CONFERENCE ABSTRACTS

Abstracts 13th PCNE Working Conference "Pharmacies' new roles in pharmaceutical care: bridging research and practice"

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Oral presentations

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Quantifying problematic prescribing cascades

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Background A prescribing cascade (PC) occurs when a medication causes an adverse drug reaction (ADR) which is seen as a new condition and treated with another medication. A PC is problematic when this combination has more risks than benefits for the patient.
Purpose To address or prevent problematic PCs, insight is needed in their occurrence. Our aim was to identify and quantify the occurrence of problematic PCs.
Method A mixed-methods study was conducted, starting with a literature review and an expert assessment to identify problematic PCs. Next, a Prescription Sequence Symmetry Analysis (PSSA) was performed for quantification, calculating the sequence ratio (SR) for patients receiving an index medication (causing the ADR) after a marker medication (proxy for the ADR) versus a marker after an index medication. These were adjusted for trends (aSR). Ncontrol provided Dutch dispensing data from 2015 until 2020.
Findings Sixteen experts -pharmacists and physicians from primary and secondary care- assessed 85 PCs from literature, 67of which were assessed 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 43 (64%) PCs. This concerned more than 60,000 out of 423,000 incident users, with a mean age of 68 years. Of the 43 PCs, the aSR was between 1–1.5 for 19 PCs and > 1.5 for 24 PCs. The highest aSR was 5.12 [95% CI 54.41–5.83] for lithium (index) inducing parkinsonism, followed by dopaminergic medication (marker), based on 59 incident users. ACE-inhibitors (index) inducing urinary infection, followed by antibiotics, showed the most (33,563) incident users.
Conclusion Out of 67 problematic PCs, 43 had a significant association. This indicates that more awareness is needed for such PCs in clinical practice. More should be done to prevent that ADRs are treated as medical conditions and to reduce unneeded medication.

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Can community pharmacists be elderly patients' bridge to deprescribing? A cross-sectional study

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Background Elderly adults are often burdened with multimorbidity and polypharmacy. Deprescribing has been suggested as tool to manage inappropriate polypharmacy and improve outcomes. Understanding how patients feel about medicines and how they perceive pharmacists' involvement in deprescribing, can help identify candidates more willing to accept this intervention.
Purpose Explore how elderly adults perceive community pharmacists' involvement in potential deprescribing.
Method Community pharmacists while dispensing medicines, approached patients 65 years and older, using at least one medicine, if they wanted to participate in the study using a questionnaire. Data was collected in three regions of Croatia (rural Slavonia, coastal Dalmatia, and urban Zagreb) in 2020. Questionnaire consisted of three parts: sociodemographic questions, the revised Patients Attitudes Towards Deprescribing questionnaire (rPATD), and questions about patients' opinions on pharmacists' involvement in deprescribing. The last five questions explored how comfortable patients would be if pharmacists were involved in deprescribing, if pharmacists had enough knowledge and skills to suggest deprescribing, preferred method of follow-up, and which medicine they would or would not be willing to stop taking.

Findings Data was collected for 194 elderly patients, of whom 62.90% were female. Patients had a median age of 76 years (IQR 69–80) and used a median of 5 medicines (IQR 3–7). Even though 86.08% of them were satisfied with their medicines, 87.11% of them would be willing to stop one or more. The majority of patients (70.10%) believe their pharmacist has enough knowledge and information about their medicines to suggest deprescribing, and 70.60% of patients would feel comfortable if their pharmacist were involved in the process of deprescribing. Patients from rural Slavonia were more likely to state they are willing to stop their medicines than patients from urban Zagreb or costal Dalmatia (59.46%, 31.09%, and 23.68% respectively), $\chi 2$ (8) = 21.054, p = 0.007. Patients from coastal Dalmatia (18.42%) were more likely to state that they would feel uncomfortable if a pharmacist was involved in deprescribing then patients from urban Zagreb or rural Slavonia (12.61% and 5.41% respectively), $\chi 2$ (8) = 16.899, p = 0.031. Patients who stated they were willing to have medicines deprescribed were also more likely to state the specific medicine from their pharmacotherapy they are willing to stop taking, than patients who did not (34.91% vs. 7.14%) ($\chi 2(2)$ = 7.328, p = 0.026).

Conclusion Elderly patients have a positive opinion on pharmacists' involvement in potential deprescribing. Those from rural areas, or those with greater involvement in pharmacotherapy could be priority for pharmacists to initiate conversation on deprescribing.

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Development of quality indicators to measure quality of medication handling in municipalities

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Background Studies have shown that community pharmacies can contribute to strengthening medication handling in municipalities by providing relevant teaching and other pharmacy services to staff at nursing homes, home care and residential facilities about how to work safely with medication handling. A Danish study is being conducted to strengthen the implementation of this teaching and pharmacy services. As part of the study a set of quality indicators has been developed.

Purpose The purpose of this part of the study is to develop and test a set of quality indicators to measure the quality of medication handling in municipalities to be used by pharmacies and municipalities to support preparation and practice-orientation of teaching and other pharmacy services about working safely when handling medication for municipal staff.

Method The indicators were developed in four steps: 1) Collecting literature on already developed indicators, issues and legislation related to medication handling; 2) Having a dialogue with a nurse responsible for medication at a nursing home to get an insight into the medication workflow; 3) Testing and adjusting the set of indicators at the same nursing home; 4) Testing and adjusting the set of indicators by a community pharmacy at a residential facility. Testing of the indicators at a larger scale is being carried out in 20 municipalities by 20 community pharmacies from November 2022 to April 2023, with a before and after teaching measurement to access sensitivity of the indicators for changes in the quality of medication handling. The measurements are registered electronically in Microsoft Forms. The data will be analysed quantitatively. After the testing in April 2023, the community pharmacies will answer a survey on the use of the indicators and data will be analysed qualitatively.

Findings Of the six indicators developed, two relate to municipal institutions' procedures (structure indicators), one is a process indicator for the medication list, one is a process indicator for dispensing medication and two are process indicators for medication administration. The measurement will be conducted by community pharmacy staff at a visit to at least one institution in the municipality, e.g. a nursing home. The indicators ready for test in a larger scale will be presented in more details at the conference.

Conclusion A set of six quality indicators, both structure and process indicators, to measure the quality of medication handling in municipalities was developed to be used by pharmacies and municipalities to support preparation and practice-orientation of teaching and pharmacy services.

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European cross-border ePrescription service: Estonian and Finnish pharmacists' first experiences with pharmacist-patient interaction and safe use of medications

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Background The European cross-border ePrescription (CBeP) system was first implemented in January 2019 when it became possible to purchase prescription medications from community pharmacies in Estonia using a Finnish ePrescription. As of November 2022, six European countries have joined the CBeP system with more to follow. This is one of the first studies to examine the practical experience with CBeP service.

Purpose To investigate the experiences of Estonian and Finnish pharmacists with CBeP regarding pharmacist-patient interaction and safe use of medication.

Method An electronic survey was forwarded to community pharmacies with experience of CBeP dispensing in Estonia (n = 289) and in Finland (n = 375). Descriptive statistics and content analysis were used to analyse the data.

Findings In total, 84 responses from Estonian and 154 responses from Finnish pharmacists were included in the study. Majority of Estonian (61%) and Finnish (73%) respondents had never had any problems with identifying the patient. Those who encountered obstacles in confirming the identity of the patient, had most often had problems with interpreting the identity document. Nearly all respondents considered the CBeP system safe from the standpoint of personal data protection. More than 50% of the respondents informed the patients about the processing of personal data. Those who did not or who did so but rarely, brought up language barrier as the main reason. Of Estonian respondents, 80% and of Finnish respondents, 66% considered the use of medications dispensed with CBEPs to be either 'somewhat safe' or 'safe'. More than 80% of the respondents agreed that it is important to provide medication counselling to the patients with CBeP. However, approximately 70% of the respondents had encountered problems with counselling the patients due to language barrier. Moreover, approximately the same proportion of respondents reported having difficulties with medication counselling because of dosage instructions being in a foreign language. In addition, 56% of Estonian and 62% of Finnish respondents faced problems with monitoring the drug interactions when dispensing a medication with CBeP.

