what they do as a pharmacist. The semi-

structured interview guide asked open-ended questions about their photos, including a photo-elicitation exercise, and additional questions based on a recent scoping review. Through social media and relevant pharmacy organisations, the authors recruited frontline community pharmacists who provided direct patient care during the COVID-19 pandemic in Alberta, Canada. Data analysis incorporated content, thematic and visual analysis and was facilitated using NVivo software. Ethics approval was obtained from the University of Alberta Research Ethics Board.

Results: The authors interviewed 21 pharmacists who provided 71 photos. Three interviews were excluded from the analysis as it was subsequently discovered that the individuals were impersonating licensed pharmacists. Out of the 18 included participants, 11 were females, and 7 were males.

Five primary themes emerged from the photographs and interviews: 1) Autonomy; 2) Clinical courage; 3) Leadership; 4) Safety; and 5) Value and support. The photographs identified symbols participants associated with their lived experiences (e.g. worn shoes illustrate the relentless pace of pharmacists, a messy bed representing work-life balance out of control).

Conclusions: This study identified that pharmacists' felt the pandemic made them visible to the public and made them feel valued as a trusted resource and a haven for ongoing healthcare. Additionally, it was highlighted how participants demonstrated clinical courage and led their communities by adapting their roles and using their autonomy to fulfil community needs.

Developing a quality framework for community pharmacy which acknowledges the importance of integration with the wider healthcare system: Findings from a systematic review of international literature

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Introduction: Increasing patient demand on healthcare systems worldwide has driven the expansion of community pharmacy (CP) services into clinical areas once only the remit of medical practitioners. However, research suggests inconsistencies in the quality of care provided across different CPs and a need for integration with the wider healthcare system. As the role of CP continues to expand, there is a need to ensure CPs provide high-quality services, meet patient

needs and integrate across patients' primary care pathways. Yet there is no agreed framework for defining quality of care in CP.

Objectives: To identify the defining features of the quality of CP and synthesise these into a quality framework, the dimensions of which are relevant to integrated primary care and CP service provision.

Methods: A systematic review was conducted (October 2022–January 2023). Six electronic databases were searched (Embase, PubMed, Scopus, CINAHL, Web of Science, PsycINFO) using search terms relating to "community pharmacy" and "quality". Titles and abstracts were screened against an inclusion/exclusion criterion followed by full-text screening. A narrative synthesis was undertaken.

Results: Following title and abstract screening of 11,493 papers, 165 papers were assessed for eligibility via full-text reading, with 81 studies (qualitative and quantitative) included in the review. Features of quality identified from the literature were mapped across six potential dimensions:

- Access: structural and procedural components of quality such as opening hours, waiting time, physical access, availability of medicines and availability of pharmacy staff to provide services.
- Environment: the impact of facilities, equipment, and pharmacy layout on providing quality healthcare services.
- People-centred care: pharmacy staff providing patients with personalised care, establishing a patient-pharmacist relationship, and always demonstrating professionalism.
- Effectiveness: competence of pharmacy staff in the dispensing process, pharmacy professionals' clinical knowledge and diagnostic skills to assess and refer patients.
- Safety: identifying errors and intervening; accuracy in compounding; adequate information sharing between pharmacy staff when exchanging shifts; and having internal mechanisms designed to minimise patient risks.
- Integration: ways to establish and sustain the community pharmacist-general practitioner (GP; family doctor/physician) relationship; areas for collaboration between CP and GP beyond traditional dispensing; incentivisation for collaboration between CP and GP; and information sharing between community pharmacy and other primary care providers.

External and internal factors influencing the quality and integration of healthcare services provided by CP were also identified, comprising organisational culture; staffing levels and skill mix; training of pharmacy staff; workload; monitoring quality; remuneration; type of pharmacy; and service commissioning.

Conclusions: In the absence of an agreed quality framework for community pharmacy, this review identified dimensions of quality that can act as a framework for improving

healthcare services provided by CP and their integrated health service provision. The next step will be to further develop and validate these dimensions of the framework in England with patients, healthcare professionals, decision and policymakers in CP, general practice and the wider healthcare system.

Impacts of a simulation-based vaccination training course on master's degree students in pharmacy

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Introduction: As a result of the SARS-COV-2 pandemic, a new competence for pharmacists has been introduced in Belgium by the law of the 28 February 2022. Community pharmacists are now allowed to prepare and administer vaccines for the prophylaxis of COVID-19. To be allowed to vaccinate inside the pharmacy they legally need to follow and pass a specific 8-hour training course on vaccination.

Objectives: The aim of this study is to evaluate if a simulation-based vaccination training course can provide future pharmacists to develop an interest in practicing vaccination in their future professional life, self-confidence to do it and the necessary skills. At the University of Liège, this training course is divided into a theoretical and a practical part. The theoretical part consists of an e-learning course referring to the theoretical notions mentioned in the law. The practical training combines two parts. Firstly, in an Experimental Pharmacy, students follow a presentation on the legislative and ethical aspects and participate in role-playing games about vaccine hesitation and eligibility criteria. Secondly, in the Center of Medical Simulation, they participate in four workshops relating to the act of vaccination under the supervision of a physician and a nurse: preparation and injection of the vaccine in an intramuscular injection pad, cardiopulmonary resuscitation on a "little Anne QCPR", identification, distinction, and management with simulated patients of the vasovagal syncope and of the anaphylactic shock.

Methods: The framework of this quantitative study was carried out on 88 master's degree students in pharmacy. Validated questionnaires were used and aimed to analyse the evolution of the students' perception in three areas: the satisfaction with the training, the interest of this simulation-based training in a public health setting, in the pharmacy curriculum and in relation to theoretical courses, and the self-

confidence in addressing a patient vaccine hesitancy at the counter, in preparing and injecting a vaccine as well as in managing adverse events that may occur following a vaccination. These topics are evaluated by Likert scale from 1 (totally disagree with the affirmation) to 5 (totally agree). In addition, the vaccination skills acquired during this training were evaluate with procedural checklists. The data were collected before (T0) and right after the vaccination training course (T1) and then 3 months later during a second simulation training (T2).

Results: Even before the training, the students have a great interest in practicing vaccination in community pharmacies (T0 92.7%; T2 97.7% of the students totally agree or agree with the affirmation) and for simulation training course (T0 86.0%; T2 92.1%). The student's self-confidence increased considerably in preparing and injecting the vaccine (T0 36.6%; T1 72.1%; T2 86.4% of the students totally agree or agree with the affirmation) and in managing adverse events (T0 31.2%; T1 86.2%; T2 86.6%). The authors also note a clear difference in terms of communication and vaccine hesitancy. The skills evaluated on the final assessment show that 84 students on 88 (95.4%) can carry out the procedures. Finally, about the satisfaction of the training course, it can be observed that 87.6% of the students are satisfied with the training.

Conclusion: This training provides the students an increasing interest in public health and in simulation and increasing self-confidence in terms of vaccination procedures and communication. They also have the necessary skills to practice vaccination and so, in that way, respond to the requirements of the law.

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3-minute presentations

The European pharmacy market: The density and its influencing factors

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Introduction: Liberalising market structures of community pharmacies is a new trend in the European Union. The goals of liberalising the pharmacy markets are lower prices of drugs, improved services, and better accessibility. Overall, the EU pharmacy markets are somewhat more regulated than liberal. The government aims to ensure nationwide, reachable, affordable medical healthcare services by pharmacies. Therefore, the density of community pharmacies matters. So far, Sweden, Portugal, Italy, Latvia, and Austria have adopted different liberal structures within their pharmacy market. However, Poland, Hungary, and Estonia changed from a liberal pharmacy market to a regulated system, while other countries remain regulated, like Finland, Denmark, France, Spain, Luxembourg, and Germany.

Objectives: The research question is: Do market conditions, like the pharmacy system and the RX mail-order, affect the density of community pharmacies in Europe?

Methods: The analysed puzzle in this paper is that the density of community pharmacies develops differently under the same trends.

Results: Current literature has shown that changes in the system affect prices and density. A European overview of the development of the density of community pharmacies and their triggers still needs to be included.

The author focuses on liberal versus regulated market structures and mail-order prescription drug (RX) regulation. Differences between liberal and regulated systems are sometimes hard to distinguish. Therefore, this paper defines it as the following: The pharmacy system is rather liberal, whether the ownership is liberal. Hence, the pharmacy system is regulated, whether the ownership is restricted to pharmacists only. Liberal ownership allows non-pharmacists to own a pharmacy, whereas regulated ownerships only allow licenced pharmacists to own a pharmacy (no vertical integration).

In a panel analysis, the relative influence of the measures is examined across 27 European countries over the last 21 years. The results show that regulated pharmacy markets positively affect density (+4.96 pharmacies per 100.000 inhabitants). This result is statistically significant at a 0.01 level and explains 2% of the variation in pharmacy density. Further, assuming that RX mail-order is allowed, it negatively affects density (-14.46 pharmacies per 100.000 inhabitants). This result is statistically significant at a 0.001 level and explains 16% of the variation in the pharmacy system.

Conclusions: The author's analysis recommends regulated pharmacy markets with a ban on RX mail orders. This research is essential to counteract decreasing density consulting in needing more professional healthcare through pharmacies.

A qualitative study exploring factors that affect pharmacists' involvement in asthma care services in Kuwait

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Introduction: Asthma is a respiratory disease caused by chronic airway inflammation in the lungs that constricts the airway and increases mucus production. Asthma is considered the most common chronic disease of people living in Kuwait. Pharmacists can play key roles in supporting health outcomes for patients with asthma.

Objectives: This study aims to identify factors that influence the involvement of pharmacists in asthma management in primary care centres in Kuwait.

Methods: Pharmacists were recruited via convenience sampling and passive snowballing techniques. Qualitative, online semi-structured interviews were conducted via Zoom. The topic guide consisted of several sections that included demographic characteristics, pharmacists' role in asthma management, significant barriers to providing optimal asthma services, relationships, and collaboration with other healthcare professionals. Recorded interviews were transcribed verbatim and analysed utilising NVivo 11 software. Data were inductively analysed to identify themes using the Braun and Clarke framework. Ethical approval was obtained from Newcastle University and the Ministry of Health, Kuwait.

Results: Fifteen interviews with pharmacists were conducted. The sample consisted of more females (n=13) than males (n=2). Most pharmacists had working experience of 5–10 years as pharmacists in primary care centres (n=9). Also, most of them worked in primary care centres in Al-Asema (the capital) district (n=7). Two main analytical themes were identified related to the role of pharmacists in asthma management. The first theme identified was a professional identity influenced by pharmacists' knowledge, patients' and physicians' trust and hierarchy in the health system. Participants appeared to have different levels of knowledge about asthma medications and guidelines, creating different professional identities that may affect their involvement in providing information and exercising some judgments. Lack of trust from physicians and patients might prevent participants from providing asthma services. Pharmacists also seeing themselves as less significant than physicians might discourage them from sharing their ideas and collaborating with physicians. The second theme that emerged from the data was expectations. Patients' expectations appeared to influence the services provided by pharmacists in asthma care. If patients only want to dispense their medication, the

pharmacists will act as dispensers only, and if the patients expect more from them, the pharmacists will provide more services. Also, participants appeared to behave according to their expectations based on the uncertainty created by existing legal and regulatory frameworks, as working outside of these was beyond expectations.

Conclusions: Both professional identity and expectations impact the role of pharmacists in asthma management in Kuwait. Pharmacists in Kuwait may have different identities affected by their knowledge, trust from patients and physicians and hierarchy in the health system. In addition, pharmacists' expectations acquired from their past experiences with patients or due to uncertainty of the laws and regulations in Kuwait negatively influence their engagement in asthma services. A limitation of this study is that pharmacists were mostly from the capital, so findings may not apply to Kuwait.

Preferences and perceptions of pharmacy students on the sectoral development of community pharmacy in Belgium

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Introduction: Building the future of the pharmacist profession today must be done by listening to the actors of tomorrow. Their wishes and main motivations must be integrated into reflections. The university needs to understand how students plan for their future professions. Consistency between teaching and sectoral development is at the heart of university concerns: anticipating professional changes can help the academic body build flexible programmes to align with professional development and best prepare actors of tomorrow.

Objectives: To assess the preferences and perception of Master's students in pharmaceutical sciences among various potential sectoral evolution in the field of pharmacies open to the public. This research questions how future pharmacists rank in order of importance and preference for the potential sectoral developments in their profession.

Methods: An online questionnaire was sent to Belgian student in pharmaceutical sciences to understand their preferences concerning the various missions expected to be part of the role of pharmacists in the years to come. Some of these missions already exist in Belgium, others already exist abroad, and others still need to be the responsibility of the pharmacist at present.

The questionnaire used a best-worst scaling (BWS) approach to determine a hierarchy of preferences on a set of attributes describing the potential sectoral developments in community

pharmacists. The BWS then makes it possible to classify preferences based on choices and to compare preferences among all the attributes considered. Respondents do not only express their preferences among the proposed attributes but also provide information through their responses as to the most preferable and least preferable attributes in their eyes. The research team agreed on a list of 18 attributes to characterize the profession of community pharmacists and its potential sectoral developments. The 18 attributes were: preparation and dispensing of medication, pharmaceutical care, adjustment/substitution, continuity of treatment, care monitoring/risk prevention, medication review, self-medication, prescription, adherence support, health prevention and promotion, drug analysis, inter-professional collaboration, pharmaceutical care, vaccination, screening, withdrawal/deprescription, return home after hospitalization and home care.

Results: The topics for which students showed the greatest interest were delivery of medication with advice on the proper use, prevention, identifying and resolving potential drug-related problems or even assisting the patient in a self-medication situation.

The themes with the lowest interest were Greenpharmacy, the collection of used products and sustainable practices.

Conclusion: Future pharmacists do not wish to replace medical doctors and have little interest in diagnosis, prescription and laboratory analysis. Moreover, the lack of interest of future pharmacists in Greenpharmacy raises questions. Making students aware of this significant environmental challenge should be encouraged.

The role of pharmacists in deprescribing benzodiazepines: A scoping review

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Introduction: Polypharmacy and the use of potentially inappropriate medications can increase the risk of adverse drug events, hospitalisation, geriatric syndromes, and unnecessary healthcare costs. Empirical evidence indicates that discontinuing certain medications, such as benzodiazepines, can improve health outcomes, primarily by resolving adverse drug effects. Pharmacists can play a vital role in deprescribing benzodiazepines through different medical settings.

Objectives: This scoping review aims to explore the pharmacists' role in deprescribing benzodiazepines.

Methods: A scoping review has been conducted to distinguish and map the literature, discover research gaps, and focus on targeted areas for future studies and research.

