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CONFERENCE ABSTRACTS

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Pharmacy practice research

Effects of medical cannabis on illness severity, depression and anxiety in fibromyalgia patients: A large retrospective case series

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Introduction: The objective of this study was to better understand the relationship between fibromyalgia and medical cannabis use for illness severity and symptoms of depression and anxiety.

Methods: A retrospective chart review was conducted to describe all patients with fibromyalgia at Harvest Medicine clinics from January 2017 to July 2021. Data were extracted from patient charts and included questionnaire answers from initial and follow-up appointments. Outcome data included PHQ-9 scores, GAD-7 scores, self-reported illness severity and follow-up questions.

Results: Mean PHQ-9 score was significantly reduced between baseline and first follow-up (10.6 ± 6.56 vs 8 ± 5.97, n=446 $p < 0.001$). 26.7% had a clinically significant score reduction. The mean GAD-7 score was significantly reduced between baseline and first follow-up (8.0 ± 6.1 *vs* 5.9 ± 5.4, n-593 $p < 0.001$). 22.3% had a clinically significant score reduction. Mean illness severity was significantly reduced between baseline and first follow-up (4.12 ± 0.73 *vs* 2.91 ± 0.99, n=805 $p < 0.001$), and 74.7% saw a reduction from their baseline severity rating. On follow-up questions, 69% of patients reported that cannabis had a positive impact on their quality of life and 77.6% of patients reported that cannabis therapy has met their expectations.

Conclusions: Overall, these data show that medical cannabis could be an effective therapy for the management of fibromyalgia symptoms and associated mood disorder.

Which pharmacist interventions improve hypertension control? A systematic review and meta-analysis of randomised controlled trials

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Introduction: Hypertension management remains a major public health challenge in primary care. Recent hypertension guidelines, notably from the American College of Cardiology and the American Heart Association (ACC/AHA), the European Society of Cardiology and the European Society of

Hypertension (ESC/ESH) as well as the US Community Preventive Services Task Force, recommend the involvement of pharmacists for team-based care management of hypertension. However, previous research found large heterogeneity in the effect of pharmacist interventions on blood pressure (BP) control. Choosing the most effective intervention in a given healthcare setting and its implementation at the point of care is a challenge.

Objectives: The objective is to systematically review the evidence of the impact of pharmacist care alone or in collaboration with other healthcare professionals on blood pressure among hypertensive outpatients compared with usual care. One major focus is to assess the heterogeneity in the effects of pharmacist interventions to identify which ones work best in a given healthcare setting.

Methods: A systematic literature search was conducted for any articles published up to 22.10.2021 using predefined terms in MEDLINE, EMBASE, CENTRAL, CINAHL, Web of Science, and Trip databases. A search for unpublished studies using the Grey Literature Report (New York Academy of Medicine) was conducted. Randomized controlled trials (RCTs) assessing the effect of pharmacist interventions on blood pressure among outpatients were included. Based on the Cochrane Effective Practice and Organization of Care (EPOC) taxonomy, the authors considered interventions targeted at the patient or healthcare provider level. Types of intervention were further classified into education, reminder, or feedback. Primary outcomes are the change in BP or BP at follow-up or BP control. Results will be synthesized descriptively and, if appropriate, will be pooled across studies to perform meta-analyses. If feasible, the authors will also perform a network meta-analysis to compare interventions that have not been compared directly head-to-head by using indirect evidence. Heterogeneity in the effect will be evaluated through prespecified subgroup and stratified analyses, accounting notably for the type and intensity of interventions, patients' characteristics, and healthcare settings.

Results: A total of 1768 study records were identified by electronic database searching and loaded to the systematic review management software Covidence. After the removal of duplicates, 1744 were independently screened based on title and abstract by two authors (VG, ST), and 242 full texts were evaluated. A total of 72 studies with 32641 patients are currently included for data extraction. These studies were published between 1973 and 2021 and conducted in different regions (North America: n=34, Europe: n=13, other: n=25). The data extraction and analysis are ongoing. Preliminary results, mainly on pharmacist interventions will be presented at the congress.

Conclusions: This systematic review will provide updated evidence on the effect of pharmacist interventions on hypertension management. Assessment of the heterogeneity of effects may improve the effectiveness and implementation of pharmacist interventions in hypertension management.

Patient perceptions towards biosimilars and switching of biologics: A patient survey

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Introduction: The use of biologics has increased during the last ten years due to their therapeutic value. To curb medicine costs, the use of comparable and often less expensive biosimilar medicines is fostered. Patient perceptions towards biosimilars and their use in switching may affect treatment outcomes and costs but the literature on the subject is scarce.

Objectives: To study chronic inflammatory disease patients' perceptions towards biosimilars and switching of biologics, and the effect of the use of biologics and patient characteristics on them.

Methods: A cross-sectional survey with opinion questions with a 5-point Likert scale and background questions. Invitations for the survey were delivered to University Pharmacy's loyalty customers via email and two patient associations' communication in January 2021. Four outcome sum variables were constructed by factor analysis; primary outcomes: general perceptions of features of biosimilars (FeBS) and suitability of biosimilars for own treatment (SuBS) (on the scale of 1-5; 5 indicating the most favourable perception towards biosimilars or switching).

Results: Of all the respondents (N=1139; 73% inflammatory bowel disease, 24% rheumatic, and 3% psoriatic patients), 297 (26%) had used a biologic (226 original biologic and 71 biosimilar). The term "biological medicine" was recognized by 90% of the respondents while 39% recognized the term "biosimilar". The average rates for FeBS and SuBS among all the respondents were 3.99/5.00 and 3.25/5.00, respectively, and the highest among the biosimilar users (4.43/5.00 and 3.51/5.00) compared to the users of the original biologics and biologic-naïve patients (difference between the medicine user categories $p < 0.05$ for both FeBS and SuBS, Kruskal-Wallis test). Among the users of original biologics, biosimilars and traditional medicines, 29%, 20% and 18%, respectively,

perceived biosimilars' efficacy or other therapeutic features to be worse compared to original biologics. Of the users of adalimumab and etanercept original biologics and biosimilars, 69% and 55%, respectively, would not like to be switched to a more inexpensive biosimilar if their existing treatment works well. Change of the administration device was reported to decrease interest in switching by 42% of all the respondents. For example, experience and recognition of biologics, diagnosis, general beliefs about medicines, engagement with a physician, and membership of a patient association were related to FeBS and SuBS.

Conclusions: The term "biosimilar" was less frequently recognized than the term "biological medicine". In general, the respondents had a favourable perception towards biosimilars and switching. However, regarding biosimilar use for own treatment, uncertainty was widely acknowledged, in particular by the users of original biologics and biologic-naïve patients. The medicine user category and several patient characteristics were related to the perceptions towards biosimilars and switching. Further research on the optimal medicines information and its delivery to different patient groups is needed to enhance the rational use of biosimilars and other biologics.

Customer satisfaction with online dispensing and counselling services of a community pharmacy: A case study with the university pharmacy online services in Finland

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Introduction: The digitalisation of health care and the COVID-19 pandemic have increased the availability and use of online services provided by community pharmacies. In Finland, willingness to use online pharmacy services has been studied at a population level. However, sparsely is known about user satisfaction with the pharmaceutical services of online pharmacies.

Objectives: This study aimed to investigate satisfaction with the University Pharmacy's online (ya. fi) services from a customer perspective. Primarily, customer satisfaction with dispensing and medication counselling services were assessed. Characteristics affecting customer satisfaction were analysed. The conceptual framework was Andersen's Model of Health Services Use.

Methods: The data were collected by a cross-sectional survey conducted in August 2020 among University Pharmacy's online pharmacy customers who had purchased during the last three months. The survey instrument consisted of structured Likert-scale questions which were used to form two outcome sum variables: satisfaction with online dispensing services (3 variables, Cronbach's alpha 0.803) and satisfaction with online counselling services (2 variables, Cronbach's alpha 0.883). Satisfaction with online dispensing services was studied by questions describing willingness to recommend and an intention to use the online pharmacy service. Satisfaction with online counselling services was studied through questions comparing medication counselling from an online and conventional pharmacy. IBM SPSS (28) - the software was used for bivariate (Kruskal-Wallis and Mann-Whitney U test) and multivariate (generalized linear model) analyses.

Results: 15172 invitations were sent, and 2555 eligible responses were received (16 %). Of the respondents, 92 % had concomitantly used online and conventional pharmacy services. The mean of satisfaction with online dispensing services on a scale from 1 to 5 (5 indicating the most positive option) was 4.3 (SD 0.8). The mean satisfaction with online counselling services was 3.7 (SD 0.9). According to the multivariate analyses, significant characteristics affecting the satisfaction with online dispensing service were age, forms of living (alone/family with children/couple), online purchase of prescription or OTC medicine, frequent internet use, and previous visits to a conventional pharmacy. Characteristics affecting the satisfaction with online counselling services were education, online purchase of prescription medicine, use of chat information service, frequent internet use, and previous visits to a conventional University Pharmacy outlet. The individual services of online pharmacy rated most important were services on medicine availabilities (in pharmacy outlets and during a shortage) and information on medicines (prices, reimbursement and direct information about customers' electronic prescriptions).

Conclusions: In general, the customers were satisfied with the online dispensing and counselling services. Online dispensing services received a higher satisfaction rate than online counselling services. Purchases of medicines online and active use of the internet were related to higher satisfaction with online dispensing services. Customers who had used the chat information services and purchased a prescription medicine online rated online counselling services to be equal to or better than a conventional pharmacy on average. Most online pharmacy customers had also visited conventional pharmacies. The results from this study can be utilized in the development of online and conventional pharmacy services with a multi-channel approach.

Burnout syndrome in pharmaceutical sector employees in the Republic of Serbia and the Republic of Srpska

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Introduction: Burnout syndrome is defined as the result of chronic stress in the workplace that has not been successfully resolved. It is characterized by three dimensions: a feeling of exhaustion or loss of energy; increased mental distance from the work done or feelings of negativity or cynicism about one's work; and a sense of inefficiency and lack of achievement.

Objectives: This research aims to examine the attitudes of employees in the pharmaceutical sector towards burnout and to examine factors leading to burnout in specific population groups (both pharmacists and technicians) in Serbia and the Republic of Srpska, BiH.

Methods: Anonymous web-based survey is conducted in May and June 2022. Socio-demographic parameters were followed and Maslach burnout inventory (translated into Serbian) was used to assess burnout among employees.

Results: There were 154 respondents in May 2022. Over 90% (140) of them were female, and 66,2% were in the middle-aged group (between 31 and 50 years old). 18.2% (28) were technicians and the rest had master's degrees or above in pharmacy. 136 of 154 worked in a public pharmacy. The majority of respondents work in Serbia (55.1%), and practically the same per cent overall (54.5%) has fully working weekend days, both Saturdays and Sundays. 134 out of 154 respondents consider themselves to have burnout during the last year, and because of that over 40% very frequently think about changing jobs.

Maslach burnout inventory consisted of 22 questions divided into three sections: emotional exhaustion (EE), depersonalization (DP) and (lack of) personal achievement (PA). Respondents felt the most frequent EE from working with patients, which leads to decreased care for others (patients and coworkers). However, the majority felt they have a positive impact on others through their work several times a week (98 of 154), which leads to better scores in PA.

Factors that were marked as the most important for diminishing burnout were free weekends and better salary compensations, both having 23.4% (36) out of 154 answers.

Conclusions: This study concluded that there is a great chance of pharmaceutical sector employees having burnout syndrome which leads to dissatisfaction in other aspects of life, both in Serbia and the Republic of Srpska. Further studies with bigger and more homogenous samples are needed to conclude the levels of burnout in different subgroups of the pharmaceutical sector.

Assurance of quality health education and coverage amongst adolescents in the Republic of Benin

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Introduction: The Republic of Benin is a country in West Africa with a significant poverty rate and a high incidence of maternal, infant and child mortality. The national fertility rate is 5,7 but life expectancy at birth is only 63,8 years. Noncommunicable diseases such as anaemia, trauma and malnutrition account for the majority of deaths. Paludism, tuberculosis and viral hepatitis are the most prevalent infectious diseases. Access to health care is very limited and the majority of the population does not benefit from health coverage, in particular the adolescents. The nongovernmental organization Pharmaciens Sans Frontières asbl Luxembourg (PSFLux), in collaboration with the local partner APROSOC (Action pour la Protection Social), embraced a challenging initiative to bring social security to West Africa. Starting in the department of Borgou, commune of Bembèrèkè, a total of 5 administrative units (Bembèrèkè, Béroubouay, Bouanri, Gamia, Ina) are currently offering health education and coverage to schooling adolescents (10-19 years old), using a symbolic contribution.

Methods: The assurance of quality health education and coverage is a priority for PSFLux since the start of this initiative back in 2010. Unpublished indicators have shown already improvements in morbidity-related school absences and dropouts, as well as a decrease in teen pregnancies and sexually transmitted diseases, in the affected administrative units in Benin. However, little is known regarding the therapeutic diagnosis and the corresponding pharmacological treatments prescribed by the local nurses to the covered adolescents. To assess the quality of the

treatments provided, a systematic review of the medical charts from Bembèrèkè (4 school nursing centres and 10 national health centres) was conducted to include data from January to June 2020, which covers the rising period worldwide COVID-19 pandemic.

Results: The most common therapeutic diagnoses were acute respiratory infection and paludism, alone and/or in combination with other conditions. Arthritis, gastroenteritis, parasitosis, sexually transmitted infections and trauma were also commonly diagnosed. Even though COVID-19 reached Benin in March 2020, there were no reports of the viral infection in the medical charts analysed. It is assumed that COVID-19 was generally diagnosed as an acute respiratory infection because of its prevalence during the study period. Almost all patients received pharmacological treatment and there was a high incidence of antimicrobials such as amoxicillin, co-trimoxazole, and penicillin V, among others. Many of these drugs were given parenterally and in combination, which may contribute to the global threat of antimicrobial resistance. Paludism was commonly treated with Combiart (artemether and lumefantrine) whereas quinine was reserved for the most severe cases. The pharmacological treatments were not always perceived as the soundest and most effective option for the corresponding diagnosis (e.g. angina: cloxacillin, mebendazole, paracetamol and penicillin V), and there was a general lack of consistency amongst prescriptions.

Conclusions: The PSFLux are committed to supporting quality healthcare in the Republic of Benin. The systematic review of the medical charts from Bembèrèkè highlighted the need for evidence-based, standardised pharmacological treatments, as well as a global strategy to fight the use of antimicrobials.

Paediatric Oral Extemporaneous Preparations and Practices: FIP Pediatric Formulation Focus Group (PFFG) Global Survey

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Introduction: The extemporaneous preparation of oral compounded (unlicensed) medications is a common practice in hospitals and community pharmacies worldwide. Paediatric patients have specific needs that require age-appropriate formulations, including personalized strengths, child-friendly dosage forms and adequate palatability. Despite the widespread use of paediatric oral extemporaneous preparations, little is known about this practice on a global scale. National and regional studies have shown that there is considerable variability amongst the most frequently dispensed oral extemporaneous preparations, as well as current practices and regulations.

Objectives: The FIP Pediatric Formulations Focus Group (PFFG) strives to achieve global harmonization of paediatric oral extemporaneous preparation practices and research into affordable age-appropriate formulations. A FIP PFFG global survey was launched to identify current oral extemporaneous preparation practices, challenges and needs in different geographic regions across the globe.

Methods: An anonymous web-based survey (Qualtrics) was developed and translated into 9 languages in collaboration with compounding experts from all WHO regions. The survey includes 16 closed and open-ended questions distributed in three parts: (1) Paediatric oral extemporaneous preparations: dosage forms and active pharmaceutical ingredients (2) Paediatric oral liquids: solutions, suspensions and syrups; and (3) Pharmacy practice. The introduction to the survey included a consent statement and a conditional branching question to identify respondents that currently prepare paediatric oral extemporaneous preparations. A pilot survey was used to test and optimize the official survey, which was launched on November 1st, 2021 and closed on June 1st, 2022. The FIP PFFG global survey was distributed through FIP member organizations, as well as professional networks and contacts by compounding experts worldwide.

Results: A total of 730 valid responses were collected during the 7-month duration of the survey. Most responses came from Europe, Western Pacific, Eastern Mediterranean and South America. Hospital pharmacies and community/compounding pharmacies were equally represented in the survey; outsourcing facilities were a minority. Over 60% of respondents currently prepare paediatric oral extemporaneous preparations; the reasons appointed by the others for not compounding were as follows: ordered from outsourcing facilities; not needed for their patient populations; lack of resources and expertise. This survey shows that the most frequently dispensed oral dosage forms for children are liquids (solutions, suspensions and syrups), prepared from bulk powders and/or commercial tablets/capsules (opening, cutting and/or crushing). The top 20 active substances compounded for children are atenolol, baclofen, caffeine citrate, captopril, carvedilol, chloral hydrate, dexamethasone, enalapril, furosemide, hydrochlorothiazide, hydrocortisone, melatonin, omeprazole, phenobarbital, prednisolone, propranolol, sildenafil, spironolactone, trimethoprim and ursodeoxycholic acid. Globally, the major needs and/or challenges related to the paediatric oral extemporaneous preparations and practices are as follows: database with comprehensive access

to standardized formulations, updated compounding information; validated stability studies with extended beyond-use-dates, training on modern compounding practices to ensure competence and safety; and improved access to resources including active substances, excipients, vehicles and dosing devices.

