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CONFERENCE ABSTRACTS

Pharmacy practice research summer meeting for PhD students, postdoctoral fellows and supervisors conference abstracts 2022

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

15-minute presentations

Evaluation of a pharmacist-led interprofessional chronic pain clinic in Canada

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Introduction: One in five Canadians experience chronic pain, yet many have limited access to interprofessional chronic pain management programmes, which are recommended by professional practice guidelines. Access is particularly difficult for people living in rural and remote regions. The University of Saskatchewan (USask) Chronic Pain Clinic was established in 2020 to fill this gap. The USask Chronic Pain Clinic is a pharmacist-led interprofessional clinic at the College of Pharmacy and Nutrition, University of Saskatchewan, Canada. The clinical team includes four pharmacists, three social workers, two physical therapists, and one part-time chronic pain physician. Services focused on the three Ms of chronic pain management (mind, movement, medications) are delivered virtually for any resident of the Province of Saskatchewan or in-person in the City of Saskatoon.

Objectives: To evaluate the effectiveness of the USask Chronic Pain Clinic.

Methods: A retrospective chart audit of the first 103 patients who were referred to the programme was completed in 2021. A postal survey was also mailed to patients and their referring healthcare professionals three months after the patient was referred to the programme.

Results: The mean age of patients in the chart audit was 57 years (range 22 - 87) and 72.8% (n = 75/103) were using an opioid at initial referral, with a mean morphine equivalent (MME) dose of 233mg/day. Five of the 75 patients (6.7%) taking an opioid at initial referral were switched to buprenorphine/naloxone and those who remained on an opioid had their MME dose reduced by a mean of 14.2% (from 233mg/day to 200mg/day). Mean Clinical Global Impression-Severity (CGI-S) scale scores, a measure of overall disease severity, improved from 4.1 (moderately ill) to 3.4 (mildly ill). Naloxone kits were provided to 11 patients.

Patient survey response rate was 33.3% (n = 26/78) and almost all (96.2%, n = 75/78) reported to be 'very satisfied' or 'satisfied' with their experience at the USask Chronic Pain Clinic and 61.5% (n = 48/78) reported that their overall health status was 'much improved' or 'improved'. The health professional survey response rate was 33.8% (n = 21/62) and 100% responded that they would 'recommend the clinic to their colleagues' and that the 'consultations were helpful'. In addition, 52.4% felt more confident in prescribing opioids after having their patient come to the clinic and 71.4% were more confident in managing chronic pain.

Conclusions: This study provides preliminary data to suggest the novel pharmacist-led interprofessional approach utilised at the USask Chronic Pain Clinic may improve the overall self-reported health status of people living with chronic pain. The study also suggests that the clinic may improve overall chronic pain severity, while facilitating safer opioid use (i.e., lower opioid doses, transition to buprenorphine/naloxone from full opioid agonists, providing naloxone kits). The USask Chronic Pain Clinic was also well received by patients/referring health professionals and improved the confidence of health professionals in managing chronic pain and prescribing opioids. Additional research using methodologies such as a randomised controlled trials are needed to confirm these results.

Strengthening medication safety in Danish municipalities: Mapping challenges

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Introduction: The Danish Patient Safety Authority has reported an increase in the number of registered unintentional accidents from 2017 to 2019. This increase is especially observed in municipal institutions such as nursing homes, care homes and residential facilities, where 66% of the registered accidents are due to medicine mismanagement. Until now, no studies have identified the specific challenges experienced in the municipalities with medicine-related tasks.

Objectives: The aim of the study was to map challenges with medicine-related tasks in the municipalities as identified by municipal managers and further explored by municipal employees. The aim of the study was also to use the results to investigate how pharmacy technicians from community pharmacies (CP) can contribute to strengthening medication safety in the municipalities.

Methods: To understand the experience with medicine-related tasks, semi-structured, in-depth qualitative interviews with two to three municipal managers from each of the ten different municipalities were conducted. Six major themes were identified from these interviews, and they were further explored by visual storytelling by municipal employees. All interviews were transcribed verbatim before conducting a content analysis using NVivo version 2020. The results were presented at a workshop with stakeholders where pharmacy technicians from CP contribution to medication safety in municipalities was discussed. The workshop was designed by using Appreciative Inquiry.

Results: The following major themes were identified from interviews with 27 municipal managers and visual storytelling with 17 municipal employees:

- Challenges in several steps in the medication process. Municipal managers and municipal employees experience challenges in ordering, storage, and dispensing medicines for patients in municipal institutions.
- Compliance with existing procedures and instructions related to medication handling is difficult. Procedures and instructions exist, but it is difficult to follow them on an everyday basis.
- Observation of effects and side effects of medicine in patients in nursing homes, home care and residential facilities for adults and children with physical and mental disabilities can be difficult.
- Medicine during transitions is a challenge. The municipal employees are faced with a time-consuming and difficult task in identifying which medicine the patient should be given and how to get the medicine delivered from hospital or CP.
- Medicine-related issues in disease-prevention and health-promoting activities at municipal health centres, e.g., non-adherence in patients due to fear of side effects.
- The right competence for the right task. Municipal managers and some employees are worried about whether the employees who solve medicine-related tasks always have the right qualifications to do so.

At the workshop with the stakeholders, results were presented and stakeholders generated ideas on how pharmacy technicians from CP can contribute to strengthening the medication safety in municipalities.

Conclusions: This study identified six major themes that illustrate the challenges with medicine-related tasks as they are experienced by municipal managers and employees and generated ideas of how pharmacy technicians from CP can contribute to medication safety in municipalities. The ideas will be further qualified by The Danish Association of Pharmaconomists and The Association of Danish Pharmacies who also decide if one or more of the ideas will be tested in a future study.

Establishing a community pharmacy-based fall prevention service: An implementation study

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Introduction: Community pharmacists are in the position to contribute to fall prevention, but this is not yet a common practice.

Objectives: The aim of this study was to evaluate the implementation of a community pharmacy-based fall prevention service.

Methods: A fall prevention service, consisting of a fall risk screening and assessment including a medication review, was implemented in pharmacies for a three-month period. A preparative online training was provided to the pharmacy team to enhance adoption of the service. Included patients were aged ≥ 70 years, using ≥ five drugs of which ≥ one fall risk-increasing drug. The implementation process was quantitively assessed by registering medication adaptations, recommendations, and referrals to other health care providers. Changes in patient scores on the Short Fall Efficacy Scale-International (FES-I) and a fall prevention knowledge test were documented at one month follow-up. Implementation was qualitatively evaluated by conducting semi-structured interviews with pharmacists before and after the project, based on the consolidated framework of implementation research (CIFR). Interviews were conducted with patients one month after they participated in a community pharmacy fall prevention service. Topics of these interviews were: outcomes, patient's motivation, and contact with the pharmacy technician, which were based on the CFIR.

Results: The service was implemented in nine pharmacies and 91 consultations were performed. The medications of 32 patients was adapted. Patients' FES-I scores were significantly higher at follow-up appointments (p = 0.047) and patients' knowledge test scores did not differ (p = 0.86). Pharmacists experienced the following barriers: lack of time, absence of staff, and limited multidisciplinary collaboration. Facilitators were training, motivated staff, patient engagement, and project scheduling. Patients were mainly positive about receiving a medication review. Although patients reported that the service enhanced their awareness about fall prevention, only a limited number of patients were motivated to adapt their lifestyle. Patients appreciated the attention and contact.

Conclusions: The service resulted in a substantial number of medication adaptations and lifestyle recommendations, but many barriers were identified that hampered the sustained implementation of the service. Patients see a potential benefit from a medication review by their pharmacist and patient education appeared to enhance their fall risk awareness.

Implementation study of medication reviews in Swiss nursing homes

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Introduction: The ageing population is a challenge for healthcare systems, as many people suffer from multiple diseases requiring polymedications. Polypharmacy, the use of five or more medications, can cause Drug Related Problems (DRPs) including the use of potentially inappropriate medications (PIMs), i.e. drugs with a possible negative benefit-risk balance. Many services, such as clinical decision support systems or medication reviews, have been initiated to address DRPs or PIMs, but their implementation in practice remains challenging and not frequently reported. In 2021, the authors led an implementation and impact study in ten pilot Swiss nursing homes (NH), with the aim of performing medication reviews for 10.0% of their residents.

The main objectives of the study were: 1) to evaluate the implementation of medication reviews in terms of reach, adoption, fidelity, acceptability, feasibility and maintenance, and to describe implementation processes and strategies; 2) to assess the impact of medication reviews on the proportion of resolved DRPs at follow-up appointments (four months later).

Methods: This observational study was a Type 2 hybrid implementation design and used a mixed-method approach. Relevant implementation outcomes have been defined through the FISpH and RE-AIM frameworks. Data were collected through questionnaires, focus groups and administrative records. DRPs at baseline and follow up were collected based on treatment modifications plans and coded according to the PCNE classification for Drug-Related Problems V9.1.

Results: The ten pilot NHs involved 19 physicians, 18 nurses and 12 pharmacists. Eight NHs have completed the 10.0% objective, with a total of 58 medication reviews completed between March and September 2021. Data from 45 medication reviews were transmitted to the research team. The mean number of DRPs detected by pharmacist per resident was 5.2 SD 2.1, of which 42% related to safety issues, 29% were related to effectiveness issues and 29% related to other issues. As a result of the interprofessional team discussion, 147 treatment modifications issued from the 229 propositions to resolve DRPs made by pharmacists were decided, 128 implemented and 122 maintained at follow-up appointments (four months later). The main reasons for non-implementation were patients' refusal or death, and reintroduction of medication due to recurrence of symptoms.

Conclusions: A preliminary analysis of the questionnaires and focus groups shows that medication reviews are feasible, acceptable and recommendable by healthcare providers. This supported the decision of the regional health department to extend the service to more nursing homes in 2022.

Short-acting β2-agonists (SABA) use related to excessive dispensing in asthma patients: Perceptions, attitudes, and behaviour.

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Introduction: Pharmacy dispensing data indicate that excessive short-acting β2-agonists (SABA) use as a reliever therapy is prevalent in approximately 40% of adult patients with asthma in the Netherlands. This may simply reflect poor asthma control, however, dispensing data are a proxy measure, representing the acquisition of SABA and not necessarily SABA use. Understanding the reasons for excessive SABA dispensing gives the possibility to optimise asthma management for these patients.

Objective: This study aims to determine underlying perceptions, attitudes and behaviour associated with excessive SABA dispensing in primary care asthma patients.

Methods: Fifty community pharmacies connected to the Leiden University were invited. Primary care asthma patients ≥ 18 years with excessive SABA dispensing were selected from pharmacy dispensing data collected by the Foundation of Pharmaceutical Statistics in October 2021. Patients with excessive SABA dispensing were defined as ≥ 2 SABA dispensing in the past six months indicative for an average use of ≥ two inhalations per week. Patients were stratified according to SABA monotherapy and concomitant inhalation corticosteroids (ICS) controller therapy. Concomitant ICS therapy was established as ≥ one ICS dispensing in the past year. Patients were invited to fill out an online questionnaire on their SABA use and were given the opportunity to further clarify their answers in a semi-structured interview. Questionnaires were analysed with descriptive statistics and interviews were recorded and transcribed for thematic.

Results: A total of 319 eligible patients were invited from 30 pharmacies. The questionnaire was completed by 53 patients (17%) of whom 17 patients participated in a semi-structured interview. Excessive SABA use was reported in 43 patients (81%) with an average of 3.7 ± 2.1 inhalations per day. Misconceptions on adverse effects on asthma progression, a quick onset of SABA and a lack of knowledge on (avoiding) asthma triggers were reported for this behaviour in the majority of users. Knowledge on essential inhaler technique steps were missing in 27 users (63%) and annual inhalation instructions were not performed in 33 users (77%). Patients expressed wishes and needs for an annual consult with their healthcare provider and/or supporting apps. Concomitant ICS use was present in 24 users (56%) of which multiple inhaler device types requiring different inhalation techniques were applied for SABA and ICS in 12 users (50%).

Conclusions: Pharmacy dispensing data has the potential to detect excessive SABA use in asthma patients. Identified reasons related to 'knowledge', 'beliefs' and 'skills' for this behaviour requires targeted interventions by healthcare providers. Confirmation is warranted in a larger sample size.

The LiveRx Study - Eradicating Hepatitis C in Alberta, Canada: A test and treat intervention

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Introduction: Patients with chronic hepatitis C (HCV) infection who belong to priority populations (those experiencing homelessness or unstable housing, injection drug users, interacted with the corrections system, live rurally) commonly experience inequities in access to HCV testing and treatment across Alberta, Canada, through traditional referral-based systems.

Objective: To evaluate the effect of a community pharmacy-based case finding and intervention program on cure rates in patients living with HCV.

Methods: LiveRx is a multi-centre, mixed methods, before-after hybrid implementation study. Pharmacies (n=100) are recruited across Alberta, Canada. Adult patients ≥18 years of age belonging to priority populations are eligible to participate. Patients are recruited for HCV screening using point-of-care antibody (OraQuick) and confirmatory testing (HCV RNA) with dried blood spot testing or traditional phlebotomy. For individuals with confirmed HCV (HCV RNA^{+}), pharmacists prescribe HCV treatment, follow up regularly, monitor, and assess for HCV cure. The primary outcome is to evaluate the effect of a community pharmacy-based case finding and intervention program on cure rates in patients living with HCV assessed using a negative HCV RNA at 12 weeks, after completing eight to twelve weeks of Direct Acting Antiviral (DAA) therapy. The secondary outcome is patient-reported quality of life and satisfaction with pharmacist-led HCV care.

Results: The LiveRx study was launched in May 2022 and is currently in the implementation phase. Eleven pharmacies and 26 pharmacists have completed site onboarding.

Conclusion: To the authors' knowledge this is the first large trial evaluating the impact of community pharmacists case finding, independent prescribing and ordering lab tests on cure rates in patients living with HCV.

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

3-minute presentations

Effects of a communication skill based training for pharmacy-counter conversations about non-medical medication switching

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Introduction: Pharmacy staff members have important tasks related to patient education and counseling about medicines. However, especially challenging situations that increase stress or negative emotions tend to disrupt effective communication. For example, conversations about non-medical medication changes. In these encounters, the pharmacy team delivers a message to patients that may lead to negative emotions, and are often experienced as difficult conversations between pharmacy staff and patients. To support pharmacy staff in how to best deliver the message and how to address patients' emotions, a communication training has been developed. In this training, pharmacy staff members were taught how to apply two communication strategies, 'positive message framing' (emphasising positive elements of the message) and the 'breaking bad news model' (break the news immediately, give room for and address emotions) for use in pharmacy encounters.

Objectives: To understand to what extent the communication strategies learned during the training were applied in practice, and how pharmacy staff members' experienced the use of the strategies in medication switch encounters.

Methods: The training was tested on staff from 15 Dutch pharmacies. The effects of the training (level three and four of the Kirkpatrick Model) were assessed. In order to assess which strategies pharmacy staff applied in practice (level three) and how the training effects patients' and pharmacy staff satisfaction of the conversation after use of the strategies (level four), conversations were registered. The pharmacy staff filled in a questionnaire per conversation post-training. Questionnaire topics included: respondent background and conversation characteristics, applied strategies, and (overall) experience(s) (message delivery, reaction to patient's emotions/concerns).

Results: In total, 68 conversations were registered post-training by 22 pharmacy staff members (half were pharmacy technicians, about one-third were pharmacists). The applied strategies were divided, the most commonly used was breaking the bad news model (29.9%), followed by a combination of both strategies (22.4%) and positive message framing (17.9%). 14.9% staff members indicated they had used neither. About two-thirds (65.2%) of the pharmacy staff members indicated that they told the patient that they have to switch medication(s) directly at the beginning of the conversation (65.2%). The majority indicated that they brought the message by explaining why the change was taking place (93.9%) and what the similarities were between the new and old medicine (73.8%). Moreover, about three-fourths (74.2%) indicated that they could deal with the patient's emotions well. Particularly, pharmacy staff gave the patient the space to express their concerns (86.4%),

patients were reassured that the new medicine was a good alternative (80.3%), and pharmacy staff showed understanding for the patients' concern(s) (75.8%). Overall, pharmacy staff and patients were quite satisfied with the conversations about medication switches, as according to the pharmacy staff, 62% of the patients experienced the conversation as (very) positive and 78% of the pharmacy staff members themselves experienced the conversation as (very) positive.

Conclusions: This training seems to be beneficial in providing pharmacy staff members with tools on how to have conversations about non-medical medication switches. Incorporating these tools in these encounters can lead to improved patient-centred communication.

Optimising medication with focus on deprescribing in older people with multidose drug dispensing system: A pilot study

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Introduction: The number of older patients with polypharmacy will keep increasing over the next decades. Polypharmacy has been linked to increased risk of adverse drug reactions. Although deprescribing guidelines are available, older people often continue the use of chronic medication without regular reconsideration of its appropriateness.

Objective: To test the feasibility of an intervention consisting of a clinical medication review focused on deprescribing for older people using a multidose drug dispensing (MDD) system.

Methods: Pharmacists received a training and toolbox about performing clinical medication reviews focused on deprescribing and taking into account patient' preferences and health problems. The pharmacists conducted this intervention on older people (≥75 years) with hyperpolypharmacy using a MDD-system. They registered drug related problems and interventions. Patients, pharmacists and general practitioners were interviewed about their experience and content analysis was performed.

Results: Five pharmacists included 22 patients (mean 84 years old, 59% female) in the study. Per patient: 4.5 drug-related problems were registered by the pharmacist. In 20 patients (91%), at least one deprescribing recommendation was made. The implementation rate of deprescribing recommendations was 75%. The provided training and toolbox were evaluated positively by the pharmacists. Pharmacists mentioned a limited number of eligible patients to recruit. Both pharmacists and General Practitioners experienced barriers for deprescribing for patients who are also treated in secondary care. Patients were satisfied with the provided information on deprescribing and valued the pharmacists' listening skills.

Conclusions: This pilot study suggests that the pharmacist-led clinical medication review focused on deprescribing is feasible and has a potential impact on reducing overtreatment in older people with hyperpolypharmacy and MDD-systems. Both healthcare professionals and patients were positive about the intervention. To optimise the effect of the intervention, improvements can be made to the training and data collection procedures.

Public health interest of community pharmacist and home care nurses collaboration in the realisation of weekly pillboxes: A quantitative observational cross-sectional study

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Introduction: Medication errors and/or non-compliance can jeopardise patient safety. This risk can be attributed to the patient self-medication and/or her/his family and friends who may not ensure optimal follow-up of medication. Caregivers could be a risk if she/he does not prepare the medication in accordance with the prescribed treatment due to lack of time or distraction. This study analyses the practice of preparing weekly pillboxes to mitigate the potential risk of medication errors and/or non-compliance.

Methods: The authors surveyed Belgian community pharmacists and nurses in the preparation of weekly pillboxes. The authors then studied their potential interest in being involved together in a collaboration. The respective skills of these two stakeholders (community pharmacists and nurses) would be used to achieve a common goal, understand a patient's treatment in its entirety to reduce the risk of medication errors and the resulting drug-related iatrogeny. In practice, interprofessional collaboration in the health care setting is not consistently delivered by all professions, a significant disparity between the home care nurse and the community pharmacists may be a barrier to efficient collaboration.

Results: The authors describe the professional profile and collaboration interest of home care nurse and pharmacist. The added value of the collaboration was assessed by previous publication and data on drugs compliance and medication error.

It was established that 58.5% of the nurses participating in the study would find it useful to set up collaborations with community pharmacist. The responses to the open-ended

question about home care nurses' views on working with the community pharmacist were categorised to highlight the most relevant arguments. It has been calculated that 58.2% of home care nurses would be in favour of this collaboration. This approval by home care nurses is justified in half of the cases by the fact that the community pharmacist would have better knowledge of drugs (drug interactions and generics). The difference of 0.3% with the percentage quoted in the previous paragraph is explained by the fact that 8.8% of the participants did not give their opinion. There are 32.7% of home care nurses who are opposed to the establishment of these collaborations with the community pharmacist. The main reason for this refusal is that some home care nurses feel that discussions about a patient's medication should be done only with the doctor. For them, this was not the responsibility of the community pharmacist.

Conclusions: Two main things could be improved with this collaboration. First, home care nurses' knowledge about drugs should be constantly updated and optimised. Home care nurses also believed involving community pharmacists in helping nurses with updated drug knowledge would ensure better patient care; It would also have an impact on their time and workload.