Results: Twenty studies were identified, revealing three themes: 1) Pharmacists' involvement in benzodiazepine deprescribing; 2) The impact of their involvement; and 3) Obstacles impeding the process. Pharmacists have been involved in deprescribing procedures, mainly through completing medication reviews, collaborative work with other healthcare providers, and education. Pharmacists' involvement in benzodiazepine deprescribing intervention led to better health and economic outcomes. Withdrawal symptoms after medication discontinuation, dependence on medication, and lack of time and guidelines were identified in the literature as barriers to deprescribing.

Conclusions: This review highlights the importance of pharmacists in benzodiazepine deprescribing interventions and provides targeted areas for future research. While pharmacists have been involved in deprescribing intervention through multiple methods, barriers to deprescribing remain, including patient-, practitioner-, and study-related barriers. Future interventions could address these barriers and incorporate strategies to support shared decision-making and patient-centred care to improve the deprescribing procedure.

Preparing the next generation of pharmacy leaders: An international review exploring leadership development opportunities for young pharmacists

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Introduction: Traditionally, models of leadership supported an authoritarian approach suggesting leaders "were in control of groups" or "held managerial positions within organisations". Healthcare leaders often worked in

management, overseeing organisation function. There is now a growing transition towards transformational leadership, focused on “influence”, “empowerment”, and “development” of teams. In modern healthcare, leadership is the shared responsibility of all healthcare professionals involved in patient care, including pharmacists. With the expanding scope of pharmacists' role in providing specialised healthcare services, teaching and conducting research, leadership is now a professional obligation. Continuing professional development (CPD) opportunities available include International Pharmaceutical Federation's (FIP) 12-month Leadership Development Programme (LDP), which pharmacists can undertake to acquire leadership skills.

Objectives: To compare leadership training available to young pharmacists internationally, including higher education programmes and CPD courses/resources. To evaluate the effectiveness of FIP's LDP in developing leadership skills among young international pharmacists.

Methods: Pharmacy leadership education standards and resources were compared for six countries (United States, Great Britain, Canada, Australia, Nigeria, and South Africa).

Alongside this, a survey on participant evaluation of the FIP LDP was distributed to all 18 participants from the 2021–2022 cohort in November 2022: a month post-programme conclusion in October 2022. Data collected included participant ratings of different aspects of the programme, measured using a 5-point Likert scale, descriptive accounts, and personal reflections

Results: International training comparison: Four of the six countries studied had outcome-based standards on leadership in professional education guidance. Contrastingly, underdeveloped nations needed an accreditation process and better pharmacy education regulation.

A total of 9 out of 18 participants completed the FIP LDP evaluation survey. All respondents either “agreed” or “strongly agreed” that the programme helped them develop their leadership skills. Eighty-nine percent of respondents (n=8/9) reported improved self-awareness through the Clifton Strengths Finder to test the respondents completed upon programme commencement. The top five strengths for the 2021–2022 cohort were: learner, restorative, responsibility, harmony, and achiever. Seventy-eight percent of respondents (n=7/9) stated that learning from the programme will impact their future decision-making; over two-thirds (n=6/9) had already applied principles learned to pharmacy practice. Lessons learned included the importance of task delegation, developing tolerance of others and appreciation for team members' skillset (n=3/9). Respondents reported not implementing any lessons learned in the workplace. One hundred percent of respondents would recommend the programme to other pharmacists. Common words used to describe the programme included “interactive”, “engaging”, and “insightful”. Suggestions for development included introducing an e-portfolio to track personal progress, more collaborative projects, and opportunities to join FIP research groups in interest areas.

Conclusions: Overall, variation existed in standards for early pharmacist leadership training and CPD opportunities worldwide. Although leadership is increasingly integrated into pharmacy programmes, more efforts are required to promote CPD through participation in courses such as FIP's LDP. This programme was well-received by participants, with many gaining valuable learning applicable to clinical practice. However, results were subject to selection bias due to the small sample size and low response rate. Global efforts are required to improve awareness, accessibility and opportunities for pharmacist leadership development through international partnerships.

Job satisfaction among pharmacists– International survey

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Introduction: Understanding the role of pharmacists' job satisfaction is important because a lack of job satisfaction might negatively impact patient care and safety. Inadequate staffing, increased responsibilities, and a high workload are some factors that affect job satisfaction. The authors are undertaking an international survey to identify the worldwide similarities and differences among pharmacy workforces.

Objectives: This international survey aims to assess the differences among the pharmacy workforce in selected domains and to assess job satisfaction among pharmacists in European countries.

Methods: This international cross-sectional survey was performed by distributing a 40-item questionnaire to EPHeU (European Organisation of Employed Community Pharmacists) members and other countries interested in participating via e-mail. Previously validated 5-point Likert scales measured each of the study variables. This survey is launched using a recognised and valid online platform that is wholly anonymised, called Google Forms, without any e-mail verification. The EPHeU has approved the survey.

Results: Data collection took place between October 2022 and January 2023. The survey received responses from 811 pharmacists across 16 European countries.

Respondents were primarily female (79,9%), mainly from a community pharmacy (81,2%), and 44% had an additional specialisation. More than half of the respondents (60,3%) had a master's degree, and the majority (62,9%) worked 40 hours weekly. About half of the participants (51,3%) were satisfied with their job, but only 17,6% think their work is valued properly. Eighty-four percent of the surveyed pharmacists

agreed that pharmacists are important to the health system, but just 45% think they enjoy public respect. Only 21% of the respondents agreed that the health system recognises pharmacists' competencies.

Conclusions: Knowledge regarding job satisfaction will enable employers to respond to employees' needs, decrease turnover, and improve the work environment.

The primary determinants of job satisfaction were intrinsic aspects of the job. People are satisfied with their work but have a high workload, inadequate salaries, and low respect. The results can significantly help pharmacy leadership, administration, and employers. Policymakers and health service managers should act to improve the quality and quantity of pharmaceutical care services. Developing and implementing a well-framed system that provides a conducive working environment, remuneration, and greater autonomy could improve job and career satisfaction.

Development and consensus of a clinical management protocol for community pharmacist management of urinary tract infections in women

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Introduction: Evidence from several countries suggests pharmacists are well-positioned to facilitate assessing and managing acute uncomplicated urinary tract infections (UTIs) in certain cohorts within the community pharmacy setting. It has become usual practice in the United Kingdom, Canada, New Zealand, Scotland, Northern Ireland and Queensland, Australia. The development and consensus of protocols for the management, including referral, of acute uncomplicated UTIs for community pharmacists is necessary to ensure clinical governance, clinical guidance and a standardised approach to managing patients.

Objectives: The objectives were to: 1) Identify international and national clinical management protocols (CMP) (also referred to as guidelines) for community pharmacist management of acute UTIs in women (aged 18–65 years); 2) Map the components of the clinical management protocols; 3) Evaluate their quality; and 4) reach consensus on the proposed clinical management protocol between key stakeholders to define and agree on a final version of the clinical management protocol for pharmacists.

Methods: A grey literature search was undertaken using Google as the primary search tool, following the method developed by Godin and colleagues, for applying systematic review search methods to grey literature. Initially, key clinical management protocols were identified by searching Google with a range of phrases, for example, "protocol", "guideline", "UTI", and "cystitis". Each included protocol in the review was appraised using the AGREE (Appraisal Guidelines for Research and Evaluation) version II instrument. The draft protocol, formatted along the lines of Health Pathways, was subjected to a consultative process with the objective of relevant stakeholders reviewing and reaching a consensus. The 4-hour focus group was facilitated by Deloitte Australia in April 2023 and included practising health professionals; four community pharmacists, two general practitioners and representatives from peak bodies.

Results: In total, 172 records were screened against eligibility criteria, 15 of which were identified as clinical management protocols for inclusion in the review. The overall quality assessment of the included clinical management protocols varied significantly, irrespective of geographical location, with three protocols considered lower quality (overall quality ~ 28.57%). While the remaining 12 protocols were deemed low quality due to a lack of rigour and development, the protocols met the criteria to be recommended with modification. Consensus was achieved following qualitative approval between focus group members, and a final version of the clinical management protocol was produced. The major areas addressed include common signs/symptoms, differential diagnosis, red flags/referral, non-prescription medications and self-care, empirical antibiotic therapy, recommendations on antimicrobial resistance and patient follow-up.

Conclusion: The CMP identifies patient assessment, management, and referral criteria. The protocol will be used in a clinical trial evaluating the impact of a pharmacist-led UTI service.

Prescribing of oral antibacterial drugs in primary care out-of-hours services: A scoping review

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Introduction: The rapid spread of antimicrobial resistance (AMR), which causes a serious threat to both human health and the global economy, is primarily linked to the overuse and misuse of antibacterial drugs. The use of antibacterial drugs in primary care significantly impacts the AMR crisis. Within these settings, oral antibacterial drugs are considered one of the most frequently prescribed medicines. It has been claimed that within primary care, the proportion of

antibacterial drug prescribing is higher outside the regular working hours (out-of-hours (OOH) services) compared to in-hours (IH) services.

Objectives: To identify the existing body of literature around oral antibacterial drug prescribing within primary care OOH services.

Methods: The Joanna Briggs Institution manual guided the scoping review and reported following the PRISMA-ScR. Seven electronic databases (Medline, Embase, Emcare, CINAHL, Scopus, Web of Science, and Cochrane Library) were systematically searched, and the results were screened against pre-defined eligibility criteria. Original and secondary analysis studies that addressed oral antibacterial prescribing in OOH primary care and were published in English were included. Three reviewers independently screened titles and abstracts. A pre-piloted extraction form was used to extract relevant data. A narrative synthesis approach was used to summarise the results.

Results: The initial search yielded 834 records. Upon screening, 28 publications fulfilled the eligibility criteria. Included studies originated from nine high-income countries, with the most frequent being the United Kingdom (six studies, 21.4%) followed by Belgium (five studies, 17.8%). Literature on antibacterial prescribing in OOH services was mostly from quantitative studies (23 studies, 82.14%), with only a few employing a qualitative design (five studies, 17.86%). Different themes and sub-themes were identified across these studies. Most discussed antibacterial prescribing data regarding the commonly prescribed medications and/or associated conditions. Eleven studies provided a comparison between IH and OOH settings. Seven studies reported the trends of prescribing over time; of these, three explored prescribing trends before and during COVID-19. The impact of intervention implementation on prescribing was investigated in two studies, an educational intervention in one study and an interactive booklet in the other. Four studies assessed the quality/appropriateness of prescribing by adherence to guidelines or antibiotic prescribing quality indicators. Limited studies explored prescribing predictors and patients' expectations and satisfaction with OOH services. In contrast, qualitative studies focussed more on exploring prescribers' experiences, perspectives, behaviours, and the challenges the prescribers face during consultations within OOH settings which may influence their decision-making process. One study explored why patients consult OOH services and how the patients communicate their problems.

Conclusions: This review shows the key areas around oral antibacterial prescribing in primary care OOH services. While a satisfactory number of published articles cover various areas within OOH, using different approaches to OOH across countries may need clarification in comparing practices. Further research is needed to understand better current practices in these settings and how the practices may contribute to AMR.

Theory-based development of an intervention towards benzodiazepines deprescribing in nursing homes

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Introduction: Despite recommendations to deprescribe chronic benzodiazepines receptor agonists (BZRA) in older adults, the prevalence of use in Belgian nursing homes remains above 50%.

Objectives: This study aimed to develop an intervention towards BZRA deprescribing in nursing homes, with insights from behaviour change theories.

Methods: Following identifying domains of the theoretical domains framework (TDF) that relate to barriers and enablers for BZRA deprescribing, the authors first identified behavioural change techniques (BCTs) that could impact these TDF domains. This step was done using the Theory and Techniques Tool. The authors then established a selection of BCTs through an online survey and a group meeting with stakeholders (healthcare providers, nursing home directors, and policymakers). An intervention was developed encompassing these BCTs, with specific contents and methods of delivery validated by the stakeholders' group. Tools developed for the intervention were also discussed with appropriate stakeholders (healthcare providers or nursing home residents).

Results: Regarding BCTs selection, 18 stakeholders participated in the online survey and 7 in the following group discussion. This led to a selection of 9 BCTs: instruction on how to perform the behaviour, information about health consequences, pros and cons, problem-solving, goal setting (behaviour), social comparison, restructuring physical environment, restructuring social environment and graded tasks. These 9 BCTs have been merged into a complex intervention encompassing six components: process and goals setting, healthcare providers' education, physical environment adaptations, audit and feedback, residents' and relatives' awareness and education, and multidisciplinary work.

Conclusions: Following a theory-based approach, the authors developed an intervention towards BZRA deprescribing that will now be pilot-tested in a sample of Belgian nursing homes.

A pharmacist-led interprofessional medication adherence programme improved adherence to oral anticancer therapies: The OptAT randomised controlled trial

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Introduction: Oral anticancer therapies such as protein kinase inhibitors (PKIs) are increasingly prescribed in cancer care.

Objectives: To evaluate the impact of a pharmacist-led interprofessional medication adherence programme (IMAP) on patient implementation, persistence and adherence to 27 PKIs prescribed in different types of solid cancers, as well as the impact on patients' beliefs about medicines (BAM) and quality of life (QoL).

Methods: Patients were randomised 1:1 in two parallel arms. All PKIs were delivered in electronic monitors (EM). During the 12-month educational, behavioural and affective intervention, pharmacists supported patient adherence through monthly electronic and motivational feedback; the control arm received standard care plus EM without intervention. Medication implementation and adherence were compared between groups using generalised estimating equation models, in which relevant covariables were included; persistence was compared with Kaplan-Meier curves. Questionnaires to evaluate BAM and QoL were completed in patients who refused to participate and those who accepted at inclusion, 6- and 12 months post-inclusion.

Results: PKI implementation was constantly higher in the intervention (n=58) than in the control arm (n=60), 98.1% and 94.9% (Δ 3.2%, 95%CI 2.6%; 3.7%) at six months. The probabilities of persistence and adherence were comparable between groups and BAM and QoL scores—no differences in BAM or QoL were found in patients who refused versus those who participated. The intervention benefited most men (Δ 5.4%, 95% CI 4.2; 6.5), those who initiated PKI for more than

60 days (Δ 4.6%, 95% CI 3.7; 5.5), patients without a diagnosis of metastasis (Δ 4.6%, 95% CI 3.4; 5.7), those aged less than 60 years (Δ 4.1%, 95% CI 3.3; 4.9) and those who had never used any adherence tools (Δ 4.1%, 95% CI 3.4; 4.7). Oncologists prescribed regular treatment interruptions to help patients recover from side effects; this information was compiled in the implementation and adherence analyses.

Conclusions: The IMAP, led by pharmacists in interprofessional collaboration, supports the implementation of PKIs in solid cancers. Patients struggle with side effects, forcing oncologists to prescribe off-label regimens. Longer-term medication adherence interventions embedded in routine care should provide results on the impact on progression-free survival.