Conclusion The pharmacists were able to identify the patients and inform them about the processing of personal data mostly without any

problems. The pharmacists considered the use of medications dispensed with CBeP to be safe. However, disruptive factors such as language barrier and problematic drug interaction monitoring may not support safe use of medications.

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Implementation of pharmaceutical care in daily practice in South-eastern Europe Health Network (SEEHN) member states

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Background The South-eastern Europe Health Network (SEEHN), a regional intergovernmental organisation, and the European Directorate for the Quality of Medicines and HealthCare (EDQM), a Directorate of the Council of Europe, are committed to contributing to improve the health of their member states' (MSs) populations.

Purpose To promote Resolution CM/Res(2020)3 on the implementation of pharmaceutical care and support its use in MSs, a joint EDQM-SEEHN survey was conducted to map the implementation of pharmaceutical care and related services in daily practice in SEEHN MSs (Albania, Bosnia and Herzegovina, Bulgaria, Moldova, Montenegro, North Macedonia, Romania, Serbia).

Method The survey was distributed using a web-based application to SEEHN National Focal Points with in-depth knowledge of health policy developments. Questions covered the concept of pharmaceutical care, its implementation in daily practice, pharmaceutical care services available in community and hospital pharmacies, and barriers to the implementation of pharmaceutical care. Responses were collected over a 12-week period. Quantitative data were analysed in percentages and thematic analysis was used for qualitative data (free-text questions).

Findings Seven of eight countries completed the survey (response rate: 87.5%) and eight answers were included in the analysis, including two from the two federal entities of Bosnia and Herzegovina. These are the major findings: a) 50% of respondents are familiar with Resolution CM/Res(2020)3 and 37.5% said it had been translated it into the national language. b) The concept of pharmaceutical care is familiar to 62.5% of respondents and included in legal documents (25%) and in guidance documentation developed by healthcare professionals' (HCPs) associations (50%). c) Electronic Health Information Exchange between HCPs is more commonly used in hospital pharmacies than community pharmacies (75% versus 25%). d) The pharmaceutical care process is not fully implemented in SEEHN MSs. No activities are remunerated in hospital pharmacies and one country remunerates them in community pharmacies. e) Pharmaceutical care services are mostly available in community pharmacies; reimbursement is lacking in all countries. f) Major barriers to the implementation of pharmaceutical care are the absence of regulations or healthcare policy, lack of data on the proven benefit, lack of computerised systems and/or IT tools, and lack of access to patient medical records.

Conclusion In conclusion, wider dissemination of Resolution CM/Res(2020)3 and promotion of the pharmaceutical care concept is needed in SEEHN MSs. A first step could be to disseminate these results among relevant stakeholders and policy makers, and to develop a roadmap with all parties to help remove some of the barriers identified.

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Effect of an intake aid with reminder function on timing adherence to DOAC in stroke patients—a randomised cross-over trial

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Background Patients with atrial fibrillation and a recent ischaemic stroke are at high risk of recurrence. While direct oral anticoagulants (DOAC) are effective in secondary stroke prevention, these agents have short half-lives and low adherence has been associated with worse outcomes.

Purpose We investigated the effect of an adherence-enhancing intervention on timing adherence to DOAC in patients with a recent stroke.

Method We performed a randomised cross-over study (MAAESTRO; NCT03344146) including patients with atrial fibrillation who were hospitalised for ischaemic stroke at the University Hospital Basel, Switzerland. After hospital discharge, patients used an electronic device to measure adherence to DOAC for 12 months. We randomized participants after 6 months of observation to use an intake aid either with (group 1) or without (group 2) an acoustic and visual alarm as intake reminder for 3 months, followed by cross-over between the groups for further 3 months. The main study outcomes were i) patients [%] with 90%-timing adherence (taking $\geq$ 90% of prescribed doses within a pre-set grace interval), ii) patients [%] with 90%-taking adherence (taking $\geq$ 90% of prescribed doses), and iii) overall taking and timing adherence [median]. Mixed-effect logistic models were used for statistical analyses. Clinical events were descriptively reported.

Findings We recruited 130 participants between January 2018 and April 2022, of whom 84 were included in the analysis (mean [SD] age 76.5 years [9.1], 39.3% women, median [IQR] National Institutes of Health Stroke Scale Score 1 [0–2], indicating minor stroke severity). Reminder use significantly improved adherence to DOAC, with a 2.7-fold higher probability of achieving 90%-timing adherence (6% patients without reminder vs 18% patients with reminder; OR 2.65; 95% CI 1.05–6.69; $p = 0.039$), and 90%-taking adherence (6% patients without reminder vs 20% patients with reminder; OR 3.06; 95% CI 1.20–7.80; $p = 0.019$). Overall timing adherence increased from 92% [IQR 81–97] without reminder to 96% [IQR 85–98] with reminder, as did overall taking adherence (median [IQR] 94% [83–98] without reminder vs 97% [90–99] with reminder). Nine patients suffered ischaemic events during the study (eight recurrent strokes, two myocardial infarctions), whose timing adherence during the observational phase were in the lower range (mean [SD] 77% [17] with event vs 85% [17] without event).

Conclusion The use of an intake reminder significantly enhanced adherence to DOAC in stroke patients. Offering intake aids with reminder function in patients with recent stroke may be justified to improve their adherence to DOAC and might reduce recurrent ischaemic events.

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Barriers and facilitators to implement a service for pharmacists prescribing in Switzerland

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Background Expanding pharmacists' responsibilities is one of the measures adopted in Switzerland and other countries to face the shortage of general medical practitioners (GPs) and health care system rising costs. In 2019, the Swiss Therapeutic Products Act was revised to allow pharmacists prescribing (medication supply without prescription on the pharmacists' own responsibility). Pharmacists prescribing is one of the new roles for community pharmacists in pharmaceutical care, however its implementation is lacking and factors that influence it need to be understood.

Purpose (1) To identify the factors (barriers and facilitators) for the implementation of pharmacists prescribing in community pharmacies and (2) to evaluate the interventions developed by the cantonal pharmacy associations in the French-speaking part of Switzerland to support implementation.

Method A different methodology was used for each objective: (1) semi-structured interviews with community pharmacists who had been practicing for at least one year in a pharmacy in the French-speaking Switzerland. The interview guide was developed using the Consolidated Framework of Implementation Research (CFIR) and piloted. Data was recorded and transcribed, thematic analysis was undertaken assuring intercoder reliability. (2) A five-item ad-hoc questionnaire developed by a group of experts was submitted to each board of the six cantonal pharmacy associations: Vaud, Fribourg, Jura, Valais, Geneva and Neuchâtel, by email.

Findings Ten community pharmacists were interviewed (last interview without new codes) and the main barriers found were non-reimbursement by the compulsory health insurance, irrelevance of the drugs included (i.e. not first-line therapy) and/or of their dispensing conditions (i.e. requirement of an initial prescription), negative perception by GPs and lack of pharmacists' time. The main facilitators mentioned were availability of information and knowledge related to the prescribing medication, being part of a chain or group of pharmacies, avoidance of medical consultations, proximity and accessibility provided by the service. One questionnaire was answered by the board of five cantonal associations, who showed different interventions for the implementation related to training and documentation. However, none of them had developed interventions towards policy nor communication strategies with patients and/or GPs.

Conclusion The factors influencing the implementation of pharmacists prescribing were described, highlighting the most frequently mentioned. In addition, the different involvement of each cantonal pharmacy association for the integration of the pharmacists prescribing into daily practice was shown. The study is a first step to increase the implementation of the pharmacists prescribing in community pharmacy in French-speaking Switzerland as it will allow the development of targeted interventions.