Conclusions: The FIP PFFG global survey demonstrates that despite the diversity of paediatric extemporaneous preparations and practices worldwide, there is a common global need for freely accessible compounding formulations, stability studies and information resources.

Response to the coronavirus disease 2019 (COVID-19) pandemic at private community pharmacies in Kenya

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Introduction: Private retail pharmacies (community pharmacies) present a highly accessible channel for implementing pandemic responses. For COVID-19, this includes screening, prevention interventions, and continuing care for chronic illnesses. The team aimed to assess preparedness, experiences, and response to the COVID-19 pandemic at private retail pharmacies in Kenya, with an overall goal of identifying strategies for maximising their contribution to the national response.

Methods: The authors conducted a prospective study, consisting of a service provider questionnaire (n=108), a simulated client survey (n=103), and in-depth interviews with providers (n=18). Pharmacies were randomly selected from a list of licensed pharmacies in three counties with high concentrations of pharmacies and COVID-19 cases (Nairobi, Mombasa, and Kisumu). Data collection started in November 2020, approximately seven months after the pandemic reached Kenya. Given the travel restrictions at the time, all data collection was done remotely. A mixed-methods approach was used in data collection and analysis.

Results: The initial weeks of the pandemic were characterized by fear and panic among service providers and a surge in client flow. Subsequently, 60% of pharmacies experienced a dip in demand to below pre-pandemic levels and 31% reported challenges with unavailability, high price, and poor quality of products. Almost all pharmacies were actively providing preventive materials and therapies; educating clients on prevention measures; counselling anxious clients; and handling and referring suspect cases. While no point-of-care test for COVID-19 was readily available at the time of the study, 59 pharmacies (55% [95% CI 45-65%]) reported receiving a client asking for testing, and a similar proportion stated they would support pharmacy-based testing if implemented. For the treatment of simulated clients, most pharmacies (71%, 73 of 108) recommended alternative therapies and nutritional supplements such as vitamin C; the rest recommended conventional therapies such as antibiotics. Providers expressed high levels of motivation and confidence in supporting the pandemic response. About half (48%) of pharmacies had at least one staff member trained on COVID-19. However, direct linkages and material support from the government and other implementing partners were missing.

Conclusions: Community pharmacies in Kenya were actively contributing to the COVID-19 response. However, more deliberate engagement, support, and linkages are required. Notably, there is an urgent need to develop guidelines for pharmacy-based COVID-19 testing, a service that is needed and which could greatly increase test coverage. Interviews with policymakers and captains of industry may be required to probe these topics further and to assess if other COVID-19 interventions, such as vaccination, can be delivered in this setting.

Note: The authors are currently analyzing data from a recent assessment of the feasibility, acceptability, and cost of COVID-19 rapid antigen testing at private retail pharmacies. The authors plan to include these new findings in the presentation if accepted.

Maximising pharmacists' roles using collaborative pharmacy practice agreement and provider status in the United States

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Introduction: Collaborative Pharmacy Practice Agreements (CPPA) in the United States of America (USA) enhance pharmacists' roles through integration with healthcare teams. CPPAs include disease-specific education or medication management to affect clinical outcomes. Pharmacist provider status refers to recognizing pharmacists as healthcare professionals who can provide billable services outside of dispensing. Little is known about the CPPA and

provider status implementation and benefits to the healthcare team.

Objectives: To identify and contrast specific CPPAs, provider status, and their implementation across the USA and its territories.

Methods: Using the data available in January 2022, from Boards of Pharmacy and NASPA in all states and territories of the USA, the CPPA and provider status were analysed using descriptive statistics with an emphasis on legislation availability.

Results: The data showed that out of 50 contiguous states, 98% had passed legislation regarding CPPA. Out of five USA territories, 20% have CPPA agreements. Reimbursement models for CPPAs vary widely by state with differences primarily in the types of services provided and nuances in contractual obligations. Data demonstrated that out of the 50 states, 78% of the states passed laws and regulations regarding the pharmacist provider status, while none of the USA territories has the legislation. One state and four territories are without both CPPA and provider status.

Conclusions: CPPA implementation enabled pharmacists to expand their roles in patient care through billing and collaborative practice and serves as the stepping stone towards gaining provider status. Pharmacists remain the most accessible health professionals who serve to increase access to medications and care for individuals and communities. Provider status would enable pharmacists to bill for cognitive services and engage communities in care provision through enhanced public health service delivery models such as screening, programmatic interventions, and applications.

Population-based pharmacy care services in a private practice physician group in the United States

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Introduction: Pharmacists who provide population-based pharmacy care are often employed by private health plans, government payers, and supporting entities such as pharmacy benefit management companies. However, recent payer initiatives to reward value-based care have expanded opportunities for pharmacists. In their local market, a commercial payer provides financial incentives to a multi-location primary care physician group when benchmarks for medical and pharmacy spending for their member panel are met. This group practice was searching for solutions to help manage pharmacy spend and engaged us. Since there is limited information available in the published literature, the authors share their experience with providing services.

Objectives: To develop and implement pharmacy strategies to improve medication use and decrease unnecessary drug costs.

Methods: Pharmacy claims data for the calendar year 2020 containing the following fields (e.g., unique de-identified patient identification number, patient age, sex, claim number, drug name, drug strength, drug quantity, days supplied, prescriber identification number, and patient and health plan paid amounts) were obtained. Analyses provided overall spending per medication, median cost per prescription, and median cost per patient. The top 15 medications were reviewed to determine opportunities for pharmacy strategies based on the following criteria: availability of therapeutic alternatives, the preferred status of therapeutic alternatives, ease of interchanging medications and projected impact. A second request for pharmacy claims data for the calendar year 2021 provided data for assessing changes in utilization and cost.

Results: The analysis of the 2020 pharmacy claims data identified high-cost medication targets for the group practice. Included in this list were several medications for managing rheumatologic/immunologic disorders, diabetes, and multiple sclerosis. Diabetes was chosen as the first pharmacy strategy as there were several opportunities for intervention due to the availability of therapeutic alternatives with preferred use status. A stop-light campaign was created which showcased preferred medications (green light), and non-preferred medications (red light) within the glucagon-like peptide-1 (GLP-1) agonists, sodium-glucose cotransporter-2 (SGLT2) inhibitors, dipeptidyl peptidase-4 (DPP-4) inhibitors, and long-acting insulin classes. Data from 2021 pharmacy claims revealed increased use of preferred medications after the intervention within the GLP-1 inhibitor and long-acting insulin classes. The second pharmacy campaign worked with prescribers outside of the group practice (i.e., specialists) who cared for patients within the practice's member panel. This campaign focused on increasing the use of biosimilars instead of the originator products. There are no data from 2022 available to assess the impact of the biosimilar campaign. However, outreach to specialists was viewed favourably by the group practice.

Conclusions: A new approach to managing medication use and cost for a primary care physician group is described. This population-based pharmacy service required interfacing with prescribers in the physician group, the health plan, and specialist prescribers. Access to prescribers within the group practice for the diabetes medication campaign was facilitated by the practice's administration while access to specialists required greater investment in time and resources. Prescribing for antihyperglycemic medications shifted to more preferred products. Future work in this area should study the clinical and economic impact of pharmacy campaigns in private physician group practices.

A qualitative exploration of key stakeholders' views and perceptions about organisational change for the implementation of polypharmacy management in Oman

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Introduction: Polypharmacy contributes to patient non-adherence and increases medication harm. Barriers to implementation prevent desired outcomes when addressing inappropriate polypharmacy at organisational levels and there is a need for theory-based strategies for change management.

Objectives: The objective of this study was to explore the views and perceptions of key stakeholders about organisational change for the development and implementation of a polypharmacy management healthcare strategy in Oman.

Methods: Qualitative face-to-face interviews started in March 2022 with key stakeholders in the Oman Ministry of Health (MOH) including leaders from the practice of medicine, pharmacy and nursing as well as academic leaders from the school of medicine, pharmacy and nursing. The interview schedule was developed based on a scoping review, Kotter's first three steps of leading change and grounded in the consolidated Framework for Implementation Research (CIFR). Interviews were digitally recorded, transcribed, and analysed independently by at least two researchers using CFIR as a coding framework. Ethics approval was in place before data generation.

Results: To date, ten interviews have been conducted with directors of medical (n=2), pharmacy (2) and nursing practice (1), academic healthcare leaders (3), healthcare policy developers (1) and patient safety leaders (1). Additional interviews are planned and will continue until data saturation. Emerging themes show that participants have views that polypharmacy is a burden on healthcare services and there is a need for organisational change in polypharmacy management. Perceptions of reported organisational level barriers were; fragmentation of care, lack of systems for coordination among healthcare providers, absence of an electronic link between the government and private sector, lack of sense of urgency among leaders regarding the polypharmacy and shortage of pharmacists. Facilitators were; the presence of a well-developed electronic health system and leadership support.

Conclusions: There is a need for organisational change in polypharmacy management in Oman. Further research is needed to obtain the consensus of Omani stakeholders on the plan for a strategic framework for organisational change regarding polypharmacy management.

Can pharmacists improve their patient communication by reading fiction? Narrative medicines in pharmacy practice – A feasibility study

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Introduction: Empathy is an essential part of good patient communication. However, pharmacists often provide information without taking patients' preferences into account. Narrative medicine is an innovative approach, where empathic skills are nurtured through close reading of literary texts and creative writing.

Objectives: The purpose was to investigate the feasibility of a narrative medicine course for pharmacists and to explore the experiences of the participating pharmacists.

Methods: A two-day course on narrative medicine was offered to Danish community and hospital pharmacists in the summer of 2020. The course capacity was set to 16 pharmacists. The course consisted of close reading of short literary texts about illness and related creative writing, facilitated by both experienced literary and health care professional lecturers. Pharmacists' empathy was assessed before and after participating in the course by The Jefferson Scale of Empathy (JSE). Feasibility was assessed by focusing on acceptability, demand, implementation, practicality, and limited efficacy using focus group interviews, participant observation and satisfaction questionnaires.

Results: In total, eight pharmacists participated in the course. All pharmacists answered the questionnaire, and five focus group interviews were held with participants and lecturers. The practicality of the course can be optimized, as only half of the course capacity was filled. This could, however, be due to the situation with the COVID-19 pandemic, as the workload at the pharmacies was unpredictable in that period. The pharmacists accepted the participation in the course, even though some of the sessions required a personal investment far from their normal routines and education. The pharmacists were, in general, very satisfied with the course and found it useful in their daily patient communication as it

helped them to envision the life of each patient. As expected, no significant change was found in the JSE, but the pharmacists found the scale acceptable to complete.

Conclusions: The course in narrative medicine was feasible on all assessed parameters, even though the course capacity was not fully utilized. A course in narrative medicine has the potential for improving pharmacists' general communication with patients. Yet, the results should be tested in larger studies, including patient-reported outcomes, to provide distinct evidence of an eventual effect.

Assessment of Hepatitis C Virus-Human Immunodeficiency Virus co-infection among Human Immunodeficiency Virus patients on anti-retroviral therapy at public secondary care hospitals in a North-Central Senatorial District, Nigeria

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Introduction: One of the infectious diseases that cause significant morbidity and mortality in human immunodeficiency virus (HIV) -infected individuals globally is the hepatitis C virus (HCV) infection. The co-infection is associated with higher rates of end-stage liver disease-related deaths when compared with HCV mono-infection. Hepatitis C virus-human immunodeficiency virus (HCV-HIV) co-infection global estimate by World Health Organization (WHO) in 2020 was 6.2%. The dearth of information on HCV-HIV co-infection among HIV patients on highly active antiretroviral therapy (HAART) in a North-Central Senatorial District of Nigeria occasioned this study.

Objectives: This study aimed at detecting the prevalence of HCV-HIV co-infection among HIV patients on HAART, assessing the patient's knowledge of HCV, their status regarding HCV-associated risk factors and HAART at secondary care hospitals in a North-Central Senatorial District of Nigeria.

Methods: This multi-centre study was conducted from January to May 2021. Based on the Fisher formula, a sample size of 303 patients was obtained, which was proportionally allocated to the hospitals and an eligible sample unit was consecutively obtained. Pretested structured questionnaires were interviewer-administered to these patients to obtain their knowledge of HCV and their status regarding HCV-associated risk factors. Rapid diagnostic screening of these patients for HCV antibodies and data extraction of clinical and treatment variables from their medical records were also conducted. Data were analyzed using descriptive and inferential statistics with statistical significance set at $P < 0.05$. Ethical approval was obtained from Institutional Ethical Review Committee (MOH/KS/EU/777/475).

Results: Study participants' (SPs) median age was 40 years, most were females (78.5%) and married (85.8%). The modal class for the duration of HAART since diagnosis (DHSD) was 6 -10 years. All SPs were on tenofovir-based HAART of which 86.5% were on tenofovir-lamivudine-dolutegravir (TDF-3TC-DTG) combination antiretroviral therapy while 13.5% were on tenofovir-lamivudine-ritonavir boosted lopinavir (TDF-3TC-Lp/r). Also, all SPs were on Co-trimoxazole preventive therapy (CPT) while 77.6% have completed the Isoniazid preventive therapy (IPT). The prevalence of HCV-HIV co-infection was 2.3%. All HCV-HIV co-infected patients have married females and are in WHO clinical stage 1. The co-infection was higher in the age group 40 years and below (57.1%); and those who practice ear/body piercing (71.4%). However, the co-infection rate was not significantly different ($p>0.05$) with regards to the age groups and HCV-associated risk factors such as the practice of ear/body piercing, injection-drug use, sharing of sharp objects and toothbrushes. Also, the co-infection was higher in DHSD greater than 5 years. All co-infected were on TDF-3TC-DTG, CPT while 85.7% had completed the IPT. The co-infection was higher in patients that had no viral load suppression (85.7%) and it was significantly associated with no viral load suppression ($p < 0.05$).

Conclusions: The HCV-HIV co-infection prevalence is lower than the WHO global estimate. Also, none of the investigated risk factors was significantly associated with the HCV-HIV co-infection. Moreover, the HCV-HIV co-infected patients were on Tenofovir + Lamivudine + Dolutegravir (TDF-3TC-DTG). Routine screening for HCV antibodies and necessary precautions should be incorporated into HIV patients' care policy.

Attitudes of pharmacists about anthocyanin-based products from blueberry fruit in the pharmacies

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Introduction: The attitudes of pharmacists about anthocyanin-based products from blueberry in the pharmacies were tested with an electronic-based questionnaire.

Methods: In the study, 107 pharmacists from the Republic of Serbia and the Republic of Srpska participated, mostly females (84.1%), over 30 years of age who work in pharmacy chains (3 or more pharmacies) (79.4%).

Results: When asked if they have any of the anthocyanin-based products from blueberry fruit in the pharmacy, the majority answered in affirmative (72.0%) and that these are dietary supplements for maintaining eye health (76.9%). Half of the surveyed pharmacists (50.5%) answered that they only sometimes recommend these products. More than 50% were familiar with the pharmacological action of anthocyanins, and as many as 64% that anthocyanins achieve their positive effect on vision in low light by regenerating visible purple, rhodopsin. Also, the pharmacist knew other pharmacological activities of anthocyanins, such as vasoprotective (52.3%), antioxidant (83.2%) and anti-inflammatory (44.9%). A large number of respondents knew that carotenoids (lutein and zeaxanthin), in addition to anthocyanins, also show a beneficial effect on vision.

Conclusions: Finally, it can be concluded that pharmacists in pharmacies lack knowledge about the pharmacological effect of anthocyanins and that the authors need to work on educating pharmacists about the effects of these herbal pigments and herbal ingredients in general.

Pharmacovigilance of medicines used in the treatment of chronic pain

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Introduction: Chronic pain is the most common type of pain, closely related to numerous health disorders, such as headaches (migraines), musculoskeletal pain syndromes, nerve damage (neuralgia, radiculopathy, plexopathy), and pain in malignant diseases. In the pharmacotherapy of chronic pain, non-opioid analgesics are most often used, which are considered to be very safe and effective medicines. However, with longer treatment in concurrence with comorbidities, the possibility of serious adverse effects increases. Furthermore, the likelihood of interaction with chronic medications also rises.

Objectives: The study was designed to determine the prevalence of adverse effects of medicines used in the treatment of chronic pain. In addition, potential interactions of used analgesics with other medicines in chronic therapy were explored.