Key components of theories, models, and frameworks for health systems integration in the context of community pharmacy and primary care: A scoping review

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Introduction: With the rise in healthcare demand, the fragmentation or duplication of services within health systems becomes untenable. A growing global trend towards integrating health systems aims to leverage all available health resources to tackle this challenge.

Objectives: To synthesise the key components of health system integration within theories, models, and frameworks published in the scientific literature and adapt them to community pharmacy (CP) and primary healthcare (PHC) integration context.

Methods: A scoping review was conducted to identify the theories, models, and frameworks utilised in health systems integration from 2013 to 2022. The review used Medline, Cochrane Library, Web of Science, Scopus, and Scopus databases. Evans and colleagues' review of the different strategies used in health systems integration served as a starting point for the review. Then, a qualitative content

analysis of the selected publications was performed using an amended method described by Levac D.

Results: Two theories, fifteen models, and nine frameworks for health systems integration were identified. Eleven key components, with different frequencies, were identified from these theories, models and frameworks, including stakeholder management (n=22); adequate funding (n=20); connectivity (n=20); roles (n=19); governance (n=19), communication (n=19) and shared vision, values, goals and trust (n=19); context (n=16); culture (n=16); community engagement (n=15); co-location (n=10). Stakeholder management was the most frequent component, including important stakeholders' management and participation. Adequate funding and connectivity were also highly emphasised, comprising financial drivers and information exchange through a common technological system. Co-location was the least emphasised component in health system strategies, referring to physical proximity between providers or workplace sharing.

Conclusions: Health systems integration is a complex, multi-component process that requires policymakers and professionals to understand the essential factors for its success. Identifying eleven key components constitutes a useful starting point for this purpose. It is necessary to consider healthcare systems' social and political dimensions and engage healthcare professionals to promote professional engagement and create trust. These findings reveal that adequate funding is crucial but may be challenging to obtain in CP and PHC. It may be important for CP to be part of the system's governance and to define and understand the roles of different healthcare professionals. Furthermore, only ten studies mentioned co-location, which allows pharmacies to be located outside the PHC centres. Finally, contextual factors will determine the importance assigned to each component and guide the selection of the most appropriate model according to national health needs.

Potential of pharmaceutical consultation regarding the prevention of drug intoxication in the female population over 51 years

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Introduction: Drugs are the second cause of intoxication-related mortality and the first in intoxication records. Additionally, the years of life that could be lost due to drug intoxication point to significant social and financial costs. A

pharmacist is a healthcare professional with a major role in counselling patients because of having all information about overall therapy. Their role is to control appropriate adherence and rational drug use, raising awareness about side effects and all risks during misuse. Proper education of patients can be crucial in preventing unintentional intoxication.

Objectives: To characterise intoxication patterns and identify drugs most commonly detected, especially in females older than 51 years, which are the predominant category in drug intoxication, according to different studies and confirmed by the results.

Methods: The study was conducted in Nis, southeast Serbia, with a population of about 2 million. Retrospective data on intoxication cases were collected from the medical records section of the Toxicological Laboratory of the Institute of Forensic Medicine in Nis from March 2020 to March 2022. Results were statistically evaluated using SPSS 20.

Results: Of all analysed samples (320 cases), 20.96% of drug intoxications were observed in females older than 50. After case stratification into four age categories (51–60, 61–70, 71–81, and over 81), female predominance in all age categories was reported, with a female-to-male ratio of 2:1. Age categories ranging from 51 to 60 had the highest incidence (42.22%), followed by those between 61 and 70 (33.33%). Multidrug intoxications were reported in 80% of cases, with psychotropic drug intoxications at 37.78%. Regarding therapeutic classes, the most frequently detected drug classes in intoxication were sedatives (32.67%), followed by drugs for cardiovascular diseases (15.84%), antiepileptics (13.86%), and antidepressants (11.88%). Bromazepam and diazepam were detected in 13.86% and 10.89% of all cases, respectively. In all cases of ethanol intoxication, benzodiazepines were also identified. Most of these cases were unintentional poisoning with a high survival percentage.

Conclusions: The results draw attention to women's mental health. Women over 51 should be the target group for raising awareness about proper drug use. Drug responses in the middle-aged and elderly differ from those in younger people due to pharmacokinetic and pharmacodynamic alterations associated with the physiological changes of ageing. Also, poly psychotropic drug intoxications can lead to synergistic and additive pharmacodynamic interactions, resulting in depression of the CNS and an eventual lethal outcome. As the most approachable healthcare professional, the pharmacist should be more involved in reconsidering psychotropic drug prescriptions and their dose regimen and identifying misuse and abuse during drug dispensing. The potential usefulness of structured counselling and education in the case of patients undergoing psychopharmacotherapy is high, which imply the need for new pharmaceutical service. These results identify community pharmacies as the right place for education and therapy monitoring and give a place to the pharmacist as a healthcare professional capable of identifying drug misuse and abuse.

Medication review type 3: Experiences of general practitioners

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Introduction: General practitioners (GPs) are important stakeholders in medication review type 3 (MR3), and their experiences and opinions about this service can impact its implementation.

Objectives: To collect opinions from GPs to inform the further implementation of MR3.

Methods: Qualitative study through semi-structured in-depth interviews of GPs with 13 main questions supplemented by sub-questions. Interviews were transcribed and coded using NVivo 12.

Results: Through purposive sampling, 42 GPs were invited for an in-depth interview. Sixteen effectively participated (38%, age 25–76 years) between October and November 2022. The interview took place at the GPs' practice or online and lasted 25 minutes on average. Data saturation occurred during the last interviews, and further recruitment was halted. A very broad spectrum of opinions was documented. Current collaboration with pharmacists was considered good by the clear majority of GPs. Contact with pharmacists was better in rural than in urban settings. The GPs experienced pharmacists as an additional check of their prescribing. The majority supported MR3 and also perceived this as a benefit for the patient by optimising pharmaceutical care. In addition, face-to-face consultation improved interprofessional collaboration, motivating GPs to participate. Time constraints were cited as a barrier, but also issues such as differences in academic training between GPs and pharmacists: GPs thought pharmacists were more textbook-oriented, while the GPs were more practice-oriented. Other barriers mentioned were not being informed about what MR3 entailed, the modalities in sharing patient data, the commercial nature of certain pharmacies and not remunerating GPs for their cooperation.

Conclusions: The qualitative research approach yielded a wide diversity of GPs' opinions that will be useful to inform the further implementation process of MR3.

Implementation of the medication use review service in a community pharmacy: An open door to other pharmaceutical services

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Introduction: The Medication use review (MUR) is a promising service for optimising medication management by patients, making it possible to identify and solve problems related to medication use and refer the patient to other pharmaceutical services.

Objectives: This work aimed to implement the MUR service in a community pharmacy.

Methods: This was an intervention study on 100 community pharmacy patients approved by the Ethics Committee of the Faculty of Medicine of the University of Coimbra (CE-038/2022). Adult individuals who were autonomous in managing their medication were invited to participate if the individuals met at least one of the following requirements: use of a medical device; recent initiation of a new therapy; polypharmacy (≥ 5); signs of non-adherence to therapy; difficulty in managing therapy. After checking the medication bag, a semi-structured interview was carried out, following a MUR protocol. The questionnaire beliefs about medicines questionnaire (BMQ) and therapy adherence measure (MAT) were applied. The data obtained were statistically analysed using Excel.

Results: The average age of participants was 59.1 \pm 11.5 years; 60 women and 61 were under polypharmacy.

The mean BMQ score on the Needs subscale was 21.1 \pm 2.39 (max. 25), and on the Concerns subscale was 15.2 \pm 3.07 (max. 30). The mean MAT score was 33.82 \pm 3.86 (max. 42).

In total, 495 medicines were reviewed, of which only 453 were used. Of the participants, 53 did not take at least one medication as prescribed, and 62 did not know the purpose of at least one of the medications they were taking.

During MUR, the purpose of the various medications was explained, and to 4 patients, the functioning of their medical devices was clarified. A total of six duplications were detected, and one adverse drug reaction was reported.

Sixteen patients were referred to the medication education service, 54 to medication review and 13 to individualised medication preparation.

Conclusions: The MUR, associated with assessing adherence to therapy and the patient's beliefs toward medications, is an easy-to-implement service in community pharmacies, which allows for identifying potential medication errors and intervening early to optimise health outcomes directly or referring to other pharmaceutical services.

Community pharmacy-based hypertension screening: May measurement month in Canada

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Introduction: Elevated blood pressure (BP) is the largest contributing risk factor for global death and the global burden of disease. This impact is largely due to increased cardiovascular (CV) disease rates, specifically coronary artery disease, heart failure, stroke, and renal disease. CV disease affects one-third of adults globally. However, approximately 50% of individuals with hypertension are unaware of having the condition. In reviewing this evidence, a reduction in CV morbidity and mortality is possible through increased hypertension awareness with enhanced screening. May measurement month (MMM) is a global blood pressure screening awareness campaign led by the International Society of Hypertension since 2017. In Canada, MMM participation has previously involved physicians and nurses but has never been completed in community pharmacies.

Objectives: To develop and evaluate the effect of a community pharmacy-based hypertension screening programme as part of MMM 2023 to guide the future scale-up of a national community pharmacy-based screening programme for MMM 2024.

Methods: MMM23 is a global multi-centre prospective cross-sectional study with 90 participating countries. Any adult aged ≥ 18 who provides informed consent can participate. In Canadian community pharmacies, participants (n=1000) will be screened for raised BP using an automated electronic BP monitor recommended by Hypertension Canada and an appropriate BP cuff size. The screening will occur from May to July 2023. Data collection will occur in pharmacies (n=30) across Alberta and Newfoundland, Canada. Pharmacy employees, including pharmacists, pharmacy students, and pharmacy technicians, will screen participants using proper BP measurement techniques; three BP readings will be recorded for each participant. Data will be collected, with no

personally identifiable information, and analysed using descriptive statistics, including mean (SD) and proportions, as appropriate. The analysis will include the proportion of participants with previously undiagnosed hypertension, age and sex-stratified and standardised levels of systolic, diastolic, and BP variability, the proportion of participants with uncontrolled hypertension among those with a previous diagnosis of hypertension, and the association between BP parameters and other factors such as smoking.

Results: MMM2 2023 in Canadian community pharmacies will occur from May to July 2023 and is currently being implemented.

Conclusions: To the authors' knowledge, no other countries participating in MMM 2023 are utilising the accessibility of community pharmacies or the therapeutic knowledge of pharmacists for data collection. Community pharmacy involvement can potentially improve the detection of elevated blood pressure and highlight the role pharmacists could play in hypertension management.

The role of herbal medicines: A survey exploring pharmacist's perceptions across the UK

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Introduction: Pharmacists have a key role to play in optimising patient care. As the use of Herbal Medicines (HM), are on the rise, it is important that Pharmacists have knowledge of them, to help patients make informed treatment decisions. One of the WHO Traditional Medicine (TM) strategy goals are to promote the safe and effective use of HM by increasing the knowledge base so that practitioners and consumers can make rational and therapeutic decisions.

Objectives: The aim of the study was to explore UK based Pharmacist's personal and professional views on HM.

Methods: An online questionnaire was distributed via various professional networks employing a snowball sampling technique to recruit Pharmacists from diverse sectors across the UK. The results were analysed via SPSS and NVivo software.

Results: A total of 340 Pharmacists responses were analysed, most of the respondents were Community Pharmacists (45.3%) Hospital Pharmacists (24.8%) and GP practice & Primary care Pharmacists (15%).

Most of the patient queries received by Pharmacists regarding HM were on their efficacy, interactions, and adverse drug reactions. 48.9% of the Pharmacist's did not know where to access evidence-based information on HM from. 48.2% of Pharmacists had received some training on HM as part of their degree however 82% of Pharmacists identified insufficient education and training on HM which made them unable to advise patients on the safe and effective use of HMs.

Pharmacists (42.5%) who used HM for their own health found them to be effective (66.6%): the most frequently used HMs by Pharmacists were Echinacea, St John's wort and Turmeric. However, there was some uncertainty around what Herbal, Homeopathic and Nutritional supplements were amongst Pharmacists.

Conclusions: Pharmacists have little knowledge of HM due to their limited training therefore there is a need to review the current HM training provision for Pharmacists and make improvements to facilitate informed consultations as Pharmacists have an important role to play in medicines management and Pharmacovigilance in regard to HM.

Pharmacy and Pharm.D. degrees in Jordan: A cross-sectional study comparing employment rates, income, and job satisfaction

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Introduction: Pharmacy is a well-respected career worldwide, and its graduates have various work opportunities. Therefore, it became a highly enrolled university major and a competitive market field. Currently, 16 universities in Jordan offer pharmacy education.

Objectives: This study assesses employment rates, income, and job satisfaction among Jordanian pharmacy graduates and compares those outcomes between Pharmacists and Pharm.D.

Methods: This multi-centre cross-sectional study uses an online questionnaire distributed through social media

platforms targeting Jordanian Pharmaceutical Association (JPA) members. The questionnaire included a section for demographic characteristics, a section to assess employment, and a section to assess job satisfaction. The minimum sample needed was 378 Pharmacists and 323 Pharm.D., and analysis was conducted using SPSS version 26.0.

Results: Among 693 participating graduates from pharmacy schools in Jordan, about half were Pharmacists, and the remaining were Pharm.D. A significant difference was found in the time needed to find the first job when comparing Pharmacists and Pharm.D., which were 4.64, and 7.49 months, respectively (p -value= 0.002). Salary gained from the first job was significantly higher among pharmacists (634 USD/month) compared to Pharm.D. (558 USD/month) (p -value= 0.004). Pharm.D. were significantly higher in reporting that they are not working in their major (66%) (p -value = < 0.001). The Job Satisfaction Scale (JSS) score showed no significant difference between the two majors (total mean score= 126.9), reflecting an ambivalent total satisfaction. There was no significant difference in terms of time to find the first job and monthly salary when having a postgraduate degree, having more than two languages, and having advanced English language skills. Most pharmacy graduates work as community pharmacists (26%), followed by clinical pharmacists, hospital pharmacists, and medical representatives (12.6%), (12%), and (11%); respectively.

Conclusions: Although pharmacists study for five years compared to the six-year Pharm.D. programme, pharmacists are significantly faster to get a job than Pharm.D. and more likely to get a higher salary. No significant difference in JSS score between both majors is found, and the mean job satisfaction for all pharmacy graduates in Jordan is ambivalent. Having a postgraduate degree, earning a third language, and having a better English language did not enhance graduates' opportunities to get a job or to increase their salary. More research is needed to unveil strategies for enhancing pharmacists' and Pharm. D.'s employment and job satisfaction.