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Health outcomes of patient-centered medication review interventions. Preliminary results

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Background In recent years, the geriatric population has increased by 29%. This has led to an increase in multiple pathologies, frailty, polypharmacy, health costs, adverse events and mortality. Thus, there is a broad international consensus that integrated, person-centered care should be promoted.

Purpose The main objective was to evaluate the efficacy of intervention in optimizing medication in geriatric patients with polypharmacy through the application of the person-centered care model. The secondary objectives were to evaluate the safety and continuity of interventions carried out.

Method A multicentered controlled clinical trial. 12 Primary care teams were randomized (1:1 ratio). Patients $\geq$ 75 years old with $\geq$ 8 drugs prescribed were included. In the intervention group, the multidisciplinary team (primary care pharmacist, family doctor and nurse) carried out multidimensional structured reviews (frailty, clinical complexity, morbidity and therapeutic adequacy) of the patients, and the proposed changes were agreed with the patient. Follow-up visits were scheduled at 6 and 12 months. In the control group, the standard clinical practice by nurses and/or the family doctor was carried out. The main outcomes were the change in the mean number of prescribed medications, potentially inappropriate medications, hospital admissions and deaths. Secondary outcomes were the mean number of medication-related adverse events resulting from the intervention and changes in the treatment plan.

Findings Preliminary results are based on the sample (40 subjects in the control group and 31 in the intervention group) that have finished the follow-up period. No significant differences were observed between the two groups in the sociodemographic variables. Significant differences between groups were observed with the main outcomes: 3.9 points in the mean number of medications, and 3.6 points in the variation of the number of potentially inappropriate medications. However, there was no significant differences in the number of hospital admissions and deaths. Regarding secondary outcomes, the mean number of changes produced in the therapeutic plan was 4.6 ($\pm$ 3.4) in the intervention group while in the control group no changes were made. 15 incidents caused by changes in medication were recorded in the intervention group but none of them caused serious harm in patients and in the control group 3 adverse medication events that required urgent attention.

Conclusion Interventions at this time seemed to be efficacious, to optimize the use of medications in geriatric patients with polypharmacy, although no differences were observed about the number of hospital admissions and deaths. We hope to achieve more ambitious results at the end of study.

Poster abstracts

PCNE abstract number 576

Medication adherence assessment in patients with rare diseases—a scoping review

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Background Medication adherence (MA) is a key factor in the achievement of therapeutic goals for patients with rare diseases (RDs). Collecting and analyzing the existing information on different aspects of MA would bring value for better and adequate support to this specific group of patients.

Purpose To critically appraise, consolidate and present an overview of the scientific literature focused on MA assessment methods, influencing factors and interventions that can support patients with RDs to improve MA. The findings could be informative about the available approaches and the most studied aspects of MA in the selected group of patients.

Method A scoping review was performed. The sources searched were PubMed and Google Scholar with no limit on date. A specific combination of keywords was used: medication adherence OR compliance, AND interventions OR methods, AND assessment OR evaluation, AND rare diseases AND orphan medicines OR orphan drugs. A number of inclusion and exclusion criteria were defined: studies were not excluded by publication date and type of study design. We included only English-language articles focused on methods for assessment and improvement of MA in RDs and MA importance. Studies that presented other aspects of RDs treatment and monitoring without considering MA were excluded.

Findings Out of 167 screened paper, 9 were included. Twelve more studies met the criteria and were analyzed. The patients' groups varied regarding the type of RD: growth hormone deficiencies (n = 3), cystic fibrosis (n = 2), type 1 Hereditary Tyrosinemia (n = 2), acromegaly (n = 2) etc. Most studies were systematic reviews (n = 5), followed by cross-sectional studies (n = 4) and quantitative, descriptive, national cohort surveys using claims data (n = 4). The main observed aspects related to MA were the level of adherence and the influencing factors. No specific recommendations for MA improvement were given in most of the studies. Both objective (n = 1) and subjective (n = 21) methods were applied to assess the level of MA. Morisky scale and other questionnaires were the most commonly used subjective methods followed by the objective methods (dose counts, pharmacy records). The level of MA varied in different studies based on the type of therapy and RD: between 44.8% and 92.1%.

Conclusion Considering the variation in MA levels, most of the authors highlighted the need for improvement of MA in patients with RDs. Development and implementation of government-supported programs and other diseases-specific methods, involving various medical specialists, are needed. FUNDING: The Bulgarian National Science Fund approved and financed the study (No. КП-06- 361 КОСТ/6/14.06.2022).

PCNE abstract number 579

Identifying patients at high risk for drug-related problems: preliminary results of the MediPORT-study

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Background Prioritizing pharmaceutical care is needed to make pharmaceutical service more efficient and available for high-risk patients. Little is known about risk factors associated with drug-related problems (DRP) of patients in hospitals.

Purpose The aim of this study was to identify objective and easily ascertainable factors correlated with DRP in patients undergoing elective surgery. Results contribute to the development of a Pre-Operative Risk-prediction Tool for medication review (MediPORT) at hospital admission.

Method The study was a retrospective, single centre case control study. Patients $\geq$ 18 years, participating in a medication review (PCNE type 3) and undergoing elective surgery in 2021 were included. The sample size was calculated to reach a representative sample out of a defined study population (n = 1500), considering 5% precision and 95% CI. Outcome measures were defined on the basis of a focused literature review and of applicability on real clinical practice data. Frequencies, ranges, means and SD were used for descriptive analysis. The χ2-test, Mann–Whitney-U-Test and two sample t-test were used to measure differences in the prevalence of sociodemographic and clinical parameters in the presence of DRP. Variables were explored via binary logistic regression. Analyses were performed with IBM SPSS statistics V.27. The study protocol was approved by the local ethics committee of Salzburg County, Austria (ID: 1158/2021) and was registered in the German Clinical Trials Register (DRKS00028763).

Findings According to the literature review, age, allergies, Body Mass Index (BMI), the calculated Carlson Comorbidity Index (CCI) and gender were chosen as primary outcome factors. Overall, 460 participants consisting of 169 cases (defined as patients with at least one DRP identified by pharmacists) and 291 controls (defined as patients without any detected DRPs) were analysed. Mean age of participants was 59.9 years ($\pm$ 18.87). Most individuals were men (55.1%) and persons without allergies (66.1%). Mean index of chronic conditions was 1.76 ($\pm$ 2.11) and mean BMI was 26.6 kg/m2 ($\pm$ 5.59). Age showed a positive association with the occurrence of allergies ($p = 0.010$). Preliminary results of the adjusted model indicated that age and the calculated CCI were associated with a higher risk of DRP. However, these should be interpreted as associations rather than determination of causal relationships.

Conclusion Risk factors for the appearance of DRP in patients undergoing elective surgery could be identified. Measures appear to be easily assessable in clinical settings and are a promising approach for the development of the MediPORT-tool.

PCNE abstract number 580

Evaluation of impacts of a structured counseling approach on pharmacy students' communication confidence and skills: A mixed-mode research

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Background Using standardized instructional methods to teach communication skills in pharmacy education is strategic to ensure high instructional quality and accountability. We provided pharmacy students with a 5-step structured counseling approach to reinforce their ability to practice counseling on over-the-counter (OTC) medications.

Purpose This study engaged senior pharmacy students in applying a structured approach to counseling on over-the-counter medications during advanced experiential training. By using a mixed-mode assessment technique, we aimed to evaluate the impact of this approach on pharmacy students' confidence and skills in counseling on over-the-counter medications.

Method The structured counseling approach (SAIDS) comprised five elements: (1) Surfacing Symptoms and medication history, (2) inquiring Allergy, (3) providing medication Indication, (4) Directing correct medication use, and (5) Supporting Self-care. During six-week Advanced Community Pharmacy Practice Experiences (ACPPEs), each student provided consumers with conventional counseling and SAIDS approach on OTCs during the first three and the last three weeks, respectively. Consumer participants were recruited at six community pharmacies in Taiwan between 2020 and 2022. Self-administered questionnaires were deployed to assess consumers' understanding of OTC use and to evaluate students' confidence and skills in the provision of OTC counseling.