Home care nurses' perceptions about their role in interprofessional collaborative practice in clinical medication reviews

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Introduction: Regular clinical medication reviews (CMRs) are recommended for monitoring and addressing potential drug-related problems, especially in elderly people. Interprofessional collaborative practice (ICP) by general practitioners, community pharmacists, and nurses in a CMR is recommended and expected to produce more efficient CMRs. Involving home care nurses in ICP is not yet well implemented, and their perspectives are unclear.

Objectives: This study explores how home care nurses perceive their role in ICP in CMRs and the requirements to assume that role.

Methods: Structured interviews were performed, using case-vignettes; data were analysed with a thematic analysis approach.

Results: Twelve home care nurses were interviewed. Three themes regarding the nurses' role were identified: (1) observing, recognising, and communicating information for a CMR to prescribers and community pharmacists; (2) helping to provide patient information and education about implemented changes in the pharmaceutical care plan; and (3) the nurses' level of involvement in ICP. Three themes regarding requirements were identified: (1) nursing competences, (2) periodic interprofessional consultation and ad hoc interprofessional communication, and (3) guidelines describing the role of nurses.

Conclusions: Home care nurses could provide additional support in a CMR. Nursing competences, periodic interprofessional consultation and ad hoc interprofessional communication, and guidelines describing the role of home care nurses are required for this support to be realised.

Completeness of handwritten outpatient prescriptions in community settings in Albania

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Introduction: Drug prescribing is still a handwritten process in many countries. The quality of handwritten medication orders plays a crucial role in achieving the desired therapeutic goal. Therefore, the caregiver should ensure the completeness and the legibility of the prescription according to the legal requirements in order to minimise errors in the dispensing process.

Objectives: To evaluate the completeness and legibility of handwritten outpatient prescriptions in community pharmacy settings in Albania.

Methods: This study was conducted among community pharmacies in ten different cities in Albania. The handwritten outpatient prescriptions kept in pharmacy from April to May 2021 were collected using a random sampling technique. The prescriptions were analysed for completeness using a checklist developed based on the outpatient prescription form used in primary care settings. Legibility was evaluated by two experienced pharmacists.

Results: A total of 535 prescriptions from primary care centres retained by pharmacies were collected for analysis. The majority of the prescriptions (66.9%) missed patients' diagnoses. In many cases prescribers' information such as name, signature and stamp were missing altogether (56%). The most often omitted element from patients' information was registration number (65.3%) followed by address (59.1%). Information relating to dosage form, dose, frequency, quantity and route of administration of the prescribed drugs were present altogether in approximately 21% of prescriptions observed. The commercial name of the drugs was mentioned in all the prescriptions, with only 12% of them having the generic name. About half of the prescriptions (53.6%) were moderately legible.

Conclusions: This study revealed that there is a need for improvement regarding the level of completeness and legibility of handwritten outpatient prescriptions in Albania. The implementation of an electronic prescribing system in the outpatient setting can substantially contribute to improving the prescription writing process.

Development of quality indicators for community pharmacies: A qualitative study

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Introduction: New pharmacy services are constantly being designed and implemented in an increasing number of pharmacies in Norway. Monitoring and evaluating these services is critical for continuous improvement. To measure quality and change in quality, different stakeholders have developed quality indicators (QIs) for several areas of healthcare. However, in Norway, QIs are yet to be developed for community and hospital pharmacies. Qualitative research is necessary to identify how different key stakeholders perceive good quality in pharmacies and use this to create QIs.

Objectives: To explore pharmacy professionals' and customers' experiences and perceptions about what constitutes good quality in community pharmacies and potential means to measure this quality.

Methods: The authors applied a conveniently sampling approach to recruit five homogenous semi-structured focus groups. All interviews with 27 participants were conducted via Teams. Interviews were transcribed verbatim, and an inductive thematic analysis with a reflexive approach was used. The study followed the Consolidated criteria for reporting qualitative research (COREQ) checklist.

Results: The study identified four main themes from the analysis; good communication skills and relationships with the pharmacy professionals, sufficient and substantively suitable information to cover individual needs, customer satisfaction with knowledgeable employees and conveniently located pharmacies, and factors that affect the working environment of the pharmacies. According to the informants, these themes significantly impacted their perception of the quality of pharmacy services.

Discussion: This study has identified areas that pharmacy professionals and customers consider essential to define good quality in pharmacies. Several of these informants' perceptions can guide the development of QIs to be used in Norwegian pharmacies.

Development of practical instruments aimed at preventing and reducing inappropriate use of opioids in primary care: A pragmatic delphi study

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Introduction: In the past decades, opioid prescriptions have been rising in The Netherlands. The primary care guideline on pain were recently updated to tackle inappropriate opioid use. Healthcare providers are in need of tools to aid with implementation.

Objectives: To construct a tool to prevent and reduce inappropriate opioid use for non-cancer pain for primary care.

Methods: A Delphi approach was used. A draft of an intervention tool was constructed based on literature and Dutch primary care guidelines regarding pain. In the three-round consensus process, a multidisciplinary expert panel of 21 experts assessed the content, usability and feasibility of the components.

Results: The draft tool consisted of two parts: part A to reduce opioid initiation and short-term use, and part B to reduce chronic (more than three months) opioid use. In three rounds, components and subcomponents were added, deleted and adapted until consensus was reached. The final part A consisted of six components: education, decision tree for start, risk assessment, agreements on dose and duration of use, guidance and follow-up, and interdisciplinary

collaboration. The final part B consisted of five components: education, patient identification, risk assessment, motivation and tapering (see Figure 1).

Conclusions: By a consensus process, a tool for primary care to prevent and reduce inappropriate opioid use was developed, with six components to reduce initiation and short-term use of opioids for non-cancer pain and five components to reduce long-term opioid use in patients with chronic non-cancer pain. The tool will be tested in a feasibility and implementation study in 2022/2023.

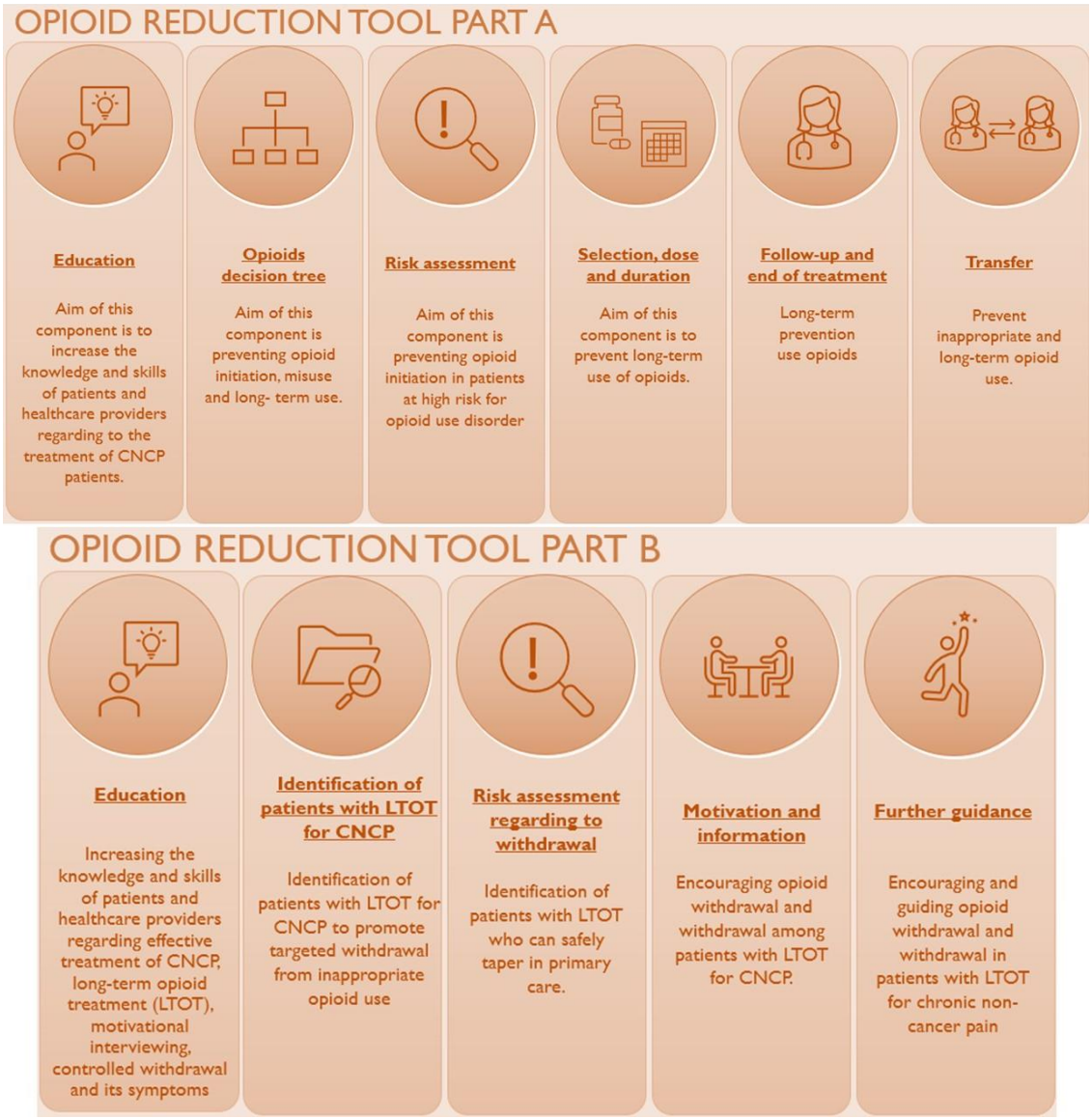

Figure 1: Opioid reduction tool

From pharmacy student to pharmacist: Exploring the journey of moral development

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Introduction: It is widely accepted that the role of a pharmacist is becoming more complex and the scope of practice has broadened over the past decade. With restricted access to hospitals and general practice, the COVID-19 pandemic shone a light on the vital role that pharmacists play in maintaining patient care and disease management. Pharmacists have always been at the forefront delivering safe and effective care across all settings. Recent reforms to the education and training of pharmacists in the United Kingdom, will see that from day one on the register, pharmacists are expected to play an active role in the provision of clinical care and consultations

including prescribing medicines. These advances make it more important now to have a better understanding of what moral development through pharmacy education and once in practice. Research has shown that healthcare professionals can make better decisions in the interests of their patients when they have advanced levels of moral decision making.

Objectives: It is hypothesised that as students' progress through pharmacy education they will demonstrate maturation in moral development, and this should continue as they progress through their careers. This research intends to measure and evaluate the pattern of moral reasoning of undergraduate pharmacy students at the University of Hertfordshire (UH) as they progress through formal education and practice.

Methods: A ten-year longitudinal study which employed the Defining Issues Test 2 (DIT2) to quantitatively measure the changes the participants' moral development. The DIT2 was completed by participants of a single cohort of students, who started the Master of Pharmacy (M.Pharm.) programme in 2008 in each year of study at the University of Hertfordshire, once after passing the General Pharmaceutical Council pharmacist registration exam (as Newly Qualified pharmacists) and a final time five years after they qualified (as matured Established Practitioners). Medians and standard deviations were calculated and compared analysed using pairwise comparison with the Wilcoxon signed-rank test.

Results: The statistically significant changes were in N2 scores between Level 1 (Median = 22.07) and Level 3 (Median = 26.80) (p = 0.025), this is a positive finding which supports the research that shows that moral development can be taught. To further support these results there was an increase in N2 score between Level 1 and Level 4 (p = 0.011). Research has also shown that practice-based experience can give rise to maturation in moral development, this research showed a statistically significant difference between Level 4 (Median = 22.62) and NQ Level (Median = 40.53). Despite this, surprisingly, there was a marked decrease in p and N2 scores at Established Practitioner level.

Conclusion: Overall, the research showed a general increase in moral development as the participants progressed through the M.Pharm. programme and in the first year after qualifying. However, with the decrease in moral development indices as an Established Practitioner qualitative research to investigate factors that may have caused this then recommend ways to support pharmacists better through education and practice.

Physicians – Pharmacists team intervention in antimicrobial stewardship in hospitals: A systematic review and meta-analysis

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Introduction: The World Health Organization (WHO) stated that one of the ten threats to global health in the year 2019 was antimicrobial resistance (AMR) or antibiotic resistance. AMR happens when microorganisms, such as bacteria and fungi, develop the ability to stop an antimicrobial, or multiple antimicrobials, from working against it. Its emergence is creating 'superbugs' that make treating basic infections difficult and surgeries risky.

Objectives: The purpose of this study was to summarise multiple interventional studies into a single report to validate if these interventions would establish a statistically significant difference in antibiotic resistance reduction between patients managed by a Physicians – Pharmacists Team intervention in antimicrobial stewardship programmes and those regular patients who were given only the usual medical treatment.

Methods: The researcher performed a systematic search of Biomed Central, NCBI, Proquest, Elsevier, Google Scholar, Cochrane electronic databases, and EBSCOhost(UIC-Lrsc) from 2000- 2019. Studies were included if they are RCTs or have the quasi-experimental design. Initial studies reviewed were 351, and only 12 studies met the inclusion criteria and were selected for systematic review and meta-analysis.

Results: The researcher identified five intervention types: Audit and Feedback (six papers), Point of Care (three papers), Automatic Stop Order (one paper), Antimicrobial stewardship programme (ASP) intervention on *S. aureus* bacteraemia (SAB) therapy (one paper), and Post Prescription Review and Authorisation done by a trained pharmacist (one paper). Physicians – Pharmacists Team interventions were associated with reductions in Defined Daily Dose (DDD) of surgical antibiotic prophylaxis in antibiotic use (control: 16.6 *vs* experiment: 12.8, p = 0.000), total number of antibiotic days per patient (control: 7.6 *vs* experiment: 6.6, p = 0.006), bacteremia > 7 days (control: 4 days *vs* experiment: 3 days, p = 0.024), length of stay (control: 7.2 *vs* experiment: 6.5, p = 0.004), infection-related mortality no. (control: 16 *vs* experiment: 8, p = 0.047) , overall time to first antibiotic (control: 9:09 *vs* experiment: 1:23, p < 0.001), antibiotic consumption (control 33% *vs* experiment: 3% , p = 0.003), median duration of IV antimicrobial treatment (control: 71.7 hours *vs* experiment: 55.5 hours, p=0.017), length of antimicrobial therapy (control: 11 days *vs* experiment: 10 days, p = 0.000), length of IV therapy (control: 10 days *vs* experiment: 8 days, p > 0.001), total number of DDD of the targeted antibiotics (control: 10 *vs* experiment: 8, p = 0.040) and total number of days receiving the targeted antibiotics per patient (control: 6 *vs* experiment: 4, p = 0.002).

Conclusions: In conclusion, the results emphasised that the Physicians – Pharmacists Team interventions in antimicrobial stewardship such as Audit and Feedback, Point of Care, Automatic Stop Order, and ASP intervention on SAB therapy are more effective than the conventional methods. Thus, these interventions in antimicrobial stewardship will significantly reduce, lessen, slow down, or prevent the emergence of antimicrobial resistance. Furthermore, among the various interventions, the prospective audit and feedback strategy will have a greater chance to be widely applied because of its clear advantages.

'The Envelope': A tool to support transmural communication between the hospital and the community pharmacist

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Introduction: Considering the home-based character of oral anticancer therapies (OACT), the general practitioner and community pharmacist (CP) are important players in the follow-up of these patients. However, collaboration between primary and secondary care (SC) is currently impeded by various barriers, such as lack of communication and absence of a shared electronic patient record. Often, CPs are not informed by the hospital about the start of OACT.

Objectives: The aim of this pilot project is to support transmural communication between SC and CPs at the initiation of an OACT using 'The Envelope'. By improving information transfer between these two settings, the authors hope to enable CPs to perform medication reconciliation at treatment-initiation and assume a (more) substantial role in counselling and follow-up of patients on OACT.

Methods: In December 2021, the oncology departments of two Flemish hospitals started using 'The Envelope' as a tool for transmural communication with CPs. Patients starting a new OACT received an envelope upon their consultation in the hospital. The envelope is intended for the CP and should contain the following documents: an information letter, an information leaflet on the OACT, and a medication therapy plan from the hospital. Upon receipt, CPs are asked to scan a code, as to register the number of envelopes that make it from the hospital to the pharmacy. Furthermore, CPs are asked to complete an online survey on what actions were taken and/or problems were detected using the information in the envelope.

Results: By April 2022, 25 envelopes were received by a CP. Of those CPs who received an envelope, 16 completed the online survey. The CPs received the envelope from the patients themselves (N = 11) or from their caregiver (N = 5). The ensuing counselling interview lasted on average 14 minutes (range 2 – 60 min). Several actions were taken by the CPs: an extensive conversation with the patient/caregiver about the OACT or other medication (N = 14), adding the OACT to the patient's medication history in the pharmacy software (N = 8), providing intake instructions (N = 3), contact with hospital pharmacist (N = 2), and substitution to the original drug (N = 1).

Only ten out of 16 envelopes contained a medication therapy plan from the hospital. Seven CPs compared the schedule to other available information (e.g. prescription(s) from the hospital, medication history, previous medication therapy plan, information from the patient/caregiver). One discrepancy (two drugs of the same class) and one drug-related problem (inadequate adherence to co-medication) were discovered.

Conclusions: Based on these preliminary results, the envelope seems a valuable and efficient tool for communication between SC and CPs that can be used as an intermediate solution in anticipation of a shared electronic patient record. The envelope seems to enable CPs to take up a role in the counselling of patients upon initiation of OACT and perform a medication reconciliation.

Self-care advice in community pharmacy: A qualitative study of facilitators and barriers using the theoretical domains framework

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Introduction: In The Netherlands, guidelines for self-care advice for pharmacists were implemented in the 1990s. Since then, guidelines have been frequently updated. However, limited studies have been performed regarding the implementation of self-care advice.

Objective: Evaluation of community pharmacists' and pharmacy assistants' perceptions on facilitators and barriers for self-care advice.

Methods: Community pharmacists and one of their assistants were invited to be interviewed. Semi-structured interviews were conducted either face-to-face or online. A topic guide was developed based on the Theoretical Domains Framework (TDF). Interviews were audio-recorded and transcribed verbatim. Transcripts were analysed using

NVivo 20. Content analysis was used to identify facilitators and barriers in providing self-care advice.

Results: In total, 13 pharmacists and 12 pharmacy assistants were interviewed. Self-care advice was based on national guidelines including a protocol with Who, What, How long, Action, Medication (WWHAM) questions. As most important facilitators communication skills were named and ready knowledge of at least first and second choice medication. Further, some pharmacists mentioned a policy on in-service training and skills assessment, and a consulting room or privacy counter as facilitators, and high workload, hurried customers, language problems, and expensive image with General Practitioners (GPs) and consumers as barriers. Most pharmacists thought GPs were unaware of policy and content of self-care advice in pharmacy.

Conclusions: Pharmacists should pay attention to in-service training, skills assessment and environmental stressors to improve quality of self-care advice in pharmacies. To improve their image, community pharmacists should discuss self-care advice and product prices in pharmacy with GPs.

Clinical reasoning by pharmacists: What does it entail and how do pharmacists conduct it?

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Introduction: Clinical reasoning is considered a core competence for pharmacists, but there is a lack of conceptual clarity that complicates teaching and assessment of clinical reasoning in pharmacy practice and education.

Objective: This scoping review was conducted to identify, map and examine the evidence on used cognitive processes and their conceptualisation of clinical reasoning by pharmacists.

Methods: Seven databases were searched for relevant primary research studies in March 2021. Studies were included when cognitive processes in clinical reasoning (or surrogate terms) among pharmacists or pharmacy students addressing a clinical scenario in a pharmacy-related setting were examined. Study characteristics, conceptualisations, operationalisations and key study findings were analysed. Results were reported using Preferred Reporting Items for Systematic reviews and Meta-Analysis extension for Scoping Reviews.

Results: Included studies examined clinical reasoning in the context of forming a diagnosis (n = 8) or, therapy planning and medication review (n = 5). Clinical reasoning was described as a context-dependent cognitive process whereby pharmacists apply and integrate knowledge and clinical experience to interpret available clinical data. Different terms labelled pharmacists' reasoning that showed both analytical and intuitive approaches to clinical scenarios, separately or combined as dual process. Several diagnosis-forming studies indicated no distinct cognitive pattern as pharmacists relied on inappropriate questioning methods. Medication review studies reported an analytical preference to reasoning.

Implications: Explicate each stage of the clinical decision-making process with cognitive processes and put the clinical reasoning stage in context by using the terms 'diagnostic reasoning' and 'therapeutic reasoning', respectively. This research shows the need to develop appropriate teaching strategies to improve pharmacists' diagnostic reasoning.