Methods: The research was conducted from March 1 to April 20, 2022. in Belgrade, Republic of Serbia, among adults of both genders, who use medicines to alleviate chronic pain (pain lasting more than three months). The study was conducted using a survey that consisted of questions about the demographic characteristics of the respondents, diseases, medications, problems during the use of analgesics, as well as questions about compliance with recommendations and treatment regimen obtained from pharmacists.

Results: The study involved 202 respondents (77 men, average age 51.34 and 125 women average age 50.82). More than half of the respondents (56.44%) reported suffering from chronic diseases (hypertension 60.53%, diabetes 23.68%, hypercholesterolemia 7.89%, musculoskeletal, respiratory and cardiovascular diseases were in smaller percentages). Almost 99% of respondents in the treatment of chronic pain use non-opioid analgesics: 39.60% ibuprofen, 28.22% paracetamol, 17.82% metamizole, 11.88% diclofenac, 8.42% nimesulide, 5.94% acetylsalicylic acid (to a lesser extent other NSAIDs). Only 3 subjects reported using opioid analgesics in the treatment of chronic pain (cancer pain relief).

In the study of pharmacovigilance of analgesic therapy, the occurrence of milder and more serious adverse effects, as well as interactions were examined. Mild side effects are primarily symptoms of GIT (nausea, vomiting, diarrhoea, constipation, flatulence), which occur in 14.35% of subjects, while more serious adverse effects include vertigo and palpitations in 9.91% of subjects. Among the potential interactions with other medicines in chronic therapy in the subjects are: Interactions of acetylsalicylic acid with anticoagulants, opioids with other neuropharmacological medicines, NSAIDs and corticosteroids.

In addition, the results show that almost a third of respondents do not report adverse effects and that nearly 70% of respondents do not take analgesics on the recommendation of pharmacists and/or doctors, but at their discretion or on the recommendation of friends/relatives, which is concerning.

Conclusions: The data indicate good tolerability of medicines in the treatment of chronic pain. On the other hand, indicate insufficient education of respondents and the importance of improving patient compliance to more realistically review the general health of the patient.

In modern pharmacotherapy of chronic pain, the key role in improving the safety and effectiveness of therapy belongs to the community pharmacists who are in constant and direct contact with patients.

Community pharmacy provider and client experiences with COVID-19 rapid antigen testing in Kenya

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Introduction: Community pharmacies in developing countries provide a unique setting for COVID-19 detection, as they are often the first point of contact with the healthcare system. A formative study in the early period of the epidemic revealed significant client demand and provider interest in pharmacy-based COVID-19 testing.

Objectives: Within a larger study assessing the feasibility, acceptability, and cost of pharmacy-based rapid antigen testing for COVID-19, the authors qualitatively assessed provider and client experiences.

Methods: Between August 2021 and March 2022, the authors piloted pharmacy-based COVID-19 testing at 28 pharmacies in four purposively selected Kenyan counties. Pharmacies were randomly selected from a list of licensed pharmacies in the study counties. the authors purposively conducted focus group discussions with 13 providers with at least three months of experience in the testing program and conducted in-depth interviews with 13 clients who had tested for COVID-19 through the program (6 who tested negative and 7 who tested positive). The interviews were audio-recorded, transcribed verbatim, and analyzed thematically.

Results: Clients reported the main reasons for testing were having symptoms suggestive of COVID-19 infection, curiosity, affordability, and being encouraged by providers. Provider friendliness, proximity, and speed of service were the most popular features of the pharmacy-based service. Most clients learned about the service through friend referrals and provider initiation.

Providers reported variations in demand due in large part to pandemic waves and government-led prevention measures. Towards the end of the study, the government lifted most prevention measures, including testing requirements for employment and within-county travel, resulting in near-zero demand for the pharmacy service. Provider confidence to offer the service was associated with earlier experience in offering rapid testing services for other conditions such as HIV and malaria, and training received from the program. The main motivators were an opportunity for professional development, business value addition in terms of raising the profile of the pharmacy in the community, and income generation.

Conclusions: Both clients and providers were highly receptive to pharmacy-based COVID-19 testing. However, the value and feasibility of scaling up the service are unclear given the apparent tight dependence on epidemiological variations and the consequent government actions.

Oncology clinical trial patient satisfaction with pharmacy service in a third-level hospital

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Introduction: A clinical trial is any research conducted before the approval of a new medicine. Participation is voluntary and patients are subject to constant control and monitoring. The preparation and dispensing from the Pharmacy Service (PS) is more complex than conventional practice.

Objectives: To evaluate the opinion of oncology patients included in a clinical trial (CCT) about the pharmacy service, through a satisfaction survey.

Methods: Prospective observational study of patient satisfaction with the care received from the PC. The data collection period was March and April 2022 (2 months). The method used to obtain the information was by means of a paper survey. The patient volunteered to complete the survey and the anonymisation of responses was respected. The survey asked about: the location and opening hours of the PC, waiting time, care received and ECEC medication. Respondents were asked to indicate their overall satisfaction with the PC. The degree of satisfaction was evaluated with a numerical score from 1-10 (maximum satisfaction). The project was approved and supervised by the quality area.

Results: During the data collection period, a total of 51 patients completed the satisfaction survey. One patient refused to complete the project due to visual disturbances. Fifty-seven percent of the patients were male. The prevalent age range was over 65 years in 39.2% of the respondents. The results regarding the location of the service were 8.8, concerning the timetable the average was 9.3, the waiting time 8.9, the space of the

attention was evaluated 8.8, the information of the attention received 9.6, the human treatment received 9.7 and the EECC medication 9.5. Overall satisfaction with the SF was rated 9.6.

Conclusions: The functioning of the Pharmacy Service is highly satisfactory from the patients' point of view. Aspects such as waiting time or place of care will be taken into account to promote outpatient satisfaction in a clinical trial.

Knowledge, Attitudes, and Perceptions of a patient population on the COVID-19 vaccine rollout in South Africa

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Introduction: COVID-19 first emerged in Wuhan, China, in December of 2019. The virus has since spread rapidly leading to a global pandemic with many countries, including South Africa, being gravely affected. The zoonotic virus is transmitted via droplets in the air when an infected person sneezes or coughs or through direct contact. Due to the current global crisis caused by COVID-19, it has become increasingly vital to develop and establish treatments to combat the disease. Since its emergence, scientists have been working tirelessly on several vaccine candidates. The rollout of the COVID-19 vaccine was a major development in the fight against this pandemic. However, vaccine hesitancies amongst the general population threaten the successful immunization of populations across the globe. This study is necessary to optimize vaccine acceptance.

Objectives: This study set out to investigate the knowledge, attitudes and perceptions of a patient population in Merebank, Wentworth and Bluff (Ward 68), South Africa on the rollout of the COVID-19 vaccines. The study aimed to identify reasons for vaccine hesitancies and the likeliness of the population to vaccinate against COVID-19.

Methods: A quantitative cross-sectional study was conducted using an online self-administered questionnaire on Google Forms. This took place between April 2021 to September 2021 in a community pharmacy in Merebank, Wentworth and Bluff (Ward 68), South Africa. Simple random sampling (SRS) techniques were employed in this study. There was a total of 430 participants. Data was collected on Google® Forms®, recorded in Microsoft® Excel® and analysed using descriptive and inferential statistics.

Results: According to the results obtained, 65% of participants stated that they would take the COVID-19 vaccine. A total of 67.1% of participants stated that they would definitely encourage family and friends to take the vaccine. Participants who were willing to take the Johnson and Johnson vaccine amounted to 66.2% while 64.5% were willing to receive the Pfizer-BioNTech vaccine. Both these vaccines are currently part of the South African vaccine rollout. A total of 66.3% of the participants said they were not hesitant to take the vaccine with 33.7% stating that they were hesitant. The top 3 reasons for vaccine hesitancies were concerns surrounding the side effects of the vaccines, their safety and efficacy profile and fast-tracking of the vaccines. It was noted that participants who watched the news had better overall knowledge compared to those who did not watch the news. Furthermore, participants with social media showed greater knowledge than those without social media.

Conclusions: Education campaigns need to be customized to provide the population with reliable and vetted vaccine information and address specific concerns or hesitancies present. Healthcare workers and the government need to work with religious leaders to improve public trust and confidence in the vaccine. To reach herd immunity and prevent increased morbidity rates, there needs to be a rise in vaccine acceptance across South Africa and globally.

Indirect costs of haemodialysis versus peritoneal dialysis from a patient's perspective for the management of end-stage renal disease at a tertiary hospital in Gauteng

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Introduction: Chronic Kidney Disease (CKD) is a condition which is characterised by a low glomerular filtration rate as well as kidney damage. CKD has 6 stages with End Stage Renal Disease (ESRD) being the last stage. ESRD is treated using Renal Replacement Therapy (RRT) which includes dialysis methods such as peritoneal dialysis (PD) and haemodialysis (HD). CKD is one of the Non Communicable Diseases (NCDs) that has been affecting the health sector globally. As a result of its prevalence, a lot of research has been carried out, analysing the cost of treating CKD and ESRD, although there has been a lack of information regarding the indirect costs incurred by patients as a result of undergoing treatment such as dialysis. This study aimed to compare the indirect costs associated with haemodialysis (HD) and peritoneal dialysis (PD) at a tertiary hospital in Gauteng from the patient's perspective.

Objectives: The objectives of the study were to calculate the average productivity losses incurred by patients with ESRD

who are on PD or HD respectively, to compare the productivity losses between PD and HD patients and to determine whether ESRD has resulted in the loss of employment for the patient or the caregiver.

Methods: A cross-sectional prospective study using face-to-face interviews was carried out amongst all all patients over the age of 18 years old ESRD patients on HD or PD for at least three months. Socio-demographic data were collected and the human capital approach was used to calculate productivity losses. Data were captured using Microsoft Excel®, cleaned, and then imported to IBM SPSS® Statistics for Windows V25.0. for descriptive statistical analysis. Ethics approval to conduct the study was obtained. All participants provided informed consent.

Results: 54 patients were interviewed, 28 were on HD and 26 were on PD. More (35%) patients were in the age bend of 35-44. More HD patients (96.4%) were unemployed compared to PD patients (76.9%). HD patients incurred greater productivity losses per annum (R132987.02) compared to PD patients (R55065.43) and the difference was statistically significant (p= 0.0001). Time spent on dialysis was the biggest contributor of productivity loss for both HD and PD.

Conclusions: Patients undergoing HD incurred a higher productivity loss compared to those undergoing PD although the difference was not significant. This is due to the high average productivity loss PD patients incurred because of time lost performing dialysis every day at home. With that being said, the study proved PD to be the least costly treatment modality since fewer patients on PD were unemployed compared to HD patients.

The direct costs of treating and managing haematological cancers from the perspective of a tertiary hospital, in South Africa

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Introduction: The treatment of haematological cancers is extensive and may cause a significant financial burden on the funder and provider of care. With the growing HIV population, the prevalence of haematological cancers in South Africa is rising and as the incidence of cancers escalates, so do the costs of treatment. Knowledge on the direct costs of managing these cancers in the public healthcare system in South Africa is very limited.

Objectives: To determine the direct costs of treating and managing haematological cancers at a tertiary public sector hospital.

Methods: A descriptive retrospective study, using data from patient files and medical records was carried out. A micro-costing method was utilised to establish direct medical costs which were determined from the perspective of the provider using a 'time-in–motion' method. The sum of all costs was used to establish the average total cost of care per haematological patient. Data were captured using Microsoft Excel® then imported to IBM SPSS® Statistics for Windows V25.0. for descriptive statistical analysis. Ethics approval (SMUREC/P/300/2020: PG) and permission to conduct the study were obtained. All participants provided informed consent.

Results: 53 patient files met the inclusion criteria for the study. Hodgkin's lymphoma had the highest patient count [36%; 19/53)] with HIV being the most common co-morbidity [40.7%; (22/53)]. The total average cost of treatment and management of haematological cancer per patient was R133593,50 and the average cost per cycle per patient was R26718,70. The major cost driver was chemotherapeutic agents accounting for 76,8% of total costs. Non-Hodgkin's lymphoma had the highest average cost with ABVD regimen being the most prominent.

Conclusions: The direct costs of managing and treating haematological cancers in South Africa are substantial. This may have a significant negative impact on the health budget if the cases of haematological cancers continue to escalate.

The use of local data to develop and implement sustainable antimicrobial stewardship (AMS) interventions as part of the Commonwealth Partnerships for Antimicrobial Stewardship Scheme (CwPAMS)

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Introduction: The Commonwealth Partnerships for Antimicrobial Stewardship Scheme (CwPAMS) is a health partnership programme funded by the UK aid Fleming Fund to tackle antimicrobial resistance (AMR) globally. CwPAMS is managed by the Commonwealth Pharmacists Association (CPA) and the Tropical Health & Education Trust (THET). The scheme was initiated with twelve partnerships based within four countries: Ghana, Tanzania, Uganda and Zambia.

Objectives: The CwPAMS health partnership scheme uses local data to develop and implement sustainable antimicrobial stewardship (AMS) interventions in Low Middle Income Countries (LMICs).

Methods: Each partnership developed multiple types of data, which was used to engage pharmacists and clinicians in innovative ways to improve ways of working.

The Global Point Prevalence Survey (G-PPS) of Antimicrobial Consumption and Resistance (G-PPS) was carried out at hospitals across Ghana, Tanzania, Uganda, and Zambia. CwPAMS used PPS data to evaluate local antimicrobial prescribing practices.

Alongside the G-PPS, several partnerships conducted audits to assess local practice. The data was used to facilitate discussions on local practice and identify barriers to change.

The CwPAMS app was developed to improve access to national prescribing guidelines.

Results: 17 CwPAMS healthcare facilities carried out point prevalence surveys. As a result of the programme, PPS data became readily available for the first time, strengthening the global commitment to improved antimicrobial surveillance. The data revealed that a variety of AMS interventions were required across the partnerships.

App metrics show how many times the guidelines were opened, the pages that were looked at the most, and the number of registered app users.

The partnerships have developed links to national stakeholders, such as national pharmacy and medical associations, within each of the 4 countries. Partners presented to national committees and working groups, which has enabled them to disseminate project findings on a national level.

Conclusions: The CwPAMS health partnership scheme demonstrates how local data can be used to develop and implement sustainable AMS interventions in LMICs. This data informs the implementation of the National Action Plans (NAPs), as governments use the data from partners when assessing the NAP objectives.

Antimicrobial Stewardship tools developed through the Commonwealth Partnerships for Antimicrobial Stewardship (CwPAMS) health partnership scheme

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CwPAMS have aimed to enhance the implementation of protocols and evidenced-based decision-making to support antimicrobial prescribing, as well as capacity for antimicrobial use surveillance.

Objectives: To identify and highlight the range of educational and AMS resources developed by individual CwPAMS partnership teams and those resources developed by the CwPAMS programme team with input from the health partnerships.

Methods: A list of tools and resources developed through the CwPAMS programme was collated by the authors.

Results: Resources developed by the CwPAMS programme team with input from the partnerships:

AMS Game, CwPAMS Microguide App, Continuing Professional Development platform, CwPAMS AMS toolkit, Behaviour change toolkit, AMS explainer videos in regional accents, Point prevalence survey training (in conjunction with Global Point Prevalence Survey team), Infection prevention and control resources including training videos on how to manufacture alcohol hand rub. Webinars, blogs, and articles, AMS Checklist, AMS Action Plan

Resources developed by the individual health partnership teams include committee structures, terms of reference and work plans for AMS Committees, teaching slides for delivery of multi-disciplinary courses in AMS, audit templates, guideline templates and local quality improvement projects.

Conclusions: The CwPAMS programme has led to the development of a wide range of AMS resources and educational tools which use a variety of different media formats and have been used across several health partnerships.

Indonesian Young Pharmacists Group's "Local Heroes": A project to unveil pharmacist contribution nationally

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Introduction: Pharmacy practice in Indonesia has evolved from a product-oriented approach to being more engaged in health promotion and public health practice. With the advancement of technology, pharmacists can also contribute to delivering pharmaceutical care to local communities, especially since rural areas are the main challenge of healthcare delivery in Indonesia. In this context, pharmacists can explore potential ideas for better practice delivery to society and improve social knowledge about the role of pharmacists. The World Health Organization (WHO) introduced the concept of a seven-star pharmacist in 2014, which covers the roles of a caregiver, decision-maker, communicator, manager, lifelong learner, teacher, and leader. In the following year, two other parts were added. The addition of "entrepreneur" and "researcher", has expanded the opportunity of pharmacists besides the conventional roles of dispensing. Currently, there is still no organisation project to appreciate young pharmacists who have outstanding performance in society. The "Local Heroes" project by the Indonesian Young Pharmacists Group (IYPG) aims to empower young pharmacists in Indonesia to showcase their contributions to the community while applying for the role of nine-star pharmacists.

Objectives: Aim of this study is to elaborate on the implementation of the "Local Heroes" project by the Indonesian Young Pharmacists Group.