Findings One hundred and fifty-nine customer participants received conventional counseling while 133 individuals got SAIDS counseling services. Consumers receiving the SAIDS medication counseling showed a significant understanding of the cautions needed to pay attention to the OTCs they purchased ($p < 0.001$). Thirty-one pharmacy students participated in the study and reported significantly improved confidence ($p < 0.001$) in OTC counseling during the 6-week ACPPE. They indicated the ACPPE provided them with opportunities to practice medication counseling independently ($p = 0.023$). The qualitative findings showed the SAIDS helped students prompt questions to understand consumers' needs, recommend proper OTCs, and provide relevant information to OTC counseling. The students mentioned the SAIDS approach directed them to empathize with consumers' discomfort, provided shared decision-making, completed the counseling loop, and empowered consumers' self-medication. Students also pointed out consumers may not reconcile conflicting information from different channels or lack knowledge of ailments. The SAIDS approach allowed students to engage consumers in conversation to clarify key information on OTC use.

Conclusion Pharmacy students reported enhanced confidence in OTC counseling and improved consumers' understanding of OTC use under the structured SAIDS approach. Using a structured counseling approach to involve pharmacy students in OTC counseling is viable to cultivate their communication skills to assist the public in using OTC safely and effectively.

PCNE abstract number 584

Exploration of pediatric adverse drug reactions in Taiwan: illustrated by antibiotic- and anticonvulsant-associated liver injury

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Background Drug-induced liver injury (DILI) is an adverse reaction to medications that lead to expected or unexpected hepatotoxicity. Most DILIs in pediatrics are caused by treatment with antibiotics or anticonvulsants, while the pattern of DILI in pediatrics remains unclear in Taiwan.

Purpose The study aimed to evaluate drug class, pattern, and risk of DILI among pediatrics in Taiwan.

Method A retrospective analysis of the data, from May 1998 to July 2017, archived in the Taiwan National Adverse Drug Reactions Reporting System was performed. The Standardised MedDAR Queries (SMQ) was applied to obtain suspected DILI cases. The data were analyzed descriptively. We used disproportionality analysis and presented reporting odds ratio (ROR) to compare individual antibiotic or anticonvulsant DILI reports with respective antibiotic or anticonvulsant non-DILI reports.

Findings A total of 484 (2.8%) suspected DILI cases out of 17,248 reports were identified, comprising 214 drugs. Suspected DILI cases were 8.0 years old (SD: 6.1; 0–18 years), predominantly girls (52.9%; boys 39.7%), and reported mainly by health professionals (71.9%). These suspected DILI cases were mainly (74.0%) designated as serious, including death, life-threatening, caused or prolonged hospitalization, and other serious adverse reactions (medically important). The most frequently observed drug classes were antibiotics (23.0%) and anticonvulsants (7.9%). Oxacillin (20.7%; ROR 5.33; CI 3.14–8.78; p-value < 0.001), isoniazid (9.0%; ROR 23.77; CI 8.83–67.92; p-value < 0.001), and rifampicin (9.0%; ROR 13.97; CI 5.71–33.48; p value < 0.001) ranked top three for antibiotics DILI. All three antibiotics were shown to be associated with DILI significantly under disproportionality analysis. Phenobarbital (31.9%), valproic acid (26.3%), and phenytoin (23.7%) were the most frequently reported anticonvulsant DILI. However, only the ROR (3.23; CI 1.39–7.02; p value = 0.008) of valproic acid truly demonstrated statistical significance.

Conclusion The DILI in pediatric is rare but serious. Among common culprit antibiotics and anticonvulsants, oxacillin, isoniazid, rifampicin, and valproic acid pose greater risks for pediatric DILI and deserves clinicians' special attention in patient care.

PCNE abstract number 585

Facilitating implementation of medication reviews in the community pharmacy setting: an application of the Implementation Research Logic Model

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Background Previous research has identified both determinants and potential strategies to facilitate implementation of medication reviews (MR). A conceptual model which links determinants, strategies to support implementation and mechanisms of change to execute

implementation, with projected outcomes is helpful to plan the approach and facilitate MR-implementation.

Purpose The aim of this research was to apply the Implementation Research Logic Model (ILRM) for the implementation of medication reviews in the German community pharmacy setting, and thus illustrate the links between determinants, strategies, and implementation outcomes. The resulting map is meant to inform and facilitate MR-implementation.

Method The IRLM was populated with determinants (barriers and facilitators structured using the Framework for Implementation of Services in Pharmacy, FISpH), proposed strategies (according to the Expert Recommendations for Implementing Change, ERIC) and mechanisms of change which were identified in an interview study with 21 German pharmacy owners. The research team linked these with 8 implementation outcomes derived from Proctor: acceptability, adoption, appropriateness, cost, feasibility, fidelity, penetration, sustainability.

Findings Twenty strategies from the interview study were mapped against 32 determinants. All strategies were hypothesised to impact on one or several of the 8 implementation outcomes. Depending on pharmacies' implementation stage (exploration, preparation, implementation, and sustainment) the importance of strategies was expected to vary. Strategies such as educational meetings and learning collaboratives can increase perceived appropriateness and boost adoption of MRs which is particularly important for pharmacies in the early exploration stage. Strategies such as receiving support from external implementation advisors as well as recruiting and training internal implementation leaders were deemed particularly important for pharmacies at the preparation stage to strengthen feasibility and fidelity. In later stages (implementation and sustainment) pharmacies were thought to benefit from provision of clinical feedback, obtaining and using patient feedback and re-examining implementation to achieve high fidelity, penetration, and sustainability of MR-provision. Some strategies such as fixed payment and stable delivery contracts were deemed pre-requisites for implementation irrespective of the stage the pharmacy was at.

Conclusion The application of the Implementation Research Logic Model illustrated the relations between determinants, strategies, mechanisms, and implementation outcomes. Future research is needed to ascertain that strategies work as planned and achieve the projected implementation outcomes.

PCNE abstract number 586

Pregnancy prevention while using oral retinoids: a questionnaire survey in Denmark

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Background The use of oral retinoids during pregnancy is associated with teratogenic effects and malformations in newborn babies. The European Medicine Agency (EMA) provided recommendations regarding the restrictive use of oral retinoids during pregnancy in 2003, and updated these recommendations in 2018 by introducing a pregnancy prevention program (PPP).

Purpose This study aimed to investigate the awareness of oral retinoid teratogenicity and the adherence to the PPP by physicians, pharmacists and patients in Denmark.

Method As part of the EMA initiated multi-country survey, web-based questionnaires were distributed among Danish dermatologists and general practitioners, community pharmacists, and women of childbearing age, who were not pregnant and were using or had used oral retinoids within the past five years. Questionnaires were distributed via respective professional and patient organizations' social media.

Findings Convenient samples of 62 physicians, 96 pharmacists, and 50 oral retinoid using women responded to their questionnaires; 95%, 100%, and 98%, respectively, were aware of the teratogenic risks of oral retinoids. For physicians, the most applied PPP measures were the usage of the patient (44%) and the healthcare professional (19%) guides, while the least applied measure was signing medication risk form (3%). The majority of the physicians discontinued oral retinoids in women who wanted to become pregnant (90%). Performing pregnancy tests and monthly follow-ups with women using oral retinoids were practiced by appr. two thirds of the physicians. Among the pharmacists, the warning sign on the outer medication package was the most used measure (45%), the other measures showed a use of 12.0% or lower; 79% of the pharmacists often or always provided information about the importance of effective contraception when dispensing oral retinoids, and 74% advised women to contact their prescriber if they suspected being pregnant. Among the women, a majority (90%) had read the patient information leaflet included in the medication package and 72% discussed the use of contraception with their healthcare provider, while risk awareness forms and patient cards were seen by only few.

Conclusion The study showed that in Denmark physicians, pharmacists and medicine users are aware about the teratogenic effects of oral retinoids. Adherence to pregnancy prevention measures varied considerably for different measures, suggesting a lack of access or unwillingness to use the measures that require patients' signatures. Feasibility and accessibility of the PPP measures need to be improved to help increase their adherence and improve the safety of oral retinoid prescribing, dispensing, and use.