Theories, models and frameworks: How to achieve the integration of community pharmacy in primary health care?

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Introduction: Health policies focus on achieving integrated health systems to improve their efficiency and sustainability. System integration result in improved health and patient satisfaction. It is a means of unifying visons and missions and attempts to optimise the use of the available resources, whether professional, financial or setting. However, despite being a major gateway to primary healthcare, due to the reach and accessibility of community pharmacy (CP), it often remains overlooked by governments in integration policies and processes. Critically there is limited literature on theoretical concepts that could be applied to the possible integration of CP and primary health care (PHC).

Objectives: To identify and classify the theories, models and frameworks of health system integration.

Methods: A systematic review was undertaken in PubMed, Scopus, Web of science, Psycinfo and Cochrane library using the terms: 'integrated/organized delivery system, health care/services/systems integration, and integrated health care / services / system / delivery' from 2013 to 2022. The guidelines for the classifications were: Theory was 'a set of

analytical principles or statements designed to structure our observation, understanding and explanation of the world'. Theories are explanatory as well as descriptive.; Models typically 'involves a deliberate simplification of a phenomenon or a specific aspect of a phenomenon'; Framework usually 'denotes a structure, overview, outline, system or plan consisting of various descriptive categories, e.g. concepts, constructs or variables'. Frameworks do not provide an explanation however they only describe empirical phenomena by fitting them into a set of categories.

Results: From 4323 articles, 30 papers were retrieved according to inclusion and exclusion criteria, identifying 12 models, ten frameworks and two theories, categorised; Theories: Integration degree; Complex Adaptive Systems or Complexity theory. Models: Model for an integrated health system; Model INSIDE; Network Integration; LOPSI Conceptual Model; SNEI; The McKinsey 7S model; Conceptual model of integration types (Singer); Integrated Primary Care (IPC) Model; Shared Mental Models; Provider-based Conceptual Model; Funnel Model; Co-location Model.; Frameworks: Conceptual Framework: Five healthcare activities that facilitates Integration (5As); The Four Domain Integrated Health (4DIH) framework; Atun el at. Framework; Clinical integration Conceptual Framework based on Mauer (2006); Integrated Performance and Incentive Framework; System level measures framework; Theoretical framework: Conceptual scheme of different forms of integration; Monitoring and Evaluation (M&E) framework; Framework SAAS.

Conclusions: It's interesting to know that there were many interpretations to the differentiation between a theory, a model and a framework but the literature review did not produce any CP and PHC specific model, framework or theory. However, there were suggestions on positioning CP in integrated care, rather than integrating into PHC. In order to find and choose the most suitable model, framework or theory to guide the integration of CP into PHC, rigorous criteria need to be set according to national health needs, culture and local context for PHC and CP.

The effect of a mentalisation-based communication skill training in pharmacy practice: A pilot study

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Introduction: Pharmacy staff members have important tasks related to patient education and counseling about medicines. For example, pharmacy staff have a central role in providing support and advice to patients regarding potential drug related problems they may have that hinder proper use. These may include patients' misunderstanding of essential medication use information (practical barriers) or the hesitancy patients may have to take their medication due to certain needs and concerns (perceptual barriers). The detection of perceptual barriers is made difficult by stress or negative emotions, as these can disrupt effective communication. The pharmacy team can be trained on how to deal with both pharmacy staff member's own emotions and those of the patient. A communication training based on the mentalising concept, the ability to reflect on the behaviour of oneself and others in terms of mental states, was developed to improve patient-oriented communication in community pharmacies.

Objectives: The aim of this study was to investigate whether a mentalisation-based communication training for Dutch pharmacy staff members impacts their ability to provoke and recognise patients' implicit and explicit medication related needs and concerns.

Methods: In this single-arm intervention study, conversations at the pharmacy counter between pharmacists or pharmacy technicians and patients were video-recorded before and after the mentalisation training. The data from the video-recordings were observed and coded using a developed protocol for analysing perceptual barriers. The protocol combined the Beliefs about Medicine Questionnaire (BMQ) and the Verona Coding Definitions of Emotional Sequences (VR-CoDES). Outcome measures included: recognition of patients' implicit and explicit medication related needs and concerns and implicit and explicit provocation of these needs and concerns. Descriptive statistics, such as frequencies on provocation and recognition of needs and concerns, were used to describe the effect of the training on mentalisation. Also, differences between job function and the outcome measures were investigated.

Results: In total, 22 pharmacy staff members participated. 84 video-recordings were analysed, of which 50 videos were

from before and 34 from after the training. Patients seemed to explicitly express more concerns during counter-conversations post-training compared to implicitly expressing concerns (shift 40.0% to 55.6% (N = 10 and 5). Pharmacy staff members seemed to provoke and recognise needs and concerns explicitly more often (shift 60.0% to 100.0% (N = 6 and 4) and 70.8% to 86.7% (N = 17 and 13)). Specifically, pharmacy technicians showed an increase in explicit provocations (n = 1 to 4) and recognitions (n = 4 to 11) after the training.

Conclusions: This training appears to increase pharmacy staff members' explicit recognition of patients' medication related needs and concerns. The training seems to be valuable to improve patient-oriented communication in the pharmacy. Larger studies should further confirm this result.

Types of integration and their applicability to the integration of community pharmacy and primary healthcare

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Introduction: Traditionally, pharmacists have not been perceived as providers of health services. This is changing as in many countries the Community Pharmacy Network (CPN) is being recognised as a valuable resource for the health system due to pharmacists' accessibility, distribution and extensive knowledge of medicines. Community Pharmacy (CP), due to many factors, however, remains largely unintegrated in Primary Health Care (PHC) systems. Integration is a complex term with multiple interpretations with a number of policy options on the method of integration that CP could pursue.

Objective: To Identify and analyse the different types of integration used in health to assess their applicability to the integration of CPN and PHC.

Methods: A narrative review was undertaken to identify the different types of integration in health. Initially, the International Journal of Integrated Care was manually reviewed from the inception of publication in November 2000 to January 2022 Additionally, a Google search was performed with the query: integration health types OR processes OR dimensions file type: pdf.

Results: The review ended with 55 articles where five integration types were identified and classified according to the hierarchical levels of the health system: clinical and service integration at micro level (CP and primary health care centres), professional and organisational integration at the meso level (provincial level), and system integration at macro level (national state level). Different attributes were identified that serve to define and consolidate the integration process. The attributes were classified into the following groups: breadth (horizontal, vertical); interaction (linkage, coordination, cooperation, collaboration, full integration) and enablers which assist integration (informational, normative, functional, cultural, contextual, structural and financial). The intensity of integration was related to different components such as trust, consensus, connectivity and communication.

Conclusions: The most appropriate single or combination of integration types needs to be analysed in order to approach the complex problem of integrating CPN and PHC. Without a formal integration in primary health care system the evolution of community pharmacy as a health care provider may be impaired.

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CONFERENCE ABSTRACTS

Pharmacy practice research summer meeting for PhD students, postdoctoral fellows and supervisors conference abstracts 2022

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

Poster presentations

Feasibility of personalising dispensing quantities to prevent waste of oral anticancer drugs

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Introduction: Personalising oral anticancer drug (OAD) quantities dispensed to patients could prevent medication waste, avoiding its economic loss and contributing to sustainability.

Objectives: Evaluating feasibility of a personalised dispensing programme to prevent OAD waste.

Methods: Personalising dispensing quantities was implemented as standard care for adult patients starting OAD treatment at Radboudumc. 50 patients were followed for six months in a feasibility study conform Bowen's framework between December 2021 and December 2022. A) Demand was determined by frequency and economic value of OAD waste. B) Implementation was measured by reach (percentage of eligible patients included) and protocol fidelity (percentage of dispensings that followed protocol). C) Acceptability was assessed with a survey among patients and pharmacy technicians requesting satisfaction rate on a scale of 0 - 10 and agreement with Theoretical Framework Acceptability domains on a 5-point Likert scale. D) Practicality was based on costs for additional activities. E) Effect was determined by waste reduction and net cost-savings *versus* standard care (one-month and one package supply). Descriptive statistics were used.

Results: Participants' median age was 67 (IQR 58-71) years and 76% was male. Reach and protocol fidelity were respectively 89% and 91%. Satisfaction was high: patients scored on average nine out of ten (SD ± 1), and pharmacy technicians seven out of ten (SD ± 2). All acceptability domains were agreed on (median ranking ≥ 4). Total programme costs were €4,036 related to patient counselling, additional dispensings and home delivery services. OAD waste was reduced by 24% - 35%, corresponding to net cost-savings between EUR 5,133 and EUR 11,053 when compared with one-month and one package supply.

Conclusions: Personalised dispensing appears feasible for preventing waste of OADs in terms of demand, implementation, acceptability, practicality, and effect.

Impact of COVID-19 on frontline pharmacists' roles and services around the world: The INSPIRE Worldwide Survey

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Objectives: Evaluate the impact of COVID19 on pharmacists' roles and services around the world

Methods: A cross-sectional online survey with pharmacists who provided direct patient care during the pandemic. Pharmacists were recruited through social media with assistance from national and international pharmacy organisations. The survey was divided into three sections: 1) demographics, 2) pharmacists' roles and services during the pandemic 3) practice challenges. The data were analysed using SPSS 28, and descriptive statistics were used to report frequencies and percentages.

Results: A total of 419 pharmacists practicing in 25 countries provided consent to participate. The most common role that pharmacists undertook was responding to drug information requests (90%), followed by allaying patients' fears and anxieties about COVID19 (82.6%), then addressing misinformation about COVID19 treatments and vaccinations (80.4%), and educating the public on strategies to reduce COVID19 transmission (e.g., handwashing) (80.2%). Despite the demands of the pandemic, pharmacists continued to provide clinical services regularly. Managing and/or monitoring patients' chronic diseases was the most frequently provided service (72.6%), followed by treating ambulatory conditions (65.4%), then renewing/extending prescriptions (58%) and prescribing emergency supply refills (52.7%). Interestingly, almost half of the participants reported administering COVID19 vaccines (45.6%). Pharmacists reported being involved in pandemic management through consultations, policy development and participating in taskforces. The most common challenge that pharmacists encountered was increased stress level (84.7%), followed by medication shortages (73.8%), general supply shortages (71.8%), inadequate staffing (69.2%), and concern for the safety of self and others (66.8%).

Conclusions: Despite the uncertainty, the massive pressure, and the constant need to adapt, pharmacists around the world continued to put the patient first, providing them with highest quality services and making sure that all their needs are met. Pharmacists are definitely the unsung heroes of pandemic and their actions should cement their place as an essential health service.

Definitions and indexing of 'simulated patient' studies in health: A classification system proposal

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Introduction: Several inconsistencies on the definition and indexing of the term 'simulated patient' have been reported in the health literature, including in pharmacy practice.

Objectives: To propose a classification system for studies on 'simulated patient' and to assess the coverage of 'simulated patient' in the National Library of Medicine's (NLM) Medical Subject Headings (MeSH) thesaurus.

Methods: This was a cross-sectional study. To identify all the potential terms used to describe simulated patient studies, a systematic search using combinations of synonymous/ related words of simulated and patient in MEDLINE until October-2019 was performed. Records presenting at least one MeSH term, with an available abstract and referring to a simulated patient study within the scope of health were included. A flowchart on the different methods and scenarios of patient simulation was developed grounded on scientific literature; five categories were proposed: 'machine/automation' (no interaction between humans and the simulated patient); 'audit' (aims to inspect the service or the service' provider behaviour where participants are not aware of the simulation); 'assessment' (aims to evaluate the clinical skills and competencies of students or health professionals, where participants are aware of the simulation); 'education' (aims to educate students or health professionals where participants are aware of the simulation); and 'others' (secondary studies, e.g., reviews). The included studies were classified in at least one these categories. Additionally, seven related MeSH terms were identified: 'Simulation Training' (affiliated terms: 'High fidelity simulation training' and 'Patient simulation'), 'Computer simulation' (affiliated terms: 'Patient-Specific Modeling' and 'Virtual reality') and 'Virtual reality exposure therapy' (no affiliated terms). Exploratory analyses on the included articles allocation considering the seven selected MeSH were performed. Accuracy parameters were calculated to entire sample and for each proposed category.

Results: The authors retrieved 9,451 registers, of which 2,238 were excluded due the absence of an abstract or MeSH, and other 2,683 were considered irrelevant during

screening. The remaining 4,530 studies were classified into: 'assessment' (n = 1159, 25.6%), 'education' (n = 491, 10.8%), 'audit' (n = 441, 9.7%), 'education and assessment' (n = 364, 8.0%), 'machine/automation' (n = 316, 7.0%) categories. The 'machine/automation' category included studies using an automaton (computer, mathematical model, virtual system) for simulating a human (virtual models of kinetics/dynamics of drugs, computational circuits on therapeutic effect). Most studies on 'audit' evaluated the performance of healthcare services (31.1%) or the behaviour of physicians/residents (29.3%) or pharmacists (27.7%). Most studies classified as 'assessment' were designed to measure the skills or performance (e.g., comprehension, problem resolution) of medical students/residents (75.3%). In the 'education' category, studies were mostly represented by humans as simulated patients (49.5%), followed by dummies (23.4%); they targeted medical students/residents (51.1%), nurses (18.5%) and pharmacists (7.1%). The overall accuracy for all MeSH terms was 70% with sensitivity and specificity rates of 55% and 93%, respectively.

Conclusions: The number of publications using 'simulated patient' significantly increased in the past years. Yet, around half of studies are not indexed with one of the currently available MeSH terms. The lack of standard definitions for these types of simulations may hinder the retrieval of relevant studies.

Critical appraisal of dyslipidaemia clinical practice guidelines: A scoping review

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Introduction: Dyslipidaemia, the unbalanced level of lipoproteins and triglycerides, contributes to or aggravates cardiovascular diseases. In 2019, high LDL-c levels were responsible for 5 million deaths worldwide. Several clinical practice guidelines (CPG) about dyslipidaemia aiming at guiding healthcare professionals towards more assertive decisions exist. However, previous studies reported low quality of the clinical content and evidence supporting recommendations provided by CPGs in different areas, and a lack of involvement of multi-professional experts and stakeholders, such as pharmacists, into their development. This may lead to inconsistencies and risk of bias in decision-making and negatively impact on patients' outcomes. The quality of CPG can be assessed through Appraisal of Guidelines, Research and Evaluation (AGREE) tools as the AGREE II (methodological assessment) and AGREE REX (clinical recommendations).

Objectives: The authors aim to evaluate the quality of available CPG on dyslipidaemia and assess the extent of involvement of stakeholders using AGREE II and AGREE REX appraisal tools.

Methods: A scoping review following Cochrane Collaboration and PRISMA recommendations was performed. Systematic searches to retrieve CPG on the use of pharmacological treatments in adult patients with dyslipidaemia (written in Portuguese, Spanish, English, French, German) were conducted in PubMed and Scopus. The eligible records had their data extracted and were assessed using AGREE II (23 quality items within six domains: scope and purpose; stakeholder involvement; rigor of development; clarity of presentation; applicability; editorial independence) and AGREE REX (nine items within three domains: clinical applicability; values and preferences; local application and adoption). Both instruments were applied following the original users' manual guide. Grades of dominions were reported as percentages, items as absolute rates (1.0 to 7.0 scale) and final scores as median [minimum-maximum].

Results: 20 guidelines (Brazil, Canada, Europe, India, Mexico, Poland, South Africa, United States), mainly authored by professional societies (95%) and targeting clinicians as their primarily users were selected. The overall quality of CPG was low-moderate (mean 65% in AGREE II and 46% in AGREE REX). All guidelines lack on discussing the role of patients or caretakers on treatment decisions and most of them were methodologically poorly developed (low score on the 'Rigor of Development' domain, < 45%). The Domain 1 from AGREE II ('Scope and Purpose') presented the higher rates of compliance (95%). Conversely, only half of CPG (56%; [36-74]) comply with the AGREE II Domain 2 ('Stakeholder Involvement'); its three items (participation of all relevant professional groups, patients and caretakers' involvement, definition of the target users) were rated as 4 (1.8-6.3), 2 (1.0-4.0) and 7 (6.0-7.0), respectively. The Domains 1 and 2 of the AGREE REX ('Clinical Applicability' and 'Values and Preferences') were graded as 66% [20-94] and 34% [19-44], respectively. No statistical difference between results of the same dominion were found.

Conclusions: Dyslipidaemia's CPG can be improved, especially regarding: evidence updating, compliance with quality standards for literature search, appraisal and recommendations, and the addition of stakeholders' values and preferences.

Healthcare providers' knowledge and awareness of deprescribing

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Introduction: Deprescribing, discontinuation of a medication without an indication or benefit, is a patient centred intervention aimed to improve outcomes. It requires shared-decision making as well as an interdisciplinary approach. Healthcare providers, pharmacists, or physicians, are in ideal position to suggest, discuss and lead deprescribing. For successful implementation of deprescribing it is important to assess stakeholders' preparedness to provide such a service. This is especially important in healthcare systems with developing pharmaceutical care.

Objectives: To explore healthcare providers' knowledge and awareness of deprescribing.

Methods: A cross-sectional internet survey on primary care pharmacists and physicians in Croatia. A 20 item questionnaire scored on a five-point Likert scale was used. The questionnaire was developed based on literature review, expert opinion and focus groups, and subsequently validated. It was designed using the LIMESurvey software, and distributed via email through healthcare providers' associations. An email remainder was sent two weeks after the initial invitation to complete the survey. Data were collected between November 2021 and January 2022. The questionnaire consisted of five sociodemographic, and 15 deprescribing-related items. The deprescribing-related questions explore participants' knowledge (three items), awareness (four items), opinion (four items), confidence, and willingness to deprescribe (two items each). Factor scores range from one to five, with higher score meaning greater knowledge, awareness, confidence, or willingness to suggest deprescribing.

Results: Over 200 healthcare providers completed the survey (n = 206; 111 pharmacists and 95 physicians). Participants were mostly female (79.6%), had a median of 38 years (IQR 30 - 53), and a median of 12 (IQR 5 -28) years of experience. More than half of participants worked in an urban area (58.3%) and in practices within or near other healthcare facilities (56.8%). The majority of participants (91.8%) agreed that deprescribing is as important as prescribing medication, and that it should involve shared-decision making (87.4%). Both pharmacist and physicians largely agreed that they are willing to suggest deprescribing to patients if appropriate (89.8% off al participant; 83.8% pharmacist and 96.8% physicians), but only 17.0% agreed that it is a simple and easy task (9.9% of pharmacists and 25.3% physicians). Pharmacist had statistically significantly higher awareness and knowledge scores than physicians (4.64 ± 0.48 *versus* 4.24 ± 0.72; t (204) = -4.792, $p < 0.001$ and 4.08 ± 0.84 *versus* 3.74 ± 0.82; t (204) = -2.889, p=0.004 respectively), but lower confidence and willingness scores (2.61 ± 0.94 *versus* 3.42 ± 0.79; t (204) = 6.633, p<0.001 and 3.64 ± 0.75 *versus* 4.11 ± 0.59; t (204) = 4.905, $p < 0.001$ respectively). Physicians, on the other hand, were more likely to suggest deprescribing if patients expressed their desire than pharmacists (51.6% *versus* 34.2%; $\chi 2$ (2) = 6.77, p = 0.034).

Conclusions: Healthcare providers have the willingness to suggest deprescribing, but might lack confidence to propose intervention. Future research should explore potential barriers and facilitators to gain a comprehensive view of important factors contributing to successful deprescribing implementation.

EvaPharMed – Development and evaluation of an interprofessional education project for pharmacy and medical students: A pilot study

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Introduction: Interprofessional education projects with pharmacy and medical students (PS and MS) are rare in Germany (Institut fuer Medizinische und Pharmazeutische Pruefungsfragen, 2019). However, for a future trustful collaboration personal contacts and mutual understanding are vital (Weißenborn *et al.,* 2019). Care by an interprofessional team is beneficial for patients. According to the fifth Action Plan 2021 – 2024 to improve medication safety of the Federal Ministry of Health (2021), interprofessional collaboration is an important key element.

Objectives: The authors developed and implemented an interprofessional education project for PS and MS. The pilot study was conducted to understand the students' perceptions and to evaluate whether students were satisfied with their learning progress and would recommend this project.