Methods: Each local Indonesian Young Pharmacists Group (IYPG) region is allowed to nominate one or more young pharmacists to be awarded a monthly Local Heroes award. The internal committee consisted of a president, president-elect, and each division coordinator from IYPG is in charge of the nominee's assessment. The appointed committee will assess the nominees based on some aspects: ideas and project sustainability, social contribution, implementation of the nine-star pharmacist, and the act of empowering others.

Results: The program has been ongoing since July 2021. Out of nineteen regional IYPG, ten pharmacists from nine regions across Indonesia (Kalimantan Timur, Nusa Tenggara Timur, Riau, Bali, Nusa Tenggara Barat, Sumatera Utara, Sumatra Barat, Lampung, and Jakarta) have awarded as monthly Local Heroes. The projects initiated by the local heroes are varied from rural areas education, social outreach, campaign awareness for the pharmacist as a healthcare professional, pharmapreneur, fundraising for social activities, and global opportunities for pharmacists. Monthly virtual sharing sessions are regularly scheduled by each winner and have reached 2,954 audiences from the beginning of the project. Most of the award winners conveyed that this project has encouraged them to continue their project and contribute more to society.

Conclusions: Local Heroes project by the Indonesian Young Pharmacists Group has enabled young pharmacists across the nation to introduce their initiations in exploring various roles of pharmacists in society. The continuity of this project will be kept for better exposure to inspiring pharmacists to empower other young pharmacists in Indonesia then. Further research about this project evaluation is needed to examine the project's impact on young pharmacists and the impacted society in Indonesia.

Generics Adoption in Lebanon: A response to the Lebanese Economic, social and political crisis

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Introduction: The Pharmaceutical market in Lebanon is facing many challenges leading to high expenditure on pharmaceuticals, high out-of-pocket expenditure (OOP), and major budget constraints. Such challenges could partially be attributed to the low adoption of generics in the market. The contribution of local manufacturers even though with Good Manufacturing and Practice (GMP) certification and high-quality standards, is very shy. The government has conducted many initiatives to push towards the adoption of the generic notably the local ones, yet the success remained very low.

Objectives: The authors propose a comprehensive strategy with a long-term vision aiming to achieve Universal Health Coverage under the Ministry of Public Health framework. Their vision will be achieved through the SECURE Project: "Sustainable Early Care and Universal coveRagE", a five-year plan built on four pillars: the increase of generics adoption; ensuring early access to innovation; attracting foreign investment such as public-private partnerships, health tourism, or partnership with international health or financial organizations, and standardizing healthcare. The scope of this paper will be focusing on the first pillar: to increase generics adoption.in Lebanon.

Methods: A thorough analysis of the generics pathway "from registration to adoption" was conducted. This medical journey allowed us to identify the main value drivers that

would enable us to achieve their objectives. Those were translated into four main strategic objectives revolving around (1) enhancing quality, (2) trust, (3) regulations and (4) digitalization, and abiding by Good Governance Principles as a fundamental element for success. For each strategic objective, several initiatives and activities are proposed as part of the implementation plan under Good Governance Principles.

Results: The results of the different initiatives adopted will be for the:

-Objective one:

i. Full implementation of the Quality Assurance of Pharmaceutical Products program (QAPP).

ii. Partner with a certified laboratory for quality control in the short term and establish a central laboratory in the long term.

-Objective two:

i. Update the National Drug Strategy Plan (October 2021 - September 2026) and inclusion of generics' adoption as a main section in the plan

ii. National communication and educational strategy

iii. Launching of AL Bassma Program: The main objective is to provide holistic support to the patients through education, follow-up and care

-Objective three:

i. Use of MediTrack the Track & Trace software developed by the Ministry of Public Health as well as the E-Prescription implementation.

Conclusions: Generics adoption in Lebanon is essential to achieve better allocation of resources, reduction in healthcare expenditures and OOP expenditures on pharmaceuticals, and improvement in access to medication given achieving Universal Health Coverage. Adequate policies and programs should be implemented to build the Trust. The key success factors are to devise a strategic vision, build strategic partnerships, put in place robust policies, programs, and tools, ensure sustainability, and abide by good governance principles while keeping focused on the patient.

Impact on clinical outcomes of the integration of a virtual clinical pharmacist in a primary care practice

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Introduction: Comprehensive medication management (CMM) is designed to improve clinical outcomes for patients. The clinical impact of CMM at primary care clinics is still underestimated, and hence CMM is not a routine standard patient service provided in primary care practices.

Objectives: The goal of the program was to target patients with uncontrolled chronic conditions, such as diabetes, hypertension, and/or hyperlipidemia, and evaluate the clinical impact of CMM on glycosylated haemoglobin (HbA1c), total cholesterol (TC), low-density lipoprotein (LDL), systolic blood pressure (SBP), and diastolic blood pressure (DBP) on patients receiving the service.

Methods: A clinical pharmacy team from the University of Maryland School of Pharmacy provided CMM as an integrated service in a primary care practice in Calvert County, Maryland, United States. A total of 337 patients met with a clinical pharmacist through telephonic appointments or video calls. Patients' HbA1c, TC, LDL, SBP, and DBP are being used to assess the value of the addition of the clinical pharmacy service in helping patients attain their therapeutic goals. This retrospective study was conducted by observing patients seen in the clinics between May 11th, 2021, and April 22nd, 2022. Clinical data of patients who received CMM was retrieved directly from the EMR to evaluate the progress in patients after pharmacist intervention. A paired-sample t-test was conducted to compare each clinical measure before and after the pharmacist intervention (CMM). All statistical analyses were performed with SAS version 9.4 (SAS Institute, Cary, NC).

Results: The study population consisted of 67% female, with the majority of patients aged older than 55 years old (54% between 55-75 y.o., and 38% older than 75 y.o). Within the primary outcome analysis, a statistically significant reduction in average HbA1c from baseline (mean difference -0.19, 95% CI [-0.34 to -0.03, P 0.02]) was observed. Although changes in TC (mean difference -3.1, 95% CI [-11.6 to 5.4, P 0.5]), LDL (mean difference -6.8, 95% CI [-14.6 to 1.1, P 0.09]), SBP (mean difference -0.61, 95% CI [-2.1 to 0.8, P 0.4]), and DBP (mean difference 0.3, 95% CI [-0.5 to 1.1, P 0.5]) were not statistically significant, clinically significant changes were

observed. After the intervention, the number of patients with average TC at goal (<199 mg/dl) and patients with average LDL at goal (<100 mg/dl) increased by 4% and 8%, respectively. A slight decrease in the number of patients with average SBP at goal (<130 mmHg) and average DBP at goal (<80 mmHg) was observed after the intervention; 2% and 3%, respectively. In addition, 63% of patients stayed at their goal SBP, and 86% of patients stayed at their goal DBP after the intervention.

Conclusions: An integrated pharmacist's CMM service within primary care practice demonstrated statistically significant reductions in HbA1c and clinically significant improvements in TC and LDL. This analysis shows that clinical pharmacist-led CMM has positive impacts on clinical outcomes for patients receiving care at primary care practices. Further studies and analysis are needed to confirm these findings in other settings and the economic impact of these interventions.

Chief Pharmaceutical Officer's Global Health (CPhOGH) Fellowship Scheme: Assessing the benefits of Commonwealth Partnerships for Antimicrobial Stewardship (CwPAMS) collaborative projects

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Introduction: The CwPAMS programme takes a novel approach to enhance antimicrobial stewardship (AMS) through establishing partnerships between multidisciplinary teams in the UK and 8 African Commonwealth countries. To support the pharmacists working within these teams, the Chief Pharmaceutical Officer created a fellowship programme to develop leadership and project management skills throughout the project and provide background knowledge of global health principles.

Objectives: This evaluation was carried out to identify the outputs of the projects led by the CPhOGH fellows and assess the professional and personal benefits of taking part.

Methods: Outputs of the projects were identified through Fellows' project plans and progress updates. A questionnaire was sent to the fellows, asking them to reflect on their experiences.

Results: Ten responses were received, giving a response rate of 77%. Only 3 of the fellows had the opportunity to visit their partner country due to COVID restrictions; 1 fellow was visited by their commonwealth partners instead.

Project outcomes included the creation and delivery of train-the-trainer education and resources, completion of point prevalence studies, and co-development of key performance indicators for AMS and antimicrobial prescribing guidance.

The fellows reported being proud of the amount achieved, the building of strong and sustainable partnerships, and the engagement of their partner teams. The biggest challenges included building rapport and presenting using only digital platforms, time management including realistic objective setting and the completion of project work alongside an increased workload in their primary roles due to COVID. The main benefits were greater knowledge of AMS, health economics and global health issues, increased confidence in leadership and project management skills. The fellows gained experience of the opportunities and challenges of implementing health service improvements in a resource limited setting, innovating, and effecting positive change. On a personal level, fellows valued the new friends and colleagues they had made, a gain in confidence and enthusiasm. One fellow said that the fellowship had 're-ignited my enthusiasm for pharmacy.'

Conclusions: The CwPAMS programme has achieved its aims, empowering the fellows to successfully deliver project outcomes to improve AMS practice in partner countries. In the process, they have gained new skills and experience, developing professional networks which will facilitate future collaborative work.

Systematic review and meta-synthesis - challenges and problems during professional development of pharmacists and preceptors

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Introduction: The pharmacy transformation process is closely related to the professional development of pharmacists, with the main goal of increasing their competencies and performances. The biggest changes in this process are related to the undergraduate education of pharmacists and lifelong learning. Lifelong learning includes learning through practice and continuing education, which is especially important for young pharmacists.

The aim of the research was to identify the most common challenges and problems faced by pharmacists and preceptors during professional practice through a systematic review and meta-synthesis.

Methods: The research included a systematic review (PRISMA method) and meta-synthesis of selected publications (6 of the

initial 133) during the period from 2006 to 2020. The included publications focused on the development and evaluation of professional development programs for pharmacists and preceptors; challenges and problems faced by pharmacists in these programs. The quality ranking of 6 selected publications was performed according to the GRADE methodology. Further systematic search of data from selected publications was performed by meta-synthesis, which included the extraction of important determinants; afterwards by the thematic analysis in identifying the characteristics of the study, descriptive and analytical topics, which provided the basis for meta-synthesis of de novo topics.

Results: Six publications were selected (by the PRISMA method) and analyzed. The assessed quality of three studies was high, two were assessed as moderate, and one study had low quality. The publications were studied through 3 phases as a part of meta-synthesis. Phase 1 showed the difference in the type and characteristics of the examined population. In Phase 2, two descriptive topics of importance were identified: (a) development and evaluation of preceptor development programs and (b) outcomes of preceptor development programs. The results of Phase 3 provided three major analytical topics for the preceptor development programs that pharmacists and preceptors face in the future: (a) challenges, (b) problems, and (c) critical thinking skills.

Conclusions: The demand for increasing the performance of pharmacists is directly related to the role of pharmacists in the modern age, where they are expected to have a range of competencies, skills and abilities in a real working environment. Critical thinking skills are indispensable in the daily practice of pharmacists and not enough attention has been paid to them as a part of professional development programs for pharmacists and preceptors. This conclusion was supported by a qualitative method, systematic review and meta-synthesis.

The pharmacist's role in screening patients experiencing homelessness for HIV and Hepatitis C

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Introduction: In 2019, there were over 1.1 million people living with HIV and 2.4 million people living with HCV in the United States. The CDC estimates that one in seven (14%) are unaware of their HIV infection and almost half of all HCV infections are undiagnosed. People with unstable housing are disproportionately affected by HIV and HCV, with prevalence rates of HIV infection estimated to be as high as 21% and HCV infection as high as 36%. Pharmacists are in a unique position to contribute to The Joint United Nations Programme on HIV/AIDS (UNAIDS) '90-90-90' initiative and the U.S. National Viral Hepatitis Action Plan.

Objectives: The objective of this study is to evaluate the prevalence and risk factors for HIV and HCV infection in individuals with unstable housing and to assess the impact pharmacists can have on the HIV and HCV care continuum through screening, education, risk mitigation counseling and referral.

Methods: This study was conducted in a single independent community pharmacy in Spokane, Washington. Eligible study participants were walk-in patients of the pharmacy, over the age of 18 and currently experiencing homelessness. Pharmacy patients were excluded if they had a prior history of HIV or HCV diagnosis, received a screening for HIV or HCV in the last 6 months or were unable to give informed consent. The study intervention included administration of an HIV and HCV point-of-care antibody test using a blood sample from a finger prick, risk determination interview, comprehensive HIV and HCV education, personalized post-test and risk mitigation counselling followed by referral to a partnering health clinic.

Results: A total of 50 participants were recruited and included in the final data analysis. The majority of participants were white (68%), male (80%), and aged 31 – 40 (52%). A total of 22 participants (44%) had a reactive HCV POCT, and one participant had a reactive HIV POCT. Of the 94% of participants who reported any recreational drug use, 74% reported injection drug use. There was a high prevalence of diagnosed mental health conditions (92%) and individuals reported using illicit substances as a coping mechanism for their mental health (87%). Seventy-six percent (n = 38) were determined to qualify for PrEP and no participants were currently taking PrEP. Pharmacist referrals were made for 28 participants and 71% were confirmed to have established care through direct communication with the referred provider.

Conclusions: Individuals experiencing homelessness are at an increased risk for acquiring HIV and HCV due to sexual behaviours, high prevalence of substance misuse and mental health conditions. Pre-exposure prophylaxis is currently underutilized in the U.S. and would greatly benefit this study population with the identification of eligibility and patient-specific counselling provided by pharmacists. Pharmacist involvement in mental illness, substance misuse and the communicable disease care continuum can have a positive impact on improving linkage and retention in the care of difficult-to-treat populations such as those experiencing homelessness.

Utilising the Patient Activation Measure (PAM) as part of comprehensive medication review services for complex, high-risk patients

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Introduction: The Patient Activation Measure (PAM) is a validated and reliable tool designed to assess a patient's level of engagement in managing their own health. PAM has been used in multiple sectors of the healthcare industry but there is limited data from pharmacists using this tool to identify and address medication-related problems (MRPs). The purpose of this project was to implement the PAM in a rural, critical-access hospital where a pharmacist was providing outpatient comprehensive medication reviews for high-risk patients.

Active Description: A critical-access hospital in rural Washington State began providing pharmacist-led outpatient medication reviews in 2019. Patients were referred to this service by hospital physicians and nurse educators with the goal of identifying and resolving MRPs. The PAM was conducted upon enrollment in the program and again at least six months later by a nurse educator with experience using this tool. PAM is a series of Likert-response questions that assess a patient's confidence, skills, and knowledge reported as a PAM score (out of 100) and PAM level (out of 4) with higher scores correlating to higher levels of activation. The pharmacist used the initial PAM results to individualize interventions with the patient and work to resolve the identified MRPs. The second PAM score was compared to the first to determine whether engaging with the pharmacist may have improved the patient's activation.

Programme Outcomes: Twenty-nine patients were referred to the pharmacist for medication reviews between 2019 and August 2021. The patients had an average of 14 medications (range 5 to 25) and 19 diagnosed medical conditions (range 10-30). Of those, 23 (79%) participated in the program and had two PAMs scores conducted at least six months apart. Twelve (52%) of the patients had a PAM score that increased (enhanced motivation/activation), two (9%) stayed the same, and nine (39%) decreased (decreased motivation/activation) during the project period.

Financial Viability: Implementing the PAM was part of a grant-funded research project. However, this was a useful tool that aided the pharmacist in providing a comprehensive medication review. Consideration is given to purchasing and using the PAM tool with all high-risk patients.

Future Directions: Incorporating PAM into pharmacist interventions with high-risk patients may be beneficial. Studying the use of the PAM in more detail could provide insight to assist pharmacists and other healthcare providers in creating tailored interventions.

Breaking inertia in addressing older people's drug iatrogenic in Catalonia: Emerging barriers and enablers with pharmacists and other health professionals' perspectives

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Introduction: The increase in adverse medication effects among older patients is a major concern worldwide. For this reason, ongoing medication review and withdrawal of inappropriate medications are essential to improve patient safety. On this subject, work has been done in the multicentric OPTIMAGE project (POCTEFA).

Objectives: Within the framework of the OPTIMAGE project, to explore barriers and facilitators to emerge recommendations perceived by health professionals in the prevention of drug iatrogenesis in the aged population in primary care, public hospitals and community pharmacies in Catalonia.

Methods: It was applied in-person method using a purposive sampling approach. The Metaplan© methodological technique was used to generate motivation for professionals to identify key aspects and establish possible actions. The sessions were carried out in five regions. Their contributions were audio-registered, categorized and analyzed based on a thematic analysis.

Results: Sixty participants contributed emerging 132 thematic areas categorized into barriers, facilitators, and recommendations to prevent medication iatrogenesis. Although healthcare professionals focused on detecting those barriers perceived from the perspective of healthcare services, they also emphasized the importance of overcoming other social barriers related to health education and social

determinants of health that could mediate the problem. They also detailed the existence of specific barriers faced by groups such as patients, prescribers, pharmacies and the healthcare system. On the other hand, there were pointed out facilitators prescriber's competencies, specific medication results, availability of empirical evidence and role of the pharmacist.