PCNE abstract number 587

How medicines are playing out for patients in daily life—a qualitative analysis of drug related problems identified at the pharmacy counter

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Background Up to 80% of patients with chronic illness experience drug related problems (DRPs), which decreases their quality of life and is costly for society. To tackle DRPs, more insights into what they involve is needed. Besides insights measuring the effects of a controlled pharmacist intervention, or pertaining to poly-pharmacy, insights into how all types of patients experience DRPs in their daily life are also needed.

Purpose To holistically investigate the DRPs that patients are experiencing in a daily life context across therapeutic areas and existing DRP categories.

Method The data material in this study was part of a larger study evaluating a new education in patient-centered communication offered to pharmacy staff in Denmark. The extracted data consisted of short written descriptions of DRPs detected during counter conversations when dispensing medicines, as recorded by the pharmacy staff. The content of these stories were subjected to an inductive content analysis to understand the problems patients face with their medicines in daily life as they are happening.

Findings 297 short descriptions made by 28 pharmacy staff members from 11 different pharmacies were analyzed. Results showed that

establishing and maintaining good medication treatment involves considerable efforts from both the patient and the prescriber. Three overall DRP themes were identified. Firstly, problems of actually receiving the medicines were observed. These pertained both to patients not picking up the medicine (for example due to the price or forgetfulness), a missing prescription or lack of prescription renewal, or problems with the medicine distribution system. Secondly, situations with lack of clarity about how to take the medicine were identified. This entailed patients not knowing why to take the medicine, how to administer the medicine or how to coordinate the intake with food/supplementary products. Thirdly, problems with getting satisfactory effects were registered. This included negative experiences with the medicine and concern of future side effect or lack of effect leading to strong worries and undertreatment.

Conclusion DRPs are widespread and impact patients' daily lives practically, emotionally and health-wise. The DRP descriptions in this study clarified fundamental problems with the medicines, which have not been registered using other approaches: Before even considering whether the medicine has the desired effects, it's necessary to ensure that basic conditions are in place, such as a continued supply of medicine and that the patient knows the treatment plan.

PCNE abstract number 588

RetinoidRiskAware Study: AWARENESS AND IMPLEMENTATION OF PHARMACOVIGILANCE MEASURES FOR THE SAFE USE OF ORAL RETINOIDS AMONG PATIENTS, PHARMACISTS AND PRESCRIBERS IN SLOVENIA.

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Background Retinoids are a class of compounds derived from vitamin A. Oral and topical forms are used to treat numerous dermatologic conditions such as severe acne, eczema, psoriasis, and certain cancers. Due to teratogenicity, the use of oral retinoids is contraindicated during pregnancy. In 2018, the European Medicines Agency introduced a pregnancy prevention programme and revised educational materials to ensure that patients treated with oral retinoids are fully informed about the risks and the need to avoid pregnancy.

Purpose To determine patients' and healthcare professionals' awareness of the teratogenic potential of oral retinoids and their adherence to the pregnancy prevention programme in Slovenia.

Method This was a mixed-methods study in which both quantitative and qualitative data were collected and analysed. A cross-sectional web-based survey was developed and conducted among physicians, pharmacists, and female patients receiving oral retinoids. The study is part of the international RetinoidRiskAware study, which was conducted in eight European countries. We are presenting the results for Slovenia in relation to the aggregated study results.

Findings The study included 30 patients (mean age 27 years), 60 community pharmacists, and 35 physicians prescribing retinoids in Slovenia (mainly dermatologists and general practitioners). Awareness of teratogenic risks was high among patients, pharmacists, and physicians (83%, 100%, and 94%, respectively), both in Slovenia and overall. The materials most frequently used by patients were the information leaflet (60%) and the warning symbol on the packaging (50%), the other measures were less known. Pharmacists found the warning symbol on the packaging (78%) most useful. The other measures were used less frequently. Only 17% of pharmacists used the pharmacist checklist when dispensing medications. Among physicians, the risk acknowledgement form was most used (60%), as was the patient reminder card (37%). Most pharmacists (87%) and

physicians (80%) advise on the importance of effective contraception during retinoid treatment. Similar trends in program adherence were also observed in the overall study results. Healthcare professionals in Slovenia reported that the main barrier to adherence to the programme was lack of accessibility to the materials and lack of time for patient counselling.

Conclusion The study shows that awareness of the teratogenic risks of retinoids is high among both patients and healthcare professionals in Slovenia. However, risk minimisation measures are not sufficiently implemented in clinical practice.

PCNE abstract number 590

Interprofessional Education and Collaboration between Pharmacy Technician Students and University College Copenhagen Students

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Background Since 2019, the Danish College of Pharmacy Technicians (CPT) has collaborated with University College Copenhagen (UCC) on a course where the students cooperate interprofessionally. The students from UCC are studying to become nurses, day-care teachers, school and after-school teachers, social workers, psychomotor therapists, or physiotherapists. The UCC students were presented with a challenge concerning a specific patient group at the community pharmacy. To solve the challenge, the UCC students worked in interprofessional groups. The CPT students did not participate in these groups, but they engaged in interprofessional communication in a sparring session, where they gave feedback and discussed the ideas, the different UCC students had developed.

Purpose To identify the kind of learning the students from various educations acquire when they engage in an interprofessional course to discuss and solve health care challenges.

Method Thirteen students from UCC and 43 students from CPT took part in the course and they were all were invited to answer electronic questionnaires. Five (38%) UCC students and 27 CPT students (63%) answered the questionnaires. The Data from the questionnaires was analysed quantitatively in Excel and qualitatively in NVivo version 13. The results were discussed at a workshop where teachers from the CPT and the UCC shared their reflections about the students' learning from working with the challenge.

Findings CPT students scored 5.4 and the UCC students scored 6.0 on average on a scale from 0 to 10, where 10 is the highest, on the question: "How much did working with the challenge contribute to your learning about interprofessional collaboration?". The following themes were found from the students' qualitative answers of the questionnaires and from the workshop with teachers:—CPT and UCC students found it useful to see their role and practice from another perspective—The CPT students' professional identity was boosted in the process—UCC students acknowledged that they would face medicine-related challenges when working with patients—UCC students' knowledge of the pharmacy technician profession varied—Knowing each other's strengths and competencies is important—Developing holistic solutions to the presented challenge was complex—A collaboration across sectors can be beneficial for patients in transition between health care sectors.

Conclusion CPT students and UCC students learned how important interprofessional collaboration is, and that it is beneficial to meet each other during their educations. They learned about their own competencies and those of other professions and how they can complement each other in patient care.

PCNE abstract number 591

Challenges in medication safety experienced by employees and managers in Danish municipalities—a qualitative study

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Background 66% of the registered unintentional accidents from 2017 to 2019 in municipal institutions, such as nursing homes, home care and residential facilities, are due to medicine management according to a report from the Danish Patient Safety Authority. Until now no studies have identified how different municipal employees and managers experience medicine-related tasks, and which challenges they face.

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

Method Semi-structured, in-depth qualitative interviews with two–three municipal managers from ten different municipalities were conducted. Six themes were identified from these interviews, and they were explored by visual storytelling by municipal employees. All interviews were transcribed verbatim before conducting a content analysis using NVivo version 13. The results were presented at a workshop with stakeholders where pharmacy technicians from CP contribution to medication safety in municipalities was discussed.

Findings The following themes were identified from interviews with 27 municipal managers and visual storytelling with 17 municipal employees: 1. Challenges in several steps in the medication process. 2. Compliance with existing procedures and instructions related to medication handling is difficult. 3. Observation of effects and side effects of medicine in patients in nursing homes, home care and residential facilities can be difficult. 4. Medicine during transitions is a challenge. 5. Medicine-related issues in disease-preventing and health-promoting activities at municipal health centres. 6. 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 stakeholders, results were presented, and stakeholders generated ideas on how pharmacy technicians from CP can contribute to strengthen the medication safety in municipalities—such as:—Delivering educational programme on quality and safety in medication handling for municipal employees—A hotline or a contact person service to answer medicine-related questions from municipal employees—Medication reconciliation after transitions.