CONFERENCE ABSTRACTS

FIP Pharmacy Practice Research summer meeting for PhD students, postdoctoral fellows and supervisors conference abstracts 2023

Hosted by the FIP Pharmacy Practice Research Special Interest Group (PPR SIG) and the University of Granada

Poster presentations

Patients' experience with home parenteral therapy: Results from a qualitative study

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Introduction: Patients are increasingly being sent home with parenteral (injectable) therapy to continue for an extended period or lifelong. A literature review showed a lack of research into patients' preparation and training on injectable medications outside of the hospital setting, its impact on their experience with therapy, and their health outcomes. Some evidence suggests that the patients might achieve competence with their home parenteral therapy but may not achieve confidence. Providing continuous access to advice can boost confidence, but patients' information needs of not always met. Poor communication can leave patients lacking the knowledge and confidence needed to be competent collaborators in their care and affect their perceptions of the service, even with positive health outcomes. Medical decisions are delegated to non-medically trained individuals when patients can be treated at home. New home care patients are often overwhelmed during the first few days following discharge home. Early studies focused on the clinical outcomes and complications of the treatment rather than the patient experience. Home parenteral therapy (HPT) effect on quality of life has been studied globally in the United States of America, Australia, Canada, and Japan but not in the United Kingdom (UK).

Objectives: To explore if patients' experience with self-management and HPT matches the expectation of the healthcare professionals who requested it, intending to develop a better patient education programme on HPT and suggest strategies and guidelines for improving homecare service in the UK.

Methods: A qualitative study was conducted using a semi-structured phone interview with 45 consented patients identified as being on HPT for various medical issues (multiple sclerosis, atopic dermatitis, inflammatory bowel disease, psoriasis, high cholesterol and intestinal failure). Audio recordings were transcribed verbatim, anonymised and managed using NVivo software. Data were explored using an inductive thematic analysis approach to identify key themes relating to patients' experiences and perceptions of the strengths and challenges of HPT.

Results: Patients reported various strengths and positive experiences with HPT while identifying several challenges. Specific challenges included: perceived lack of support, guidance, training, reassurance, and follow-up; concerns about injecting the drug (fear of injections, concerns about side effects, injection site problems, troubleshooting); problems with travelling and special storage requirements; challenges with access to information; scepticism towards treatment options; problems with home deliveries or supply; and various communication issues.

Conclusions: The qualitative information gathered from the patient interviews identified areas of improvement and will be used to create an HPT training package concept and to suggest strategies for improving homecare service in the UK.

Independent pharmacist prescriber intervention to improve type 2 diabetes patients' outcomes

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Introduction: In the UK, 4.9 million people have type 2 diabetes mellitus (T2DM), costing the NHS £10 billion annually. In England, one in six people (17.0%) has experienced depression or anxiety in the past 12 months. T2DM is managed by pharmacological therapy and lifestyle adjustment.

Objectives: This study aimed to explore if there is a relationship between depression, anxiety and poor medication adherence in patients diagnosed with T2DM. This was a pilot, single-site, observational study of patients with T2DM (n=64) randomly assigned into group A (three consultations) or group B (two consultations). All initial consultations were in-person, while follow-ups were by telephone. The measurable outcomes were changes in HbA1c, BP, and self-reported well-being. Thematic and comparative analysis was conducted by groups and demographic variables using paired sample *t*-test and statistical regression.

Methods: A scoping study was also carried out to identify gaps in the current literature and understand the T2DM and MIH comorbidity trends in the local population from the West Midlands, UK, to inform future studies. The reviewed studies reported a relationship between T2DM control and depression and anxiety but disagreed on its significance. The clinical audit of 71 patients diagnosed with T2DM showed that 73% of males presented with poor diabetes control (HbA1c > 7) compared to females (46%). Conversely, females exhibited a higher prevalence of MIH (45%) than males (31%).

Results: The overall study showed that BP readings were unchanged but remained in the recommended range for both groups, under 130/82 mmHg. Based on the manual thematic coding, there were three possible phenomena (high self-care efficacy and favourable disease prognosis [F=7 & M=4], high self-care efficacy and poor disease prognosis [F = 15 & M = 11] and poor self-care efficacy and poor disease prognosis [F=12 & M=11]) and one phenomenon was not proven due to the small sample size and possible patients self-reporting bias (poor self-care efficacy and favourable disease prognosis [F=1 & M=3]). More frequent interventions were advantageous.

Conclusions: Two prototype T2DM management algorithms were created, which were generic and tailored to patients from Pakistani and Bangladeshi backgrounds. These were adopted in the study site and were provided to the HRA in the final ethics report for NHS use in wider primary care. Other ethnicities and chronic conditions could be similarly investigated.

Reducing medication errors in Kuwaiti government hospitals through pharmacovigilance

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Introduction: Medication error reduction has been a focus of pharmacy practice research to improve patient safety, reduce unnecessary hospital admissions and emergency department visits.

Objectives: This study aimed to investigate the extent of medication errors, the adequacy of healthcare professionals' (HCPs) awareness of their significance on patients' outcomes, medication error prevention and their attitude towards error reporting in six government hospitals to inform the development of a framework for an electronic medication error reporting system to support future practice and training.

Methods: This research design contained qualitative and quantitative aspects. The study was conducted over four phases:

- Phase 1: Medical records, medications errors, system records audit
- Phase 2: HCPs observation study
- Phase 3: HCPs interviews
- Phase 4: Developing a medication error reporting and recording system for use in Kuwaiti public hospitals and effective training on reducing medication errors shared by doctors, pharmacists and nurses.

Results: The study found that pharmacists made the lowest number of medication errors (30%) compared to errors made in the processes of prescribing (44%) and administration (21%). Drug-drug interaction errors were most prevalent in the incident reports at 39%. Notably, (60%) of the pharmacists indicated that they do not double-check the medication dispensed before handing them to the patient. Of the pharmacists interviewed (39%) stated that they double-checked the prescribed medication and found that the most common errors were; wrong dose (16%), sound-a-like medication (16%) and controlled (12%) vs immediate release medications (29%). Medication errors are unintentional. This study found that interdisciplinary staff training was lacking, and clinical vigilance must be strategically enhanced at all points of the medication management process (prescribing, dispensing and administration).

Conclusions: The research findings support the strategic objective of reducing the likelihood and severity of medication errors through appropriate and effective clinical vigilance processes that mitigate risk in the long term against medication errors.

The role of antibiotics in preventing infection and its complications in dental surgical procedures

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Introduction: Antibiotic prescribing practices in dental procedures vary widely, including the type of antibiotic, route of administration, timing, and course length.

Objectives: This study aimed to determine the scientific evidence to support the use of antibiotics in reducing postoperative infections after third molar extraction (M3) and dental implant placement (DIP).

Methods: The study used two main designs: a systematic review and meta-analysis of randomised controlled clinical trials and a survey of practising dental professionals to determine their actual practice and opinions relating to antibiotic use.

Results: The results of the study showed that the use of prophylactic antibiotics was statistically significant in preventing infection in both M3 extraction ($p < 0.001$) and DIP ($p < 0.001$) procedures. However, the prevention of other complications, such as dry sockets, was not statistically significant in either procedure (M3 extraction: $p = 0.34$; DIP: $p = 0.96$), and the NNT was larger than 5 in both cases (M3 extraction: 17 and DIP: 14), which suggests that the intervention was not sufficiently effective to justify its routine use.

Antibiotic adverse effects were insignificant in M3 extraction ($p = 0.88$) or DIP ($p = 0.63$) procedures. The NNH for M3 extraction was 55, while for DIP, it was 528. This suggests that while antibiotics may pose a small risk of harm, it is not significant enough to outweigh the potential benefits of using antibiotics when necessary.

The survey of dental professionals revealed that 42% of respondents discouraged the prophylactic use of antibiotics in M3 extractions for patients without systemic conditions, preferring to use antibiotics postoperatively when required. However, 57.9% of respondents supported the short-term use of antibiotics (5–7 days) in M3 extraction and 53% in DIP placement for patients without a relevant medical history.

Additionally, dentists reported the negative impact of heavy smoking and oral parafunctional behaviour on DIP success.

Based on the calculated NNT, using prophylactic antibiotics to prevent infection in M3 extraction and DIP interventions was insufficient to justify its routine use in patients without underlying medical conditions. This conclusion aligns with the fourth European Association for Osseointegration Consensus in 2015. The study suggests that clear clinical assessment pathways are necessary to prevent the unnecessary use of antibiotics, considering the patient's dental risk factors, physical risk factors, other health determinants, and demographics. Furthermore, future research comparing patients with and without underlying medical conditions is necessary, and a standardised dental infection clinical trial design and protocol are required to improve the quality of research and to unify reporting to allow better future systematic reviews.

Conclusions: This study recommends clear clinical assessment pathways to prevent the unnecessary use of antibiotics in dental procedures. The study provides valuable insights into the use of prophylactic antibiotics and highlights the need for evidence-based practice in this area. This study provides a more informed conclusion and recommendations by combining a systematic review, meta-analysis, and a survey of dentists' practice opinions.

The use of antipsychotic drugs for the treatment of psychosis in patients diagnosed with schizophrenia

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Methods: A rigorous comparative analysis of antipsychotics used for treating schizophrenia was conducted to determine their relative efficacy, risk of all-cause discontinuations, reasons for discontinuation and potential side effects. A systematic review was developed following PRISMA-P guidelines, the RevMan statistical analysis tool and the Effective Public Health Practice Project (EPHPP) methodological rating tool to assess the quality of included studies. The primary outcome of interest was the difference in overall clinical efficacy between various antipsychotic medications. Then a survey of psychiatrists from the UK and India was conducted to understand their opinions regarding their choice of antipsychotic medications, their experience with tolerance and efficacy in managing psychosis. The survey was open for three months, from 26 April 2022 to 31 July 2022.

Results: Aripiprazole was found to have significantly fewer long-term side effects than ziprasidone ($p = 0.008$, NNH=27, RR=0.84, CI=0.74-0.96) and quetiapine ($p = 0.009$, NNH=38, RR=0.79, CI=0.66-0.94). Quetiapine was found to have a significant advantage over ziprasidone in long-term treatment-emergent akathisia ($p = 0.005$, NNH=7, RR=1.87, CI=1.21–2.90). The long-term treatment of akathisia between olanzapine and haloperidol showed significant differences, with haloperidol being significantly favoured in weight gain ($p < 0.00001$, NNH=4, RR=1.56, CI=1.31–1.86), and olanzapine being significantly favoured in treatment akathisia ($p = 0.002$, NNH=6, RR=3.09, CI=1.49–6.39). Moreover, the forest plot outcomes for treatment akathisia showed a significant advantage of quetiapine over haloperidol ($p = 0.02$, NNH = 8, RR=1.80, CI=1.08–3). Additionally, weight gain was significantly better in ziprasidone than against both haloperidol ($p = 0.04$, NNH=6, RR=1.45, CI=1.03–2.04) and olanzapine ($p < 0.00001$, NNH=2, RR=2.27, CI=1.69–3.03) in long-term analysis. In the long-term analysis, olanzapine ($p = 0.001$, NNT=17, RR=0.67, CI (0.53–0.85)) and ziprasidone ($p = 0.003$, NNT=17, RR=1.47, CI=1.14–1.90) were found to have significantly lower discontinuation rates than haloperidol, with longer time to discontinuation.

The survey showed that Olanzapine, Risperidone, and Aripiprazole remain popular antipsychotic medications in India and the UK. The primary consideration for prescribing, switching, or adding a second antipsychotic was efficacy, and psychiatrists preferred adding a second medication after 4–6 weeks (28.4%) or 3–6 months (24.2%). Illicit drug use was the main cause of relapse among patients who had discontinued antipsychotics. Non-adherence to treatment was also identified as the main challenge in treating psychosis, using long-acting injectable (LAI) formulations of antipsychotics preferred over oral formulations. Indian psychiatrists reported greater acceptance of LAIs among patients (57%) than their UK counterparts (36%). Non-adherence was the leading cause of hospitalisation, and illicit drug use was the primary cause of relapse. Weight gain was the most commonly reported troublesome side effect causing poor adherence. Psychiatrists also reported weight gain as the most common reason for switching antipsychotic medications and the most common side effect leading them to seek termination of treatment patients.

Conclusions: The analysis revealed more pronounced variations relating to side effects compared to efficacy. The findings have important implications for selecting and managing antipsychotic treatment for individuals with psychiatric disorders and inform the development of tailored treatment plans for patients, optimising their overall treatment outcomes.

Study of the quality of sleep and pharmaceutical care for insomnia in representatives of the educational environment of the pharmaceutical field

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Introduction: Full-quality sleep is one of the main conditions for proper working capacity, learning and mastering new skills, and readiness to fulfil one's obligations and interact with others effectively.

Sleep disorders in pharmacists are closely related to several diseases that are professional and today are aggravated by factors caused by the state of war, the ongoing COVID-19 pandemic, the rapid development of information technologies, and an unfavourable social situation, which add nervous tension to work.

Objectives: To diagnose and treat sleep disorders among representatives of the pharmaceutical academic community.

Methods: The survey was conducted in an online format (the electronic version was created using Google Forms) in February–March 2023. A total of 378 questionnaires were received.

Results: A survey of students, interns, and teachers of pharmaceutical higher educational institutions showed that over the past year (complicated circumstances caused by the war in Ukraine), 63% of respondents had clearly defined sleep problems. However, only 36% turned to a doctor or pharmacist to improve sleep. When the quality of the pharmaceutical care was determined during the purchase of sleeping pills at the pharmacy, in half of the cases, the pharmacist found out how problematic the process of falling asleep is and how often the patient wakes up at night; inquired about consultation with a doctor; have you taken sleeping pills before and which one.

In less than one-third, the pharmacist asked about medications (hormones, antibiotics, etc.) the patient was taking and warned about the need to take a break from sleeping pills.

In addition, it was determined that in 22% of the cases of interaction with the pharmacist, there was a patient request for a stronger "sleeping pill" (prescription). Among them, 30% of patients received the specified drugs, as the pharmacist was their acquaintance, which is a violation of pharmacists' protocols.

It was established that sleep problems occur most often and are related to the sex of the respondents (women suffer more often). A significant difference between the age groups of the

population with sleep problems was revealed—respondents under 25 often sleep badly.

Ukrainians living in the occupied territory have constant problems with sleep; respondents who are in the front-line zone and the rear zone more often than other respondents who are abroad experience problems with sleep all the time. The obtained statistically significant difference can be directly related to wartime circumstances.

Conclusion: Diagnosis of the factors that determine the scenario in which acute insomnia will develop will prevent this disorder's chronicity. This personalised treatment approach will reduce insomnia's prevalence and economic burden.

Knowledge, attitude and practice towards diabetes mellitus among diabetic patients in the federal territory of Labuan, Malaysia

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Introduction: Diabetes is a large and growing global epidemic year after year. The prevalence of type 2 diabetes mellitus (T2DM) is increasing in Malaysia, but diabetes patients still lack knowledge and have poor attitudes toward diabetes with compliance issues towards T2DM treatment. Diabetes knowledge, attitude, and practice (KAP) are important in diabetes management.