Conclusions: To address the existing inertia in dealing with medication iatrogenesis requires a simultaneous approach that helps to overcome barriers in three spheres: in the social area, going beyond the social determinants of health that add complexity to the management of the problem in groups of poly medicated and multi-pathological older people. Especially, when other aspects are concomitant such as social isolation or cognitive decline, etc. Key actions were considered based on supporting people in vulnerable situations, empowering patients, and giving them a voice in improving their health and medication management skills. Also, putting patient and informal caregivers at the centre of the healthcare system, synchronizing their personal goals with the therapeutic ones.

With respect to the healthcare system, it was visualized care processes as a continuum in order to reduce existing fragmentation, but also to develop actions to strengthen care management through a more integrated, holistic, personalized, cross-cutting and longitudinal organization of care. It was recommended to develop more multidisciplinary follow-up of treatments and to settle single protocols. Furthermore, to potentiate the involvement of stakeholders with formalized and fluid coordination and communication. Additionally, taking care of and motivating professionals provides them with resources as tools, simple and easy-to-use systems and technologies, as well as, facilitating time, human resources and training.

In relation to community pharmacies, it was pointed out to integrate the role of pharmacies as health agents and improve communication channels between primary care, hospitals and pharmacies to access to critical information.

Finally, to promote changes it is required to have support from the Health Administration in the implementation of these initiatives.

Perception of health professionals on drug iatrogenia and its prevention: A transpyrenean approach

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Introduction: Drug iatrogenia costs global health systems $52 billion annually and it is a major concern around the world. OPTIMAGE (Opter pour la Prévention Transpyrénéenne de l'Iatrogénie Médicamenteuse chez la personne Agéis) is a transpyrenean project that brings together 11 territories from France (Haute-Garonne, Ariège, Hautes-Pyrénées, Pyrénées-Orientales), Spain (Navarra and Catalonia: Alt Urgell, Badalona, Baix Ebre, Reus, Ripollès) and Andorra aimed to promote the exchange of good practices and training on therapeutic optimization in the elderly.

Objectives: The aim of this study was to explore the perception of health professionals based on the territories of OPTIMAGE project about drug iatrogenia and its prevention.

Methods: A web-based cross-sectional survey was used for the study. The survey was sent to all the members of the RELIM network created during the OPTIMAGE project. The survey was designed and distributed using Microsoft Forms during October and November 2021. Informed consent was obtained from all the participants.

Results: A total of 134 health professionals answered the survey (77 pharmacists, 34 physicians, 18 nurses, and 4 other health professionals) from Occitane, Navarre and Catalonia (45% Occitanie, 24% Navarre and 31% Catalonia). The results of the study show that almost 48% of the respondents detect almost every day potentially iatrogenic treatments. Communication between different health professionals is considered difficult or very difficult in 49% of responses. In turn, 98% consider that the incidence of drug iatrogenia would be reduced with better control of prescriptions and dispensations and with periodic review and readjustment of treatments. Other problems highlighted by respondents are related with the lack of homogeneity in the use of databases and management programs. Suggestions to improve the prevention of iatrogenia are most related with the use of a shared clinical history and a unique electronic prescription

program, the increase of the ratio physician-patient, the better communication between prescribers and dispensers, and continuous training and regular meetings between professionals.

Conclusions: Drug iatrogenia is a common problem in the daily pharmacy practice in the transpyrenean region that could be reduced with better coordination and communication among health professionals and the harmonization of technologies and management software. The survey has been useful to explore the perception of health professionals about drug iatrogenia but further research would be needed to deepen these results.

Can a course in narrative medicine encourage empathy in pharmacists' medication counselling? – A before/after intervention study using the Jefferson Scale of Empathy

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Introduction: Health professionals' level of empathy has been shown to have various positive effects on patients' health experience and outcomes. Narrative medicine is a recent cross-disciplinary approach aiming to encourage empathy, reflection, professionalism, and trustworthiness.

Objectives: The aim of this study was to investigate if and how a course in narrative medicine affects level of empathy among pharmacists from community and hospital pharmacy.

Methods: During 2020-2021, three 2-day courses in narrative medicine were held. The courses consisted of alternating lectures and exercises with close reading and creative writing, all on topics related to narrative medicine, e.g., basic concepts, theory, and practice. The primary endpoint was change in pharmacists' self-reported level of empathy from before to after the course measured with Jefferson Scale of Empathy (JSE). The secondary endpoint was patient-reported level of empathy for the pharmacists measured with the Consultation And Relational Empathy scale (CARE).

Results: A total of 33 pharmacists participated in a course in narrative medicine. The pharmacists were a median of 41 years, 91% were female, 76% were working at community pharmacy, and 47% rarely read fictions.

A statistically significant increase was found in mean total JSE score from 109.9 +/- 17.1 before the course to 115.7 +/- 14.6 after the course (p=0.0362).

Only 12 patients answered the CARE scale in total, and therefore a before/after calculation was not possible. However, the patients reported the empathy of the pharmacists as excellent or very good in most questions both before and after the pharmacist had participated in the course.

Conclusions: The pharmacists reported that the course in narrative medicine was enhancing their level of empathy, but future studies should use patient-reported outcomes to confirm that the experienced enhanced empathy also reaches the patients.

Collaboration agreements between community pharmacies and primary healthcare centres for acute COVID-19 and long-term COVID-19 management in the Northern Metropolitan Area of Barcelona, Catalonia, Spain

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Introduction: Collaboration between community pharmacies (CP) and primary healthcare centres (PHC) has been shown to be useful for the management of many diseases. Community pharmacists were among the healthcare professionals readily available for face-to-face consultation during the COVID-19 crisis, which reached Barcelona, Catalonia, Spain in March 2020. Initially, an acute COVID-19 management program was created to coordinate the referral of patients with COVID-19-like symptoms and those with close contact with COVID-19-positive persons, as well as the referral of people who have not received all COVID-19 scheduled vaccines. Once long-term COVID-19 syndrome was described, a collaboration protocol for its screening involving CP and PHC was designed.

Objectives: To establish collaboration agreements involving CP and PHC to screen patients with acute COVID-19 and long-term COVID-19 syndrome and to ease the linkage to care.

Methods: For the acute COVID-19 program, Epidemiological Surveillance Services (ESS) of Vallès and Barcelonès-Nord-Maresme Areas, the Catalan Healthcare Service (CatSalut) and Barcelona Pharmacists Association (COFB) jointly

designed the circuit and a safe cloud-based software hosted in Farmaserveis, the Catalan pharmacy services platform, to facilitate patients' referral. For the long-term COVID-19 syndrome, Maresme Healthcare Consortium (CSDM) Hospital de Mataró and PHC, as well as COFB, designed another safe cloud-based software hosted in Farmaserveis. In both cases, pharmacists screen patients according to the agreed criteria, provide health education and refer patients to PHC when needed.

Results: For the acute COVID-19 program, community pharmacists performed interventions in 1303 CP users. 63.1% of CP users, received health education by the pharmacist, while 36.9% were referred to their PHC, as well: due to COVID-19-like symptoms (71.6%); being close contacts to COVID-19-positive cases (25.3%); and to be vaccinated (3.1%). 63.4% of the visited patients needed some kind of diagnostic test. 30.8% tests were COVID-19-positive. The long-term COVID-19 syndrome screening program is going to be initiated in the second half of 2022.

Conclusions: COVID-19 crisis has highlighted the need of establishing collaboration agreements involving CP and PHC which have been useful for acute COVID-19 management. When it comes to the implication of community pharmacists for long-term COVID-19 syndrome screening further research is needed.

Community-dwelling mental health patients' access to pharmacogenetics through community pharmacies as a tool for pharmacotherapeutic optimization: A research design in Barcelona, Catalonia, Spain

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Introduction: Response to psychotropic drugs is highly variable: 20-30% of patients have no response to antidepressants, whereas 30-50% of patients treated with neuroleptics have side effects or no response to them. Many factors affect psychotropic response: age, sex, adherence, comorbidities and genetic baggage amongst others. Ineffectiveness, side effects and economic expenditure can be avoided by identifying those patients not responding to a given drug through pharmacogenetics. However, this technology is not widely available at community adult mental healthcare centres.

Objectives: To set a pharmacogenetic testing circuit to assess psychotropic drugs toxicity and refractoriness in mental health patients, involving hospital and community pharmacists, geneticists and psychiatrists; and to evaluate this circuit's feasibility and operability.

Methods: Fifty patients with ineffectiveness or side effects to psychotropic drugs are meant to enrol to this exploratory prospective study. They are invited by their community mental healthcare centre psychiatrist to enrol at any of the participating community pharmacies. Community pharmacists collect from each participant's pharmacotherapeutic profile and a saliva sample to be sent to the hospital for CYP1A2, CYP2D6, CYP2C19, CYP3A4, 5-HTT and HTR2A genotyping. Hospital pharmacists gather all obtained data with their clinical records. Data are analysed together with a psychiatrist to assess the prescription adequacy. Barcelona Pharmacists' Association (COFB) coordinates the whole project and provides IT and logistic support.

Results: This study is the 2nd part of a pharmacogenetics implementation study initiated in January 2020 which was temporarily suspended due to the COVID19 pandemic. The 1st part focused on clopidogrel pharmacogenetics, with 114 patients with a clopidogrel prescription assessed, from which 15 were analysed and 5/8 were intermediate/poor metabolisers. The 2nd part is resumed in 2022.

Conclusions: This circuit has shown to be feasible initially. This 2nd part set in community adult mental healthcare centres justifies better the collaborative integrated approach involving geneticists and community healthcare providers, however further research is needed once the study is resumed.

Chagas disease screening program in community pharmacies from Barcelona, Catalonia, Spain

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Introduction: Chagas disease (CD) is a parasitic disease caused by Trypanosoma cruzi, which is endemic in

continental Latin American areas. Its main vectors are insects in the subfamily Triatominae ("kissing bugs"). In non-endemic areas CD transmissions occur mainly by vertical transmission, organ donation or use of blood products. In its early stage, symptoms are absent or mild, however up to 45% of chronically infected patients develop heart disease 10-30 years after CD infection. It is underdiagnosed in European countries, thus implementing screening methods and facilitating access to adequate follow-up and treatment of people living with CD in non-endemic areas is also indispensable to its control and to enhance the access to the healthcare system in the migrant population.

Objectives: To facilitate the access of people living with CD from endemic areas to rapid screening tests through community pharmacies, and to increase the number of patients living with CD receiving care in international health units.

Methods: Approximately 10% of community pharmacies in 3 districts in Barcelona with an important Latin American population (Nou Barris, Horta-Guinardó and Poble Sec) were called to participate in this screening program. Pharmacists were trained and started recruiting target population in November 2019. However, there was an important hiatus due to COVID-19 healthcare crisis and the project was resumed in November 2021. To approach the target population 3 strategies were design. All pharmacies in the same district were allocated to the same strategy: a passive strategy, using only printed materials and an online informative campaign through social media and a landing website; an active strategy, using the aforementioned materials as well as a pharmacist-led promotion; and a community strategy, in which the previous activities were supplemented with informative sessions in Latin American cultural associations in the corresponding district. After the participants sign the consent form, they are screened using a Chagas Detect Plus Rapid Test (InBios Inc., Seattle, USA) and epidemiological data is collected. Additionally, blood drops from finger prick will be collected using filter paper to evaluate the positive predictive value of the rapid test. If the result is positive, patients are referred to Vall d'Hebron Hospital Tropical Medicine Unit to access adequate healthcare. If it is negative, patients are informed and provided further information.

Results: From November 2019 to May 2022, 340 participants enrolled in 37 community pharmacies (9.19 tests/pharmacy). 71.76% of participants are female. 66.47% of the participants are from Bolivia, Ecuador, Honduras and Peru, the rest are from other Latin American countries. 12 patients were positive for Chagas (3.53% positivity) and were referred to Vall d'Hebron Hospital Tropical Medicine Unit for further assessment. 83.33% of the positive patients are from Bolivia. 59.12% of participants enrolled due to a pharmacist-led active promotion; 37.06%, reported asking for this service due to brochures available at the pharmacy, and 3.82% knew the service by other means.

Conclusions: Despite initial difficulties due to the COVID-19 crisis, community pharmacies have proved to be an effective CD screening point which is close to the migrant citizens and provides an effective linkage to care.

Assessing the Quality of life in HIV-infected patients receiving a fixed-dose combination therapy at a public primary healthcare

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Introduction: The availability of free cost-effective antiretroviral therapy (ART) in South Africa, has improved the longevity of disease. However owing to lifelong treatment, opportunistic-infections, and quality of life (QoL), has emerged as a significant medical-outcome measure.

Objectives: To assess QoL in HIV-infected patients attending a public primary healthcare (PHC) for their ART.

Methods: A cross-sectional study was conducted among 100 patients ≥18 years. World Health Organization-QoL-BREF and semi-structured questionnaires were used to obtain QoL-domain and demographic-informations. Data were analyzed using SPSS calculating median-scores in each domain. Using ANOVA associated factors were obtained considering $p < 0.005$ statistically significant.

Results: Of 100 participants interviewed, 52% females and 48% males had mean-age 37.53±9.127 (range18-60years), 35(36.1%) had secondary-level education, 38(40%) singles, 40(40.8%) permanently employed (40;40.8%) earning >R4000 monthly, (64;65.3%) lived in rural-areas, 94(96.9%) had chronic-diseases and 45;48.9% asymptomatic. Overall mean-scores for health-related-QoL-domains were: 41±11.9 psychological, 68.9±17.0 physical, 39.7±26.6 social, 58.1±13.2 environmental, 29.5±28.7 personal/spiritual/religious/beliefs and 54.0±20.9 level-of-independence. Mean-significant differences in QoL-scores were: level of concentration in psychological (p=0.001), physical environmental (p=0.006), fear of future/death in personal (p=0.0001) and physical pain in physical (p=0.001).

Conclusions: Challenges related to QoL in HIV-infected patients are to be addressed by healthcare providers and other stakeholders to enhance patients' QoL.

P-glycoprotein neurotransmitters homeostasis modulation following the administration of CNS active drugs

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Introduction: The blood-brain barrier (BBB) restrains the pharmacotherapy of the majority of central nervous system (CNS) disorders, like brain cancer, epilepsy, and neurodegenerative diseases. A distinctive element of the BBB is the xenobiotics efflux transporter, P-glycoprotein (P-gp) which is a selective sentinel due to the high level of expression, selectivity, luminal membrane location, high transport potency of the BBB and hence it is the main impediment to drug delivery at the cerebral level. P-gp restricts many drugs from entering the CNS, contributing to the low success rate of CNS drug candidates and presumably contributing to patient-to-patient variability in response to CNS pharmacotherapy. P-gp modulation could thereby improve drug transport to the brain and consequently their efficacy.

Objectives: The study of endogenous chemical neurotransmitters has lately gained much interest, driven mainly by the discovery and use of more complex and extremely accurate investigative methodologies. This study explores the impact of BBB permeability and the P-gp efflux mechanism, upon exposure to CNS active drugs.

Methods: Albino Swiss mice were randomized in groups and intravenously treated with CNS active drugs: valproic acid, risperidone, fluoxetine and lithium, as monotherapy or their combined administration, paralleled to quinidine administration, a classic P-gp inhibitor. After the treatment completion, brain tissues were collected and the neuronal concentrations of noradrenaline, dopamine, serotonin, and gamma-aminobutyric acid were assessed using an LC-MS method.

Results: As such, the administered CNS active drugs triggered an increase in the brain concentration of noradrenaline, depicting an adrenergic hyperfunction. This aspect becomes clinically important, regardless of the mechanism involved in increasing the concentration of noradrenaline through the blockage of adrenergic receptors, inhibition of postsynaptic reuptake and the inhibition of metabolic enzymes. Thus, clinically, an increase in adrenergic tone contributes to antidepressant efficacy while improving concentration and attention. From this particular point of view, the effect of inhibiting the P-gp activity is spectacular for the group treated with lithium (406.66%).

The experimental results showed that all administered drugs increase the neuronal concentration of dopamine at different rates, and most of them generate a statistically significant increase in serotonin concentration compared to the control group ($p<0.05$). The highest values were recorded for the groups treated with risperidone, fluoxetine and lithium.

The co-administration of quinidine with the studied drugs demonstrated the decrease of the cerebral concentration of gamma-aminobutyric acid, illustrating the inhibition of GABA-ergic transmission, for most animal groups.

Risperidone acted as an atypical antipsychotic, increasing concentrations of noradrenaline, dopamine, and serotonin and decreasing the concentration of gamma-aminobutyric acid.

Conclusions: The experimental results of this study are valuable research data on multidrug resistance mechanisms encountered in various neuropsychiatric disorders, bringing new perspectives to the currently employed therapeutic schemes.