Conclusion This study identified themes that illustrate the challenges with medicine-related tasks as experienced by municipal managers and employees and generated ideas of how pharmacy technicians from CP can contribute to medication safety in municipalities.

PCNE abstract number 592

Novel screening method to identify patients that benefit from the implementation of a pharmaceutical care intervention in the inpatient setting—a pilot study

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Background Pharmaceutical care interventions show benefits to patients such as improved medication adherence and quality of life. However, pharmacists' availabilities are scarce and therefore, patients who might benefit the most from these interventions should be prioritised.

Purpose The purpose of this pilot study was to test whether the study concept is feasible and accepted by the patients. The study concept consists of three parts, i.e. (i) a screening of the patients at hospital admission, (ii) a pharmaceutical care intervention during hospital stay for selected patients and (iii) a follow-up phone call two weeks after discharge for all screened patients.

Method The admission screening comprised of the Beliefs about Medicines Questionnaire (BMQ-D), the A14-scale for assessment of adherence and individual barriers, as well as self-developed questions on patient activation, complexity of drug treatment, and problems with medication administration. According to predetermined scores, patients were identified as suitable for the intervention. These patients were provided with drug information materials according to their needs. Patients with newly prescribed drugs received a "One-Pager", a patient leaflet in plain language, those with insufficient medication adherence received a patient diary to document drug intake, and those who indicated problems with medication administration were handed leaflets on correct drug handling. Two weeks after discharge, all screened patients were contacted again for a follow-up phone call and asked about their problems with drug administration and satisfaction with the received intervention.

Findings Overall, 44 patients were screened upon admission, wherefrom 36 (82%) were identified as suitable for the pharmaceutical care intervention. Among these, 24 patients actually received an intervention and 11 were reached for the follow-up phone call. Overall, 47 information leaflets were distributed, namely 22 One-Pagers, 9 drug administration leaflets, and 16 patient diaries. During the follow-up call, all but one patient (89%) assessed the information materials as helpful and everyone (100%) thought that the intervention was helpful. None of these patients reported a drug administration problem. From the 20 patients without an intervention, 8 received the follow-up phone call. In this group of patients, one patient reported problems with drug administration (13%).

Conclusion The pharmaceutical care intervention was positively perceived by all patients from the intervention group. Henceforth, the study will enter a next phase to evaluate whether (i) the screening is actually able to identify patients with problems regarding their drug therapy and (ii) if the intervention is suitable to solve these.

PCNE abstract number 593

Identifying possible drug-related hospital admissions in older patients: a comparison of two validated research tools

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Background Drug-related admissions (DRAs)—unplanned hospital admissions where a drug-related problem is either the main cause or a significantly contributing cause—is an important outcome in research areas with a strong link to pharmacotherapy, such as pharmaceutical care. However, great heterogeneity in methods to measure DRAs exists and validated methods are scarce. Researchers may find it hard to choose the most suitable and reliable method to measure DRAs.

Purpose The aim of this study was to assess the agreement and reasons for disagreement between two recently developed and validated research tools to identify possible DRAs in older patients.

Method This study included older patients ($\geq$ 65 years) admitted to one of four internal medicine wards at two hospitals in Uppsala County, Sweden that were participating in an ongoing clinical trial. These patients' unplanned hospital admissions during up to 12 months after index admission, available at the time of this study, were first retrospectively assessed with the OPtimising thERapy to prevent Avoidable hospital admissions in the Multi-morbid elderly DRA Adjudication Guide (OPERAM tool) and then with the Assessment Tool for Hospital Admissions Related to Medications (AT-HARM10). Both tools distinguish between possible and unlikely DRAs. One final-year pharmacy student performed all assessments based on information in the patients' electronic health record, being blinded for the results from the OPERAM tool when using AT-HARM10. Agreement was defined as the percentage of admissions that had the same result with both tools. McNemar's test was used to test difference in agreement between the tools. Reasons for admissions with disagreement between both tools were discussed with a senior researcher.

Findings In total, 308 hospital admissions of 258 patients were assessed. The OPERAM tool and AT-HARM10 resulted in 49% (151/308) and 48% (149/308) possible DRAs, respectively. The agreement between the tools was 95% (294/308), with no difference between the tools ($p = 0.057$). Reasons for differences were ambiguous patient cases, a lack of updated evidence-based recommendations in the OPERAM tool, and implicit assessment by the researcher using AT-HARM10.

Conclusion Both tools had a high level of agreement and can used to distinguish between possible and unlikely DRAs. The main limitation of the OPERAM tool seems the need to keep it up to date with evidence-based recommendations, whereas AT-HARM10 relies on the implicit assessment of the researchers applying the tool.

PCNE abstract number 595

The implementation of clinical medication reviews in community pharmacies within a multidisciplinary setting: a cross-sectional study

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Background Polypharmacy is common in chronic medication users, which increases the chance of drug related problems. A suitable intervention is the clinical medication review (CMR) that was introduced in the Netherlands ten years ago. The effectiveness might be hindered by limited implementation in community pharmacies. Factors contributing to the lack of implementation were the large number of patients eligible for a CMR, inadequate selection criteria, the time consuming and inefficient review procedure, a lack of collaboration between HCPs and insufficient reimbursement.

Purpose To get insight into the current implementation of CMRs in Dutch community pharmacies and to identify barriers to the implementation.

Method An online questionnaire was developed based on the Consolidated Framework for Implementation Research (CFIR) and consisted of 58 questions with open ended, multiple choice or Likert-scale answering options. It was sent out to all Dutch community pharmacies (n = 1953) in January 2021. Descriptive statistics were used.

Findings A total of 289 (14.8%) community pharmacies filled out the questionnaire. Pharmacists conducted 56 CMRs annually on average. Most pharmacists agreed that a CMR has a positive effect on the quality of pharmacotherapy (91.3%) and on medication adherence (64.3%). Pharmacists structured CMRs according to available selection criteria or guidelines (92%). Pharmacists (90%) believed that jointly conducting a CMR with a general practitioner (GP) improved their mutual relationship, whereas 21% believed it improved the relationship with a medical specialist. Lack of time was reported by 43% of pharmacists and 80% (fully) agreed conducting CMRs with a medical specialist was complicated. Most pharmacists indicated that pharmacy technicians can assist in performing CMRs, but they rarely do in practice.

Conclusion The response rate was 14.8%. This response rate is too low to take our results as representative for the whole group of community pharmacists. Assuming that those who are most involved in CMR filled out the questionnaire, our results may reflect the current best practice of CMR performance. Pharmacists in the Netherlands seem to conduct CMRs in a structured manner and major barriers including the lack of a systematic approach and suboptimal selection criteria for patients have been overcome. Lack of time is a major implementation barrier for most pharmacists. We suggest that (vocationally educated) pharmacy technicians might be able to assist the community pharmacist in conducting a CMR. Suboptimal collaboration between pharmacists and medical specialists is a major implementation barrier. Future studies should explore medical specialists' perspectives and explore ways in which the collaboration might be improved.

PCNE abstract number 597

Annual medication consultation among direct-acting oral anticoagulant users in the pharmacy refill service: experiences of pharmacy staff and patients

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Background Optimizing patient adherence is essential, as non-adherence is associated with worse patient outcomes. Implementation of adherence interventions is a challenging process due to barriers in clinical practice. In the city of Amersfoort, a pharmacy-led intervention was implemented in three pharmacies to improve medication adherence by introducing an annual medication consultation in which potential medication-related problems were discussed.

Purpose This study aimed to evaluate the experiences of patients and pharmacy technicians (PTs) with the implementation of an annual medication consultation to enhance medication adherence among users of direct-acting oral anticoagulants (DOAC) in the pharmacy refill service.