Methods: The project, developed by an interprofessional team, consisted of three parts: (1) an interprofessional online seminar, (2) practical training at the Medication Management Center (MMC) and (3) a one-day internship in a general practitioner's (GP's) office. In all three parts, PS and MS performed patient-oriented casework and medication reviews together. The project was evaluated using anonymous pre- and post-questionnaires, containing the German version of the Student Perceptions of Physician-Pharmacist Interprofessional Clinical Education instrument (SPICE-2D) and open-ended questions to further evaluate the students' perceptions (Pudritz *et al*., 2020). The post-questionnaire asked for feedback as well as a recommendation of this project for other students, using a five-point Likert scale. Furthermore, the students` satisfaction with their learning progress was assessed.

Results: Due to the SARS-CoV-2 pandemic, only the seminar (part 1) was performed in each term. The other parts of the project were implemented progressively. The third execution in the winter term 2021/22 was eventually able to contain all three parts. Through all executions, 105 students (46 PS, 59 MS) attended the interprofessional seminar, 64 (29 PS, 35 MS) the practical training at the MMC and nine joined the internship in a GP's office. For the seminar, 41 of 53 participants were satisfied with their learning progress and 64 of 67 students would recommend it to others. Regarding the practical training at the MMC, 37 of 46 students were satisfied with their learning progress and 45 of 47 would recommend it to others. Finally, the internship in a GP's office was mostly rated positive.

Conclusions: Despite the pandemic, the interprofessional education project was successfully implemented. The insights gained from the evaluation will be used to adapt the project and its evaluation, eventually. Moreover, the development of further interprofessional education projects will benefit from the gained understanding. The focus of the evaluation of the main study will shift to the students' perceptions towards patient-oriented casework and medication reviews. In addition to the questionnaires, guided individual interviews will be used.

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A community pharmacy-led deprescribing service – in collaboration with general practice (GP)

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Introduction: Deprescribing of inappropriate medication is becoming an increasingly important task for pharmacists. Here, the authors describe the results of a scoping review identifying roles and tasks for pharmacists in different settings and for all phases of the deprescribing process. Also, using the results from the scoping review the study explores the possibility of collaboration between community pharmacists (CP) and general practice (GP) in the deprescribing process.

Objectives: The purpose was two-fold: first, a review of the scope for pharmacists' involvement in deprescribing within primary and secondary healthcare; second, conducting a pilot study where CP and GP develop and test a deprescribing service.

Methods: For the scoping review, we searched the PubMed database (2015-2020) with search terms identified through PICO analysis. Furthermore, the authors identified relevant literature and ongoing projects by searching grey literature and contacting national and international pharmacy care networks. All identified literature was screened by the researchers according to inclusion criteria. A pilot study was carried out involving one CP and one GP. In a workshop, CP and GP developed a collaboration contract covering a deprescribing service targeting 20 patients. To facilitate testing and overcome potential obstacles, participants took part in bi-monthly follow-up phone meetings. Quantitative data for the deprescribing process was registered electronically by the CP throughout the intervention period of June-September 2021. We collected qualitative data for evaluation of the collaboration using post-intervention semi-structured interviews conducted with CP and GP.

Results: From PubMed, 387 studies were identified of which 18 were included. From grey literature and pharmacy care networks, five studies were included. A review of the included studies shows that pharmacists collaborate with patients, GPs and other healthcare professionals in deprescribing. These studies showed that pharmacists take part in identifying candidates for deprescribing, can deprescribe using an approved protocol with authorisation by the GP, and provide information about deprescribing to

either healthcare professionals or patients. The involvement of pharmacists can take place in both primary and secondary healthcare settings. In the pilot study, CP and GP developed a deprescribing service targeting inappropriate use of proton pump inhibitors (PPI) with both parties involved in recruiting patients. A deprescribing guideline and patient interview were used to assess patients prior to the final approval of the GP. The deprescribing process was delivered by CP and consisted of an initial consultation and two follow-ups. After the final follow-up, an electronic status report was delivered to the GP. The pilot study showed that CP and GP were able to design, collaborate and deliver a deprescribing service for patients using inappropriate PPI. Of the 17 patients recruited, 16 experienced deprescribing, defined as stoppage of drug or dose reduction. CP and GP reported satisfaction with the collaboration, division of tasks and roles, and considered that there was indeed value for the patient.

Conclusions: The scoping review showed that pharmacists can contribute to all phases of the deprescribing process in primary and secondary healthcare. Also, a pilot demonstrated that general practitioners and community pharmacies can develop and collaborate successfully in a CP-led deprescribing service to patients.

The effect of probiotics on functional constipation in the elderly

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Introduction: Constipation is a common gastrointestinal complaint. Clinical research suggests that probiotics may improve people's condition of constipation.

Objectives: This study aimed to examine the impact of selected strains of probiotics on the functional constipation of elderly people.

Methods: The authors conduction the study on elderly people in a nursing home, using a randomised, double-blind, placebo-controlled, parallel study design. Participants in the probiotic study were randomised into two groups over 12 weeks of intervention with probiotic strains of Bifidobacterium animalis subsp. Lactis BLC1, Lactobacillus acidophilus LA 3, Lactobacillus casei BGP93 or placebo. The primary objective was to examine the effect of selected probiotic strains on the number of daily stools over 12 weeks. Secondary objectives of the study included assessing the effect of selected probiotic strains on markers of inflammation, glucose and lipid metabolism indicators, liver enzymes and other laboratory parameters of complete blood count, as well as the effect of pharmacy interventions on improving therapeutic outcomes and quality of life of elderly with functional constipation in a nursery home.

Results: After 12 weeks of treatment, the cumulative stool count increased continuously compared with placebo, but without statistical significance. However, excluding stool count data on days when laxative use was recorded, statistical significance was reached on day 71 of treatment. There, was no significant changes in blood parameters.

Conclusions: Pharmacy interventions were an essential part of pharmaceutical care in a nursing home.

Medication adherence evaluated through electronic monitors during the COVID19 pandemic lockdown in Switzerland

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Introduction: During the lockdown enforced from March to June 2020 by authorities due to the COVID19 pandemic in Switzerland, patients included in the Interprofessional Medication Adherence Programme (IMAP) in Lausanne and Bern continued to use electronic monitors (EM), which register daily doses intake.

Objectives: The aim of this study is to use EM data to understand to what extent patients' medication implementation, described as the extent to which the

patient takes the daily prescribed regimen, was impacted by the lockdown. The authors hypothesised that medication implementation might be lower during and after the lockdown compared to before.

Methods: Included participants attending the IMAP were diagnosed with diabetic kidney disease (DKD), solid cancer, HIV and miscellaneous long-term diseases.

Patients' implementation was defined through a proxy: if all EM of each patient were at least opened once daily, implementation was considered optimal (= 1); and suboptimal (= 0) otherwise.

1) Implementation before (from December 2019 to March 2020), during (March to June 2020) and after (June to September 2020) the lockdown was compared. Subanalyses were also performed according to sub-groups of patients.

2) As comparison, implementation of included patients using at least one EM the year before, in 2019, during the same time frame, defined as winter, spring and summer periods, was analysed.

A logistic regression model was used to estimate medication implementation according to the period, using 'before the lockdown' or 'winter' as the reference. The model was fitted using generalized estimating equation.

Results: 1) In 2020, implementation of the 118 patients did not differ statistically before and during (OR = 0.97, CI: 0.84 - 1.15, p = 0.789), and before and after (OR = 0.91, CI: 0.79 - 1.06, p = 0.217) the lockdown. These findings remain stable even when analysing separately the implementation of patients with HIV (n = 61), DKD (n = 25) or miscellaneous long-term diseases (n = 22). Too few patients with cancer (n = 10) were included in the analysis to interpret their results.

2) In 2019, implementation of the 61/118 (51.7%) patients was statistically significantly lower during summertime compared to winter (OR = 0.73, CI: 0.59 - 0.89, p = 0.002).

Conclusions: The authors results infirm their hypothesis as the implementation remained steady during and after the lockdown in 2020 in comparison to the period before. Still, adherence in 2020 was different compared to 2019 as the decreased implementation during summertime 2019 was not observed after the lockdown in summer 2020.

Because of the COVID-19 pandemic, many patients slowed down their activities, travelled less, and may have been more cautious in managing their treatment due to the fear of developing a complication of their disease in a difficult sanitary context. Moreover, during the pandemic, continuity of care was ensured by medical teleconsultation between patients and their health care providers, mailing medications to patients' home by the pharmacy and leading interviews by phone calls for patients included in IMAP. The IMAP before, during and after the lockdown may have supported the adherence of complex patients across the pandemic in 2020. Interprofessional adherence programmes should support patients during routine-disturbance periods, such as a lockdown in a pandemic context or during summertime.

Financing prostate cancer therapy in the Ashanti region of Ghana: What are the financial implications on patients and caregivers?

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Introduction: The late detection of prostate cancer (PCa) and the unavailability of the needed financial muscle have contributed to a poor prognosis in Ghana. Although the National Health Insurance Scheme (NHIS) funds top adult cancers such as breast and cervical, PCa has been ignored. The situation has financially burdened patients and caregivers and requires attention.

Objectives: To investigate the direct cost incurred by patients/caregivers in diagnosing and managing PCa in Ghana. The availability and affordability of cytotoxic and hormonal agents for the management of PCa are studied.

Methods: The prevalence approach to studying cost-of-illness was employed. This Kumasi study included a public and a private hospital, four laboratories, and ten community pharmacies. Data was collected with validated instruments, computed, and analysed in Microsoft Excel Spreadsheet. The 2021 Ghana National Daily Minimum Wage (GHC 12.53) and the 2 August 2021 foreign exchange rate of the Bank of Ghana (USD 1.00: GHC 5.8021) were utilised in analysing the results.

Results: The estimated direct cost incurred by patients/caregivers in accessing a health facility and getting screened for PCa were respectively GHC 96.00 (USD 16.55) and GHC 1,205.00 (USD 207.68). Laboratory workouts that were routinely done for non-metastatic PCa were estimated to attract an additional cost of GHC 385.00 (USD 66.36) whilst metastatic PCa attracted approximately GHC 5,475.00 (USD 943.62). The need for specialized consultation from private laboratories, for metastatic PCa, incurred an additional GHC 100.00 (USD 17.24) which made the diagnosis of metastatic PCa four times as expensive as non-metastatic PCa. The management of localised (Gleason grade 6) PCa through radiotherapy and radical prostatectomy was respectively GHC 12,950.00 (USD 2,231.95) and GHC 15,000.00 (USD 2,585.27). Whilst the benefits of a six-month androgen deprivation therapy (ADT) were assessed in managing localised (Gleason grade 7) PCa by the radiotherapy approach, which increased cost by GHC 3,000.00 (USD 517.05) when used, the surgical management did not require ADT. The management of locally advanced PCa was mainly radiotherapy and 18-24 months of ADT. The palliative nature of metastatic PCa did not permit the estimation of cost because various approaches were employed based on the patient's peculiar needs and

concerns. Cytotoxic and hormonal agents that were reported to be employed in the management of PCa were six with a mean availability of 51.5%, reflecting the various dosage forms and formulation strengths. The originator brand (OB) of bicalutamide 50 mg and 150 mg tablets, and generic (G) flutamide 250 mg tablets had median price ratios (MPR) above four. The MPR of abiraterone acetate (G/OB) 250 mg tablets, docetaxel (G) 120 mg injection, goserelin (OB) 3.6 mg and 10.8 mg injection, and mitoxantrone (G) 20 mg injection could not be determined due to the unavailability of their median international reference prices.

Conclusions: The diagnosis and management of PCa is expensive and unaffordable to Ghanaians. The NHIS must consider including PCa in the service package to reduce the financial distress on patients/caregivers, improve quality of life and reduce mortality. Also, efforts must be made to improve the early detection of PCa.

Impact of an intervention associating the community pharmacist and the use of a mobile health application for patients with Type 2 Diabetes

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Introduction: Diabetes represents a serious public health problem, due to its constantly increasing prevalence and many complications. Management based on a change of lifestyle and the adoption of health-promoting behaviours, complemented if necessary by drug treatment, prevents complications, improves the patient's quality of life, and reduces mortality. In order to achieve this, it is essential to implement multidisciplinary patient support, in which the pharmacist can participate, not only through pharmaceutical care, but also through the implementation of educational sessions promoting the involvement of the diabetic patient in the management of his or her health. Research suggests that the use of mobile technologies combined with health coaching can help patients with their daily life and disease management.

Objectives: This study analyses the impact of a device combining the intervention of the community pharmacist, in the form of educational sessions, and the use of a mobile health application on the level of medication adherence and secondary outcomes considered as cardiovascular risk factors.

Methods: A quantitative pre-experimental study, established over a period of six months with three data collection periods (before, during, and after the intervention), made it possible to analyse the evolution of different primary (HbA1c and MARS-5 score) and secondary (HDL cholesterol, LDL cholesterol, systolic and diastolic blood pressure, BMI and waist circumference) outcomes in relation to the monitoring of Type 2 Diabetic patients. The baseline sample consisted of 66 patients.

Results: Statistical analyses did not show an improvement in the level of medication adherence. However, significant results were observed for systolic blood pressure (p = 0.01) and waist circumference (p = 0.002). All the other outcomes studied changed positively or stabilised between the beginning and the end of the study.

Conclusions: This study showed that monitoring by a pharmacist, combined with the use of a mobile health application, can have a positive impact on the management of Type 2 Diabetic patients. Additional studies are necessary to investigate the subject further and gather more results.

Chronic patients perceive conflicting information on their medications: In-depth qualitative interviews

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Introduction: Patients with multiple chronic diseases visit various healthcare professionals and are exposed to medication information from different sources which, when not concerted, cause an increased potential risk of patients' perceptions of contradictory medication information. A quantitative study conducted in 2019 revealed that 47% of chronic patients had perceived conflicting information regarding one or more medications in the previous 12 months.

Objectives: The aim of this study is (i) to characterise conflicting medication information perceived by patients with chronic diseases and (ii) to better understand the related impact on chronic patients' medication self-management and healthcare system navigation.

Methods:

The design of this study is qualitative semi-structured interviews. The study was conducted at the outpatients

visiting community pharmacies and medical centres in Geneva, Switzerland. This study included 22 chronic patients from April 2019 to February 2020. Patients were included after participating in the epidemiology survey of the same study. Inclusion criteria for this qualitative part were: (i) Taking at least one medication for at least six months; (ii) Having visited at least two prescribers in the past three months; (iii) Being able to communicate in French, English, Portuguese or Spanish; and (iv) Having described at least one perceived conflicting information regarding their medication in the past twelve months, while filling in the quantitative survey.

Semi-structured audiotaped interviews of 20 to 60 minutes based on an interview guide to explore participants' perceptions of conflicting information. Interviews were transcribed verbatim and coded using MaxQda. Each interview was coded independently by two researchers using a comparative approach. A reflexive thematic analysis was used as theoretical approach, which allowed identifying themes related to participants' experiences and perspectives.

Results: Participants mentioned professional sources such as general practitioners, medical specialists, and pharmacists as main sources of conflicting medication information. Lack of time, insufficient information provided and a poor communication among healthcare professionals and with the patient were described as possible causes for such conflicting information. Other than the impact on the patients' care trajectory by visiting multiple healthcare professionals for a different opinion, conflicting information affected medication adherence, often by not taking the medication as prescribed but also by not initiating the treatment or by temporarily stopping it without any healthcare professional advice. Finally, for many participants, feelings or emotions such as fear, anxiety, anger or even guilt originated from perceived conflicting information, which sometimes prevented the patients in participating in the shared decision making process.

Conclusions: New interprofessional models of care with more efficient and seamless communication among healthcare professionals are essential to respond to the evolving needs of chronic outpatients regarding their medication. To the authors knowledge, little is still known about the way in which chronic patients respond to conflicting information and how it affects the decision-making process regarding medication management.

Developing a questionnaire comprising clinically useful patient-reported outcome measures in software-assisted medication reviews

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Introduction: The before-after study OPtiMed aims to evaluate effects of community pharmacist-led and decision support software-assisted medication reviews on medication-related and patient-reported outcomes (PRO). As the study relies on routine documentation within the medication review software, there was a need for easy and quick to use PRO measures (PROM) that were equally practical to collect outcome data as well as information relevant to a medication review in clinical practice. For various outcomes (e.g. perceived changes), we did not identify validated PROM fitting the needs of pharmacists and their patients in the latter regard.

Objectives: The aim of this project is to develop a software-integrable questionnaire comprising clinically useful instruments for measuring PRO in the context of structured medication reviews.

Methods: The questionnaire and included PROM were developed in four phases: literature review; expert rounds involving pharmacists, a physician, and a public health scientist; item generation; pretests in elderly patients (≥ 65 years of age) with polypharmacy (≥ 5 medicines in long-term use). The pretest procedure followed a cognitive interview approach.

Results: We designed a questionnaire consisting of six PROM, three newly designed: (1) A rating scale for the assessment of symptom burden, encompassing 18 symptoms / symptom categories frequently associated with adverse drug reactions. Patients rate the degree of symptoms experienced over the last four weeks on a four-point scale at baseline (t0) and follow-up (t1). (2) A three-point scale to measure the extent of achievement of health-related goals stated by a patient at t0. The instrument contains eight individualizable categories of goals, which were selected based on previous research and an evaluation of data from a medication therapy safety training programme (Apo-AMTS-programme). (3) An instrument (five items) to assess perceived changes and benefit attributed to the medication review service on a five-point Likert-Scale.

Conclusions: With a partial lack of instruments both suitable for an ongoing study and clinical practice, we developed tools that have become an integral component of the medication review software Medinspector. Although we did not have the capacities to validate the instruments, the questionnaire was thoroughly designed and pretested.

Positive feedback from software-users indicates its clinical usefulness for performing medication reviews.

Health literacy and self-care among Malaysian with Type 2 Diabetes: Patients' and pharmacists' perspectives

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Introduction: Diabetes is a chronic metabolic disorder which is associated with high blood glucose. In Malaysia, one in five adults are diagnosed with diabetes. Limited health literacy among diabetes patients may result in poor self-care management and diabetes outcome. Pharmacists play a major role in patient education especially on medication adherence and diabetes self-care as they are easily accessible to the public. The accessibility of pharmacy services to the public may aid diabetes patients with health literacy challenges getting advice and support they need in empowering self-care.

Objectives: This exploratory qualitative study examined both patients' and pharmacists' perceptions of the knowledge of diabetes and management, and what empowers pre-diabetes and newly diagnosed Type 2 Diabetes (T2D) (≤ 5 years) patients to practise self-care and how pharmacists interact and communicate with individual patients to promote self-care in preventing disease progression.

Methods: 22 patients (18 newly diagnosed and four pre-diabetes) and 12 pharmacists (two; public clinic, six; community pharmacy and four; hospital pharmacy) were recruited through purposive sampling. Nine patients were recruited from two public clinics and 13 from online posting on social media platforms. seven patients were individually interviewed using semi-structured interview via Microsoft Teams, while the rest were interviewed via telephone calls. All pharmacists were recruited through online posting on Facebook or instant messaging application, WhatsApp. Three pharmacists attended a virtual focus group, while the rest were interviewed individually on Microsoft Teams. All interviews and focus group were audio-recorded, translated to English language and transcribed verbatim. NVivo software was used for data analysis and data obtained were coded and categorised into themes using reflexive thematic analysis.

Results: Four themes were identified as empowerment to patient self-care: accessibility to reliable resources, mental health, self-awareness and overcoming the barriers to self-care. Having sufficient access to reliable resources, continuous support from family, peer and healthcare professionals (HCPs), a good understanding about their diabetes, and overcoming the barriers to self-care such as lack of support, difficulty finding information and having the thought that self-care is hard are important in empowering self-care. For pharmacists, four themes were identified to promote self-care: pharmacist's roles in diabetes care, ways to empower self-care, multidisciplinary team approach and continuing pharmacist's education. The themes identified from patients and pharmacists can be linked to further empower self-care. Pharmacists are easily accessible and thus a reliable source of information and are capable to provide different services like blood glucose monitoring and patient education using literacy-sensitive techniques. Working together with other HCPs is crucial to provide direct care to tackle complex needs of diabetes patients. Continuing pharmacist's education on health literacy to enhance communication strategies used for patients with different levels of health literacy is also needed.

Conclusions: With sufficient access to health services, information and support, diabetes patients may be empowered to practise self-care. Managing low health literacy is also crucial to increase patient's knowledge and self-awareness in preventing diabetes complications. With the accessibility of pharmacists especially in the community to the public, they could be big players in self-care education.