Models derived using machine learning to assist clinical decision-making for minor ailment presentations in community pharmacy

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Introduction: There is considerable evidence that patients with minor ailments (MAs) can be treated successfully in community pharmacy (CP) through a minor ailment service. This type of practice programme generates rich and large data sets. INDICA+PRO is a Spanish study to evaluate the impact and implementation of this service. Machine learning and big data analytical techniques can be utilised to create models to assist in clinical decision-making and increase patients' safety.

Objectives: To develop decision-making models to manage patients with MAs through CP using machine learning science.

Methods: A pragmatic study with hybrid effectiveness-implementation type 3 was used with a co-designed service with several intervention components: agreed standard operational procedures with scientific medical societies, protocols for ailments (dermatological, digestive, related to pain, upper respiratory tract related and others) including referral criteria, a web-based program-based consultation protocol and training before and during the study. Patients were followed up after 10 days by pharmacists. Data were collected through IT systems as a by-product of service delivery and implementation. Machine learning analysis was carried out to evaluate a patient outcome: referral to the general medical practitioner. The analysis used the following variables related to patients: gender, age, province, consultation type, quality of life, physiological status, other health problems, other treatments, MA, whether the MA has been treated previously, MA duration, and referral criteria. 70% of the database was used for creating the models to be validated with the other 30%. Accuracy, Cohen's kappa and other metrics were used to assess the performance of the predictive models.

Results: A total of 1246 pharmacists from 24 provinces in Spain documented 14083 consultations up to December 2021. Nine models were developed for the outcome referral to the general medical practitioner: three statistical models (k-Nearest Neighbour-kNN, Naive Bayes-NB, Logistic Regression-RegLog), three black box models (Artificial Neural Network-ANN, Support Vector Machine Lineal-SVM.L, Support Vector Machine Radial-SBM.R) and three tree models (C5.0 Decision Tree-C5DT, Random Forest-RF, XGBoost-XGB). Seven models obtained an accuracy > 0.90, kNN obtained 0.88 and NB 0.87 (min recommended to consider a model appropriate is set a 0.62). Cohen's kappa was over 0.62 (min recommended) for three models (SVM.R, SVM.L, C5DT), between 0.55-0.60 for four models (XGB, RegLog, RF, ANN) and smaller for NB and kNN. All models obtained a recall of 0.95 or over (0.62 min recommended).

Conclusions: Good predictive models were obtained for referral to the general medical practitioner. The ongoing study will provide further data to develop stronger predictive models thus increasing patient safety through the incorporation of alert models in the IT program and improving practice behaviour by identifying individual educational needs for pharmacists. Computer science and artificial intelligence can be used to assist community pharmacists' decision-making and patients' safety.

Rising blood pressure amongst patients in Pune, India: A role for clinical pharmacists

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Introduction: Hypertension continues to be a concern worldwide, as one of the leading causes of premature death worldwide. The prevalence of hypertension continues to rise, including in the rapidly urbanising country of India.

Objectives: The objective of this study was to assess the change in prevalence and patient awareness of increased blood pressure in a suburban region of Pune, India.

Methods: Utilising a week-long annual medical camp, willing patients 25 years of age and older had their vitals checked and recorded. Blood pressure readings were categorized based on 2017 ACC/AHA hypertension guidelines. Patients identified with elevated blood pressure were asked if they were previously aware of their blood pressure status. Data gathered in this study were normalised and compared to data from a similarly operated medical camp hosted in 2013 at the same location.

Results: Of the 404 patients screened, 153 (37.9%) were found to have increased blood pressure. Of these, 50 (32.7%) had been previously told they had high blood pressure. When compared to the data collected at the same site and conditions in 2013, the patients screened in this study were at 2.33 times greater odds of having an increased blood pressure reading ($p < 0.0001$; 95% CI, 1.82-3.08).

Conclusions: Hypertension prevalence is growing worldwide, including in Pune, India. Increased screening and education efforts are needed to combat this chronic disease and pharmacists are well positioned for the task.

An assessment of perceived depression in patients in Pune, India

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Introduction: Cultural traditions largely influence the diagnosis and treatment of certain disease states. In India, this is especially relevant to psychological disorders such as depression due to stigma. False beliefs and negative attitudes often lead individuals to ignore symptoms and make them more hesitant to seek treatment. The unspoken nature of these health conditions often leads to decreased awareness and ultimately treatment.

Objectives: The purpose of this study was to assess perceived depression amongst a select population in Pune, India.

Methods: An adapted PHQ-9 survey tool was used to assess depression in patients over 30 years of age at an outpatient medical camp in Pune, India. In the triage area of the medical camp, the survey was verbally read to participants. The translation was used when needed.

Results: Over a 5-day medical camp, 52 patients (35 female and 17 male) were screened for depression using the modified PHQ-9 survey tool. Of the patients screened, 76.47% of males and 97.14% of females identified some signs of depression, ranging from mild to moderately severe. Of the 47 identified, 33 (70.21%) were found to have minimal or mild signs of depression. None of the patients displaying signs of depression had spoken to a physician regarding potential treatment.

Conclusions: Compiled data suggests that a large number of patients are at risk for depression in the Pune, India region, with women having a greater tendency than men. This study supports the need to increase awareness and education programs to address the mental health needs of patients in the region.

Encouraging advocacy by Portuguese pharmacists: preliminary results on the development and implementation of a programme

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Introduction: It is becoming increasingly essential to involve all healthcare stakeholders (from healthcare professionals to patients and caregivers) when making health decisions. Due to its enormous proximity to the population, pharmacists can play a prominent role, contributing for the advocacy of the profession and its importance to patient's safety and the overall success of the health system. To do so, pharmacists must be aware and prepared to act accordingly.

Objectives: To show preliminary results on the development and implementation of a programme aiming to empower Portuguese pharmacists to advocate for the profession and overall community health.

Methods: Portuguese Pharmacists' Society (PPS) has been developing, since 2019, a programme designed to encourage pharmacists to be more involved in politics, namely in regards of understanding the decision and policy-making logic, thusly enabling pharmacists to have a more active role in their communities.

The programme comprises three parts that develop critical thinking and action regarding this topic. Firstly, there are a series of virtual and face-to-face meetings with different key opinion leaders (KOL), named "MeetUp at the Portuguese Pharmacists' Society" aiming to involve pharmacists in social and civil pressing questions. These MeetUps are done with an informal setting, to promote a free and conscient debate, intending for the designated KOL to share their views. Through these events, pharmacists, in the audience, are able to make comments, queries and arguments. In addition, these gatherings are made only for a small number of participants, in favour of having an easier environment for reflections and argumentation. Secondly, to prepare pharmacists for their political interventions, it has been designed an intensive course, titled Winter School, which its main objective is to capacitate for political civic action and establish a network of active political pharmacists. By immersing the participants in a thorough soft skills and hard skills plan, this phase of the Programme will ensure that pharmacists share information with their peers and determine crucial points in a pharmacist's role in society, hence developing their capacity at political intervention.

Thirdly and lastly, the Portuguese Pharmacists' Society wishes to compose a formal paper to align and detail a pharmacist's political and civic action, as a guide to pharmacists and their intervention at local, regional, national, or international level.

Results: So far, only the first phase is under way with over 240 pharmacists being active participants in the referred events, engaging 10 different KOL's.

Conclusions: The pharmacist' political and social empowerment project is having great participation from the pharmacists, showing the relevance of a training project for political and social intervention.

Involvement of patients' organisations: Key approach to improve pharmacists' empowerment in pharmaceutical care

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Introduction: Alma Ata Declaration asserted people's "right and duty to participate individually and collectively in the planning and implementation of their health", which led to a progressive public and patient participation in their own health.

Nowadays, it is essential to create bridges between patients and caregivers, their representatives, and health professionals, aiming to improve care at all settings and levels. Being aware of that, the Portuguese Pharmacists' Society (PPS), representing all pharmacists working in Portuguese territory, is committed to engaging patients in the organisation.

Objectives: To present a framework of patient organisations' involvement in initiatives aiming to improve scientific and social pharmacist empowerment in communities.

Methods: Aligned with the proven added value of involving and empowering patients in all healthcare settings, the PPS has been developing a programme to congregate pharmacists, healthcare policy-making leaders, patients' organisations, and society in general, named "Citizen's Involvement with the Pharmacy Profession". The programme encompasses three phases, aiming of assembling a partnership between pharmacists and Patient Organisations, while developing online free courses for pharmacists to improve their pharmaceutical care in approaching patients with a certain pathology. When engaging with a patient organisation, a project plan is developed, and responsibilities are shared between the parties.

Results: The first phase is developed for disease awareness, as such, its central focus is to inform the general population, as well as pharmacists, about a chosen disease, whilst in partnership with the Patient Organisation, thusly presenting both the pathology and the Patient perspective. This stage of the programme may be done, for instance, via written communication (factsheets, social media disease awareness campaigns, etc.) or via webinars, joining several stakeholders on the topic at hand.

The second phase has a main target of empowering pharmacists in their direct intervention with citizens who are living with the chosen disease. At this stage, an online course is developed in close collaboration with the patient organisation and medical societies, as it intends to provide an upgrade on pharmacists' professional approach to patients and promote refinement of the pharmaceutical intervention at the community level. The online courses are held in a Moodle learning management system and the content is revised by all parties to ensure it fits with the desired goals of the project.

The third and last phase of the programme intends to build a pharmacy profession toolkit, in which a pharmacist may have a compendium of important guidelines on how to provide the best care possible to someone suffering from the chosen health condition.

By March 2022, the authors have been able to reach over 780 pharmacists and pharmaceutical sciences students with online courses about Pharmaceutical Intervention with people with Migraines and Headaches, and Pharmaceutical Intervention with people with Gout.

Conclusions: Patient involvement through Patient Organisations has proved essential in improving the adequacy of Portuguese pharmacists' training for providing pharmaceutical care to citizens in the health context. Overall, with different Patient Organisations, PPS is simultaneously developing a solid pharmacy profession toolkit for pharmacists' daily activity among communities.

The assessment of pharmaceutical care on patient safety, drug-treatment effectiveness and quality of life in conditions related to the use of psychotropic medicines-pilot study

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Introduction: Mental disorders are among the leading causes of the global burden of disease. The promotion of the appropriate use of psychotropic medicines plays an important role in the mental health system. Their use can result in significant drug-related problems (DRPs), potentially leading to inadequate symptom control, worsening or relapse of illness, hospitalization, increased suicide rates and negative impact on psychosocial outcomes and quality of life. Community pharmacists have an important role in recognizing and solving DRPs. The current guidelines for community mental health care in Croatia do not point out the role of pharmaceutical care. The authors identified the need for a pilot study to develop a research protocol to assess the impact of pharmaceutical care on patient safety, drug-treatment effectiveness and quality of life for conditions related to the use of psychotropic medicines.

Objectives: The aim of a pilot study is to collect preliminary data, define research questions and hypotheses, develop a research protocol and assess the feasibility of the research.

Methods: The pilot study was conducted by pharmacists in two community pharmacies in Istria County (Croatia). Inclusion criteria were adult patients of both sexes, using psycholeptics and/or psychoanalytic, living independently, not- hospitalized and able to participate in the study for 3 months. Detected DRPs and the type of pharmacist's interventions were documented using the PCNE (Pharmaceutical Care Network Europe) Classification for Drug-Related Problems, Version 9.1. Quality of life was assessed using the WHOQoL-BREF questionnaire (World Health Organization Quality of Life abbreviated version). For collecting and presenting the data, the authors obtained ethical approval from the Ethics Committee of Istrian Pharmacies and informed consent from patients.

Results: Preliminary data involve nine patients (seven female; 77,78%), mean age 53,78 (range 27- 80) years. The number of detected DRPs was 12 (manifested 5, 41,67%; per patient 1,33). 52,94% of pharmacist interventions consisted of patient counselling and referral to the prescribing physician in 29,41%. Pharmacist interventions were accepted and fully implemented in 40% of proposed interventions, but in 50% there was no acceptance because of no agreement. DRPs were not solved in 50% (lack of patient cooperation) and in 25% the outcome is unknown. The second measure of the quality of life was completed by 3 patients (2 with unsolved and 1 with partially solved DRP). A reduction in scores in the psychological domain of the WHOQoL-BREF was observed in 2 patients indicating a deterioration in mental health.

Conclusions: For the comprehensive management of DRPs, pharmacist intervention in future research will be based on Medication Review (MR) and Medication Therapy Management (MTM). The tools used in the pilot study are suitable for conducting the research due to their proven validation and practical application. The authors hypothesize that pharmacist interventions can contribute to patient safety, drug-treatment effectiveness and quality of life for conditions related to the use of psychotropic medicines. To test the hypothesis the authors will conduct a randomized trial with a larger sample, control group and several pharmacies in Istria County.

Introduction and results analysis of international pharmaceutical submission tutoring course at Taipei Pharmacists Association

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Introduction: In this fast-changing world, globalization and integration with the international community is an important issues. The practice of pharmacists must not be absent from this wave of globalization. Participating in international pharmacy conferences can allow pharmacists to understand current trends of pharmacy practice in the world.

Objectives: The purpose international pharmaceutical submission tutoring course is to encourage pharmacists to attend international congresses such as FAPA (Federation of Asian Pharmaceutical Association) and FIP (International Pharmaceutical Federation) and have poster publications or oral presentations. The research is to evaluate the result of the courses.

Methods: The study is a retrospective analysis of the Taipei Pharmacists Association's international pharmaceutical submission tutoring course in 2014-2019. Taipei Pharmacists Association held an international pharmaceutical submission tutoring course every year. The course contents include an introduction to FAPA and FIP congress, abstract mentoring, past participants' experience sharing, and international etiquette courses and practices.

Results: From 2014 to 2019, 77 pharmacists participated in the tutoring course. There are 23 posters published, 12

pharmacists participated in FIP, and 11 pharmacists participated in FAPA.

Conclusions: The International Pharmaceutical Submission Tutoring Course can encourage pharmacists to participate in international conferences and increase international experience sharing.

Factors associated with Medicines Related Problems (MRPs) in frail older people from primary care-A mixed methods study

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Introduction: Working with patients to identify, resolve actual MRPs, and prevent potential MRPs is a mandate of patient safety. Hence identifying and making accessible, appropriate interventions and strategies to achieve this is a key role in pharmacy practice. This is because unresolved MRPs can result in costly deterioration of health including falls, delirium and even death. Frail older people (defined in this study as people who measured 4 and above on the Rockwood frailty scale) are at greater risk of MRPs than younger people without frailty because of the body system that has become compromised through ageing and frailty. It is important to identify factors associated with MRPs in order to prevent it.

Objectives: To investigate factors associated with MRPs in frail older people from primary.

Methods: A concurrent mixed-methods study was carried out to investigate MRPs in frail people aged 65 years and over from primary care. One of the outcomes investigated was factors associated with MRPs. These included factors associated both with deterioration (defined in this study as hospitalisation, delirium falls and NEWS ≥3) from MRPs and interventions and strategies in place in Primary Care to mitigate MRPs and deterioration. Retrospective admissions identified as medicines related were coded using the World Health Organization International Classification of Diseases (WHO ICD 10) scheme of coding. This together with admissions not linked to MRPs were randomly sampled and investigated for quantitative factors. A purposive sampling of health care professionals from primary care was also undertaken. Through simultaneous retrospective semi-structured interviews, perceptions of these professionals were explored to assess qualitative factors of preventative interventions in MRPs. Findings from both studies were integrated to obtain factors associated with MRPs-deterioration.

Data obtained from the retrospective cohort study were analysed through descriptive, inferential and multivariate analysis. These identified factors are associated with MRPs in the patient cohort. Qualitative content analysis was applied to interview transcripts to develop codes, categories and themes on factors of interventions and strategies associated with MRPs.

Results: Social support, number of comorbidities, presence of potentially inappropriate medicine, and time of year (Winter) were significant predictors of MRPs in a multivariate model. Deprescribing for frail older people was challenging as prescribers found it easier to give than to stop medicines because patients became attached to medicines. An indicator of deterioration significantly associated with MRPs was delirium. On the other hand, number of people that deteriorated with falls were comparable in group with MRPs and those without. Falls preventative interventions were available and accessible in primary care. Frailty assessment systems, medication review processes, and medicines-related knowledge in primary care were other factors considered important in halting deterioration from MRPs.

Conclusions: Availability and accessibility of falls preventative strategies can explain the difference in deterioration from falls and delirium respectively. Furthermore, based on these findings, it would be appropriate to say that resistance to deprescribing contributed to potentially inappropriate medicines which was a factor associated with MRPs. MRPs can cause deterioration in the health of frail older people in primary care but preventative interventions can prevent MRPs and deterioration from them. It is therefore important to promote, utilise and evaluate medicines-related interventions for frail older people in primary care.

Analysis of pharmacists' interventions on paediatric outpatient prescriptions in South Batinah Governorate, Oman

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Introduction: The number of paediatric patients visiting primary health care centres (PHCCs) in Oman is steadily increasing. From July to September 2018, the proportions of paediatric patients visiting Awabi HCC, Musanah HCC, Rustaq HCC, Barka HCC, and Nakhal HCC are 46%, 33%, 34%, 36%, 42%, respectively. These large figures indicate the necessity for a dedicated study addressing interventions for paediatric prescriptions.