Method After each consultation, PTs completed a checklist to determine the intervention fidelity. Semi-structured interviews were conducted among patients and PTs to gain insight into their experiences with the intervention and implementation process. The interviews were recorded and transcribed verbatim. Thematic analysis following dimensions of the RE-AIM implementation framework was used to code the data in Atlas.ti software (version 22.0.2).

Findings Ten PTs and 21 patients from the three participating pharmacies were interviewed and 114 checklists were filled out. Adoption was high as all interviewed PTs were willing to continue to provide this form of care. Regarding the fidelity, several components of the protocol were not delivered as intended. Barriers to implementation were both patient- and pharmacy-related. Facilitating factors were the communication training to support PTs in communicating about adherence, the TRIAGE questions that helped PTs in asking patients about their experiences with their medication, and being able to prepare the consultations. Patients mainly appreciated the improved contact and the check of their medication use. PTs mentioned several factors that were essential for successful maintenance, including clarifying the goal, matching the planning to the workload, being more involved during the implementation process and better documentation.

Conclusion This study shows that implementing an annual medication consultation is feasible and supported by both PTs and patients. Fidelity of the intervention can be improved. The annual consultation is a way for the pharmacy to increase its visibility and build a trusting relationship with patients.

PCNE abstract number 598

Enhancing cultural competences in pharmacy students

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Background Dealing with diversity is one of the patient-centered communication aspects, while cultural competence is proposed as a strategy to deal with diversity and to tackle inequality in health among different population groups. Despite the fact that one of the core activities at community pharmacies is communication with patients, only few pharmacy education programs include education on cultural competences.

Purpose This project aimed to develop and pilot a course on cultural competences for pharmacy students.

Method The content of the course was developed by the researchers from the Universities of Copenhagen and Vilnius. The framework of cultural competencies covering knowledge, awareness and ability was used as a theoretical basis. The course was piloted with pharmacy students at Vilnius University in May 2021. After the course, its content, structure and teaching methods were discussed with the participating students.

Findings The 2-week blended learning course was developed. To address knowledge, the concepts related to migration, diversity, inequalities, vulnerability and their influence on health and health efforts were discussed. Separate classes were devoted to migrant and ethnic minorities, sexual and gender minorities, disability, addiction, and sensitive clinical cases. To address awareness, awareness of own socio-cultural background, identity, context, implicit prejudices, tendency to stereotype and how this influences the interaction with other people were discussed in the class, where the students were also engaged into the exercise. To address ability to apply diversity competence in the interaction and communication, the students conducted an in depth interview with a person from ethnic or sexual minorities, with a disability or mental disease diagnosis. The teaching methods included lectures with real-life cases and discussions, self-study using pre-recorded videos, online courses and literature, and a field study conducting interviews. In total, 15 students participated. The students thought that they learned about the importance of being aware of and attentive to other peoples' perspectives. The exercise visualizing own cultural background and work with cases were liked the most, while online lectures were evaluated as least beneficiary. To improve the course, the students suggested having more time for interviews, and more detailed instructions for self-study.

Conclusion After some adjustments, the course on cultural competences will be implemented and further evaluated as an elective course for master level pharmacy students at Vilnius University. Addressing cultural competences in pharmacy education in a long run are expected to make communication in pharmacies more patient-centered.

PCNE abstract number 599

Translation and validation of the European Health Literacy Survey Questionnaire (HLS-EU-Q47) into Slovenian language

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Background The European Health Literacy Questionnaire (HLS-EU-Q47) is a self-assessment tool developed by the HLS-EU Consortium for the standardised measurement of health literacy in the general population. The conceptual model of the HLS-EU-Q47 distinguishes between three health contexts of health literacy: health care, disease prevention, and health promotion, and four health information processing competencies: access, understand, appraise, and apply.

Purpose The purpose of this study was to translate HLS-EU-Q47 into Slovenian and to investigate its reliability and validity.

Method The HLS-EU-Q47 was translated into Slovenian using back-translation and then subjected to a pilot test. Sociodemographic questions were added to the translated final version of the questionnaire. The Slovenian version of the HLS-EU-Q47 was then mailed to 2.500 randomly selected adult residents of the Republic of Slovenia. Reliability was examined using Cronbach's alpha for the 1-, 3-, 4-,

and 12-factor models addressing health literacy, three health contexts, four health information processing competencies, and twelve combinations, respectively. Validity was explored with confirmatory factor analysis, univariate analysis, multiple linear regression, and additional exploratory factor analysis.

Findings A total of 517 responses were collected (21% response rate). The median age of the respondents was 55 years (IQR; 37—66), and 58% were female. The Cronbach's alpha of the 1-factor model was the highest compared with the other models (0.950). According to the confirmatory factor analysis, the 12-factor model provided the most valid results, but none of the models fully satisfied all validity criteria. The 4-factor model suggested by the exploratory factor analysis did not distinguish between four health information processing competencies subdomains, but the items were mostly grouped together according to three health contexts. According to the multiple linear regression analysis, only the association between self-assessment of health ($p < 0.001$) with health literacy index was statistically significant.

Conclusion The Slovenian version of the HLS-EU-Q47 is a reliable instrument for measuring health literacy. All models of the questionnaire showed reasonable model fit, but none fully satisfied all validity criteria. Respondents did not distinguish between the four health information processing competencies (access, understand, appraise, and apply), but rather between the three main health contexts (health care, disease prevention, and health promotion).

PCNE abstract number 600

PCNE Classification for Drug-Related Problems V9.00—a tool for better provision of pharmaceutical care services for patients with diabetes

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Background In order to achieve the therapy goals, pharmacists undertake appropriate interventions for patients where a problem has been identified at the level of therapy and monitor both the intervention outcome at the drug level and the impact of those changes together with changing living habits advice.

Purpose The study aimed to document and evaluated the nature, prevalence, and incidence of drug-related problems (DRP) during the standardized pharmaceutical service provision to diabetes patients. Pharmacists determined the causes of the drug-related problems, undertook interventions, and monitored the impact of interventions on the therapy outcomes.

Method This study is a part of an ongoing diabetes patients counseling study which commenced in December 2021 in 110 BENU pharmacies in Serbia. The service is provided in line with the Pharmaceutical Chamber of Serbia guidelines. Data on DRP were obtained using the Pharmaceutical Care Network Europe (PCNE) Classification of DRP (Serbian validated version 9.0) checklists. We have analyzed data from 410 patients gathered until June 2022 in the OpenClinica software. Descriptive statistics were used to analyze the data provided by participants.

Findings The most common causes of DRPs among diabetic patients were: patient-related problems (19%), drug choices problems (18%), and multiple causes of problems (40%). The most frequent patient-related causes were: a patient intentionally uses less drug than prescribed or does not use the drug at all (19%), a patient use drug in the wrong way (18%), and multiple causes of patient-related problems (32%). The most common causes of drug choice problems were incomplete drug treatment despite existing indications (44%), and inappropriate drugs according to guidelines/formulary (29%). In 54% of cases, pharmacists' interventions were at the patient level, while in 29% multiple interventions were undertaken at the same time. Pharmacists' interventions were accepted in 89% of cases. Regarding the status of the DRPs, problems were solved or partially solved in the same percentage values of 40% of cases.

Conclusion The PCNE DRP classification was proven to be an effective tool in providing pharmaceutical care. This classification could help a better understanding of the therapy problems causes and help in making decisions for achieving patients' therapeutic goals.

PCNE abstract number 601

Community pharmacists' stress: factors of influence—variation over time

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Background Work related stress can be caused by different factors or their combination. These factors may vary over time. It is important to examine influencing factors, as well as the influence of time on the type of stressor.

Purpose The aim was to examine the stress level of pharmacists, as well as the factors considered to be significant sources of stress. Stress has an impact on well-being of health professionals and cause burnout, and thus affect the delivery of healthcare services and the patients' experiences in receiving health care.