Objectives: To assess the level of knowledge, attitude, and practice toward diabetes mellitus among diabetic patients in Labuan Federal Territory, Malaysia. To determine the association between patients' knowledge about T2DM and patients' attitude toward T2DM, patients' knowledge about DM and T2DM practices, patients' attitude toward T2DM and T2DM practices, patients' KAP and the socio-demographics among diabetic patients.

Methods: This research is a cross-sectional study conducted from November 2021 to January 2022 in the Health Clinic of Labuan Federal Territory, whereby 121 eligible T2DM patients who are regularly receiving treatment here were recruited via convenience sampling method to answer a validated self-administered KAP questionnaire.

Results: Significant moderate correlation was observed between knowledge and attitude ($r = 0.454$; $p < 0.001$), knowledge and practice ($r = 0.463$; $p < 0.001$) and attitude and practice ($r = 0.402$; $p < 0.001$). In addition, knowledge,

attitude and practice towards DM are significantly associated with other variables such as educational level, monthly income, attended DM programme and occupation.

Conclusions: T2DM patients in Labuan need better knowledge towards T2DM, poor attitude towards T2DM and good T2DM practice. To implement activities, programmes or diabetes education suited to the local setting/culture to empower diabetes patients with adequate knowledge. More studies need to be done to determine other factors that affect the attitude and practice of diabetes mellitus.

Implementation of a therapeutic drug monitoring service for patients with bipolar disorder in a psychiatric hospital in Algeria

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Introduction: Therapeutic drug monitoring (TDM) services have positively impacted patient outcomes. TDM aims to use appropriate difficulty concentrations to manage medication and optimise individual dosage regimens. Lithium carbonate is considered the gold standard treatment for bipolar disorder, yet it is unavailable in many low and middle-income countries such as Algeria. In this context, valproic acid (VA) and carbamazepine (CBZ) are the mood stabilisers of choice to treat bipolar disorder. Regular monitoring of plasma levels is important as these drugs have marked pharmacokinetic variability.

Objectives: This study aimed to conduct TDM for bipolar patients treated with VA or CBZ to identify any concentration abnormality. When necessary, pharmacists proposed dosage adjustments to achieve appropriate and effective treatment. The effectiveness of those interventions was evaluated to determine if the implementation of the TDM service improved clinical outcomes and medication safety.

Methods: TDM services were implemented in the Psychiatric Hospital of Tlemcen, Algeria, from November 2019 to March 2020. A multidisciplinary team comprised of psychiatrists, nurses, laboratory technicians, and pharmacists. Implementation strategies and barriers to the TDM service were recorded during monthly meetings. Pharmacists selected patients eligible for TDM. If an abnormality of plasma concentration was identified, the laboratory informed the pharmacists who analysed patients' reactions to drugs and advised doctors on suitable treatment adjustments. Pharmacists' interventions and doctors' responses were documented, and patients' outcomes focused especially on adherence and safety.

Results: Fifty-three patients were included in this study. Almost half (47%) of drug blood concentration figures were deemed inferior to the recommendations for optimal treatment outcomes. No patient showed concentrations above the norms. No linear correlation was found between concentrations and dosage administered, which confirms the importance of TDM for AV and CBZ. Pharmacists proposed dosage adjustment when concentrations were below recommended ranges and patient education and counselling when concentrations suggested poor adherence; physicians accepted 29% of recommendations. Seven of eight accepted pharmacists' interventions helped achieve optimal drug concentration and clinical outcomes. Barriers faced during the implementation of the TDM service included patients' unwillingness to collaborate, challenges regarding interprofessional collaboration, and physician resistance to interventions.

Conclusions: TDM is a useful tool to ensure good patient outcomes. By providing clinical pharmacokinetics data to pharmacists, they can advise doctors on suitable prescriptions and easily detect non-adherent patients. For best results, good multidisciplinary collaboration is fundamental. Strategies and challenges presented in this study can be used to implement similar services in other limited-resource environments. TDM can be recommended for bipolar patients treated by VA or CBZ.

Quantitative evaluation of essential medicine list for children: The Albanian case study

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Introduction: Essential medicines are central to achieving universal health coverage (UHC), which ensures that all people have access to health services, including essential medicines, without risking financial hardships. There is, however, a global paucity of age-appropriate formulations of paediatric medicines to treat and prevent various conditions, especially in low- and middle-income countries. As a result, there is a major gap in the author's understanding of the accessibility of medicines for children. As a global action to improve access to child-specific medicines, the WHO Essential Medicines List for Children (EMLc) was released on the 30th anniversary of the general EML in 2007 to recognise special

needs for medicines in children and to promote the inclusion of paediatric medicines in national procurement programmes.

Objectives: This study aimed to investigate the alignment of the medicines on the WHO Essential Medicines List for Children (EMLc) list (2021) and the medicines included in the Albanian reimbursement drugs list of the Mandatory Healthcare Insurance Fund (MHIF).

Methods: WHO EMLc 8th list 2021 (n=471) was compared with the medicines (n=1166) in the list of reimbursed drugs from the MHIF of the year 2022. A quantitative evaluation was performed to compare the paediatric medicines included in the MHIF list of Albania against the medicines on the Essential Medicines List for Children (EMLc-WHO).

Results: A total of 284 medicines were found on both lists. Among these, 137 (48.2%) medicines in the MHIF list had the same dosage form, strength and indication as in the WHO EMLc. The EMLc categories mostly present in the MHIF list were the Medicines for Mental and Behavioural Disorders 100% and 75% of Cardiovascular medicines. Of the 24 vaccines listed on the EMLc, 14 are a part of the Albanian National Immunization Programme and the Seasonal Influenza Immunization Programme, despite not being included in the MHIF list of medicines.

Conclusions: This is the first study in Albania to investigate the alignment of the WHO EMLc and MHIF list. The results provide insight as to the areas in which there are similarities in both lists in ensuring access to medicines for children in Albania, as recommended by the WHO EMLc.

A study on drug utilisation evaluation of bronchodilators using a defined daily dose method

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Introduction: Drug therapy is crucial to promoting human health by increasing the quality of life and extending lifespan. A drug utilisation study is a method to assess and improve drug use. The defined daily dose (DDD) concept is a drug quantification approach. Drug utilisation, in terms of DDD, aids in converting the available volume of medications into medically relevant units, allowing estimations of the number of people exposed to a certain medicine or class of medicines. The unit DDD per 100 bed-days in a hospital context indicates the proportion of inpatients who may receive a DDD. It is a reasonably simple and affordable approach for comparing medications in the same therapeutic class. DDD in

bronchodilators assists in discovering the consumption of prescribed drugs and analysing the drug usage pattern. As the national burden of respiratory disease rises, so does the use of medications such as bronchodilators in hospitalised patients. Such research aided in the effective management of bronchodilators in the ward.

Objectives: This study aimed to assess the drug utilisation of broncho-dilating agents prescribed to patients admitted to the General Medicine ward.

Methods: A prospective observation study was conducted six months in ESIC MC-PGIMSIR, Rajajinagar, Bengaluru. A total of 216 in-patients from the General Medicine ward who were prescribed broncho-dilating agents were included in the study. Patients' case sheets were collected, and data were entered in a self-designed data collection form. These data were entered into the MS Excel sheet. Drugs were classified according to ATC classification, and consumption of broncho-dilating agents was calculated in terms of DDD & DDD/100 bed days, and descriptive statistical analysis was performed.

Results: During the study period, 216 patients were enrolled and had an average length of 9.90 hospital stay days. The highly utilised bronchodilator during the study period in the general medicine ward was theophylline with 469.54 DDD/100 bed days, and its PDD:DDD was 4.35. The current study found that the total consumption of broncho-dilating agents in the general medicine ward was 2696.35 DDD; and 872.91 in terms of DDD/100 bed days.

Conclusions: This study concludes that the most common reason for admission was respiratory system-related complaints, and the most commonly prescribed bronchodilators were ipratropium bromide and salbutamol in a fixed-dose combination. The study found that bronchodilators were mostly prescribed as combination therapy, with 87.36% of prescriptions comprising combination therapy. The study population had a high prevalence of hypertension and diabetes mellitus, with 36.57% and 33.80% of patients, respectively, being known cases. The study also found that the number of smokers and alcoholics was higher than non-smokers and non-alcoholics. Bronchodilators in a general medicine ward were classified using ATC classification. Theophylline was the most utilised bronchodilator, with 469.54 DDD/100-bed days. Total consumption was 2696.35 DDD and 872.91 DDD/100 bed days, indicating 872.91% of in-patients received 1 DDD of bronchodilator on average daily. Methylxanthines were over-utilised with a PDD:DDD ratio of 4.35 and 3.26 for theophylline and etofylline tablets, respectively.

A study on drug utilisation evaluation of antihypertensive drugs using a defined daily dose method

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Introduction: The defined daily dose (DDD) concept is a method for quantifying a drug. Drug use in terms of DDD aids in converting the number of pharmaceuticals readily available into medically significant units and estimating the number of people exposed to a specific drug or class of drugs. In a hospital setting, the unit DDD per 100-bed days suggests the proportion of inpatients that may receive a DDD. It is a rather simple and affordable procedure that aids in comparing medications belonging to the same therapeutic class. DDD in anti-hypertensive medications helps track prescription drug usage and examine drug usage trends. Anti-hypertensive medications with DDD help identify prescription drug intake and examine drug usage trends.

Objectives: This study's objective was to evaluate how often patients hospitalised in the general medicine ward took the antihypertensive medications that were recommended to them.

Methods: A 6-month prospective and observational study was conducted in Rajajinagar, Bengaluru, at the ESIC MC-PGIMSIR. The study analysed 8519 prescriptions of antihypertensive agents from 285 patients in the in-patient department of the General Medicine ward at ESIC Medical College, PGIMSIR & Model Hospital, Rajajinagar, Bengaluru. Data were entered into a self-designed data collection form using patient case sheets that were gathered. Data was entered into an MS-Excel spreadsheet, medications were categorised using the ATC classification, antihypertensive drug consumption was determined using DDD and DDD/100 bed days, and descriptive statistical analysis was carried out.

Results: Most patients were males (62.46%) aged 50–59 (27.72%). Smoking and alcohol use were observed in 20% and 28% of patients. Hypertension (53.68%) was the patients' most common past medical condition, and diuretics were the most commonly prescribed antihypertensive agents. The average hospital stay was 9.75 days, with most patients (63.86%) staying there for 1–10 days. The most common complaints for hospital admission were cough and expectoration (71) and body and peripheral swelling (53). Furosemide and Spironolactone were the most commonly prescribed antihypertensive agents in single therapy, while telmisartan + hydrochlorothiazide was the most commonly prescribed in dual therapy. Propranolol was the most highly utilised antihypertensive agent during the study period, and the total consumption of antihypertensive agents in the general medicine ward was 6807.40 DDD.

Conclusions: This study measured the consumption of antihypertensive agents over a period of 3 months, finding a total consumption of 7544.27 units. Furosemide had the highest consumption, followed by spironolactone and amlodipine. Mono therapy was more frequently used than combination therapy. Propranolol was the most commonly used antihypertensive drug in the General medicine ward, followed by atenolol and spironolactone. Furosemide and hydralazine were the most highly utilised drug classes. The total antihypertensive drug consumption was 890.75 DDD/100 bed days. Propranolol and Metoprolol were found to be utilised with PDD:DDD ratios of 1.74 and 1.63, respectively, indicating potential overuse of these drugs.

Referring patients from community pharmacy to primary care as a pathway to integrate it into the health system

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Introduction: Consultations on minor ailments represent between 9–16% of the activity carried out in community pharmacies (CP). The protocolised minor ailments service (MAS) implementation has been implemented in CP since 2020 using the SEFAC eXPert registration programme. The registration of the MAS, as well as a possible direct connection with the primary care physician (PCP), could be a way of integrating the CP into the Health System.

Objectives: To evaluate the number of referrals to the PCP made through the CP and to identify and evaluate the consultations that have required a referral to the PCP.

Methods: Hybrid effectiveness-implementation type 3 design study carried out in 360 CFs belonging to the 17 Autonomous Communities of Spain, following the INDICA+PRO IMPLANTACIÓN research project method.

The data was recorded using the SEFAC eXPert platform, following the procedures of the Pharmaceutical Care Forum-CP and using protocols agreed upon between the scientific society of Pharmacists SEFAC, the scientific societies of primary care physicians Semergen and SemFyC, the College of Pharmacists of Valencia MICOF and the University of

Granada GIAF-UGR. Referral to PCP was made using a referral report obtained through the registration platform.

The study's results from October 2020 to April 2023 are presented here.

Results: 20333 MAS were performed by 527 community pharmacists, who referred 1622 (7.98%) of these patients to the PCP.

Regarding referrals for minor ailments consulted, 16.39% of consultations for headache were referred (n=80/488), 15.10% for wounds (n=55/364), 12.17% for red eye (n=66/542), 8.71% for cough (n=101/1159), 7.77% for diarrhoea (n=53/682) and 7.58% for dermatitis (n=81/1068).

Consultations for constipation only generated 4.85% (n=44/906), cold and flu syndrome 5.12% of referrals (n=45/878) and joint and back pain 6.95% of referrals (n=139/1999).

Conclusions: The community pharmacist, following agreed protocols, can resolve most of the consultations for minor ailments such as constipation, cold and flu syndrome, or joint and back pain made in CPs as well as many of the other minor ailments consulted.

On very few occasions, the community pharmacist has been required to seek assistance from a PCP. Consequently, physicians are deprived of vital information concerning the health status of non-referred patients. To fully integrate CP into the healthcare system, it would be beneficial to document all MAS consultations in patients' medical records.

Attitudes of pharmaceutical and medical students towards academic fraud in higher educational institutions in Russia and Belarus

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Introduction: Academic fraud (AF) among students in higher education institutions is being discussed by researchers worldwide, as its influence on the quality of education leads to improper development of the skills and knowledge of postgraduates. AF's background and common traits must be properly investigated in medical universities because future pharmacists and doctors are responsible for people's health and lives.

Objectives: The study aims to examine medical students' engagement in various forms of AF and analyse the determinants of AF behaviour, comparing students from two medical universities in Russia and Belarus.

Methods: The study surveyed students from two major medical universities in the Russian Federation and the Republic of Belarus from December 2021 to January 2023. The survey included 408 participants from the pharmacy faculty of RUDN University, Moscow (64%) and 223 students from Grodno State Medical University (GRSMU), Belarus (36%). The sample included students majoring in pharmacy, general medicine, paediatrics, medical diagnostics, and mental health medicine.