Pharmacists use their expertise in identifying drug-related problems, monitor the efficacy and safety of treatment, and educate patients. Pharmacists are considered an important part of the healthcare team. Their role and interventions in the outpatient department (OPD) are associated with the improvement of healthcare outcomes and the reduction of drug therapy-related problems, particularly in children.

However, proper documentation is lacking and not all interventions were recorded, which demands a systematic approach for recording and analysing them to reflect the actual important role of pharmacists. The poor documentation of interventions in OPD pharmacies is mainly attributed to pharmacist workload, staffing levels, and a large number of prescriptions.in addition, filling out intervention forms is time-consuming as it's still not in software.

Objectives: The objectives of this study were to describe the number and types of interventions performed by pharmacists in an outpatient pharmacy setting for chronic and common diseases in children in the South Batinah Governorate. The study aims to identify drug-related problems and as well as addressing them. Furthermore, the study also emphasizes the importance of the role of the pharmacist in primary health care.

Methods: A prospective study is conducted among paediatric patients aged 14 years and below who visited OPD pharmacies in five health facilities in the Al Batinah South Governorate during the three-month study period. The prescriptions with drug-related problems were manually documented by pharmacists using a form specifically designed to record the patient's age, weight, and gender, as well as listing the drugs involved in the intervention, the type of interventions, and the recommendation made by the pharmacists. The types of pharmacist interventions were categorized according to the Pharmaceutical Care Network Europe classification of drug-related problems.

Results: A total of 543 interventions were performed by pharmacists (0.33% of the total 160,526 prescriptions received) during the three months. Approximately 93.7% of interventions were categorised as problems with the (lack of) effect of the pharmacotherapy with a 2%probability that the patient suffered or might suffer, from an adverse drug event. Around 90.2% of the total interventions were accepted by prescribers and the drug-related problems were solved.

Conclusions: The significant number of interventions accepted by prescribers supports that pharmacists are, undoubtedly, considered an important part of the health care team and their role and interventions in outpatient department (OPD) care area associated with the improvement of care and reduction of drug therapy-related problems in children.

Perceptions of healthcare professionals of healthcare services provided virtually in Kuwait: A qualitative study

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Introduction: The rapid advancement of technology in recent decades has led to the recognition of telemedicine, which is the delivery of medical services over a long distance using technological methods, as a crucial element of a high-quality healthcare system and a convenient alternative to in-person encounters. In the era of the Coronavirus Disease 2019 (COVID-19) pandemic, healthcare professionals worldwide were forced to switch to telemedicine to provide distant health services.

Objectives: This study aims to explore the perceptions of healthcare providers (HCP) of the healthcare services provided virtually in Kuwait and to assess their acceptance and intention to implement this service.

Methods: A qualitative study with data generated from individual semi-structured interviews with HCPs involving nine physicians, eight pharmacists, two nurses, and three allied health professionals was performed. These healthcare professionals provide services to patients in Kuwait in either

the governmental or private sector. The interviews were conducted using a topic guide that addressed the following: (1) HCP experience with telemedicine and especially television; (2) Barriers to implementing and incorporating telemedicine in their practice; (3) Perceived benefits of telemedicine. The data collected from the interviews were analyzed and coded using MAXQDA software version 22.2.0 and inductive and deductive thematic analysis methods were applied to identify themes.

Results: Twenty-Two interviews were conducted. Five themes were identified: (1) The overall acceptance of telemedicine; (2) Skills and training required to conduct tele-visits; (3) Barriers limiting the use of telemedicine; (4) Strategies to overcome the barriers; (5) Benefits of telemedicine. The HCPs had an overall positive perception about telemedicine and readiness to resume using it in the future not only during the COVID-19 pandemic. However, one participant questioned the ethics of this practice as the quality of provided care is not the same as the in-person visits. Most of the participants recognized that training and effective communication skills are important to conduct telemedicine visits. Participants reported several barriers that may limit the use of telemedicine. The most frequently mentioned barriers were lack of physical examination and poor internet connection. The HCPs suggested training programs as a solution for the barriers identified. Telemedicine was found to be time-efficient for both providers and patients. Moreover, the most benefited patients mentioned by their participants were geriatrics and follow-up cases.

Conclusions: Most HCPs tend towards incorporating telemedicine in Kuwait's health system as they found that it has several positive effects on both patients and healthcare providers. Although some barriers were identified, several strategies to overcome them were also suggested by the HCPs.

What challenges are we facing regarding medication complexities among elderly patients with dementia in nursing homes? A Portuguese cross-sectional study

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Introduction: The elderly normally experiences multimorbidity and polypharmacy, and, therefore, are more prone to serious adverse events (AE). They normally present medication complexities, which may include Potentially Inappropriate Medications (PIMs), clinically relevant drug-drug interactions (crDDI), and the use of medications with a high anticholinergic burden. However, there is still scarce information on the prevalence of these medication complexities among Portuguese institutionalized patients with dementia.

Objectives: The authors aimed to evaluate the prevalence of PIMs, crDDI, and medications with high anticholinergic burden.

Methods: A cross-sectional study was undertaken in five nursing homes in the region of Lisbon and Tejo Valley and Alentejo (2015-2019). Patients were included if they were 65 or older and had at least one medication in their pharmacotherapeutic regimen. The primary outcome was defined as the prevalence of medication complexities, which included: PIMs (identified using the 2019 update of Beers criteria); crDDI (identified using the Drug Interaction Checker – Medscape -, and the Summary of Product Characteristics – SmPC); and anticholinergic burden (calculated using an online calculator that used the ACB scale). DDI was classified as crDDI if they were considered serious or contraindicated by the Drug Interaction Checker. The anticholinergic burden was considered high if the score was 3 or higher. Data analysis was performed using descriptive statistics (IBM SPSS v.26).

Results: The authors included 231 residents, where 24.7% (n=57) were male gender with a mean age of 84±6.8 years old. About 33.0% (n=77) of the sample had dementia and 86.0% (n=199) presented polypharmacy. Near 92.0% (n=212) were using at least one PIM, with a mean of 2.2±1.2 PIMs per patient. Benzodiazepines (51.9%; n=120)), antipsychotics (45.9%; n=106)) and proton pump inhibitors (43.7%; n=101)) were the three most reported PIMs. The prevalence was higher in the group of elderly with dementia (96.1%; n=74)) and antipsychotics were the most reported PIM. The prevalence of crDDI was 42.9% (n=99), with a mean of 0.9±1.5 interactions per patient. The prevalence of crDDI was even higher in the group of patients with dementia (44.2%; n=34). The prevalence of medications with high anticholinergic burden was 48.1% (n=111) in the total sample and 62.3% (n=48) in the group of elderly with dementia.

Conclusions: The authors found that patients with dementia have a higher prevalence of medication complexities, namely medications with high anticholinergic index, PIMs and crDDI, compared to patients without this disease. This may suggest that pharmacists, along with clinicians and nurses, should perform routine medication reviews in this group of patients since they are at higher risk of AE. Future research should be performed to evaluate the potential of a multidisciplinary intervention during medication review in nursing homes, especially in patients with dementia.

The impact of cross-border e-prescriptions on access and safe use of medications - A survey of pharmacists in Finland and Estonia

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Introduction: In 2014, guidelines on the e-prescriptions dataset for electronic exchange under cross-border Directive 2011/24/EU were developed. The European cross-border e-prescription (CBEP) service launched in January 2019 with Finnish patients gaining the possibility to purchase medications with a Finnish e-prescription from community pharmacies in Estonia, followed in 2020 by Estonian patients in Finland. The implementation of CBEP is an important milestone in increasing access to medications across the EU, and to date unstudied.

Objectives: The main aim of this study was to evaluate and gain an understanding of the impact of CBEPs on access to and safe use of medications.

Methods: An online survey was conducted among Estonian and Finnish pharmacists in the spring of 2021. The survey was distributed to all community pharmacies in Estonia (n=289) and Finland (n=375) where CBEPs had been dispensed in 2020. Descriptive statistics and content analysis were used to analyse the data.

Results: Pharmacists from Estonia (n=84) and Finland (n=154) participated in the study. More than 80% of pharmacists agreed that the CBEPs have improved patients' access to medications. The availability of medications was moderately affected by market characteristics, as well as technical problems in dispensing CBEPs. Approximately 80% of Estonian and 66% of Finnish respondents considered the use of medications dispensed with CBEPs to be either 'somewhat safe' or 'safe'. Language barriers, dosing instructions in a foreign language, and the difficulty of identifying drug interactions reduced the quality of medication counselling.

Conclusions: According to the pharmacists' opinions, the CBEPs improve access to medications. However, interfering factors, such as medication unavailability or technical problems in the CBEP system can reduce the accessibility. The medication counselling is interfered with by disruptive factors, and thus, CBEP may not always support the safe use of medications.

Exploring the experience of young people about pharmacy services in primary care: A cross-sectional study

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Introduction: According to recent literature, the prevalence and incidence of long-term illnesses such as asthma and diabetes in young people have substantially risen over the past 13 years. Recent figures indicate that, in England, 4.10% of all prescriptions were prescribed for young people. More than 45 million prescriptions were dispensed to young people in 2017 by pharmacists.

Objectives: This study aimed to investigate young people's perspectives on the pharmaceutical services that are provided by primary care pharmacists relating to medication.

Methods: A cross-sectional survey using both online and paper-based tools was conducted from March to November 2019. The population for this survey was young people from ages 18 to 24 years registered as students at one of the universities in the UK. The survey consisted of twenty-four questions and they were a mix of closed-ended questions such as multiple choice and Likert scale and open-ended questions. This research gained ethical approval from the Ethics Committee of the same University.

Results: A total of 210 survey responses were returned. Most of the participants were female (62.38%). The most frequent age was 18 years (35.24%). Among participants, 15.70% were diagnosed with long-term illnesses and the majority of them (33.33%) were diagnosed with respiratory disease all of which was reported as asthma. Pharmacists were not utilised as a source of information for young people whereas the majority (60.60%) obtained information from their doctors. Most of the participants (96.97%) had not taken part in an MUR or NMS and 78.79% of them had never been told about any services or support groups by their pharmacist.

Conclusions: There is a lack of provision of pharmaceutical services and support by primary care pharmacists to young people with long-term illnesses. Previous evidence shows that this could be due to a lack of confidence when dealing with young people, the unwillingness of pharmacists to take on more responsibilities, or a lack of training and support[3]. The results would be of benefit to the policymakers to assist in the further growth of pharmacy services. Further research will enhance understanding of the perceptions of young people about the pharmaceutical services that are offered by primary care pharmacists concerning medications.

Hypertension management. The 22-year history of Mr Jonas

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Introduction: Hypertension is a lifelong disease. Management of hypertension is recognized as the most effective way to prevent target organ damage and reduce cardiovascular mortality. Even though there is extensive evidence of the benefits of lifestyle modification and antihypertensive treatment, many patients with hypertension do not reach their therapy goals. Pharmacist interventions could improve patient outcomes.

Objectives: This study aimed to describe the complexity of hypertension treatment and issues that the patient faced during their 22-year hypertension management history.

Methods: In this case report handwritten health record of Mr Jonas was used. Each visit to the family doctor in the record was coded into digital. Records included diagnoses, symptoms, blood pressure (BP) values, lab results, medicines prescribed and referrals to specialists if any. A timeline with BP and medicines prescribed was created. Short comments from the patient were collected to address issues he faced at certain points in his treatment history.

Results: Mr Jonas was 41 years old when first diagnosed with III-grade hypertension in November 1998. At the time of diagnosis, Mr Jonas was obese and smoking. His first BP record showed 150/110 mmHg. His treatment was started as monotherapy with a beta blocker. Later step-care treatment was followed by the addition of a second and a third antihypertensive. No pharmacy-led interventions or hypertension management intervention at the pharmacy was provided for the patient before the study. During followed period four main hypertension management problems were found. First, the patient has not changed his lifestyle to improve hypertension. Second, the patient was non-adherent to prescribed medicines. Third, the patient was complaining of adverse drug reactions from the prescribed beta blocker for nearly a year. Fourth, the patient was dispensed inappropriately over-the-counter medicines several times which increased his BP. At the last health record patient was 64, retired, still obese, and has developed hypertensive heart disease without heart failure, type 2 diabetes without complication, hypothyroidism and old age-related cataracts. The last BP record showed 144/85mmHg. In the end, the patient quit smoking without any intervention. The patient confirmed that he had problems with hypertension management, especially at the beginning of the treatment. A medication use review service was provided to the patient at the end of the study.

Conclusions: Consultation on lifestyle and medication adherence, rational use of medicines and patient-centred care are key components of good pharmaceutical care for patients with hypertension. Services and interventions for hypertension patients need to be implemented in daily pharmacy practice.

Healthcare professionals' knowledge and implementation of valproate related safety communications in Kuwait

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Introduction: Adverse drug reactions (ADRs) contribute to hospitalisation, increased healthcare costs and mortality. Post-marketing reports on ADRs to medicines is critical due to restrictions on clinical trial sample populations, resulting in the under-representation of various population groups. Regulatory agencies usually share emerging information that could affect a medicine's benefit-to-risk balance. Healthcare professionals (HCPs) providing direct clinical care to patients are responsible for the implementation of emerging information such as medication safety warnings. However, studies suggest that this practice is varied. In 2014, the European Medicines Agency (EMA) issued warnings regarding the risk of malformations and foetus developmental problems caused by valproate-containing medicines. In 2018, EMA strengthened valproate-associated risk minimisation measures to support the provision of this information to patients promptly. The Kuwait Drug and Food Control (KDFC) released a letter to HCPs in 2016 detailing how to mitigate the risks of valproate-containing medicines. An evaluation of HCP awareness of KDFC recommendations regarding valproate-containing medicines, and their translation into clinical practice is needed to inform on the progress made in this clinical practice area.

Objectives: To identify HCPs' awareness of valproate teratogenicity, knowledge of KDFC's valproate recommendations, and the impact of the issued valproate warning on HCPs' practice.

Methods: Between February and June 2021, an online pre-piloted survey was distributed via anonymous link and/or QR code to HCPs working in 24 Kuwaiti hospitals. Descriptive statistics and the Fisher-Freeman-Halton Exact Test were performed using SPSS 27.

Results: A total of 169 participants responded to the survey (78 nurses, 56 pharmacists, 28 physicians, and 7 pharmacy technicians). The survey had good reliability (Cronbach's Alpha =0.867). Almost two-thirds of respondents (n=110, 65.1%) were aware of valproate teratogenicity. Specifically, physicians (n=22, 78.6%) and pharmacists (n=44, 78.6%) were more informed than nurses (n=41, 52.6%) and pharmacy technicians (n=3, 42.9%). A significant association was detected between being aware of valproate teratogenicity and the participants' professional group (p=0.003). On the other hand, none of the participants were fully aware of all issued KDFC recommendations. Most participants had learnt about valproate teratogenicity from scientific journals (n=53, 40.5%), drug companies (n=43, 32.8%) or international drug regulatory agencies (n=42, 32.1%). Only 19.8% (n=26) reported learning about valproate teratogenicity from KDFC's circular. A significant association was detected between the type of professional group, and whether they knew about the valproate teratogenicity from the media (p=.001), social media (p<0.001), scientific journals (p=0.041) or international drug regulatory agencies (p=0.009). Thirteen participants (8.3%) reported changing their practices based on the issued recommendations in the KDFC's letter. More than half of responders implemented at least one of the KDFC's recommendations (n=89, 57%), while nearly one-fifth (n=35, 22.4%) stated that the drug safety issue did not affect their practice. Seven participants (4.5%) reported a spill-over effect (stopped prescribing valproate to all patients).

Conclusions: All patient-facing HCPs should be aware of relevant medication safety warnings to facilitate its implementation in practice. Future research is needed to assess the barriers to disseminating KDFC communications as well as the barriers to its implementation in practice.

The SMART Pharmacist Podcast: Medication Safety Learning Anywhere Anytime

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Introduction: The recent engagement of pharmacy regulatory authorities across Canada to improve medication safety culture in pharmacies via medication incident reporting and shared learning has demonstrated a national interest to take steps to prevent errors and patient harm. Medication safety learning through podcasts will provide pharmacy professionals with a dynamic and engaging educational resource that can be accessed anywhere anytime.

Objectives: The objective of the SMART Pharmacist Podcast was to create a virtual resource for pharmacy professionals to learn more about contemporary topics in medication safety.

Methods: The authors developed six educational podcast episodes on different patient/medication safety-related topics, from the aftermath of an incident, and medication incidents associated with students, to compounding errors, and drug-drug interactions in older adults. A professional tone, along with a short duration of approximately 15 minutes per podcast episode was maintained to optimize audience engagement. All episodes contained specific learning objectives and take-away key learning points. The podcast content was supported with real-life medication incident examples that have been anonymously reported to a national medication safety organization in Canada. The authors released the episodes on SoundCloud and iTunes and administered a 12-item online questionnaire to pharmacy professionals across Canada to obtain feedback from listeners.