Virtual online focus group discussions using four domains of appreciative inquiry to explore community pharmacists' actual experiences and aspirations around antibiotic smart use in Thailand: A qualitative study

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Introduction: Antimicrobial resistance (AMR) is a global threat. The Global South has illustrated gaps and challenges in contextual interventions to tackle AMR due to economic development and existing legislation on antimicrobial use. Community pharmacists are vital healthcare professionals in primary care settings to promote Antibiotic Smart Use (ASU).

Objectives: The aim of this study was to explore their experiences and aspirations around ASU to tailor sustained interventions.

Methods: Virtual online focus group discussions (FGDS) were conducted to explore the views of part- and full-time community pharmacists in Thailand who were systematically recruited to ensure their eligibility to fit with Appreciative Inquiry (AI) theory. Out of a pool of eligible participants, those who had scored above average (> 74%) and above in the attitude questionnaire – the earlier part of the project - were quota sampled and purposively invited to take part. A specific topic guide was developed using the four domains of AI (Discovery, Dream, Design and Destiny), to provide insights into their thought processes and their recommendations for the facilitation of ASU in community pharmacies. Qualitative data were analysed using Nvivo12, using thematic framework analysis with a deductive approach.

Results: Twenty one community pharmacists participated. Seven themes around ASU emerged in the Discovery Domain of AI. There are pharmacists' practices for non-prescribed antibiotic dispensing, professional experience, work environment, commercialisation and business, commonly used non-prescribed antibiotics, visibility of the National Plan for tackling AMR, and learning points from the COVID19 pandemic. The participants dreamed about the ideals of ASU in the community pharmacy in five themes which are establishing One Health stakeholders- regulating the supply chain, following developed countries as role models, reviewing legislation, and forming witness checks and balances in healthcare professionals. Then the participants designed interventions and strategies on five themes: insurance system, incentive intervention, re-classification of antibiotics, and organisational unity for supporting ASU. The Destiny domain consisted of five themes that would allow sustainable ASU in their settings: the need for ASU literacy, primary care, AMR attitudes and behaviour change strategies, communication of ASU progression and resource management, and trust in pharmacists as a key to building customer loyalty.

Conclusions: Four domains of Appreciative Inquiry provided community pharmacists with the opportunity to share their experiences and aspire to desired changes to promote ASU in the pharmacy setting and broadly across the country. This framework reflected contextual interventions and strategies with bottom-up brainstorming linked to top-down approaches. The requirement of literacy, along with strategies for changing for public and healthcare providers, could elevate ASU in community pharmacies. Integration of community pharmacy into a part of government primacy care unit and communication of the ASU progression with them might promote engagement with the remaining business aspects.

Evaluation of the prescription pattern and appropriateness of therapy in the management of bacterial STIs in three hospitals in Southern Ghana

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Introduction: Sexually transmitted infections are a public health concern due to its spate of spread, associated complications and issues of antimicrobial resistance. Globally, it is estimated that more than one million people contract one or more infection types per day. Considering the wide spread of these infections, appropriate drug therapy is required to reduce spread. Evidence suggests that inappropriate drug therapy in the management of curable bacterial STIs; gonorrhoea, syphilis and chlamydia could increase the risk of antimicrobial resistance.

Objectives: The aim of this study was to assess the prescription pattern and appropriateness of therapy in the management of bacterial STIs in three hospitals in the Volta Region of Ghana.

Methods: A prospective cohort study was carried out to collect pertinent information on patient demographics, disease presentation and management at a primary, secondary and tertiary health institutions in the Volta region of Ghana (Southern Ghana). A total of 178 participants were recruited and data on demographic characteristics, knowledge on STI, STI history, diagnosis and STI management were obtained using a semi-structured questionnaire. Statistical analysis included descriptive statistics and bivariate analysis (chi square test at $p < 0.05$), using STATA 15.

Results: 71.9% (n = 128) were females and the modal age of participants was 21 to 30 years representing about 54.5% of the participants (n = 97). More than half (53.2%) had a good knowledge on STIs. Knowledge on STIs was significantly associated with occupation ($p = 0.026$), level of education ($p = 0.001$) and marital status ($p = 0.038$). About 44.4% of the study participants had no accompanying laboratory request or results prior to treatment and were treated empirically. Cephalosporins (29.4%), Quinolones (18.5%), Metronidazole and related drugs (11.8%), Macrolides (8.4%), Penicillins

(5%) were the most prescribed agents. More than half (52.8%) of prescriptions which were not based on recommended national treatment guidelines. Over 25% of the therapy administered (n = 47) were inappropriate. The appropriateness of drug therapy was significantly associated with the type of health facility (p = 0.012) and gender of participant (p = 0.025).

Conclusions: The inappropriateness of therapy involving the antimicrobials used could be a viable driver for resistance and hence future management of these STIs. There should be an increased testing of infection at the hospital before treatment.

Quantifying problematic prescribing cascades

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Introduction: A prescribing cascade (PC) occurs when a first medication (index) causes an adverse drug reaction (ADR) and is recognised as a medical condition, which is subsequently treated with another medication (marker). A PC becomes problematic when the benefits of this combination of medications do not outweigh the risks on the patient's health. Problematic PCs can result in polypharmacy and unnecessary treatment, which effects the quality of life of patients negatively. Especially elderly, for who an ADR can be misinterpreted as age progression, can experience the results of problematic PCs. To improve the quality of life and prevent unnecessary treatment, healthcare providers should be more aware of problematic PCs.

Objective: To identify and quantify the occurrence of problematic PCs.

Methods: A mixed-methods study was performed including a literature review and an assessment by 16 experts (pharmacists and physicians in primary and secondary care) to assess whether PCs were problematic. Next, a Prescription Sequence Symmetry Analysis (PSSA) was performed to quantify these problematic PCs. Dispensing data were obtained from Ncontrol from 2015 until 2020. The PSSA analyses the adjusted sequence ratio (aSR) of patients receiving the marker medication after the index medication *versus* patients receiving the marker medication before the index medication. An aSR ≥ 1 indicates an increased probability that a PC might be occurring.

Results: Experts assessed 90 PCs from literature of which 68 were regarded problematic. These PCs mostly concerned antidepressants, antipsychotics and lipid modifying agents as index medication. Depression, erectile dysfunction and urinary incontinence were the most frequently occurring ADRs. A significant aSR was found for 44 (65%) PCs for more than 93,000 out of 423,000 incident users, with a mean age of 68 years. Of the 44 PCs, the aSR was between 1-1.5 for 20 PCs and > 1.5 for 24 PCs. The highest aSR was 5.97 [95% CI 5.34-6.61] for lithium (index) inducing parkinsonism, followed by dopaminergic medication (marker), based on 84 incident users. ACE-inhibitors (index) inducing urinary infection, followed by antibiotics, was based on the most (33,563) incident users.

Conclusions: Out of 68 problematic PCs, 44 had a significant association. This suggests that more awareness is needed amongst healthcare providers for the recognition of problematic PCs. By raising awareness amongst healthcare providers, steps can be taken to reverse or prevent problematic PCs. More should be done to prevent healthcare providers in treating ADRs as medical conditions and thus prevent the unnecessary accumulation of medications and polypharmacy.

Linking implementation factors and targeted strategies for optimal implementation of community pharmacy services

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Introduction: The implementation of evidence-based practices is complex, with multiple implementation factors (IFs) that can impede (barriers) or reinforce (facilitators) this process. Change Agents (CAs) can design and apply targeted implementation strategies (TIS) with the intention of optimising the implementation process. However, there is a methodological gap linking IFs to TIS, particularly for community pharmacy services. This research is being undertaken as part of an implementation study of a Minor Ailments Service (MAS), 'INDICA+PRO', in Spanish community pharmacies (CPs).

Objectives: The objective is to develop a standardised classification system for IFs and discrete or multifaceted TIS based on implementation science theory, thus potentially

measuring their effectiveness. Secondly, to design a software tool so that INDICA+PRO CAs can document their activity during the facilitation process.

Methods: A search of implementation science journals was conducted in order to identify frameworks, classification systems, compilations and menus for IFs and TIS and to apply them within the INDICA+PRO implementation study. The INDICA+PRO implementation study is a type 3 hybrid effectiveness-implementation design trial which will be carried out in Spanish CPs between October 2020 and December 2022.

Results: For the standardised classification system of identified IFs, the Consolidated Framework for Implementation Research (CFIR) menu of constructs was derived and adapted. For the TIS, Dogherty's compilation of discrete, practical facilitation activities was selected and adapted. These two classification systems, consisting of 62 categories of IFs, together with 56 discrete TIS were incorporated into a software tool located on the SEFAC eXPERT platform. This tool enables the selection, description, linking and the reporting of outcomes of IFs and TIS by the INDICA+PRO study's CAs.

Conclusions: Addressing the existing gap in the literature and linking standardised IFs to TIS will play a vital role in in the improvement of the selection, combination and effectiveness of TIS when implementing an evidence-based practice in CP. The information documented in the software tool will be used to continuously monitor and facilitate the implementation of a MAS in Spanish CPs, aiding the INDICA+PRO CAs in facilitating change.

Discrepancies and changes during the initial medication review in the programme ARMIN: What do pharmacists and physicians contribute?

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Introduction: To optimise drug therapy, patients with polymedication participated in an interprofessional intervention provided by community pharmacists (CP) and general practitioners (GP) in the German programme ARMIN. The intervention started with a standardised medication review involving different data sources – patient, CP, GP and the health insurance fund. The initial brown bag review by the CP included a pharmaceutical risk assessment followed by an assessment by the GP. The resulting consolidated medication plan (MP) was printed out for the patient.

Objectives: To analyse discrepancies and changes in the patients' medication during different phases of the medication review and to evaluate the contribution of CP and GP to the consolidated MP.

Methods: The authors aimed to recruit a convenience sample of 60 patients. Discrepancies and changes in the medication were analysed using the medication discrepancy taxonomy MedTax (Almanasreh, E. *et al.* RSAP 2020). The authors compared (1) the patient-stated medication documented by the CP during the brown bag review *versus* (2) the provisional MP prepared by the CP, as well as (2) *versus* (3) the consolidated MP verified by the GP. Additionally the authors evaluated changes with regard to six common therapeutic indications, grouped by ATC levels.

Results: Altogether, 79 patients were included (54% female), with a mean number of 10.2 medications (median: 9; range: 5–27) on the consolidated MP (3). Almost 70% of drugs on the MP belonged to six therapeutic indications: cardiovascular system (n = 221; 28.4%), pain (n = 76; 9.8%), blood sugar (n = 69; 8.9%), alimentary tract (n = 67; 8.6%), blood coagulation (n = 48; 6.2%), and cholesterol (n = 46; 5.8%).

The authors identified 796 discrepancies and changes in total: 605 during the initial CP intervention, (1) *versus* (2), and 191 during the GP intervention, (2) *versus* (3). In accordance with that, drugs in all six most common indications were more often changed during the CP intervention compared to the GP intervention. Most often changes affected drugs for the cardiovascular system (CP: n = 140; GP: n = 74) and accounted for almost 40% of all changes during the GP intervention.

Changes during the CP intervention most frequently related to drug intake with food (n = 165; 27.3%), indication (n=147; 24.3%), or dosing regimen (n = 131; 21.7%). During the GP intervention, most frequent changes affected the dosing regimen (n=44; 23.0 %), addition of new drugs (n = 34; 17.8%), or instructions (n = 33; 17.3%). Drug omissions were most often identified during the CP intervention (n = 62; 10.3%) and most often involved drugs against pain (n = 10, 16.1%), acting on the alimentary tract (n = 7; 11.3%), or the cardiovascular system (n = 7; 11.3%). During the GP intervention, 15 drugs (7.9% of the GPs' changes) were omitted from the MPs, mostly affecting the cardiovascular system (n = 6; 40.0%) or drugs against pain (n = 4; 26.7%).

Conclusions: The number and types of discrepancies and changes varied between CP and GP: Although most changes were identified during CP intervention, often completing or correcting information on administration, indication, or dosing regimen, the GP mainly focussed on dosing regimen and addition of new drugs. This indicates that both healthcare professionals add value to obtain a comprehensive overview on the patients' entire medication.

Patients' referral through a Minor Ailment Service in community pharmacy

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Introduction: Consultation of minor ailments and direct product request are frequent in community pharmacy in Spain, although every pharmacy offers the service following their own criteria. Standard Operational Procedures (SOP) and referral criteria agreed between community pharmacists (CPs) and general practitioners (GPs) are needed to deliver a safer service. Referral criteria set the limits of action for each healthcare professional (CPs and GPs) when managing patients. Following the positive findings of an impact study, a roll out was required to translate the evidence-based approach into usual practice.

Objective: The aim was to characterise the referrals between CPs and GPs through a Minor Ailment Service (MAS, service offered in community pharmacy following the SOP).

Methods: A 12-month pragmatic study with hybrid effectiveness-implementation design was planned from October 2020 in Spain. The co-designed MAS service had several components: agreed SOP with GP scientific organisations, protocols for ailments divided into five groups (dermatological, digestive, related to pain, upper respiratory tract related and others) including referral criteria, information technology (IT) based consultation protocol and training before and during the study. Patients were followed up by pharmacists after ten days of the service. All data were collected through an IT system (SEFAC eXPERT) as a by-product of service delivery and implementation. Outcomes for the first fifteen months (up to December 2021) are shown.

Results: 1246 pharmacists from 24 provinces in Spain were trained having a reach of 14083 consultations. 1858 (13.2%) patients were referred to the GP. 2193 referral criteria were detected, most patients referred had one single referral criteria (n = 965, 80.8%). Referral criteria detected were red flags such as temperature over 38ºC, dyspnoea, etc. (n = 846, 39.5%); patients' age (n = 398, 18.6%), symptom duration (n = 361, 16.9%); patients' treatments for other health problems different than the minor ailment consulted (n = 263, 12.3%); other patients' health problems (n = 186, 8.7%) and others (n = 85, 4.0%). Minor ailments more frequently referred were joint pain (n = 190, 10.2%), cough (n = 106, 5.7%), dermatitis (n = 104, 5.6%) and heartburn (n = 63, 3.4%).

Conclusions: High-risk patients (patients with symptoms/condition that do not appear to be minor ailments) can be assessed by CPs and referred to be evaluated and diagnosed by GPs. The use of co-designed management protocols strengthened the identification of red flags in patients suffering minor ailments to be referred when necessary. Joint pain and cough were two of the minor ailments more frequently referred, which could be a result of the study being undertaken during COVID19 pandemic. CPs can perform clinically, referring patients and acting as a triage point through MAS to increase patients' safety.

Documentation of clinical activities in community pharmacy using the ClinPhADoc tool: Preliminary results

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Introduction: Drug related problems (DRP) have a significant clinical and economic burden. The management of DRPs involves diverse clinical activities and partners. Pharmacists' clinical activities have demonstrated benefits but they are scarcely reported, especially in community pharmacies (CPs). ClinPhADoc is a tool developed to document clinical activities that was shown to be reliable and acceptable for documenting pharmacists' clinical activities in Swiss CPs.

Objectives: To describe prevalence of DRPs and time required for their management using ClinPhADoc in a Swiss CP integrated in an academic outpatient hospital.

Methods: An observational study was carried out for five years, since 2017, in a CP (Unisanté) in Lausanne. The documentation was done using an electronic version of ClinPhADoc on the same 21 pre-selected days each year (depending on seasons, holidays and rotations in medical internship) to collect a sample representative of all prescriptions received. Two out of the 14 pharmacists (depending on shifts in the days selected) documented: prescription medication, DRP type (clinical: when affect efficacy/toxicity; technical: related to medication use; procedural: related to renewals of outdated prescriptions); clinical consequence (increased toxicity, efficacy loss); pharmacist's intervention (prescription modified or not); implied partner (patient/caregiver, prescriber and/or none)

and time needed for DRP management. The preliminary data presented covers from January 2017 to March 2020.

Results: A total number of 111,601 prescriptions were received, of which 7,097 (6.4%) were documented with 877 DRPs detected. The most frequent DRP was procedural (n = 284, 32.4%), followed by clinical: dosage/posology (n = 141, 16.1%) and drug interaction (n = 98, 11.2%). DRPs detected throughout the years were consistent.

The longest mean time for management was for clinical DRPs: no indication (18.3min, CI 95% = [11.2-25.5]); side effect (15.6min, CI 95% = [5.6-36.8]) and drug interaction (8.6min, CI 95% = [4.8-10.2]). Most DRPs (n = 231, 26.3%) were managed by the pharmacist alone. DRPs took less working time when managed by the pharmacist alone than when the management involves the patient and/or the prescriber.

Conclusions: DRP prevalence was high with procedural DRPs being the most frequently observed. Clinical DRPs took longer time to be managed. ClinPhADoc and its related documentation process have been proven an effective tool for documenting CP activities. DRPs documented can be used to develop interprofessional interventions to prevent them.

Cannabis for medicinal use in patients with rare diseases

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Introduction: Rare diseases (RDs) are severe, progressive, and usually chronically debilitating. About 4%–6% of the world population is affected by a rare disease. Despite the improvement in diagnostic procedures and advancements in research and development, RD patients are facing unmet medical needs. Medicinal Cannabis (MC) is used for the management of symptoms such as pain, spasticity, nausea and vomiting, seizures, and anxiety which may be experienced by RD patients.

Objectives: To identify the potential use of MC in RDs and issues related to its use.

Methods: Two questionnaires were developed for: (1) RD patients and (2) healthcare professionals (HCP). Questionnaires contained questions related to the treatment of RD patients and issues related to the treatment and use of medicinal cannabis. Questionnaires were validated and disseminated physically and online.

Results: Respondents of the questionnaire for HCP (n = 101) were mostly pharmacists (n = 40), general practice doctors (n = 17) and occupational therapists (n = 13), with more than 11 years of practice (n = 46). HCP encounters 2 - 4 RD patients a year on average. Symptoms experienced by RD patients were pain (n = 51), mainly chronic neuropathic pain (n = 38), stress and anxiety (n = 34), and muscle spasticity (n = 33).

59 HPC agreed to reply to questions related to MC. 26 of 59 HCP used MC in their practice; 48 out of 59 HCPs consider it to be effective for pain relief, 38 for stress or anxiety, and for muscle spasticity; 36 out of 59 HCP willing to use of MC in their practice. Regarding the side-effects of MC, confusion (n = 30) and addiction (n = 29) are reported to be of the most concern.

The majority of patients with RDs (n = 38) were 41 - 50 years old (n = 11) and reported stress and anxiety (n = 20), pain (n = 20), and muscle spasticity (n = 10) as commonly experienced symptoms. Seven reported experiencing side effects associated with the use of conventional medications.

20 would consider MC use to relieve symptoms of their disease, though two respondents have been prescribed MC by an HCP.

Confusion possibly associated with MC use was a side-effect reported of the most concern (n = 8). 18 patients are not concerned about MC side effects.

Conclusions: MC can be effective in relieving pain, anxiety, and muscle spasticity possibly experienced by RD patients. HCP and RD patients consider that MC can be used in the management of RD symptoms.

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Perspectives of pharmaceutical science faculty in promoting pharmacy research in doctoral students

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Introduction: Doctoral pharmacy students at Cedarville University School of Pharmacy (SOP) are required to complete and present the results of a research project. To meet this requirement, the SOP provides a list of research projects developed by pharmaceutical science and practice faculty. During their first year, students select a project and work together with the faculty sponsor over the next two years. Over the past decade, the faculty have trained students within 18 pharmaceutical science research projects that incorporate basic science concepts that are relevant to pharmacy.

Objectives: These 18 projects were classified into three categories:

1. Investigating the physicochemical properties of drug formulations.
2. Investigating the pharmacological properties of natural products or their interactions with drugs.
3. Investigating the basic physiological changes in response to various factors.

Methods: As part of a self-improvement effort, we reviewed the student's preference for projects within these three categories to develop strategies to promote pharmacy practice research among doctoral students.

Results: Of the 65 students who selected a pharmaceutical science project, 16.7% signed up for category 1, 44.4% for category 2, and 38.9% for category 3. Of all these research projects, 39% of them were presented at different national conferences while 61% of them were presented at local conferences. Few students who are interested in pursuing careers in pharmaceutical industry were interested in pursuing projects related to drug formulation. Students who expressed interest in clinical pharmacy or advanced residency training chose projects related to pharmacological properties of natural products or the effect of various factors on physiology.

Conclusions: Based on this data, the authors recommend that studies involving natural products are not only of considerable interest but also support efforts to challenge students to promote healthy living amongst patients and use medications only in appropriate circumstances. Similarly, by fostering student interest in basic physiological studies, pharmacy schools can advance their understanding of the effect of medications on their patients.