Results: More than half of medical students accept using AF methods during their education, while 41% of respondents believe such behaviour is unacceptable. Students from GRSMU more frequently reported their opinions on the admissibility of AF compared to RUDN students. A strong connection between secondary and higher educational systems was revealed: 58% of students have the same attitudes towards AF as at school, and 22% showed more tolerance for cheating at the university. Junior students are generally more likely to cheat than senior students (27% of upper-level students against 29% of freshmen and sophomores). These findings show the necessity to begin discussing academic integrity from the first days of studying. The dominant method of AF in the two universities was using self-made cheat sheets (more than 50% of respondents). Then cheating from other students (25%), plagiarism (7.1%), and cheating from electronic devices were reported (6.2%).

The most important reasons which led to AF among students were the lack of time for proper mastery of subjects (43.6%), the lack of academic motivation (15%), and the wish to get good grades at any cost (13.7%). No respondent from GRSMU believes that there are disciplines unimportant for their future career, while 8% of RUDN students indicated such an attitude. About 40% of students can refuse AF because of fear of punishment, and the same number of respondents can avoid dishonest behaviour because of embarrassment, which appears when the teacher reveals the act of AF. Less than 5% of students can avoid AF due to groupmates' condemnation, which stresses the peer-related environment's influence on the spread of AF. According to students' opinions in both universities, the most effective ways and measures to reduce the frequency of AF cases were democratic ones, such as improving teachers' competence, updating academic tasks, open-book exams, and changing the point-rating system.

Conclusions: The study data allow for the evaluation of the practice of AF among medical students and can be considered for developing higher institutional learning and assessment strategies.

Patients' perception and acceptance of medication history taking via telephone

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Introduction: Medication errors often originate from information loss at care interfaces and can potentially cause harm. Therefore, a comprehensive, high-quality medication history at hospital admission can provide safe and uninterrupted therapy. Medication history taking via telephone may provide a promising alternative for patients with scheduled admissions. Yet, patient acceptance is critical to the success of this new approach and must be considered when selecting a suitable concept for a particular patient population.

Methods: Between October and December 2021, a clinical pharmacist collected the medication history for 183 patients via telephone before elective hospital admission. After taking their medication history, patients were asked to participate in a survey on satisfaction with this new concept compared to the usual care process. They were interviewed by the same pharmacist with standardised questions on the place of taking the history (at home vs at the hospital), the timing (before admission vs at admission), the standards of communication (telephone vs in person), and the possibility of a video call. All answers were analysed descriptively. Additional statements by the participants were qualitatively assessed for factors influencing the patient's perception of the new concept. Two reviewers categorised responses independently; in case of disagreement, consensus was reached through discussion.

Results: In total, 151 patients took part in the survey. The new concept was rated as better than usual care about location, timing and communication by 34 % (n=52), 52 % (n=79) and 18 % (n=27), respectively, and as equal to it by 46 % (n=70), 30 % (n=45) and 53 % (n=80). A video call was considered technically feasible by 41 % (n=62) of patients. Factors influencing the patients' perception derived from the additional statements were feasibility and organisational matters (n=95), time expenditure (n=32), nervousness (n=22), confidentiality (n=21), and reliability of information (n=8).

Conclusions: Overall, patients were either in favour or indifferent towards medication histories collected via telephone. Factors such as time expenditure and feasibility must be considered when designing such a process. This concept will be assessed on a larger scale in a prospective study.

Personalised medication labelling service in a community pharmacy in Hyderabad, India

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Introduction: All medications can potentially cause harm if they are used inappropriately. It is important to consider various aspects while using medications; one is to ensure patients are provided with the information necessary to understand and use the medications appropriately. Community pharmacy is the ideal place to provide this information as this is the last step before patients consume the medication. In the majority of the community pharmacies, such info is not provided due to various reasons.

Objectives: The objective is to introduce personalised medication labelling service as part of dispensing in the community pharmacy setting to improve the understanding and safe use of medications.

Methods: Accurate clinical information about all the medications used in India was developed using authentic drug information resources. Relevant patient-centric info that has to be conveyed is curated. Using this information and patient factors, a personalised medication label is generated, which includes the following information: drug composition, brand name, quantity, batch number, expiry date, instructions of usage, dispense ID, name of the patient, pharmacist and doctor. The is printed and stuck on the carton with medications. Patients are educated about the same verbally while dispensing the medications. Cautionary labels, which provide additional information on the necessary precautions a patient takes while taking the medications, are also developed and given along with the personalised label.

Along with educating the patient, the dispensing pharmacist is also provided with information about special directions (SD), dispensing considerations (DC), and pregnancy and breastfeeding categories that he has to keep in mind while dispensing medications.

Results: A total of 7000 patients availed the service since its inception in 2021. They appreciated the information provided, the way it was provided, by talking to them and reinforcing it with a personalised label and reporting a better understanding of medications. As this was seamlessly

integrated into the dispensing process, it significantly increased the time to dispense the medication.

Conclusions: Personalised labelling guides patients on the safety and appropriate medicine use. It acknowledges their right to know and achieve optimum medicine utilisation, maximises therapeutic outcomes and improves patient safety and compliance. This practice, followed in developed countries, needs to be tailored to the needs of developing countries like India and implemented. As a next step, the authors plan to develop a robust research method to objectively measure the impact of initiating this service and publish the results to disseminate the findings.

Evaluation of oral antibacterial drug prescribing by community pharmacist independent prescribers during out-of-hours in Wales: A secondary data analysis study

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Introduction: Inappropriate use of antibacterial drugs has led to a worldwide increase in antimicrobial resistance. There is an ongoing discussion on whether prescribing during out-of-hours (OOH) services, i.e. weekdays (6:30 PM–8:00 AM), weekends, and bank holidays, contributes more to the problem compared to in-hours (IH) care. Since 2007, pharmacists in Wales have been able to practice as pharmacist independent prescribers (PIPs), giving them the autonomy to prescribe within their competence. However, it has only really been since the Welsh Government, in 2019, set their goal to have a PIP in every community pharmacy by 2030 that community pharmacists have become PIPs. Wales now has a pharmacy independent prescribing service (PIPS) that allows community pharmacy PIPs to prescribe for medical conditions, including acute infections. Research on PIPs prescribing within community pharmacies in Wales, particularly during OOH periods, is currently lacking.

Objectives: This study aimed to investigate and quantify oral antibacterial drug prescribing, including those associated with *Clostridium difficile* infections (CDIs), by PIPs in community pharmacies during OOHs to gain insights into potential areas of improvement.

Methods: Secondary analysis of chosen pharmacy database consultation data was conducted. The database contained details of all community pharmacy consultations performed by PIPs in Wales. The analyses focused on consultations with

an oral antibacterial drug prescription during OOH periods from June 2020, when PIPS was introduced, until September 2022. Relevant data were analysed descriptively, including service users' demographics, referral reasons, diagnoses, and medicines issued. NICE Clinical Knowledge Summaries were used to categorise medical conditions not explicitly described in the database. Local guidelines were used to assess prescribing appropriateness of oral antibacterial drugs associated with increased risk of CDIs, i.e. 4Cs: amoxicillin-clavulanate, cephalosporins, clindamycin, and fluoroquinolones. To ensure accuracy, each step of the analyses was quality assured by at least two researchers.

Results: During 30,401 consultations, 24,356 individuals were prescribed 29,256 items. Among these, 1961 consultations were during OOH periods; 772 resulted in 773 oral antibacterial drugs being prescribed. During OOH periods, most consultations were for females (n=575, 74.48%); mean age of 44 years. Most patients were self-referred to the service (n=646, 83.68%), and over half (n=409, 52.98%) reported making GP appointments if the service was unavailable. Overall, 14 different antibacterial drugs were prescribed. Nitrofurantoin was the most prescribed drug (n=243, 31.40%), and the most treated condition was urinary tract infections (n=327, 42.31%). The prescribing proportion of the 4Cs during OOH was low (n=14, 1.81%) and mostly according to guidelines. About 11% of the conditions managed were not included in the PIPS contract.

Conclusions: The study provides insight into patients' characteristics and prescribing patterns in community pharmacies during OOH periods, focussing on oral antibacterial drugs. It emphasises PIP's role in providing timely and easily accessible care when alternative options may be limited. The findings also highlight their confidence in managing a range of medical conditions beyond the scope of the PIPS contract, which may aid policymakers in enhancing the PIPS quality and delivery across Wales.

The off-label use of glucagon-like peptide-1 inhibitors

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Introduction: Ozempic (semaglutide) is a medication used to treat type 2 diabetes. It has gained significant attention recently due to its intensified marketing by famous individuals and social media influencers as a promising weight loss drug. Although Ozempic isn't registered for weight loss, off-label use led to growing demand, causing shortages in inventories and supply chains and, most importantly, affecting the treatment of diabetic patients. Additionally, despite its' shown promising effects in aiding weight loss,

there are important risks associated with its use that must be considered because of its popular off-label use.

Objectives: To investigate the usage patterns and availability of Ozempic in the Republic of Srpska, focusing on its off-label use for weight loss and insulin resistance.

Methods: This cross-sectional study was conducted among 30 pharmacies in Republika Srpska from January 2023 until the end of March 2023. The authors collected data on the number of Ozempic prescriptions dispensed, the indications for which it was prescribed, and the payment source (health insurance fund or commercial). The authors also surveyed pharmacists' role in dispensing Ozempic, implementing pharmaceutical inspection controls, and needing prescription or medical reports for its off-label use.

Results: Most of the Ozempic prescriptions issued were intended for type 2 diabetes therapy and were funded by the health insurance fund. Pharmacists reported an increase in the prescription of Ozempic for treating insulin resistance and obesity, and as a result, pharmaceutical inspection implemented stricter controls. To purchase the drug commercially, patients must present a prescription or a medical report. Pharmacists also highlighted that during these three months, there were Ozempic shortages due to increased drug demand for weight loss, leading some patients with type 2 diabetes to seek the medication in neighbouring countries.

Conclusions: Despite receiving much media attention, Ozempic and other GLP-1 medications are not indicated for use in patients outside the target population, which may experience more severe side effects because the medication has not been thoroughly evaluated in those with lower body weights. The risks for the unknown side effects are thus significantly increased and should be monitored in both long and short-term usage. The temporary nature of Ozempic-induced weight loss and the weight potential regain after discontinuing the medication should be emphasised to patients and healthcare providers. Furthermore, the availability of Ozempic for people with type 2 diabetes is significantly impacted by this drug's off-label use. It is necessary to raise awareness and promote a more holistic approach to weight management that focuses on healthy lifestyle changes rather than solely relying on medications like Ozempic.

Awareness of elderly patients on herbal products in Serbia

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Introduction: Although medicinal plants have been known since ancient times, increased use of herbal products has been evident in the last few decades, mainly as a part of self-care treatments. In addition to the positive health effects, herbal products can cause certain side effects and interactions with conventional therapy, especially among elderly patients.

Objectives: To examine the awareness, habits and attitudes of elderly patients towards the use of herbal products in the Republic of Serbia.

Methods: The quantitative, non-experimental research was conducted using a questionnaire in public pharmacies in February 2020. Patients older than 60 years were included in the study. The study was anonymous, and patients gave informed consent.

Results: The study involved 436 patients, of whom 62.4% were female. Most respondents live in the city (72.9%) and have a high school or lower education degree (61.9%). Most patients (32.3%) use herbal products daily, while only 12.1% rarely or never use them. Every fourth patient (24.5%) uses them for treatment of disease, while 69.5% to improve their health. Although most patients purchase herbal products in pharmacies and health food stores (53.6% and 20.8%, respectively), a significant number (19.3%) collect medicinal plants and prepare herbal preparations. The main sources of information about medicinal plants/herbal products are pharmacists (39.7%) and people from the immediate area (28.4%), followed by the media (18.2%) and physicians (11.1%). According to the survey, 48.9% of the participants think herbal products are generally safe but may have some side effects. On the other hand, 35.8% of the respondents believe that herbal products have no side effects at all. Half of the respondents (51.4%) believe that herbal products are as effective as or more effective than synthetic medicines. Less than one-third of patients (29.8%) indicated that they knew the difference between herbal medicinal products and dietary supplements. Still, a third of patients (36.7%) needed additional explanations for using herbal products. 76.6% of

patients stated that they always receive advice from a pharmacist when purchasing herbal products.

Conclusions: The survey conducted in this work showed that elderly patients use herbal products to a considerable extent, which means that it is necessary to educate elderly patients on this matter. Pharmacists should play a vital role in this process and actively discuss the characteristics and proper use of herbal products with patients, especially considering the high possibility of interactions with conventional medicines and the occurrence of side effects. Since some herbal products' quality could be questionable, especially non-regulated ones, patients should be encouraged to purchase them from pharmacies and consult pharmacists.

Medication review in Belgian community pharmacy: Challenges for further implementation

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Introduction: Medication review is still in its infancy in Belgium, and since September 2017, a pilot project on type 3 medication review (MR3) has been running at the Royal Pharmacists' Association of Antwerp.

Objectives: The aim was to gain insight into the challenges during the implementation of MR3 in Belgium among pharmacists without MR3 experience and pharmacists who were recently trained in conducting MR3.

Methods: On the one hand, a survey was distributed to 759 pharmacists across Flanders. On the other hand, participants of the MR3 training course were surveyed by telephone.

Results: The survey yielded 208 responses (27% response rate), with 85% of community pharmacists stating that they were familiar with the concept of MR3 but had not yet conducted it. The biggest obstacle was freeing up time (81%). Other challenges were staff shortages, insufficient knowledge, rejection from general practitioners (GPs), and lack of reimbursement.

Among pharmacists recently attending MR3 training (n=14, 70% response rate), lack of time was also seen as the main

obstacle. Other barriers included cooperation with GPs, difficulties in patient selection, problems with software and uncertainty about their knowledge. All participants reported that reimbursement should be provided for this service.

Conclusions: Most community pharmacists were familiar with the concept of MR3. The main hurdle was freeing up time in the pharmacy to perform this service. Collaboration with the GP was also perceived as a major challenge. To encourage the implementation of MR3, introducing a fee for MR3 was considered essential.

Quality assurance of a medication review type 3: What are the key elements to assess quality?

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Introduction: Following the example of other countries, medication reviews (MRs) are increasingly being implemented in primary care in Belgium. To ensure high-quality medication reviews, quality assessment is needed.

Objectives: This study investigates how the quality of type 3 medication reviews (MR3s) can be monitored by establishing a list of priority criteria.

Methods: An electronic survey was created with 57 criteria divided into nine subdomains, including general aspects of MR3, patient characteristics, therapy design and treatment plan. Participating pharmacists ranked the criteria according to importance without the possibility of equal ranking. New criteria could also be proposed.

Results: A total of 106 persons participated, of whom 42 were PRISMA pharmacists (practising pharmacists and researchers from the Netherlands), 20 were Flemish academics or pharmacists active in professional development, 23 were Flemish pharmacy students, and 21 were Flemish pharmacists who had attended training courses at the Royal Pharmacists' Association of Antwerp on MR3.