Results: A total of 13 responses were collected within a month of dissemination of the online questionnaire. Respondents practised in Ontario, Nova Scotia, Saskatchewan, and New Brunswick in Canada. Responses concerning the accessibility, information accuracy/validity, relevance of the information to pharmacy practice, and scope/coverage of information on the podcast were generally very positive. Respondents perceived the podcast episodes to contain information that has an impact on pharmacy practice and that the medication safety recommendations presented are feasible and effective.

Conclusions: The SMART Pharmacist Podcast is an accessible educational resource that can be utilized by any healthcare professionals who wish to learn more about effective and feasible (SMART = Specific, Measurable, Attainable, Relevant and Time-based) medication safety prevention strategies.

Assessment of barriers to optimum enteral nutrition practices as perceived by critical care providers

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Introduction: Nutritional support is a vital intervention for critically ill patients. Despite the existence of several clinical practice guidelines focused on enteral nutrition of the critically ill, there is still a gap between guideline recommendations and actual nutrition practices.

Objectives: The purpose of this study is to understand the role of the clinical pharmacist in identifying the barriers to applying optimum enteral nutritional practices from the perspective of critical care providers.

Methods: A descriptive cross-sectional design was utilized using a self-administered questionnaire. A total of 90 critical care providers comprising three categories: physicians (n=30), clinical pharmacists (n=30), and nurses (n=30) were recruited. "The barriers to enteral feeding critically ill patients" questionnaire was used to explore the barriers that hinder them from optimal delivery of enteral nutrition.

Results: The physicians reported the highest mean score regarding the barriers questionnaire to the barrier "Not enough dietitian coverage during holidays" with a mean score of (5.07+ - 1.31) which was significantly higher when compared to the clinical pharmacists and the pharmacists (p=0.01). As for the clinical pharmacists, the most important barrier with the highest mean score was "waiting for the dietitian to assess the patient" with a mean score of (5.38 + - 0.86). Regarding the nurses, the barrier "familiarity with nutrition guidelines" was recorded to have the highest mean score of (5.93 + - 0.25) and was found to be statistically significant when compared with the clinical pharmacists and the physicians (p=0.0001). There was a highly significant difference between physicians, clinical pharmacists, and nurses regarding subscales' scores and overall scores of the Barriers Questionnaire except for the resources and provider attitudes.

Conclusions: Barriers to optimum enteral nutrition practices were explored with more attention on barriers regarding dietitian support and critical care providers' attitudes. This article provides the basis for the creation of interventions intended to overcome these barriers and enhance enteral nutrition practices.

The effect of nitride compared with metoclopramide on the adequacy of enteral nutrition in critically ill patients with enteral feeding intolerance

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Introduction: In the intensive care unit, enteral feeding intolerance (EFI) is a common concern (ICU). Untreated EFI caused by delayed stomach emptying carries a slew of unintended clinical consequences, including increased mortality and ICU stay. Prokinetic medicines are now the standard of care for EFI patients. However, the effectiveness and safety profiles of existing prokinetics are unknown. Itopride is a prokinetic drug that differs from other prokinetics in terms of its dual mode of action, as well as its tolerance and safety.

Objectives: The purpose of this study was to assess the effect of Itopride on the adequacy of enteral nutrition & compliance with enteral nutrition orders compared with metoclopramide.

Methods: Seventy EFI patients were randomly assigned to one of two groups: Itopride or metoclopramide. After one week of therapy, the primary outcome was to assess the adequacy of enteral nutrition & compliance with enteral nutrition orders as expressed by the enteral nutrition volume ratio (ENVR) in the Itopride group compared to the metoclopramide group.

Results: The trial was completed by 35 patients in each group. In the beginning, there were no significant differences in demographics, ICU admission reason, or severity scores. At the end of therapy, itopride significantly increased the ENVR in the itopride group more than the metoclopramide group (p =0.001).

Conclusions: In critically ill patients with EFI, itopride was superior to metoclopramide regarding the adequacy of enteral nutrition and compliance with enteral nutrition orders.

Gender differentiation in pharmaceutical intervention during the COVID-19 pandemic with Benzodiazepines: Expectation versus reality?

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Introduction: Pharmaceutical Intervention (PI) focuses on parameters such as drug efficacy and safety to optimize the drug-using process. Benzodiazepines (BZD) have been identified as a target therapeutic group for Pharmaceutical Care because of the potential risks associated with their inefficacy and unsafety especially prevalent when with chronic use and among females. Following the worldwide trends, in Spain, the Covid-19 pandemic has increased BZD consumption figures (defined daily doses per 100000 inhabitants/day) from 2019 to 2021 up to 7 points according to the latest Spanish Agency for Medicinal Products and Medical Devices (AEMPS) data.

Objectives: To analyze gender differences in patients using BZD and receiving Pharmaceutical Intervention (PI) in a Community Pharmacy during the COVID-19 pandemic.

Methods: Prospective cross-sectional descriptive observational study (AEMPS classification DAA-CLO-2020-01) executed between August 2020-February 2021 in Santa Cruz de Tenerife, Spain (COVID-19 pandemic) in 127 patient's using BZD who undergo, voluntarily, a clinical interview with a data collection questionnaire. The type of PI was registered according to the Pharmaceutical Care - Community Pharmacy (AF-FC) Forum classification. Statistical analysis was performed using SPSS 25.0 software.

Results: The Pharmacotherapy follow-up (PTS) offered by the Community Pharmacy and voluntarily accepted by the patient using BZD stands out for its remarkable female profile (78.26% of all patients). The provision of Personalized Medication Information (PMI) (66.14%) followed by Health Education (66.14%) are the most common PIs provided to female patients. The referral to the physician is also one of the Community Pharmacist's interventions when possible Drug Related Problems (DRPs) /Negative Medicine Outcomes (NMOs) (78.26% of female patients) are detected and the need to initiate a deprescription (50% in women) is observed. The percentage of women accepting the PIs proposed by the community pharmacist reaches 65.6%.

Conclusions: The dispensing of BZD should follow a Pharmaceutical Care gender differentiated protocol as the type and impact of the Pharmaceutical Intervention (PI) seem to depend on or be conditioned by gender. Females stand out for being more sensitive and more accepting of the intervention of the community pharmacist as a health care provider.

Real-world effectiveness in hypertension and hyperlipidemia collaborative management between pharmacies and primary care in Portugal: A multicenter quasi-experimental pragmatic controlled trial (usfarmácia®)

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Introduction: There is some evidence of the efficacy of pharmacy collaborative health interventions with primary care, but little is known about the effectiveness of such interventions in real-world conditions.

Objectives: To assess the effectiveness and discuss the design and challenges of hypertension and hyperlipidaemia management between pharmacies and primary care in Portugal using interprofessional communication technology-driven and experimental bundled payment.

Methods: Pragmatic, quasi-experimental controlled trial. The intervention package included: consensus-based care pathways as algorithms in pharmacy software; refill text reminders to patients; technology communication between settings; interprofessional meetings; and experimental payment versus usual care. the authors collected patient-

level data from pharmacy dispensing software; primary care prescribing and clinical software; and patient telephone surveys at baseline, 3 and 6 months. The primary outcomes were changes in blood pressure and total cholesterol at 6 months. the authors used two analytical methods: 1) Difference-in-differences (DiD) estimators in a GLM; 2) Controlled Interrupted Time Series (CITS).

Results: A total of 27 pharmacists from 7 intervention pharmacies, 6 physicians and 6 nurses from the intervention primary care unit (USF) participated. A total of 5 best match control USFs and 13 control pharmacies participated. A total of 203 patients entered the study and were included in the baseline analysis for self-reported data in a telephone survey. The number of patients in the primary care database was 107 for the 6 months before recruitment and 114 for the 6 months following recruitment. After adjusting for covariates in GLM, the authors were not able to observe significant differences in the effect of intervention vs control in their sample population or subgroups of uncontrolled patients at baseline or most income-deprived patients either. When using CITS, the trend effect in systolic BP change although negative (-0.43 mmHg) is not significant either. The authors experienced several challenges which required creative strategies in real time after the onset of the trial. The authors collected additional data for economic and qualitative studies.

Conclusions: This trial was not able to show effectiveness due to the many limitations in primary care technology. It offers, however, valuable learnings on innovative methods, strategies, and real-world evidence from various data sources, and paves the way to improve future real-world trials to advance integrated care between pharmacies and primary care towards Value-Based Health Care.

Hypertensive disorders amongst pregnant women seeking care at health facilities in the Ashanti region in Ghana

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Introduction: Maternal mortality is a major public health concern. Globally, maternal mortality stands at 213 cases per 100,000 live births as at 2018. Several strides have been made over the decades at reducing pregnant mothers from dying. Nonetheless, mortality in 2018 was in excess of about 143 deaths per 100,000 live births globally compared to the Sustainable Development Goal (SDG) of having 70 deaths per 100,000 live births Most of these deaths are associated to maternal complications. One complication of particular interest is hypertensive disorders. Hypertensive disorders are one of the leading causes of maternal and neonatal mortality. In Ghana, it accounts for not much is known about the cause(s) of this condition. The World Health Organization and most protocols recommend screening for risk factors during antenatal care as part of measures to early detect and prevent the incidence of this global canker.

Objectives: This study was conducted to assess the burden and management of hypertensive disorders in pregnancy amongst pregnant women in the region and its influence on birth outcomes.

Methods: This was part of a cohort study. Pregnant women above 18 years, and were at least 20 weeks gestations, seeking antenatal care at various health facilities in the districts were considered. 500 participants were randomly sampled, informed consented and enrolled into the study. A well-structured questionnaire was administered to the mothers at every follow up. Data obtained were entered into excel and imported to Stata Version 14 for analysis. Descriptive statistics were presented in frequencies and percentages. Pearson's chi square test was used for the bivariate analysis to identify the association between each independent variable and the dependable variable. Independent variables that were significant under the bivariate analysis were put together in the multivariate analysis to adjust for association. The multivariate analysis employed was multiple logistic regression analysis. Significance of the test statistic was at a p-value <0.05 and results from these tests were presented in tables.

Results: It was shown that 30.9% (n=154) of the participants were diagnosed with hypertension during pregnancy. About 31.0% (n=155) of the mothers were anxious over their pregnancy with 14.4% (n=72) of the mothers having chronic medical conditions such as diabetes and asthma. Majority of the mothers (98.2%, n=491) had heard of hypertensive disorders in pregnancy. Amongst the prescriptions assessed for the management of hypertension in pregnancy oral Nifedipine and Methyldopa were the mostly prescribed antihypertensives. Others were i.v Magnesium sulphate (6.7%), i.v Hydralazine (4.7%), tab Prazosin & Oxprenolol (1.3%). After the six months follow-ups, 4.8% (n=24) of pregnant women experienced stillbirth, thus, neonatal mortality was 50.52 neonatal deaths per 1000 live births. Also, the prevalence of proteinuria reduced from 44.3% to 26.9% amongst mothers.

Conclusions: The burden of hypertension disorders in pregnancy was high amongst pregnant women seeking care at health facilities in the Ashanti region of Ghana. This led to high prevalence of neonatal mortality and that is of public

health concern. The role of the pharmacist would be integral to ensure treatments were mostly in line with national guidelines to optimise therapeutic outcomes.

Assessment of compliance of neonatal intensive care unit nurses with standard precautions of infection control: A clinical pharmacist contribution

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Introduction: Rigorous implementation of infection prevention and control practices by healthcare workers in different healthcare settings is of utmost importance. Nurses have the greatest risk of spreading healthcare-associated infections among patients and healthcare workers.

Objectives: The study assessed the compliance of neonatal intensive care unit nurses with standard precautions of infection control with the potential influencing factors being identified.

Methods: This was a cross-sectional study, whereby the compliance of a total of 58 neonatal intensive care unit nurses with standard precautions of infection control was assessed using the Arabic version of the Compliance with Standard Precautions Scale (CSPS-A).

Results: A suboptimal compliance rate (66.7%) was detected, with the highest for disposal of sharp articles into sharps boxes (86.2%) and the lowest for disposal of sharps boxes not only when full (27.6%). Significant differences were observed when participants were grouped according to their clinical experience & qualifications. A significant positive correlation was also found between clinical experience and CSPS scores.

Conclusions: Clinical experience & educational qualifications are key factors that impact nurses' compliance with infection control practices. NICU nurses should learn and practice skills and procedures that strictly comply with standard precautions of infection control.

Evidence-based practice and its perceived barriers among hospital pharmacists: A survey in a resource-limited setting

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Introduction: Evidence-based medicine (EBM) can enable pharmacists to answer clinical questions with accuracy and better scrutinise physician orders to identify a more suitable medication. Adequate resources and training, among other factors, are likely to influence evidence-based practice by hospital pharmacists. However, in resource-limited settings, the practice of EBM by hospital pharmacists may be a challenge.

Objectives: To investigate pharmacists' attitudes, perceived barriers and practice of evidence-based medicine and their related factors.

Methods: It was a survey of hospital pharmacists in Ghana. The researchers used a validated structured questionnaire to collect patient demographic data, attitude towards EBM, degree of practice and perceived barriers to EBM. The researchers used stratified systematic sampling to include 110 hospital pharmacists from primary, secondary and tertiary public healthcare facilities. Responses to attitude, practice and barrier questions were scored on a 5-point Likert scale. Questions on the attitude and practice of EBM were based on the Noor EBM questionnaire. The research team administered electronic questionnaires. Composite scores were calculated for each of the 3 main domains from questions under each domain. Descriptive and inferential statistics were performed using SPSS.

Results: Questionnaires completed and submitted by respondents were 102. The majority were females (55/102; 53.9%), worked in tertiary facilities (60/102; 58.8%), and were principal pharmacists. Half had more than ten years of practice experience (51/102: 50.0%). The majority (60/102; 58.8%) had not been trained in EBM. Most respondents (83.2%) had a positive attitude towards EBM. About 92% were in agreement that regular continuing professional development on EBM is important. More than 91% (mean score: 4.4, SD: 1.145) were also in agreement that research findings are important in their day-to-day drug therapy of patients. There was a significant gap in EBM practice among respondents, with only 60.5% practising EBM. Although about 75% used clinical guidelines, there was a significant gap in the use of the Cochrane database (37.2%) and journals (33.3%). Majority of respondents (62.6%) perceived barriers to EBM

practice. Lack of access to databases and journals (87.3%; mean score: 4.2, SD: 0.769) and knowledge gap (81.3%; mean score: 4.0, SD: 0.808) were the highest-rated barriers to EBM practice. The majority (58.8%; mean score: 2.4, SD: 0.976) did not agree that international evidence-based clinical practice guidelines are not applicable in their local setting. Training in EBM predicted EBM practice (B=3.60; p=0.001). Area of practice predicted perceived barriers to EBM (B=-0.84; p=0.020). The number of years in hospital practice had a positive relationship with attitude towards EBM (B=1.24; p=0.042). Training in EBM also was associated with the use of international guidelines (X^2: 11.9966; p=0.017), while institution-provided internet was associated with national guideline use (X^2: 15.9755; p=0.043).

Conclusions: Hospital pharmacists in this study showed a positive attitude towards EBM, but there was a large gap in EBM practice. Lack of access to databases and journals and knowledge gap were major perceived barriers to practice. Training in EBM predicted practice. These findings appear to inform the need for policies on training and access to resources to address EBM practice barriers.

The effect of statin types on the quality of life of patients with heart failure

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Introduction: Lipophilic statins may be more beneficial in patients with hearth failure (HF) than hydrophilic statins due to their greater uptake by cardiac tissue.

Objectives: The purpose of the study was to evaluate the effect of lipophilic *vs* hydrophilic statins on the quality-of-life scores of patients with HF.

Methods: In the current randomised comparative study, 85 patients with HF were treated with either atorvastatin 40 mg or rosuvastatin 20 mg, in addition to guideline directed therapy. At baseline, the quality of life of the patients was measured using the Minnesota Living with Heart Failure Questionnaire (MLHF-Q) questionnaire. At the end of the six months, MLHF-Q scores were reassessed in both groups. Patients also reported the patient global assessment (PGA) describing how they perceived their HF status may have changed since their participation in the study, on a 7-point Likert scale.

Results: A total of 85 patients participated in the study (n=42 in the Atorvastatin arm and n=43 in the Rosuvastatin arm). The MLHF-Q scores were comparable (p=0.721) at baseline; 32.5±9.89 and 33.25±9.58, in the Atorvastatin and Rosuvastatin arm, respectively and were significantly reduced in both patient groups (p<0.01). However, the percent change between both groups was insignificant (p=0.643). PGA reported by patients showed no difference across the groups (p=0.847).

Conclusions: The study findings indicated that there were no differences between lipophilic and hydrophilic statins in the quality-of-life outcome of HF patients.