Evaluation of a home-based service for medication review in Swiss community pharmacies: A study protocol

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Introduction: Polymedication and medication hoarding in patients' homes may increase the risk of drug-related problems (DRPs), but also an inadequate use or management of medication is a source of DRP. Community pharmacists can efficiently identify, prevent and manage these DRPs. In Switzerland, no pharmacy service that focuses on the management of DRPs related to patients' practice is currently recognised or remunerated. The medication review with follow up (MRF) at the patient's home, aims to detect DRPs related to medication management at home and self-medication, with an emphasis on issues that cannot be detected in a community pharmacy (CP), like wrong medication storage. This service also provides a systematic review of the patient's treatments.

Objectives: To evaluate the impact of the MRF service for adults with polypharmacy in Swiss CP for the identification and management of DRPs.

Methods: A pre-post intervention study will be carried out in CPs in the French speaking region of Switzerland for 15 months. Volunteer pharmacists will include adults with a prescription of at least four chronic drugs for at least three months. Trained pharmacists will conduct three-structured domiciliary consultations at six months interval to deliver the service. The primary outcome of the study is the identification and management of DRPs. Secondary outcomes are patients' knowledge about their treatments, number of expired or untaken medications and description of pharmaceutical interventions.

Results: A funding request for the study is currently underway. The study will be carried out in collaboration with CPs from the PharmaciePlus group. The Ethics Committee (CER-VD) concluded that the study does not fall under the Human Research Act. Between 20 and 40 CPs will be enrolled to recruit at least 168 patients, selected from a pool of randomised and eligible patients through a sequence of computer-generated random numbers. A validated tool (ReMeDo tool) will guide pharmacists before, during and after the consultation. Educational training and support for pharmacists will increase quality of service provision and fidelity of study protocol.

Conclusion: This study will evaluate the impact of a new service that includes validated, structured and standardised interventions, training and supervision for CP staff, self-medication evaluation and use of home-based patient data. MRF is an enhanced service that aim to complete those currently provided in Switzerland in order to identify, manage and prevent DRPs. MRF is designed to provide a follow-up service aimed to patients that cannot come to a CP.

Knowledge, perception, and management of diabetes mellitus by traditional practitioners: A descriptive survey from Mifi division, Cameroon

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Objective: A cross-sectional, descriptive survey with a convenience sample was conducted amongst traditional practitioners in the Mifi division to evaluate the ethnopharmacognosic management of diabetes mellitus and to carry out a phytochemical screening of certain species.

Methods: The study was carried out using a questionnaire amongst traditional practitioners with a recognised reputation in society, a sedentary lifestyle of more than five years, and an accessible home enrolled between 15 January to 31 October 2021. Results are reported as median and interquartile ranges for continuous data; frequencies and percentages for categorical data.

Results: Of 124 who provided informed consent, 100 were randomly selected. Diabetes mellitus is caused by poor dietary habits (94%), heredity (83%), age (79%), and poor organ function (74%). Its diagnosis is based primarily on the signs and symptoms of the disease, such as polyuria/nycturia/enuresis (88%), weight gain (83%), general fatigue (75%), but also on complications (wounds that are difficult to heal, feet that ache/heat, cramps, visual disturbance), and by measuring glycemia (64%), the presence of ants in the patient's urine 15 to 30 minutes after urination on bare soil (15%), the intervention of supernatural forces (13%), pressure on the lower limb (11%) and the throwing of cowries (09%). The treatment consists of a few hygienic and dietary measures, combined with herbal recipes and possibly rituals (31%). Most of the recipes were obtained by decoction, kept for an average of one month, and administered per os. 220 recipes, of which 187 were single-plant and 33 were mixtures (two to six plants), prepared from 80 species belonging to 39 families were listed. Chemical analysis of aqueous extracts of Vernonia amygdalina (Asteraceae) leaves, Persea americana (Lauraceae) leaves, Aloe vera (Xanthorrhoeaceae) leaves, Carica papaya (Caricaceae) fruits, Catharanthus roseus (Apocynaceae) leaves and whole plants, Picralima nitida (Apocynaceae) leaves, fruits, and seeds of Picralima nitida (Apocynaceae) showed the presence of alkaloids and reducing sugars mainly, but also flavonoids, polyphenols, terpenoids, coumarins, saponins, anthocyanins, tannins and quinones bound in the nine extracts.

Conclusions: This study showed that in traditional medicine diabetes mellitus is a disease associated with frequent, painless, sweet urination. Between the 80 species obtained in the Mifi Division, 41 were also used for the treatment of diabetes in the districts of Mbouda in the Bamboutos division, and Bangangté in the Nde division. Leaves are richer in secondary metabolites, and the metabolites identified in these aqueous extracts are important indicators of hypoglycaemic activity, so the different species could constitute a database for the isolation of new natural active principles for use in pharmacology.

Building bridges between community pharmacy and psychosocial care: findings from a Flemish pilot project (CAVAsa)

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Introduction: Community pharmacists are increasingly consulted for healthcare advice and promotion beyond medication management. Because of their high accessibility and usually close relationship with their patients, community pharmacists may be in a good position to detect unmet psychosocial needs of their patients.

Objectives: A Flemish study project CAVAsa investigated this idea and evaluated the added value and feasibility of pharmacists taking up a role in both detection and referral of patients with (unmet) mental and psychosocial needs.

Methods: Therefore, a collaboration between community pharmacies and psychosocial organisations was set up and evaluated using quantitative and qualitative methods.

A total of 71 community pharmacists in Flanders (Belgium) were trained to detect a wide range of psychosocial needs (e.g., mental health problems, family problems, substance abuse), to inform patients about possible help and to guide or refer them to appropriate care. Quantitative data were collected through an online registration form from October ’21 until January ’22 and qualitative data by focus groups held in November ’21.

Results: In total, 79 patient contacts were registered in which psychosocial wellbeing was discussed. Patients were

dominantly female and middle-aged, and the majority of patients' needs related to family problems and/or mental health problems. The focus groups revealed that pharmacists are willing to take up this role because patient wellbeing and personal assistance are key values of community pharmacy. They felt confident in detecting and referring psychosocial vulnerable patients and appreciated the growing collaboration with social workers. However, high workload, lack of staff and privacy were important barriers in taking up this new role.

Conclusions: Despite the good position of the community pharmacist to detect psychosocial needs and the willingness of the participants, some barriers for implementation were raised during the first year. At this moment preparations are being made to promote the project for another year and include more pharmacists taking into account all lessons learned.

Exploring the current state of retail clinics in community pharmacy practice: A preliminary qualitative study among pharmacists in 21 countries

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Introduction: Retail clinics (RCs), or accessible care clinics, are nonurgent walk-in clinics that provide a broad spectrum of acute and chronic condition management.

At the RCs, the family nurse practitioners (NPs) and physician assistants (PAs) can diagnose, treat and write prescriptions for common family illnesses such as strep throat, urinary tract infections, red eye, provide common vaccinations for flu and pneumonia.

Over the past two decades, RCs have been proven as effective contributors to the delivery of quality primary care in the United States (US). The significant increase in RC numbers in the US gives robust evidence of RCs success. 2019 market research about the retail clinic in the US reported around 2000 RCs all over the country.

Because the retail clinic model was first introduced in the US, almost all published literature about retail clinics comes from the American perspective.

Objectives: As a part of the Pharmacy community's ongoing project for expansion of community pharmacy services through implementation of Clinical Pharmacist-Led Retail Clinics (CPLRCs). The authors conducted this preliminary qualitative study in which we aimed to investigate the current situation in different countries other than the US regarding the 'community pharmacies associated clinics'.

Methods: The authors invited a convenience sample of 21 pharmacists representing 21 different countries worldwide. Despite the simple methodology and the subjective nature of the collected data, the approach of the unstructured narrative interviews provided the participants with greater freedom to express their thoughts.

Results: The authors have two basic findings from this study; in most studied countries, 71% (15) do not have a retail clinic model. However, in some countries, 29% (6) similar RC models exist. The latter are Canada, the UK, UAE, Saudi Arabia, Bahrain, and Pakistan.

Conclusions: The authors can consider these results as an important starting point for further research to explore the opportunities and challenges of applying the retail clinic model in different countries worldwide. There is no doubt that community pharmacists are underutilised in patient care. The authors believe that retail clinics can offer a good opportunity for pharmacists to contribute to primary care effectively. The findings of this research pave the way toward comparative studies between the different versions of retail clinics regarding the involvement of pharmacists and the types of services provided.

Perceived barriers and facilitators to community pharmacy-based tuberculosis service in Malaysia

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Introduction: Tuberculosis (TB) remains a public health concern in Malaysia. Whilst TB mortality rates have decreased over the years, proactive initiatives are required to further reduce TB incidence and improve the treatment success rates. With the success of community pharmacist-led interventions in medication review and smoking cessation service in Malaysia, community pharmacy-based TB management can serve as a value-added strategy to the national TB control and prevention programme.

Objectives: A mixed-methods study was conducted in Malaysia to evaluate community pharmacists' perception on a proposed community pharmacy-based value-added TB service to improve TB case detection and treatment completion.

Methods: Community pharmacists in Malaysia were invited to participate in an online self-administered survey, followed by a semi-structured interview for congruency between March to October 2021. The survey was developed using the Consolidated Framework for Implementation Research, and aimed to assess the potential barriers and facilitators on community pharmacy based TB service including referrals,

TB directly observed therapy (DOT), and TB education. The survey instrument was validated for content and face validity, followed by a pilot test before administration. Quantitative data were analysed using descriptive analysis, while qualitative data were analysed using thematic analysis.

Results: A total of 388 community pharmacists completed the survey, of which 23 participated in the interview. The respondents had a median age of 29.0 years with a median of three-year working experience. 83.5% of the respondents believed a structured TB referral system is needed, with 73.5% believing that community pharmacy-based TB DOT service is beneficial for treatment adherence, and 87.1% believed community pharmacists should play a role in public education about TB. Most respondents were willing to provide TB referrals (97.2%), offer TB DOT (70.1%) and provide TB education (99.6%). Some respondents were hesitant to offer services as they lacked confidence (53.4%) and knowledge (40.0%) in TB management, in addition to the complicated process needed to set up a designated area to deliver TB service to ensure good infection control (53.4%). In the qualitative analysis, three main themes emerged. Respondents felt that the community pharmacy-based TB intervention was viewed as a positive opportunity to: 1) Enhance professional role of pharmacists in patient-centred care; 2) Engage and educate the community about TB in order to overcome the stigma towards TB; 3) Encourage multidisciplinary collaboration in sharing professional responsibilities in TB management.

Conclusions: As pharmacists work towards the milestone of ending the global TB epidemic by 2035, community pharmacists in Malaysia were supportive of community pharmacy-based TB service. There is a need for collaboration and contribution from all stakeholders to upscale the effort in TB control and prevention. In order to integrate community pharmacy-based TB intervention into practice, training and accreditation, infection control strategies and standard operating procedures have to be in place to ensure a successful implementation.

Feasibility pilot study and potential impact of a mobile app intervention led by pharmacist, to support and improve self-management of diabetes, in Cyprus

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Introduction: Diabetes is a chronic disease affecting people globally and characterised as epidemic and pandemic. Cyprus had one of the highest prevalence of diabetes among other European countries in 2017. Achieving optimal management of diabetes can largely prevent or delay progression of diabetes and appearance of other comorbidities and provide long and healthy life to patients. Self-management of diabetes is fundamental for the optimal management of diabetes. However, low adherence rates and lack of empowerment and knowledge of patients results to sub-optimal diabetes management. Despite studies identifying successful strategies to improve diabetes management, the best way to deliver them and which intervention is more effective are still being searched.

Pharmacists provide high quality information to motivate patients to understand and appreciate the importance of medication. Motivational Interview is a coherent, teachable, evidence-based approach to behaviour change counselling and a vehicle in creating 'informed and active' diabetes patients. New technologies, such as m-Health interventions can be a catalyst for the provision of the aforementioned type of intervention and consist of a promising area for further research. Nevertheless, further rigorous studies are necessary, in identifying the optimum type of intervention and the way of it should be delivered.

Objectives: This study aims to design, implement and evaluate an m-health pharmacist-led intervention. To design and implement an m-health intervention aiming to improve diabetes self-management through improving patient's knowledge, adherence and patient empowerment and evaluate its feasibility and potential impact.

Methods: Developing a complex intervention by identifying the evidence base by reviewing published and existing systematic reviews appropriate theory and modelling process and outcomes. To implement an m-health intervention based on principles of Motivational Interview led by pharmacist and using mobile phone technology. The components of the intervention consisted of communication with the pharmacist, tracking and uploading blood glucose readings, graphical reports, reminders, education and optimization of pharmacotherapy with maximum three telephone sessions with 6-8 weeks intervals between the pharmacist and the patient. Assessing feasibility and piloting methods by measuring intervention's workability, service costs and acceptability from the perspective of main stakeholders by developing two semi-structured interview schedules based on the Theoretical Framework of Acceptability (TFA). Evaluation of medication adherence diabetes self-care activity prior to, and after the intervention using Diabetes Self-Care Activities Questionnaire (DSCA) - Greek version.

Results: Preliminary findings indicate that the patients were willing to take part in a novel pharmacy led intervention for diabetes using mobile phone technology and based on principles of Motivational Interview. The study also identified priorities of patients regarding five domains of self-care activities (medication adherence, blood sugar testing, healthy eating, physical activity and foot are) and showed potential input from pharmacist in supporting diabetes patients. Suggestions for changes and further extrapolating of the proposed intervention in larger settings were yielded.

Search engine redirection convert patients to illegal online drug distribution websites

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Introduction: Illegal drug distribution websites apply dishonest marketing techniques to attract customers via search engines. Search redirection attack is one of these, where vulnerable web pages appearing in is search queries are hacked and individuals are presented with the unwanted final page selling prescription medications online without restrictions or adhering to professional standards. Previous studies have reported the issue only in relation to oral medications for the treatment of erectile dysfunction.

Objectives: The authors aim to measure the prevalence of search engine redirection in query results of regularly prescribed medications for chronic conditions, visualise redirection networks referring patients to illegal internet pharmacy websites, and propose an intervention to prevent consumers from the dangers of illegal online pharmacies.

Methods: First 20 search query results of 15 prescription drugs regularly used in chronic drug therapy were documented in October and November 2021, further in March 2022. The authors searched online in incognito mode using the name of the active ingredient and 'buy' as search terms them. Redirection network visualization was done using Gephi. Redirected pages have been collected and the owners of the compromised domains have been notified via email in February 2022, links affected by redirection were reported to the National Cyber-Security Center of Hungary in March 2022 to resolve the issue.

Results: Nearly half (47%) of prescription drugs for chronic conditions have showed redirected sites in October 2021 and increased to 53% by March 2022. Highest prevalence of hacked links was observed in case of salbutamol (40%), atorvastatin (35%), metformin (35%), levothyroxine (30%). Although only two out of 16 hacked website owners responded on successfully resolving the issue, the number of redirects among results have decreased notably following the proposed intervention method from this study.

Conclusions: Search engine redirection attacks do not only affect potency-enhancing drugs but is present in a much broader range of drug searches. Coordinated interventions by authorities, search providers and individual stakeholders is required to increase the control of search engine results and to block redirected pages.

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Trimethoprim-sulfamethoxazole associated neutropenia in Mexican HIV patients: A cohort study

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Introduction: Trimethoprim-sulfamethoxazole (TMP-SMX) is the prophylactic and therapeutic regimen of first choice against *Pneumocystis jirovecii* pneumonia in immunocompromised patients, especially in people living with human immunodeficiency virus (HIV). Neutropenia is a known adverse drug reaction associated with TMP-SMX; however, it has been poorly documented in Mexican HIV patients.

Objectives: To identify the risk of early neutropenia associated with TMP-SMX use in patients living with HIV in Mexico.

Methods: A prospective cohort study was conducted in adults living with HIV admitted to a third-level hospital between August 2019 and March 2020. Socio-demographic, clinical and laboratory data were collected from the clinical record during patients' hospitalisation and from monthly follow-up calls from hospital discharge to the end of the study. Risk was quantified with robust multivariate Poisson regression model. Incidence rate ratio (IRR) with 95% confidence interval was used to measure the strength of association.

Results: 57 patients were included in the cohort, of whom 24.6% (n=14) were treatment-experienced, 56.1% (n=32) had opportunistic infection during follow-up, and 75.4% (n=43) were in HIV infection category C3 at hospital admission. 40 patients were in the TMP-SMX exposed group (204.8 person-years of observation, median 26.5 days) ,and 17 patients were in the non-exposed group (87.0 person-years of observation, median 21 days). The incidence rate of early neutropenia in the TMP-SMX exposed group versus the non-exposed group was 7.81 and 1.15 cases per 100 person-years, respectively. Current use of TMP-SMX was associated with more than a 3-fold increase in the incidence rate ratio of early neutropenia (adjusted IRR: 3.02; 95% CI: 0.26-34.97; p= 0.377) adjusted for sepsis and opportunistic infections during hospitalisation, stage C3 of HIV infection and neutrophil count <1,500 cells/mm^3 at hospital admission. While neutrophil count <1,500 cells/mm^3 at hospital admission was associated with more than a 2-fold increase in the incidence rate ratio of a more severe degree of early neutropenia (adjusted IRR: 2.72; 95% CI: 1.11-6.67; p= 0.028).

Conclusions: Current use of TMP/SMX in Mexican patients living with HIV was statistically non-significantly associated with an increase in the incidence rate ratio of early neutropenia. The results suggest that presenting neutrophil count <1,500 cells/mm^3 at hospital admission may increase the incidence rate ratio of a more severe degree of early neutropenia.

Future directions regarding the implementation of pharmaceutical services in Romania: Legislative changes and activities performed during the COVID-19 pandemic

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Introduction: In the last years, the pharmacist has performed a new range of activities, from traditional medicines dispensing to patient-centred services. In many countries, the implementation of pharmaceutical services has showed significant benefits for public health systems. During the COVID19 pandemic, pharmacists had assumed additional responsibilities and adapted their activities. Nevertheless, in Romania the legal framework and definition of pharmaceutical services have been recently established.

Objectives: The aim was to identify recent legislative changes contributing to the implementation of Romanian pharmaceutical services. Moreover, the author has highlighted some new activities performed by pharmacists throughout the COVID19 pandemic.

Methods: Data was collected by searching national authorities' databases (Ministry of Health, the College of Pharmacists from Romania, National Institute of Public Health). Electronic databases (mainly PubMed and Google Scholar) were searched to identify new responsibilities of pharmacists after March 2020. Then, information was extracted, analysed and discussed.

Results: In November 2020, an official definition of the pharmaceutical services was introduced due to the completion of the Romanian Pharmacy Law no. 266/2008. Another important event for the future of the profession was the approval of the list of pharmaceutical services (Ministry of Health Order No. 2382, November 4, 2021), divided into essential and advanced services. The legal framework could be correlated with a positive change regarding the pharmacy residency training (three year duration) and the number of specialist pharmacists. In 2019, there were reintroduced two specialties, like Pharmaceutical Industry and cosmetology and General Pharmacy, in addition to Clinical Pharmacy and Clinical Laboratory. Consequently, the number of places increased with 32% in 2019 comparing with 2018, respectively 63% in 2020, as a measure of the authorities to increase the health personnel due to the pandemic. During the national state of alert, more than 9% of the pharmacy residents had to fullfil a new professional role and to provide assistance to public health departments concerning COVID-19 public support. Through the order of the head of the department for emergency situations, they were sent to airports, ambulance service, COVID19 call-centres or other administrative departments in the period January 2021-March 2022. In addition to activities carried out usually, such as dispensing, counseling, measuring biological parameters (high blood pressure, blood sugar), community pharmacists were allowed to perform rapid antigen tests for COVID-19 after May 10, 2021. Until the 1st January 2022, there were 137 temporary authorised community pharmacies in Romania.

Conclusions: The approval of the Romanian official list of pharmaceutical services represented the first step for expanding the role of the pharmacist and his contribution to the healthcare system. As drug professionals, pharmacists are a valuable resource. During the pandemic, pharmacists were in the first line and had an active role in helping patients, proving the ability to adjust and offer new services. Therefore, in the future, regulators should consider integrating pharmacists in medical multidisciplinary teams, with benefits for patient care and health systems.