Ninety-one participants fully completed the survey, and 15 participants completed it partially. Of the 91 respondents, most considered using understandable language in communication with patients very important. Discussing the

usefulness and purpose of an MR3 with the patient was also indicated as important by all groups. The opinions of Flemish and Dutch pharmacists overlapped significantly, but Dutch respondents considered the statements on lab values more important. If people were less familiar with specific tools, their importance was rated lower. The same applied to consultation with and reporting to the treating physician. The participants formulated a limited number of new criteria.

Conclusions: There was broad consensus on the priority quality criteria of MR3. Minor differences were mainly related to a difference in respondents' experience. Together with the additional criteria formulated, these results enable the design of a quality monitoring tool for MR3.

Impact of COVID-19 pandemics on beta-lactam antibiotics consumption in Central Portugal

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Introduction: The emergence of SARS-CoV-2 obliged severe restrictions and lockdowns across the world aiming to mitigate the transmission of the virus. These measures drastically conditioned people's daily routines, having had health, economic, social and demographic repercussions. Several international studies have shown that a reduction in the consumption of antibiotics happened during the COVID-19 pandemic. The restrictive measures may have contributed to a reduction in the use of beta-lactam antibiotics.

Objectives: This study aimed to evaluate the impact of the COVID-19 pandemic on the consumption of beta-lactam antibiotics in the Central Region Health Administration (ARSC).

Methods: A descriptive analysis of the consumption of beta-lactam antibiotics (ATC J01C) was conducted between 2010 and 2021. To infer the causal impact of the pandemic on J01C consumption, an interrupted time series (ITS) analysis of the monthly consumption of antidepressants, expressed in defined daily dose (DDD), was conducted using Bayesian structural time-series models. All analyses were performed with different granularity levels: at the ARSC level, health centre groups (sub-regions), and municipalities. A bivariate analysis was also performed to identify the characteristics associated with the trend and effect of the pandemic on the consumption of beta-lactam antibiotics.

Results: Consumption of beta-lactam antibiotics rounded the 2,5 DDD/1000 inhabitants/ day in the ARSC. In the post-intervention period, there was a significant reduction in the

prescription of beta-lactam antibiotics in the ARSC. All the sub-regions, except Pinhal Interior Norte, also significantly reduced J01C consumption to an average of 1.47 DDD/1000 inhabitants/day. Seventy of the 78 municipalities presented a similar reduction in J01C consumption. No association was found between beta-lactam antibiotics consumption reduction and sociodemographic variables of the municipalities like populational density ($p = 0.277$), percentage of elderly ($p = 0.218$), purchasing power in 2019 ($p = 0.464$), inhabitants per healthcare centre ($p = 0.667$) or literacy rate ($p = 0.105$). However, a significant association between the reduction was found with consumption in 2019 ($p = 0.040$, Spearman's $r = -0.233$).

Conclusions: A substantial reduction in the consumption of beta-lactam antibiotics was found in Central Portugal due to the COVID-19 restrictive measures. Future studies should evaluate the potential relevance of this reduction in the resistance to beta-lactam antibiotics.

Statins utilisation in Central Portugal: A longitudinal 12-year analysis

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Introduction: Statins constitute a highly prescribed therapeutic class with high implications for healthcare costs.

Objectives: The study aimed to identify discrepancies in statins consumption patterns (epidemiological and economic) in the Central Region of Portugal.

Methods: Longitudinal study approved by ARSC ethics committee (ARSC 28/2022). Data of all the statin drug packages (ATC groups C10A, C10B, A10BH) dispensed in community pharmacies between Jan 2000 and Dec 2021 were provided by the Central Region Health Administration. Data comprised the number of packages monthly dispensed, total retail price (RP) (i.e. copayment + out-of-pocket), and total copayment for each medicine presentation in each healthcare centre of the region. Medicines packages were

converted into defined daily doses (DDD) using the WHO method and presented as DDD/1000 inhabitants/day (DID). Discrepancies were analysed with different geographical granularity (9 sub-regions and 78 municipalities).

Results: Statin consumption at the regional level increased from 64 DID in 2010 to 134 DID in 2021. However, expenditure at RP reduced from 31.4 million euros in 2010 to 20.0 million in 2013, remaining quite constant at around 20 million for the rest of the study period. Similar patterns happened with copayment, with 17.9 million in 2010 decreasing to 8.2 million in 2013 for the rest of the study. Simvastatin represented 34.6% in DDD and 27.6% in RP; atorvastatin was 33.5% in DDD and 25.8% in RP; rosuvastatin was 15.09% in DDD and 25.8% in RP. All the presentations with plain statins represented 92.5% in DDD and 78.3% in RP. In contrast, statins associated with fibrates, ezetimibe or omega3 were 6.9% in DDD and 20.7% in RP and statins combined with other non-antidyslipidemic drugs (e.g. antihypertensives, antiplatelets) were 0.6% in DDD and 1.0% in RP. The overall cost per DDD decreased from 0.85 in 2010 to 0.28 in 2021, ranging 2021 from 0.20 for the plain statins to 0.78 and 0.60 for combinations with antidyslipidemics and non-antidyslipidemics, respectively. These epidemiological and economic patterns strongly varied across municipalities: rosuvastatin represented 8.5% DDDs in Penela and 35.5% in Meda, or pitavastatin 1.6% DDDs in Penela and 23.9% in Aguiar de Beira. All these influences in different RP per DDD ranging from 0.28 euros in Tábua to 0.51 in Aguiar de Beira or a copayment per DDD from 0.12 euros in Soure and Tábua to 0.28 in Covilhã.

Conclusions: Not only were important geographical variations in statin consumption identified in Central Portugal, but very different prescription patterns also resulted in great economic disparities. Further studies should identify the consequences of these discrepant patterns in population lipid profile and cardiovascular risk.

A study to ascertain the antinociceptive properties of insulin and the role of circadian rhythm in cancer pain

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Introduction: The most frequent symptom cancer patients report is pain, often the earliest indication of malignancy. Circadian rhythm is the most well-known and prevalent rhythm in all living things. It has a significant impact on the way different illnesses cause pain. Pain's neurochemistry, perception, and response to medication are all impacted by time-dependent fluctuation. In both clinical and preclinical

research, endogenous insulin has been shown to play a crucial part in regulating pain.

Objectives: This investigation explored insulin's antinociceptive properties and circadian rhythm's impact on cancer pain.

Methods: The authors gathered twenty-two patients for the study at the Chandrakala Super Speciality Hospital in Danavaipeta, Rajahmundry. Three groups of patients, Group A, Group B, and Group C, were created. Patients in Group A were using opioids, those in Group B were taking nonopioids, and those in Group C were not taking pain medication. The Visual Analogue Scale was used to measure the patients' pain. With their permission, blood was drawn from patients four times a day at 6 AM, 12 PM, 6 PM, and 12 AM. The ELISA technique was used to measure serum insulin levels using the DRG Insulin Kit. The computerised statistical software from GraphPad InStat Software was used to analyse the results. The analysis of variance (ANOVA) and Tukey-Kramer Multiple Comparisons Test were used to determine the statistical significance.

Results: Patients who used opioids had higher blood insulin levels at 6 AM (31.31 ± 20.81) in the afternoon at 12 PM (33.05 ± 12.75). The non-opioid group, however, experienced a rise in insulin levels at 6 PM (69.18 ± 21.29) and 12 AM (67.33 ± 30.72) in the evening. Despite no discernible variations in the mean values of blood glucose, the serum insulin level in both opioid and nonopioid-using individuals was elevated and found to be very significant (p -value 0.0001) compared to the control group. In this study, it was shown that both circadian rhythm and endogenous insulin have a significant impact on how cancer pain is modulated.

Collaborative professional practice between community pharmacists and physicians: Quantitative changes in collaboration factors as the result of the provision of a medication review with follow-up service

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Introduction: Collaborative practice between community pharmacists and physicians is becoming increasingly common. A validated tool was developed in Spain to measure the level of collaborative professional practice between both professionals. The tool includes three factors and a total score to measure trends.

Objectives: The objective of this study was to measure the total collaborative level and the level in each of the three factors from the perspective of the community pharmacists in the medication review with follow-up (MRF) process over time.

Methods: A prospective longitudinal observational study was undertaken alongside a 12-month type 3 hybrid effectiveness-implementation study in six Spanish provinces. Student t -test for independent samples was used to evaluate the level of collaborative practice by comparing the difference in means and standard deviations between study groups for the total summed score of the three factors and each factor for each period.

Results: The study invited 323 pharmacists to participate (107 in the MRF group and 216 in the non-MRF group). A response rate of 89.7% ($n=96$) was achieved for the MRF group and 45.8% ($n=99$) for the non-MRF group. There were no statistical differences at baseline between the two study groups for the overall score and each of the three factors. At the 6-month time point, there was a statistical difference between groups for factor 1, "Activation for collaborative professional practice" ($p = 0.008$) and for the overall level of collaborative practice ($p = 0.029$). At the 12-month time point, there were statistical differences between both study groups for all factors; factor 1 "Activation for collaborative professional practice"; factor 2 "Integration of collaborative practice" ($p = 0.018$); factor 3 "Professional acceptance of collaborative practice" ($p = 0.0185$); and for the overall level of collaborative practice ($p < 0.001$). Within the MRF group, there were statistical differences between the scores at the 6-month time point (21.3 ± 0.38) ($p < 0.002$) and 12-month time point (23.3 ± 0.43) ($p < 0.0001$) compared to the baseline (15.6 ± 0.41) for all factor 3. For factor 2 and factor 3, there were also statistical differences between the scores at the 6-month time point and 12-month time point compared to the baseline. When comparing all time points, no statistical differences were observed for the non-MRF group.

Conclusions: This study found that pharmacists providing MRF have higher levels of collaborative practice with physicians. The longitudinal nature of the study allowed the identification of factors strengthening the collaboration and those needing further development.

End-users' perspectives on the awareness, usability, and satisfaction of a paediatric sepsis screening tool within an electronic health record system at an academic hospital in England: A survey-based study

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Introduction: Electronic health record systems (EHR) have been widely adopted in different healthcare settings in recent years. However, few studies have evaluated end-users' opinions and satisfaction with the various design features of EHR systems. It is important to identify users' needs and expectations to develop effective EHR systems in future. Furthermore, the availability of routinely collected data from the end-users of EHR systems after any changes within the system might facilitate redesigning of these systems in a better way to support clinical decision-making and optimum safety and quality of provided care.

Objectives: To assess a newly implemented paediatric sepsis screening tool (PSST) within an EHR system from the end-user's perspective regarding tool usability, staff awareness, and satisfaction.

Methods: A cross-sectional survey of doctors and nurses working in paediatric areas at an academic hospital in England was conducted between October 2022 and May 2023. The PSST's usability and staff satisfaction were assessed using a 5-point Likert scale adapted from an existing system usability scale. The survey was distributed online and as paper-based copies.

Results: Responses were received from 41 individuals (27 doctors and 14 nurses), with response rates of 48% for doctors and 70% for nurses. Of the total participants, 71% were female; 46% were aged 31-40; 44% had worked in clinical practice for more than ten years; 76% used EHR systems for 1-5 years; 93% of the doctors and 79% of the nurses were using the EHR system daily for more than an hour per day; 74% of doctors and 14% of nurses used their personal devices to access the system.

In relation to different design features of the EHR system, auto-calculators and visual clues were the most liked features (81% and 57% of doctors and nurses respectively); however, more than 50% of all participants disliked pop-up (interruptive) alerts. Although there was higher awareness of

the PSST amongst nurses (86%) compared to doctors (44%), usage was low in both groups, with only six doctors and eight nurses having used it, of whom only four doctors and six nurses reported receiving training on how to use it. The usability of the PSST was low (mean=2.6, SD=0.2) from the doctors' perspective and high (mean=3.7, SD=0.4) from the nurses' perspective. Doctors were less satisfied (mean=2.8, SD=0.4) with the PSST than nurses (mean=3.8, SD=0.2), and half of all participants agreed they needed more training on using the PSST.

Conclusions: The end-users of the EHR system have different design preferences based on their professions; however, interruptive alerts were the most disliked feature. The level of staff awareness of EHR system functionalities and training on how to use them is associated with their utilisation and satisfaction. More research is needed to investigate and understand the main reason behind the low usability of CDSS as perceived by end-users.

Adherence and beliefs about medicines in women with advanced breast cancer

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Introduction: Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer-related deaths in women worldwide. Oral anticancer medications (OAMs) can improve outcomes and survival in women with breast cancer, but long-term adherence is crucial for successful treatment. Patient beliefs about medicines, side effects, cost, comorbidities, and sociodemographic factors can significantly affect adherence. Adherence to OAMs has been reported as suboptimal and, over the years, has become a significant public health concern. Previous studies have mainly focused on early-stage breast cancer patients, and little is known about adherence in patients with advanced breast cancer.

Objectives: This study aimed to investigate the association between adherence and beliefs about medicines in patients with advanced breast cancer

Methods: A cross-sectional study was conducted on female patients with diagnosed advanced breast cancer (stage IV) treated with OAMs in University Hospital Centre Zagreb. Beliefs about medicines data were collected via beliefs medicines questionnaire (BMQ) (consists of six subscales;

BMQ-general: harm, overuse, benefit, sensitivity; BMQ-specific: necessity and concerns) and adherence was measured using a validated medication adherence report scale (MARS-5). Both questionnaires were adapted to the Croatian language following the principles of good practice for the translation and cultural adaptation process for patient-reported outcome measures and were approved by Horne. Statistical analysis was performed by IBM SPSS Statistics software version 22. Student's *t*-test was used to analyse differences between the two groups.

Results: Eighty-nine female patients, median age 60 (IQR 47–70) participated in the study. The average MARS-5 score was 24.1 (SD 1.6), indicating high adherence. About 67.4% of participants had a MARS-5 score of the maximum of 25 points (high-adherent group), and 32.6% had a MARS-5 score of 24 points or less (low-adherent group). According to the data collected via BMQ, most patients believe medicines bring more benefits than harm, are not overused, and do not consider themselves highly sensitive to medicines. Most of the patients also believed in the necessity of their current therapy, and they were not concerned about it. A statistically significant difference was found between the high-adherent group and the low-adherent group for BMQ-general, overuse scale ($p = 0.024$) and sensitivity scale ($p = 0.043$) and BMQ-specific, concerns scale ($p = 0.036$). It was confirmed that high-adherent patients had stronger beliefs about medicines not being overused, considered themselves less sensitive to medicines and were less concerned about their current therapy.

Conclusions: This study provides valuable information about adherence to OAMs in patients with advanced breast cancer from Croatia. Although medication adherence was very high, beliefs about medicines were still an important predictor of adherence. Healthcare professionals who work with patients with advanced breast cancer should consider addressing patient beliefs about medicines to improve medication adherence, which is a key factor for successful treatment.

Pharmacotherapy dimension of pharmacy business management in geriatric healthcare: A pilot study on pharmacy students

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Introduction: Pharmacy education is crucial in preparing competent future pharmacists and ensuring safe and effective medication use in geriatric healthcare.