Feasibility of the 'Respiratory Adherence Care Enhancer' (RACE) instrument supporting self-management by community pharmacists in asthma/COPD patients with maintenance inhaler therapy

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Introduction: Suboptimal self-management of maintenance inhaler therapy is observed in ≈ 50% of asthma and Chronic Obstructive Pulmonary Disease (COPD) patients. Driving factors consist of various types of barriers. The 'Respiratory Adherence Care Enhancer' (RACE) instrument has been developed to support self-management in these patients. This instrument consists of: 1) the RACE-questionnaire identifying individual barriers to self-management of inhaler maintenance therapy, achievable treatment goals and disease control; 2) an infographic visualising barriers for self-management and 3) a consult with the community pharmacist for tailored care with interventions to overcome barriers.

Objective: The primary goal was to assess the feasibility of the RACE-instrument from the perspective of asthma/COPD

patients and community pharmacists on self-management before progressing to a definitive randomised controlled trial.

Methods: A feasibility study was conducted in five community pharmacies in the Netherlands, as part of a prospective pilot study. Within each participating pharmacy five asthma and five COPD patients with inhaler maintenance therapy were selected for the intervention based on data retrieved from the pharmacy information system. Patients were invited to fill out the RACE-questionnaire at baseline and at follow-up after one month. Results were displayed at both timepoints after which a consult with the pharmacist took place. In advance, two trainee pharmacists were trained to provide tailored support with the RACE-instrument in consults. Subsequent patient-reported experience measures on the use of the instrument were collected through a questionnaire. Feasibility was assessed on: 1) patient recognition of identified barriers, 2) the process of setting treatment goals and 3) impediments and facilitators obtained from experiences. Descriptive analysis was performed.

Results: Pharmacist consults were performed on 44 patients (48% with asthma and 52% with COPD) with a total of 85 consults (44 at baseline and 41 at follow-up). Visualisation of self-management barriers in general were recognised by 84% of patients with similar results observed for asthma and COPD. The barrier 'Social discomfort' was least recognised by 63% of patients. Setting treatment goals was new and challenging for patients and pharmacists, especially in patients with controlled disease. The majority of patients considered the instrument useful, felt heard and understood during consults and appreciated the person-centred support.

Conclusions: Use of the RACE-instrument was feasible for pharmacists and asthma/COPD patients to discuss and improve self-management of maintenance inhaler therapy. Future research has to demonstrate its effect on clinical outcomes.

On TRACk: Through training, preparation, and counseling, to better use of inhaled medication

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Introduction: Over 70% of patients with asthma/COPD in the Netherlands make mistakes in inhaling their medication. The community pharmacy plays a vital role in medication education, especially in patients with inhaled medication. Providing accurate inhaler instruction to patients, that are actively involved in their medication treatment, is essential. The first six months since the start of their treatment in particular are essential to prevent development of (un)intended inhaler technique errors.

Objectives: The authors aimed to develop and pilot-test the On TRACk-intervention: an online communication training for pharmacy team members (PTs) on inhaled medication counselling and counselling preparation for patients and PTs to improve medication adherence and health outcomes in patients with asthma/COPD.

Methods: The On TRACk internet portal was developed to facilitate PT's communication training and PTs' and patients' counseling preparation. Focus groups with patients with asthma/COPD were conducted to accumulate relevant inhaled medication related topics to construct a question prompt list that was applied for patients' counseling preparation. The intervention was piloted in two community pharmacies, with four PTs and 13 asthma/COPD patients. Semi-structured interviews were conducted to evaluate their experiences.

Results: PTs acknowledged that the personal feedback they received in the communication training was directly applicable in daily practice. They valued suggestions to stimulate patient involvement, and to provide tailored information that matches their patients' needs. PTs also addressed that hands-on information on inhaler instruction techniques were helpful additions to their skillsets. Patients valued the opportunity to propose topics they considered significant to discuss and felt more engaged in their treatment. Patients also indicated they felt they were more a partner in conversation, than a patient on the receiving end of medical information.

Conclusions: The pilot was successful. On TRACk improves PTs' inhaler medication counseling skills and bolsters patients' involvement in their treatment. However, on TRACk needs to be evaluated in the upcoming clinical trial on its effectiveness on medication adherence and patients' health outcomes. The On TRACk intervention aligns with PTs' needs and wishes, in terms of proving directly applicable tips and hands-on information to apply in daily practice. Counseling preparation provides patients with the opportunity to explore their own barriers in medication use and empower them in consultations with healthcare providers.

Patients' perspective on the development of a prescription opioid use disorder

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Introduction: In the past decade prescription opioid use increased exponentially and concomitantly opioid use disorders (OUD) are becoming more common. Several risk factors for developing an OUD have been identified, but less is known regarding the patients' perspective on developing a prescription OUD.

Methods: 25 adults undergoing treatment for prescription OUD were recruited. In-depth, semi-structured interviews focussing on experiences with long term opioid use, knowledge and attitudes regarding opioids, and access to opioids were conducted. A directed content analysis was used to identify themes/codes in the transcribed interviews using NVivo.

Results: Participants mentioned that the development of an OUD is affected by various factors which could be grouped into three themes: 1) experiences driving initiation, 2) experiences driving continuation, and 3) experiences with prescription OUD. Besides the need for pain management the dynamics of patient-provider communication, care coordination, provider vigilance, and environmental support all contributed to the way patients used their opioids.

Conclusions: Patients experiences illustrate that development of prescription OUD generally follows the lines of other substance addictions, though negative reinforcement might play a more prominent role in the early phase of prescription opioid use. Poorly controlled pain and experiencing subjective stress were considered major risk factors for developing an opioid use disorder. It seems critical that prescribing clinicians set realistic expectations for pain management and discuss the risks of long-term opioid use at the start of treatment. Subsequently, the need for continued treatment and the risk of the development of OUD should be regularly evaluated.

Do we understand online information given by healthcare providers during the COVID19 pandemic?

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Introduction: The COVID19 pandemic has increased the need for timely and reliable health information to optimise citizens' self-protective engagement. Due to preventive measures, such as lock-down and physical distancing, people relied on the internet more than before. There is a large gap in pharmacy educators knowledge about health information-seeking pathways on the internet, especially with the appearance of the COVID19 infodemic. Results of the authors work may help healthcare professionals to better communicate and educate citizens in everyday practice.

Objectives: The aim of this study was to examine the impact of the COVID19 pandemic on searching for and understanding online health information, as well as reliance and confidence in the information gathered from various online sources.

Methods: An online survey was conducted using Google Forms on a sample of anonymous respondents in Serbia. The link for the questionnaire was posted on social media channels and was accessible from April to May 2020, during the epidemic outbreak. The survey included questions on socio-demographic characteristics and behaviour in seeking and evaluating online health information sources. The authors compared the responses collected at a one-time point in regard of period before and during the COVID19 pandemic. Healthcare professionals were excluded from the study. Data were managed using the IBM SPSS Statistics and included methods of descriptive and inferential statistics.

Results: The age of participants was 37.82 ±11.11 years in average. Out of 351 respondents, 66.7% were women, 47.9% were university graduates, and 76.6% were

employed. At the beginning of the pandemic, the average time for health-related information searching on the internet and social media significantly increased ($p < 0.01$). The majority of participants found important the profession of the author of health information published on the internet (N = 305, 86.9%) and on social media (N = 272, 77.5%). Prior to COVID19, the respondents valued the most (on a five-point rating scale) the information obtained from physicians (4.33 ± 0.75) and pharmacists (4.12 ± 0.79), followed by health officials (3.73 ± 1.02) and journalists (2.66 ± 1.02). This trend continued during the pandemic. Understanding of health information published on the internet and/or social media decreased significantly (from 3.82 ± 1.01 before to 3.67 ± 1.14 during the pandemic, measured on a five-point rating scale, $p < 0.01$). This decrease in the understanding of health information was significantly influenced by gender ($p < 0.05$). The level of education and employment status significantly impacted the understanding of health information before the pandemic ($p < 0.05$ for both variables), while during the pandemic these factors did not prove to be statistically significant.

Conclusions: Citizens' interest in health has grown significantly due to the COVID19 pandemic. However, their understanding of health information during this global crisis has decreased. This underlined the importance of clarity of the health information provided online. Physicians and pharmacists are marked as online health information providers with the highest level of confidence at the time of infodemic. They should be more involved in writing and disseminating accurate, precise, clear health information, adjusted to all categories of the population, to improve public health.

A collaborative practice programme involving community pharmacies and primary care for COVID19 detection

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Introduction: Community pharmacists were amongst the few healthcare professionals readily available for face-to-face consultation after the first COVID19 outbreak in Catalonia, Spain. A collaborative practice programme was created in September 2020 to ease the referral to and communication with Primary Care (PC) of those Community Pharmacy (CP) users who had COVID19-like symptoms. This programme, known as JoDIC, was created by the Epidemiological Surveillance Services (ESS) of Vallès and Barcelonès-Nord-Maresme Areas, the Catalan Healthcare Service (CatSalut) and Barcelona Pharmacists Association (COFB). After using a paper-based system at the beginning, a safe cloud-based software hosted in Farmaserveis, the Catalan pharmacy services platform, started running in February 2021, to facilitate patients' follow-up. In June 2021, referral for COVID19 vaccination was included to the platform. COVID19 antigenic tests were not available in Spanish CPs until July 2021.

Objectives: To enable an effective and safe referral and communication system from CPs to PC centers of patients needing COVID19-related healthcare interventions, within the JoDIC programme; and to describe the pharmaceutical interventions performed in the JoDIC programme framework.

Methods: COFB, ESS and CatSalut jointly designed JoDIC circuit, which was activated at the CP to detect users with COVID19-like symptoms, users who were a close contact to a COVID19 case or users who were not fully vaccinated. The initial paper-based circuit started in September 2020, involving Vallès area only. Complete referral data was gathered from the 5th February 2021 to the 31st December 2020 period of study, when Farmaserveis specific module was launched. On the 23rd June 2021, JoDIC was expanded to the whole Northern Barcelona Metropolitan Area, comprising more than two million inhabitants who are serviced by 649 CP. By filling up a form on Farmaserveis, the patient's data was referred by a community pharmacist to the PC centre to evaluate each case and to provide further care needed.

Results: 528 community pharmacists working in 372 CP were trained in the protocol. Community pharmacists performed interventions in 1303 CP users (496, paper-based; and 807, registered on Farmaserveis). 111 CP registered pharmaceutical interventions on Farmaserveis (7.4 patients per CP). 63.1% (n = 509) of CP users, received health education by the pharmacist, while 36.9% (n = 298) were referred to their PC centre. 71.6% of the referred patients were due to having COVID19-like symptoms; 25.3%, were close contacts to COVID19-positive cases; and 3.1%, to be vaccinated. 68.8% of the referred patients eventually attended their appointments with their family physician. 63.4% of the visited patients needed some kind of diagnostic test. 30.8% tests were COVID19-positive.

Conclusions: The current pandemic favoured the establishment of new COVID19 detection circuits and communication ways between ESS, CP and PC centers. Our data shows high efficacy to detect COVID19-positive cases (30.8% positivity) and good acceptability amongst referred citizens (68.8% successful referrals). JoDIC programme is a seminal project that will facilitate communication amongst PC and CP professionals in other contexts.

Patients' and healthcare providers' views on dose reduction of tyrosine kinase inhibitors in chronic myeloid leukaemia: A qualitative study

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Introduction: Dose reduction of tyrosine kinase inhibitors for patients with chronic myeloid leukaemia (CML) in molecular remission seems a promising way to reduce adverse events while maintaining therapeutic effectiveness. Successful dose reduction demands a patient-centred approach, meeting their concerns and needs. This study identified patients' and healthcare providers' views on dose reduction, including preferences for a patient decision aid.

Methods: Semi-structured interviews were conducted via video call with 18 adult CML patients and healthcare providers (six haematologists, four nurses, and two pharmacists). Participants were questioned about perceived (dis)advantages of dose reduction, factors patients and healthcare providers considered when making the decision to reduce TKI dose, and preferences for a patient decision aid including content and format. Data were thematically analysed.

Results: Most interviewees supported dose reduction. Reduced adverse events, lower medication costs, and 'feeling less patient' due to less medication intake were prominent perceived advantages. Participants were mainly concerned about disease recurrence and loss of molecular response. Information about personal possibilities for dose reduction and potential consequences and risks was considered essential to make a well-informed decision. Interviewees preferred such information in an online patient decision aid.

Conclusions: Patients and healthcare providers were generally positive about TKI dose reduction. An online patient decision aid could support the decision making process.

Comprehensibility of pharmaceutical pictograms in patient population in Albania

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Introduction: Pharmaceutical pictograms, defined as visual signs, contain medicine-related information with specific instructions and precautions regarding medicine use. Hence, pictograms used as a complement to written and verbal information can be a useful instrument in pharmaceutical care in enhancing patient adherence to treatment regimens.

Objectives: To assess patients' comprehensibility of pharmaceutical pictograms.

Methods: A questionnaire approach was used for this study. The survey instrument was developed containing 18 pictograms present in pharmaceutical products in Albanian market. The pictograms were presented to the participants without subtitles so that the comprehensibility of the pictograms could be assessed. The study was conducted among community pharmacies in two different regions, including patients of both genders aged 21 years and above. Relationship between participants demographic characteristics and comprehensibility of pictograms was assessed.

Results: The study included 80 fully completed questionnaires from patients. The comprehensibility of pharmaceutical pictograms in this study ranged from a minimum of 12% to 84%. Six of the chosen pictograms in this study met the comprehension criterion of 67% specified by the International Organisation for Standardisation 3864. No significant association was found about participant's gender impact on pictogram comprehensibility. With regard to the level of education and age it was shown that participants with a higher education level and participants aged more than 30 years old had a better comprehensibility of pharmaceutical pictograms.

Conclusions: More than a few of pharmaceutical pictograms included in this study were not easily comprehended by participants. Further research is needed to assess the comprehensibility of pictograms by Albanian population in order to have culturally adapted pictograms.

Towards a quality assurance system for medication reviews in German community pharmacies

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Introduction: Medication reviews in community pharmacies are a common method to improve medication safety. In Germany, several training programmes exist as well as guidelines for conducting medication reviews by the federal chamber of pharmacists (German Federal Chamber of Pharmacists, 2017; Federal Association of German Pharmacists e.V. [ABDA], 2014). Particularly with regard to quality assurance suitable instruments are needed to measure and guarantee high quality. For this purpose, quality indicators are often used within the healthcare sector but for pharmaceutical services suitable indicators are still lacking in Germany.

Objectives: The project aims at defining a set of quality indicators complemented by a proficiency test system to assess medication reviews type 2a performed in German community pharmacies.

Methods: A systematic literature search was carried out in PubMed and Google Scholar to identify existing quality indicators for pharmaceutical care used in other countries. In addition, further indicators identified in existing guidelines were added. After discussion by an expert panel a preliminary indicator set was defined. Within a two-step Delphi survey, participants were asked to evaluate the proposed quality indicators regarding their suitability to measure the quality of medication reviews type 2a in community pharmacies using the RUMBA criteria (Relevant, Understandable, Measurable, Behaviourable, Achievable). An additional Delphi survey was prepared to refine the indicator set in order to address current progress regarding the implementation and remuneration of pharmaceutical services in Germany.

Results: 350 indicators were identified by systematic literature search, from which 23 where applicable to the community pharmacy setting in Germany. In addition, three indicators were taken out of guidelines on medication reviews and six other indicators were suggested by the experts. Among these candidate indicators, the expert panel defined a preliminary set of 12 indicators, which was then further evaluated in the first Delphi survey. An indicator set of six quality indicators was obtained, including three structure, one process and two outcome indicators. During the refinement process one additional structure and one process indicator were added for evaluation in the second Delphi survey.

Conclusions: After refinement, a set of indicators will be available to assess the quality of medication reviews type 2a in the German community pharmacy setting. In the next step practicability, reliability and validity of these indicators will be evaluated while implementing a suitable proficiency test system.

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Telehealth education and music therapy for nursing-home residents during COVID19

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Objective: This project evaluated the effect of patient education and music therapy delivered by telehealth on depression related to COVID19 among rural nursing home residents.

Methods: This was a prospective, pilot intervention involving 56 residents from three rural nursing homes. The study included a convenience sample of residents at three rural nursing homes. The mean age for the three groups ranged from 67-81 years of age. Participants received either patient education or combined patient education and music therapy as depression interventions. The primary outcome was the change in PHQ-9 scores from baseline to the end of an eight-week period. The secondary outcome was resident satisfaction as measured through an evaluation survey.

Results: Of the 56 participants enrolled, 28 completed the study and were included in data analysis. Low pretreatment PHQ-9 implied minimal depression. Summary statistics show a 1.53 mean PHQ-9 change for those receiving education-only (53.6%) and a -1.16 PHQ-9 for those receiving combined therapy (46.4%) (p = 0.092). Results did not demonstrate positive outcomes on depression. A potential difference was noted among each facility. Two-thirds of participants rated their experiences as good to excellent.

Conclusions and Implications: It appears that education played a positive role, yet music therapy delivered as telehealth did not show improvement in depression. Further studies are needed to determine the potential impact of non-pharmacological interventions in rural nursing home residents during the pandemic.

The development and validation of a tool for measuring collaborative practice between community pharmacists and physicians from the perspective of the pharmacist: The professional collaborative practice tool (PCPT)

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Introduction: Collaborative practice involves bi-directional communication and a joint decision-making process, underpinned by a mutual understanding and respect of roles and responsibilities of the professionals involved. Increased collaborative practice between pharmacists and physicians will be driven by the constant increase of patient-oriented services. There are tools in the literature that measure collaboration, validated from the perspective of the physician and later adapted for the pharmacist. However, there appears to be a lack of validated tools from the perspective of the community pharmacists.

Objective: To develop and validate a tool to measure collaborative practice between community pharmacists and physicians from the perspective of the pharmacist.

Methods: The eight stage DeVellis method was used. A literature search was undertaken to define the collaborative practice construct. The DeVellis method includes the 'Generation of an item pool' and the 'Establishing the measurement format' for which a seven-point Likert scale was selected. A 156 item pool was generated and the measurement format was established, selecting a seven-point Likert scale. The item pool was reviewed by three experts. A 40-item questionnaire was sent to pharmacists providing medication review services (n =110) and to a random sample of pharmacists who were providing usual care (n =226). In step seven and eight the content validity, reliability analysis and optimisation of the tool was undertaken through Exploratory Factor Analysis using the maximum likelihood method and promax rotation (Figure 1). Items were evaluated for inclusion based on factor loadings (> 0.5). Internal reliability was evaluated using Cronbach alpha coefficient. Confirmatory Factor Analysis was applied.

Results: The response rate was 84.8% (285/336). The initial 40-item pool was tested. The validation process produced a 14-item tool, providing a three factor structure; 'Activation for Collaborative Professional Practice', 'Integration in Collaborative Professional Practice' and 'Professional Acceptance of Collaborative Practice'. The structure had a Tucker-Lewis index of 0.945, a RMSR of 0.04 and a RMSEA of 0.074. The variance explained was 62%, with factor 1 explaining 27%, factor 2 - 20% and factor 3 -15%. Internal reliability was evaluated using Cronbach alpha coefficient. The Cronbach alpha for the scale was 0.94 and for each factor 0.902, 0.813 and 0.827 respectively.

Conclusions: The tool could be used to measure the basal level of collaborative practice between physicians and pharmacists from the perspective of the pharmacist and to measure the impact of increased service provision on such collaboration.

Drug-related problems experienced by patients with rheumatic diseases: A longitudinal observational study

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Introduction: Patients with rheumatic diseases can experience multiple drug-related problems (DRPs) during their treatment process. These DRPs can lead to negative health consequences and preventable hospital admissions. Insight into patients' experience of DRPs over time might aid in timely identifying and preventing DRPs.

Objectives: To identify drug-related problems reported by patients with rheumatic diseases along the treatment process.

Methods: A prospective observational study was conducted in a Dutch outpatient pharmacy. Adult patients with rheumatic diseases that were prescribed medication by a rheumatologist were questioned about experienced DRPs by telephone four times in eight weeks using a structured interview-guide. Unique DRPs (i.e. DRPs not reported in earlier interviews by individuals) were categorised using a classification for patient-reported DRPs and analysed descriptively.

Results: In total, 52 participants (median age 68 years (interquartile range (IQR) 62-74), 52% male) completed 192 interviews with 45 (87%) participants completing all four interviews. The majority of patients (65%) were diagnosed with rheumatoid arthritis. Patients reported a median number of three (IQR 2-5) unique DRPs during interview 1. In subsequent interviews, patients reported median numbers of 1 (IQR 0-2), 1 (IQR 0-2) and 0 (IQR 0-1) unique DRPs for interview 2 to 4 respectively. Participants reported a median number of five (IQR 3-9) unique DRPs over all completed interviews. Unique patient-reported DRPs were most frequently categorised into (suspected) side effects (28%), medication management (e.g. medication administering or adherence) (26%), medication concerns (e.g. concerns regarding long-term side-effects or effectiveness) (19%) and medication effectiveness (17%).