Objectives: This study aimed to evaluate how pharmacotherapy knowledge on geriatric healthcare evolved

due to the education received by pharmacy students during their school years.

Methods: The geriatric knowledge assessment scale (GKAS) is used in this study to collect data from pharmacy students. The GKAS is a validated questionnaire consisting of 28 multiple-choice questions.

Results: This study reveals the knowledge difference and the effectiveness of geriatric healthcare education in the pharmacy curriculum between the first-year and last-year students of the pharmacy school. The results of this study will help us to estimate the healthcare quality that will be given by newly graduated pharmacists to the geriatric population, as well as give an idea about the competence of pharmacy students in the pharmacotherapy dimension of geriatric care.

Conclusions: This research is the preliminary step for further studies to plan and implement updates of the education given in the school of pharmacy on geriatric patients to adapt to the contemporary needs, requirements, and expectations to enforce the education creating sustainable value.

Attitudes of pharmacy students towards geriatric healthcare management: A pilot study

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Introduction: The geriatric patient management assessment pilot study is conducted to reveal the effect on the change of geriatric patient management skills resulting from the education process between pharmacy students in their junior year of pharmacy education and senior year pharmacy students.

Objectives: To better manage geriatrics, it aims to present a study that has yet to be conducted among pharmacy students in Türkiye by considering the strengths and weaknesses of the education given. It will serve as a guiding data set in this field.

Methods: This pilot study was to use original scale items from the University of Arizona Aging and Healthcare Questionnaire items of the "University of Arizona Aging and Healthcare (UA AHC) Questionnaire" instrument. The survey study plans to include 200 pharmacy students. The results will be analysed by the SPSS tool.

Results: The courses related to geriatric patient management, which the students have been studying over the years, will be closely evaluated. Eventually, it will provide

useful information for improving pharmacy education and a study worthy of content that will contribute to social studies.

Rapid evidence review of pharmaceutical public health in high and upper-middle-income countries

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Introduction: To support the strategic national direction and policy development of pharmaceutical public health in the UK, an evidence review of the multisectoral contributions of pharmacy professionals (pharmacist and pharmacy technicians) to public health, going beyond the ongoing focus of community pharmacy contributions at a micro (individual) level.

Methods: Searches were carried out on the PubMed database. Evidence statements were extracted from papers published in English between 2011 and December 2021, categorised by topic area and country of study, and assessed for quality. This study's approach to the rapid evidence review was guided by the NICE guidelines on best practices for reviewing evidence and the method expounded by the Cochrane Collaboration in the Cochrane Handbook for Systematic Reviews.

Results: From 2,542 papers identified and reviewed, 135 papers and 448 evidence statements were extracted. The papers were based on findings from the USA (39%), UK (29%), multiple countries (13%), European countries, apart from the UK (6%), studies from countries other than USA, UK and Europe included Canada (5), Australia (3), Brazil (2), and a single study each in China, Colombia, Jordan, Malaysia, Netherlands, New Zealand, Qatar, Singapore, South Africa, Taiwan,

There were fewer high-level reviews (17) or guidance (12) compared to reviews of moderate or low-level quality (42), single studies (33), or quantitative research (33).

Examples of case studies identified included: the health system and public health specified as part of the five key competency areas for district and sub-district pharmacists in Cape Town, South Africa. A virtual pharmacy review programme used to remotely provide pre-visit comprehensive medication reviews for patients in a defined population in Columbia, USA, the Pharmacy Society of Wisconsin collaborating with the Wisconsin Division of Public Health and a not-for-profit health insurer, to pilot pharmacist-

led medication therapy management programme for people with hypertension.

Barriers identified included a need for more awareness of the public health contributions of pharmacy professionals amongst the public and other healthcare professionals; a lack of resources for tailored public health training.

Conclusions: Pharmacy professionals make important contributions to public health. Further investigation is required to identify how pharmaceutical knowledge, skills, and resources are applied in public health. In addition, improved advanced public health training and development for pharmacy professionals is required.

Deprescribing—Pharmacist role in quaternary: A literature rapid review protocol

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Introduction: During the process of medication management, it is found that discontinuation of medication can be challenging due to different factors like provider, complex patient, and healthcare system barriers. Deprescribing is the process of withdrawing a medication to reduce potentially problematic polypharmacy, adverse drug effects and inappropriate or ineffective medicine use and improving health outcomes. A healthcare professional should supervise this process in partnership with the patient. Despite the importance of this problem, more information is needed, specifically on pharmacist interventions in the deprescribing process and its association with better healthcare outcomes.

Objectives: The proposed rapid literature review aims to collect the most recent evidence on pharmacists' interventions in deprescribing, emphasising community pharmacists. This review is the first part of a research project which consists in proposing and validating deprescribing interventions to be performed by community pharmacists as part of the primary health system in Spain.

Methods: A rapid literature review will be performed and reported. PubMed (Medline) and Web of Science will be searched using a predefined search strategy. Studies will be included in the review if available in English full text. Titles and abstracts will be screened by single review. Two independent reviewers will screen full-text articles. Reasons for any exclusion will be reported. Inclusion and exclusion criteria will be applied to select eligible articles.

Results: The review is being conducted. It is expected that full-text screening will be completed in early June 2023.

Value-based pricing in pharmacy: A pilot web-study

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Introduction: The formation of new approaches to the pricing of pharmaceuticals and other medical technologies and the development of social programmes of various directions in both high- and low-income countries is relevant. During the last decade, the World Health Organization has been actively working in the outlined direction, which continues to implement the principle of pricing transparency to increase the availability of pharmaceutical care and strengthen justice in the pharmaceutical field.

Value-based pricing is a strategy in which the price of a product should reflect the value to the patient, not "actual manufacturing costs plus markup." However, in the context of the pharmaceutical field, there is no generally accepted solution to this problem, especially when determining which indicators should be included in the assessment of "value".

Another unresolved issue remains the establishment of value-price correspondences that the consumer is willing to pay.

Objectives: To study this correspondence using the example of contraceptives, the Van Westendorp method was tested on a quota sample of women from the Zaporizhzhia region (420 people).

Methods: For the first time, new statistical approaches to determining optimal, minimum, maximum and indifferent price points were proposed and tested for the pharmaceutical industry.

Results: The results obtained during the survey made it possible to determine the ranges of willingness to pay (reference and indifferent prices) for the first time for all existing pharmaceutical types of contraception (hormonal, non-hormonal and medical devices) in age and income quotas. The results of previous studies on the existence of the relationship reference price-value (usefulness) of the contraceptive, reference price-age, and reference price-income were confirmed. However, the numerical values have significant differences with other studies of a similar focus, which is explained by the influence of external factors on the female consumer in different countries.

The paper shows the asymptotic normality and consistency of estimates of price values. Based on this, approximate

confidence intervals were constructed, in which estimates of the joint distribution function and densities with a Gaussian kernel were used. Confidence intervals for prices were also modelled by the bootstrap method.

The willingness to pay of Ukrainian women ranges from 26% to 51%. At the same time, with an increase in women's income, the values of reference prices increase from 3% to 5% and indifferent prices up to 10%. A similar relationship is observed when dividing income quotas by age.

It was found that the highest values of women's willingness to pay are determined by contraceptives with the highest value: aerosol (willingness to pay 59%–67%) and male condom (willingness to pay 59%–66%).

Phosphodiesterase type 5 inhibitors and the risk of Alzheimer's disease in men with erectile dysfunction: A cohort study

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Introduction: Alzheimer's disease (AD) is a global epidemic with no cure or treatment to slow neurodegeneration. In animal models, phosphodiesterase type 5 inhibitors (PDE5-inhibitors) have increased cerebral blood flow and neuronal cell survival. However, evidence for PDE5-inhibitors reducing the risk of developing AD is inconclusive.

Objectives: To evaluate the association between PDE5-inhibitor use compared to non-use and the risk of incident AD in men with erectile dysfunction (ED).

Methods: Primary care electronic health records from IQVIA medical research data (IMRD-UK), previously known as the THIN database, were used to conduct a population-based cohort study in men aged ≥ 40 years with a new diagnosis of ED between 2000–2018. Diagnostic read-codes linked to clinical diagnoses were used to identify the ED study population and measure the outcome of AD. PDE5-inhibitors were treated as a time-varying exposure variable to minimise immortal-time bias and lagged by one year for latency purposes. Potential confounders were adjusted using stabilised inverse probability of treatment weighting (IPTW) based on propensity scores and missing data handled using multiple imputations by chained equations. A time-dependent Cox proportional hazard model was used to estimate the adjusted hazard ratio (HR) with 95% confidence intervals (CI), associating PDE5-inhibitor use with incident AD. Secondary analysis cumulating the time-dependent total number of prescriptions received was also assessed. Sensitivity analyses using different analytical approaches were also conducted to assess the robustness of primary results.

Results: The study included 274,868 men, with 1,115 newly diagnosed with AD during a median follow-up of 5.1 (IQR 3.0–8.9) years. The crude incidence rate (IR) of AD in PDE5-inhibitor use was 8.0 per 10,000 PYAR (95% CI 7.5–8.6) and 9.8 per 10,000 PYAR (95% CI 8.8–10.8) in non-use. The adjusted HR for the associated risk of AD in PDE5-inhibitor use compared to non-use was 0.81 (95% CI, 0.71–0.92; $p = 0.002$). The risk of AD decreased among those who received more PDE5-inhibitor prescriptions; ≥ 50 prescriptions: HR 0.66 (95% CI, 0.51–0.87; $p = 0.003$). The results from sensitivity analyses that used different analytical approaches were consistent with the primary result.

Conclusions: Among men ≥ 40 years with erectile dysfunction, PDE5-inhibitor use was associated with a lower risk of AD compared with non-use. The authors could not account for physical activity, which may have a protective effect on users of PDE5-inhibitors. Nevertheless, this primary finding was consistent in sensitivity analyses, and the risk was lower for the most frequent users of PDE5-inhibitors.

Risk of osteoporotic fractures in menopausal women with common mental health problems using SSRI/SNRI antidepressants: A cohort study

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Introduction: Menopausal (perimenopausal and postmenopausal) women are at higher risk of osteoporotic fractures. Menopausal women may also experience common mental health problems (CMHP), which require the prescribing of selective serotonin re-uptake inhibitor (SSRI) or serotonin and norepinephrine reuptake inhibitor (SNRI) antidepressants. Prescribing SSRI/SNRI antidepressants may pose an additive risk of osteoporotic fractures.

Objectives: To investigate the association between prescribing SSRI/SNRI antidepressants and the risk of osteoporotic fractures in menopausal women with CMHPs.

Methods: In this cohort study, primary care records of menopausal women with follow-ups between 2000 and 2021 were retrieved from the IMRD-UK database, previously known as THIN. The authors defined menopausal women as women with a recorded diagnosis of menopause or aged ≥ 50 years. This study cohort comprised menopausal women with a CMHP (i.e. depression or generalised anxiety disorder) recorded on or after menopausal onset. Exposure to SSRI/SNRI antidepressants was defined as two new consecutive prescriptions within six months. The start of follow-up was randomly assigned to the unexposed group by

incidence density sampling. Osteoporotic fractures were defined as first incident fractures excluding fractures of the skull, face and digits during the follow-up period. Incidence rates (IR) were estimated per 1000 person-years-at-risk (PYAR) with 95% confidence intervals (CI). Potential confounders were adjusted using inverse probability of treatment weighting based on propensity scores. Covariates included exposure to HRT and other psychotropic medicines, lifestyle factors such as smoking and alcohol use and risk factors for fractures. Missing data was handled using multiple imputations by chained equations. The relative risk of osteoporotic fractures was estimated by comparing women prescribed SSRI/SNRI antidepressants to those unexposed using a Cox proportional hazards model to estimate hazard ratios (HR) with 95% CI.

Results: This study identified 459,431 menopausal women with CMHPs, with 44,582 osteoporotic fractures within a median follow-up of 5.44 (IQR 2.28–9.99) years. The mean age for participating women was 62.88 years. The risk of osteoporotic fractures was higher in women prescribed SSRI/SNRI antidepressants with an IR of 16.05 (95% CI 15.87–16.23) per 1000 PYAR compared with an IR of 12.43 (95% CI 12.23–12.64) per 1000 PYAR in women without an SSRI/SNRI prescription. The author found strong evidence of an association between using SSRI/SNRI and the risk of osteoporotic fractures (adjusted HR=1.30, 95% CI 1.27–1.32).

Conclusions: In a population of menopausal women with CMHPs, prescribing SSRI/SNRI antidepressants was associated with a higher risk of osteoporotic fractures. Careful consideration of osteoporosis risk must be taken when treating menopausal women with SSRI/SNRI antidepressants.

Prescribing of opioids in menopausal and postmenopausal women in the UK: A population-based drug utilisation study

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Introduction: Chronic pain increases substantially during menopause and post-menopause. Hormone replacement therapy (HRT) is the first-line treatment for menopausal symptoms, such as chronic pain. However, with the increase in data on the harmful effects of HRT, women are moving to other methods for pain relief. Recent survey studies have indicated that women over the age of 50 years (average age of menopause) report using opioids more than their male counterparts. The trend in prescription opioids for chronic pain associated with menopause may increase throughout the United Kingdom (UK).

Objectives: To determine and describe the prescribing trends of opioid medications in females aged 50 and above using UK healthcare data between 2010 and 2021.

Methods: In this descriptive drug utilisation study, primary care records of menopausal women with follow-up from years 2010–2021 were retrieved from the IMRD-UK database, previously known as THIN. Prescription data for opioids were identified for each participant included in the study. The menopausal population group is women aged ≥ 50 from 2010 to 2021. Prevalence and incidence rates were calculated for all women included in the study who had a prescription for an opioid. The incidence rate of women who received their first prescription for an opioid was calculated annually using person-at-risk (PYAR) as the denominator. Annual prescribing prevalence per 100 women was calculated using mid-year menopausal population estimates.

Results: The total number of women aged 50 and above from 2010–2021 was 2,736,598. The number of prescriptions for opioids in the same population group from 2010–2021 was 13,181,782. The incidence of prescription opioid use increased from 2010–2021. In 2010, the incidence was 3.67 per 100 person-years (95% CI 3.65–3.68) and rose to 5.7 per 100 person-years in 2021 (95% CI 5.64–5.74). The overall proportion of menopausal women receiving a prescription for an opioid changed from 9.45% in 2010 to 7.3% in 2021.

Conclusions: In a population of menopausal women, defined as being aged ≥ 50 years, the incidence increased from 2010–2021, which indicates that more women of menopausal age are utilising prescription opioids to manage pain. In the same population, the overall number of prescription opioids from 2010–2021 dropped, specifically after 2018, possibly due to the COVID-19 pandemic. More research on the effects of opioids in the menopausal population group is needed.