Conclusions: Patients with rheumatic diseases experience various drug-related problems over time. These patients

might benefit from more continuous support during their patient journey.

Factors influencing patients' preferences for telehealth applications in rheumatic diseases: A qualitative study

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Introduction: Telehealth applications provide greater and easier access to care and medical information, with the potential to improve patients' health outcomes and patient empowerment. Patients with rheumatic diseases are known to experience drug-related problems at various points during their treatment. This population therefore can benefit from technologies that provide continuous information about their medication and continuous and accessible healthcare provider support. To most effectively employ telehealth for this purpose, it is important that such applications match patient needs and preferences.

Objectives: Identify factors influencing the preference of patients with rheumatic diseases regarding telehealth applications.

Methods: A qualitative descriptive study was performed in the Netherlands between May and June 2021. Face to face interviews were held with patients with a rheumatic disease using a semi-structured interview guide. First, patients were presented four telehealth applications: frequently asked questions page, digital human, chatting, and video calling with healthcare providers. Second, patients were asked to use each application to answer one medication-related question predefined by the research team. During the process of answering this question, patients were asked to think aloud and were asked about the factors that influenced their experience and preference for each application. Third, to elicit additional factors influencing application preference, patients were given additional hypothetical questions after which they were asked to explain which application they would prefer to use to help them answer the question. Interviews were audio recorded, transcribed verbatim, and analysed thematically.

Results: 15 patients (19 – 73 years, 53% female) participated. Three domains influenced patients' preference for telehealth applications. First, preference for telehealth applications was influenced by factors related to individual patients such as medication-related information needs, literacy, and skills with digital applications. Second, preference was influenced by factors related to the specific applications such as speed of answer, level of interaction, extent of privacy, the perceived usefulness of an application, and actual usability. Third, preference was influenced by factors related to the context in which telehealth applications are offered, such as user-support from healthcare providers, reliability of information source, and potential to save time for healthcare providers.

Conclusions: Patient preferences for telehealth applications are influenced by patient-related, application-related, and context-related factors. To effectively support patients with rheumatic diseases, a variety of telehealth applications should be applied according to the patients' requirements.

Reduced quality of life, persistent symptoms and dissatisfaction in LT4-treated hypothyroid patients: A medical need for improved treatment

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Introduction: Generally, it is believed that standard levothyroxine (LT4) therapy is sufficient to restore euthyroidism and relieve hypothyroid symptoms in hypothyroid patients. However, a considerable proportion of treated patients remains symptomatic despite normal TSH/FT4 serum values.

Methods: Using a digital survey the authors investigated quality of life (QoL, ThyPRO), daily functioning (SF-36), and hypothyroid-related symptoms in hypothyroid patients and control persons without thyroid diseases. The ThyTSQ was used to measure patient (past and present) satisfaction. Patients and control persons (through snowballing) were recruited through patient organizations, posters/flyers and social media.

Results: The QoL of hypothyroid patients (n = 1,195) was significantly (mean +73%) more disrupted in all domains, as compared to controls (n = 240) ($p < 0.001$). TSH, FT4, age, gender and duration of illness did not significantly affect QoL, whereas the M3 comorbidity index (weighted sum of reported comorbidities) did to a minor extent. Hypothyroid patients had significantly (mean 52%) more impairment of daily functioning and reported significantly (mean 2.8 times) higher scores for symptoms related to hypothyroidism, as compared to control persons (all $p < 0.001$). The majority of patients (77.8%) reported not feeling well while their blood values were within the reference range and would like to have a better treatment for hypothyroidism (74.5%, n = 1,194). The mean satisfaction score was 3.5 out of 6 (58%). The lowest satisfaction was expressed for the information given about the illness and its treatment, as well as the

attitude of the physician, around the time of diagnosis (means 2.5, 2.7, 2.8 respectively).

Conclusions: In this comprehensive study, hypothyroid patients had a worse QoL, impaired daily functioning and residual hypothyroid-related symptoms, compared to control persons, despite thyroid replacement therapy and serum TSH/FT4 within the target range values. Furthermore, hypothyroid patients expressed dissatisfaction with treatment and care. As such, the authors see a medical need for better treatment modalities and care in a proportion of hypothyroid patients.

Potential cost of not vaccinating against COVID19 in the United States

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Introduction: As of April 2022, the COVID19 global pandemic has resulted in over six million deaths globally, and over 81 million cases of COVID19 in the United States.

Objectives: The objective of the presentation is to share estimated direct and indirect costs due to COVID19 infection juxtaposed with the costs of COVID19 vaccine administration in the United States.

Methods: A literature review was conducted to identify potential cost savings from being immunized against COVID19. The costs of COVID19 vaccinations, direct costs related to healthcare and types of indirect costs were noted.

Results: After reviewing over 40 resources, several costs were identified. The cost of COVID19 vaccine series, as defined by the Centers of Medicare and Medicaid Services (CMS), is currently USD40 for single-dose and USD40 per dose in a multiple-dose series. It is estimated that the average hospitalisation stay of an uninsured inpatient was ~USD7000-USD10,000 per day. The average cost of 12 major metropolitan cities in the United States were estimated for primary care facilities, urgent care facilities, and emergency room visits at USD195, USD239, USD1,425, respectively. As of April 2, 2022, 77% of the US have received at least one dose of COVID19 vaccine and 66% are considered to be fully vaccinated against COVID19 primary series.

Conclusions: According to the data, the cost reduction in healthcare is consequential and cost-effective in vaccinating the population. This analysis contributes to the limited reports of a national cost-benefit analysis.

Implementing interventions in healthcare – how do we MAKE-IT work?

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Introduction: Over the past few decades, numerous interventions have been developed to promote medication adherence in patients, but implementation in daily practice is often lacking. The MAKE-IT (Medication Adherence Knowledge Expertise and Implementation Taskforce) Consortium was set up to support Living Labs in the Netherlands in implementing established medication adherence improvement interventions in primary care settings.

Objective: The aim of this project is to assess the support to Living Labs in clinical practice in their implementation of medication adherence promoting interventions, for example by examining context and settings, studying implementation-barriers and facilitators, supporting in scaling-up the innovations to implement them widely.

Methods: The Living Labs have been actively supported by the MAKE-IT consortium. Each Living Lab was guided by a team of consortium members, consisting of experienced adherence researchers and health services experts. Activities included support in developing a suitable project-idea, support in writing a protocol, workshops, evaluation of barriers and facilitators, trainings, reflection meetings, monthly support meetings, helpdesk and expert support.

Results: Four selected Living Labs in primary care have been implementing a different intervention to improve medication adherence, ever since 2020. Each Living Lab consisted of (among others) general practitioners, pharmacy technicians, nurse specialists and patients, with primary care pharmacists in the lead. The interventions promoting medication adherence were aimed at start of therapy (two Living Labs), chronic therapy (two Living Labs) and patients with limited health literacy. These interventions were intended for approximately 500 patients per Living Lab. Support by the MAKE-IT teams was overall appreciated, pharmacists indicated that they highly valued the reflection meetings. Implementation of the interventions in the four Living Labs has been successfully performed.

Conclusions: Four Living Labs have been running feasible projects to improve medication adherence in daily practice. Living Labs indicate the importance of support and expert opinions by the MAKE-IT Consortium during the

implementation. They also state that support was important for creating a sustainable change in routine practice and for scaling up the interventions and implementing them widely. The next four living labs will start their projects nearby summer 2022.

Understanding knowledge skills and attitude of pharmacists towards oral calcium supplements

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Introduction: Calcium is one of the most essential nutrients required by the body. It not only maintains bone mass, structure and quality but it is also required for cardiac regulation, nerve conduction, stimulating hormone secretion and blood clotting. The human body cannot manufacture an adequate amount of calcium without external support. This is due to the fact that calcium is lost daily through hair, skin, nails, sweat, urine and faeces. If this lost calcium is not replaced, the body will take it from the bones. The loss of bone calcium can increase the risk of fractures resulting from osteoporosis. This makes it crucial to balance the loss of calcium from the body. Hence, many calcium supplements are consumed. The bioavailability of calcium depends on many factors like chemical composition of calcium salt, gastric environment, which varies patient to patient and hence, the knowledge of right salt form and dosage is important to balance the calcium levels in patients.

Objectives: The primary objective of the study was to understand the knowledge skills and attitude of pharmacists towards various calcium salts used in oral supplements. The secondary objective was to find the perception of pharmacists regarding their role in managing calcium deficiency in patients.

Methods: The study was conducted by surveying pharmacists from the Mumbai region, India. A short questionnaire was administered to each pharmacist and responses were analysed. The questionnaire was comprised of a mix of open and close ended questions. The survey is ongoing and thus statistical analyses were not performed. Descriptive statistics are presented instead.

Results: Around 54.5% responses were from community pharmacist and some from hospital inpatient and outpatient pharmacists. It was observed that the majority of the calcium supplements sold were prescription medicines in combination with other vitamins. They were prescribed mainly for bone related deficiency or related ailments. The trend is not very common for pharmacists to prescribe calcium supplements as prophylaxis or for any other disorder like post-menopausal or neuronal treatments. Out of many salts available for calcium supplements, calcium carbonate was most widely used, followed by calcium citrate and calcium citrate malate. It is also observed that pharmacists perceive variation in digestion as a key concern for bioavailability of calcium salts. Bioavailability and absorption were considered important features for distinguishing various calcium salts available in the market. 63.6% pharmacists believed that bioavailability of calcium salts is food dependant. The pharmacists also believed that there is a significant impact from the quality of API on the bioavailability of calcium salt. 81.8% of the pharmacists give instructions to patients regarding the consumption of calcium supplements.

Conclusions: This ongoing pilot study suggests that pharmacists need to play an active role in educating the physicians and patients for consumption of higher bioavailable calcium salts to treat calcium deficiency. Educating the correct use of calcium salt is important as ineffective salt may erode the value of calcium supplements. Additional efforts should focus on enhancing pharmacists perception in the role they play in managing calcium deficiency.

MaPP(s)ing the medication journey: Supporting patients with changes at discharge

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Introduction: Poor discharge communication and lack of patient engagement are major contributors to medication-related errors during transitions-in-care. The World Health Organisation Medication Safety in Transitions-of-Care report (2019) acknowledged this and recommended prioritising the following:

- collaborating with patients/families/carers
- communicating medication changes
- interdisciplinary working.

The Care Quality Commission (2022) national patient inpatient survey for the year 2020 found that only 28% of participants received information regarding side-effects, 55% given explanations on medicines-use, 48% provided written information and 12% no information. The overall consensus was that discharge medicines counselling (DMC) was inadequate. Health information systems, including Medicines a Patient Profile Summary (MaPPs) (n.d.), provide patient-friendly leaflets which may improve patient understanding and experience with their medicines. This audit aims to study patient experience of DMC.

Objectives

- Evaluate the quality of DMC at Mid Yorkshire Hospitals Trust.

- Measure patient understanding and satisfaction with information given.

Aim for 100% compliance with the following standards:

- All patients with medication changes (new/stopped/changed) should receive verbal DMC.
- Offer all patients MaPPs easy-read leaflets/charts documenting changes.

Methods: This study did not require ethics approval. Baseline data was collected from the Trust Medicines Information department to gauge which ward projected the most discharge enquiries in October 2021. Patients meeting inclusion-exclusion criteria formed part of the sample.

Inclusion: (1) ward 41(elderly) inpatient with previous admission within last two months AND (2) living at home AND (3) patients/relatives managing medications.

Exclusion: (1) care-homes residents OR (2) patients with carers visiting to administer medicines OR (3) compliance aid patients OR (4) no medication changes.

A questionnaire was used to collect data on verbal/written information given alongside patient/relative understanding and satisfaction.

Results: 20 elderly patients/relatives were surveyed: 55% female and 45% male.

- 40% of patients did not receive written information, while 35% did receive this from nurses; none received a MaPPs leaflet/chart.
- 40% of patients/relatives expressed dissatisfaction with DMC. 0% were informed about side-effects.
- 55% and 70% of patients reported partially/not fully understanding why medications were indicated and changes made, respectively.
- 85% of patients/relatives felt easy-read leaflets/charts explaining changes would be beneficial.

Conclusions: Overall, DMC was consistently below national and trust standards for patient safety. Poor explanation of changes and no information on side-effects were common practices. A preference for MaPPs leaflets/charts over discharge medications lists was also observed. Lack of nurses' DMC exposure may be contributory and will be tackled through pharmacy-led MaPPs training. Audit findings are subjected to overestimation given the small sample size. Other limitations were time constraints and limited generalisability to ethnic minorities. Future studies are needed to involve underrepresented patient groups and generally a larger sample size.

Recommendations

- Offer all patients MaPPs leaflets/reminder charts and verbal DMC.
- Offer all nurses pharmacy-led training on MaPPs-use.
- Monthly reminders during morning handovers to use MaPPs.
- Documentation on electronic prescribing system when MaPPs leaflets are provided.

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Interprofessional collaboration (IPC): A comparative analysis of global standards for pharmacy practice

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Introduction: Globally, disparities exist in healthcare quality, accessibility and regulation (Das, & Gertler, 2007). Consequently, few countries have governing bodies overlooking healthcare-professional (HCP) practice (Epstein, & Bing, 2011). Research has suggested that HCP regulation depended on nations' human development index (HDI), gross domestic product (GDP), and safety (Öztürk, & Topcu, 2014). IPC enables partnership working between HCPs to ensure patient-centred care (Gregory, & Austin, 2016). This study thematically analysed pharmacy professional standards' documents of various countries and investigated whether nations' developmental parameters influenced pharmacy regulation.

Objectives

- To compare global pharmacy professional standards on IPC.
- To synthesise a thematic framework to evaluate literature on IPC.
- To iInvestigate the relationship between HDI, GDP, global peace index (GPI), and pharmacy regulation.

Methods: A group (N = 8) of countries were studied based on 2018 HDI classification; (N = 4) 'very high' (Australia, Hong Kong, Canada, United Kingdom) and (N = 4) 'low' (Solomon Islands, Haiti, Yemen, South Sudan). Pharmacy professional standards' documents were screened to extract IPC-related themes via a constant comparative method. This facilitated thematic framework synthesis; 'pharmacists' attitudes' and 'patient outcomes' were measures of IPC. Using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), (N = 17) peer-reviewed journal articles from 2010-2019 studying pharmacists in sample countries were selected. Key terms searched on Medline/PubMed databases were: 'IPC', 'pharmacist' and 'professional standards'. Literature was then reviewed with reference to the thematic framework and development

metrics (HDI/GDP/GPI). This study did not require ethics approval.

Results: Of the countries (N = 8) studied, only HDI-classified 'very high' had professional standards' documents, frequently incorporating IPC. Key themes were: 'shared decision-making', 'continuity-of-care', and 'effective communication'. Seven studies referred to these themes and confirmed IPC benefits: fewer medication-related errors[4]. The number of IPC standards and HDI-rank for 'very high' countries, except Hong Kong, were positively correlated, suggesting possible economic impact on pharmacy sector progress. Two studies found cultural influences on Hong Kong pharmacists' attitudes as contributory to a hierarchical than IPC-approach to healthcare provision[5]. HDI and GPI had a strong negative correlation (r = -0.83), potentially explaining low pharmacist density and GDP healthcare expenditure in HDI-classified low.

Conclusions: Results denote that IPC improved patient safety (Gregory, & Austin, 2016). Global differences existed in pharmacists' attitudes and IPC training. These correlated with growing gaps in HDI and GPI between HDI-classified 'very high' and 'low' countries. Qualitative analysis highlighted the need for elaboration of 'continuity-of-care' and inclusion of 'understanding roles/responsibilities of team members' in the United Kingdom's professional standards set by the General Pharmaceutical Council. Future work could study 2021/inequality-adjusted HDI data, 'high'/'medium' HDI countries to improve validity alongside COVID19 impact on GDP and pharmacy practice.

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One recipe at a time: Evaluating an innovative teaching kitchen to create positive health outcomes

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Introduction: Noncommunicable diseases (NCDs) are the leading causes of death and disability globally. NCDs create a long-term impact on a country's productivity, competitiveness, fiscal strength, healthcare utilisation and public health outcomes. As a result, socioeconomic development, individual and household quality of life (QOL) is hindered both in developed and developing countries. Creative, easily adaptable approaches are needed to improve the key viability drivers of a country.

With life expectancy increasing coupled with increasing rates of childhood obesity due to physical inactivity, environmental factors and family dynamics changing. It is imperative to promote innovative new strategies to tackle the increasing rates of NCDs and associated unfavourable outcomes.

A teaching kitchen, led by a pharmacist and culinary chef utilising in-person and virtual/online class sessions for youth and adult age (5+ YOA) populations in tandem with national/federal programmes focusing on health education and culinary nutrition is an approach to improve health care costs, utilisation, QOL measures through informed health literacy, health outcomes, NCD prevention, management, and treatment.

Objectives: Can a teaching kitchen with a programme curriculum focused on motivational interviewing, NCDs monitoring/prevention, diet related health and nutrition education improve participant health outcomes?

The health and culinary education cooking programme was developed to empower participants with a multi-sensory approach to modifying risk factors associated with diet related illnesses and chronic diseases. With a target audience focus on minority, underserved communities within Central Florida.

Methods: The yearlong in-person observational study that started in October 2021 analyses the participants' (ten persons, 18+ YOA) medication usage, change in weight, biomarkers (i.e., blood pressure, glucose), behavioural habits including food shopping patterns and healthy food consumption. The class curriculum is offered once weekly classes and the curriculum highlights monthly health awareness observances, health literacy, chronic disease education/monitoring, primary, secondary and tertiary prevention strategies. Participants have their blood pressure and weight recorded at each class session. Culinary instruction was developed to be hands-on, culturally sensitive, healthy meals that were easily accessible at local food markets with a goal to challenge fast food menu costs.

Each class session concluded with handouts of the day's topic with meal recipe, credible resource information, weekly follow-ups to help guide participants in between classes and access to exercise fitness and wellness membership subscription. Participants were given evaluation assessment surveys examining health literacy and food habits at pre-, mid- and post- programme implementation.

Results: Within the first six months of study observation; preliminary data results have shown all participants recording favourable change in biomarkers, reduction of A1c levels (i.e. 2 point reduction), medication usage and frequency (TID to BID or QD), goal blood pressure, weight

and BMI levels including positive behavioural/shopping patterns and improved healthy food consumption frequency amongst participants with extension to their families.

Conclusions: A teaching kitchen headed by a healthcare provider and culinary expert is a feasible approach to improving patient and public health outcomes. Broader aspects of the programme include expansion of health education internationally (i.e. Caribbean), collaborating with fellow public health officials and key stakeholders to serve more communities of need.

Therapy-related determinants of medication non-adherence: A systematic review protocol

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Introduction: Medication non-adherence is a complex and multifactorial problem which places a significant cost burden on healthcare systems. According to the World Health Organisation, determinants of non-adherence can be classified into five dimensions, which include: patient-related factors, clinical condition-related factors, socioeconomic factors, therapy-related factors and healthcare system-related factors. Despite the availability of studies on medication adherence determinants, conflicting evidence exists specifically on therapy-related determinants (e.g., drug frequency, drug regimen, side effects, time since diagnosis, time since treatment) and their association with medication non-adherence.

Objectives: The proposed systematic review aims to synthesise the most recent evidence on determinants of medication non-adherence, specifically the ones which belong to therapy-related factors.

Methods: A systematic review will be performed and reported according to PRISMA guidelines. PubMed, EMBASE, Web of Science, Cochrane and PsycINFO will be searched using a predefined search strategy. Studies will be included in the review if available in English full text. Titles and abstracts will be screened and full text articles will be screened by two independent reviewers. Inclusion and exclusion criteria will be applied to select eligible articles and a methodological quality assessment will be conducted. Data extraction will be done using a predefined extraction structure.

Results: The database search is being conducted. It is expected that full-text screening will be completed in July 2022. The following outcomes will be reported: therapy-related determinants of medication non-adherence, identified among the most recent scientific research.

Conclusions: The expected outcomes from this systematic review include the determinants of medication non-adherence, particularly the therapy-related ones. Different factors associated with the therapy may be identified. This study will provide clear evidence that medication adherence is affected by multiple modifiable therapy-related determinants. Therefore, numerous interventions may be performed by different healthcare professionals to improve medication adherence.