Method This study is a part of ongoing comparative cross-sectional behavioral study. Pharmacists employed in community pharmacies in Serbia were given a scale for self-assessment of stress levels on 2 occasions: in 2018 (Group 1, 475 participants) and in 2022 (Group 2, 442 participants). The link to access the questionnaire was sent to all licensed pharmacists in Serbia and was active for 2 months. All completely completed questionnaires were taken into account. Based on study power of 80%, known population size, probable first type error of 0.05, effect size of 0.5, the minimum statistically valid number of subjects was calculated. Self-assessment stress test (SAS) based on the four main factors of overload (chronic lack of time, excessive responsibility, lack of support and excessive expectations from oneself and others) was used. It is a four-point Likert-type scale, validated and culturally adapted, with the overall Cronbach alpha reliability of 0.947 and 0.902, respectively, calculated in both groups.

Findings The results indicated that in both Group I and Group II, more than half of subjects self-assessed the high stress' levels (55.2% and 60%, respectively). The stress level between 2 Groups were compared using the T test of independent samples. There is a statistically significant difference between the level of stress among pharmacists in Group I (MD = 25.89, SD = 8.94) and pharmacists in Group II (MD = 26.87, SD = 6.96). t(915) = -1.865, $p = 0.11$ (two-sided). The results show a high correlation between the level of stress and various factors affecting stress in Group I: lack of time (r = 0.713, $p < 0.01$), high expectations (r = 0.716, $p < 0.01$), exhaustion (r = 0.785, $p < 0.01$), overload (r = 0.810, $p < 0.01$), work under pressure (r = 0.824, $p < 0.01$), too much responsibility (r = 0.702, $p < 0.01$), while only 2 factors stood out in Group II: exhaustion (r = 0.692, $p < 0.01$) and work under pressure (r = 0.712, $p < 0.01$).

Conclusion Stress level increased in Group II compared to Group I. There is a difference in the factors influencing stress. There is less

difference in the factors affecting the stress level in Group II. Over time, chronic lack of time and excessive responsibility cease to be the dominant causes of stress, and work under pressure and burnout have an increasing influence on stress.

PCNE abstract number 602

Implementing adherence interventions in real world settings requires use of multiple implementation strategies: worskhop with interventionists

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Background Implementation of adherence-enhancing interventions in daily clinical practice is not common. In the Netherlands, four local multidisciplinary groups were funded as a living lab for implementation of a (previously been tested) medication adherence enhancing intervention in their daily practice. All project leads were pharmacists. The implementation process was guided and evaluated by the Medication Adherence Knowledge and Implementation Taskforce (Make-It consortium). One aspect of the evaluation focused on the implementation strategies that are needed to integrate a medication adherence intervention in daily clinical practive.

Purpose The ERIC-study distinguishes 73 implementation strategies that can support implementation of interventions in health care. To explore which and how many of the 73 implementation strategies from the ERIC-study are used in four local real-world primary care settings (living labs) that implemented pharmacy-led adherence interventions.

Method The living labs each implemented different interventions: teach-back method at first dispense, annual medication consultation, telephone counseling after hospital discharge and telephone counseling when implementation of the medication regimen fails. During a one-day interactive workshop with two representatives per living lab the members of the Make-It consortium presented the 73 strategies to the living labs. The representatives were asked to note strategies used in their living lab for different stages over the course of their projects.

Findings All living labs used at least 20 strategies. Overall, 42 strategies were used by at least one living lab, 9 strategies by all. These nine included: Assess for readiness and identify barriers and facilitators, audit and provide feedback, centralize technical assistance, use an implementation advisor, inform local opinion leaders, build a coalition, work with educational institutions, develop educational materials and distribute educational materials. The use of implementation strategies changed over the course of the project: from creating support and facilitating cooperation in the preparatory stage to supporting health care professionals in implementation and evaluating processes in the execution stage.

Conclusion The fact that multiple strategies have to be used in different stages of implementing even a relatively simple intervention might be a reason for the lack of implementation so far in the Netherlands and beyond. To implement an adherence intervention in daily practice, a wide range of strategies is needed. The Make-it consortium extracts recommendations from the acquired knowledge to promote wider implementation.

PCNE abstract number 603

Influence of vitamin K content in patients' diet on the effectiveness of anticoagulant treatment with acenocoumarol—a pilot study

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Background Proper diet in anticoagulant therapy with acenocoumarol, a vitamin K antagonist, should be a regular part of the treatment. Too high intake of vitamin K in food products can decrease the effectiveness of the drug, while too low vitamin K intake may promote adverse events.

Purpose The study aimed to evaluate the content of vitamin K in the diet of patients taking acenocoumarol and to assess the effect of vitamin K on anticoagulant treatment. We also assessed patients' knowledge of proper diet during acenocoumarol therapy.

Method The study group consisted of 30 patients (15 men and 15 women) of cardiology departments (21 patients with atrial fibrillation, 1 with venous thromboembolism, 8 after artificial valve insertion) treated with acenocoumarol for at least 6 months, who agreed to participate in the study. The mean age of the patients was 76.2 ± 8.8 years. The study was conducted using a face-to-face in-depth semi-structured interview and the FFQ-6 food frequency questionnaire.

Findings 40% of the respondents said that they did not receive any dietary guidance from their doctor while on acenocoumarol therapy. Use of other sources of knowledge was declared by 3 patients (internet, book, patient materials obtained from another person). Only 1 person received professional training on diet. 40% of patients declared a lack of knowledge about the correct diet during acenocoumarol therapy, the knowledge of the remaining patients was about avoiding single products. There was a wide variation in the vitamin K content of individual patients' diets (28.6–348.2; median 136.0 μg/day). More than 40% of patients admitted that their INR results fluctuate and are not within recommended limits. 50% of the patients were found to have an occasional high intake (with a frequency of 1/month to 1/week) of vitamin K-rich foods (150 to 600 μg of vitamin K in a single serving). In 60% of these patients, there were changes in INR levels in successive measurements exceeding 1 (maximum Δ INR = 4.5). In 3 patients occurring adverse events, such as hematuria and gingival bleeding, could be linked to the low vitamin K intake (below 55.0 μg/day).

Conclusion The results indicate insufficient patient education regarding the role of diet in vitamin K antagonist therapy. Pharmaceutical care for this group of patients could significantly improve the effectiveness and safety of pharmacotherapy and reduce the incidence of adverse events.

PCNE abstract number 604

Characteristics and availability of medicines' early access programmes and donations in Slovenia

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Background Early access programmes (EAPs) and medicine donations enable access to new medicines prior to regulatory approval or national reimbursement, respectively. The care of patients with seriously debilitating or life-threatening diseases and no alternative treatment options can be significantly improved through EAPs. Their importance is even greater in countries with scarce availability of clinical trials and delays in the reimbursement of medicines.

Purpose The aim of this study was to evaluate the availability and characteristics of EAPs and medicine donations in Slovenia.

Method Data on the availability of EAPs and medicine donations in Slovenia for the new medicines, approved by EMA in a centralised procedure between 2010 and 2019, were provided by the Agency for Medical Products and Medical Devices of Slovenia and pharmaceutical manufacturers. Medicine reimbursement data were retrieved from the nationwide Bismarck-type obligatory health insurance institute ZZZS. Every indication of the same medicine was analysed as a separate entity and is referred to as a medicine-indication pair.

Findings Between 2010 and 2019, 458 new medicine-indications for 324 medicines were approved by EMA. In Slovenia, a total of 58 (12.7%) medicine-indications were available prior to their approval or reimbursement, 35 (7.6%) as EAPs and 26 (5.7%) as medicine donations. Of this, 3 medicine-indications were available through both programmes. Among all, 37 (63.8%) medicine-indications belonged to antineoplastic and immunomodulating agents (ATC L; of which 35 (60.3%) belonged to oncology area), 10 (17.2%) to anti-infectives for systemic use (ATC J) and 4 (6.9%) to cardiovascular medicines (ATC C). EAPs enabled access to medicines 6 months (median time) prior to marketing authorization and 19 months prior to national reimbursement. If EAPs were initiated at the time of the submission for marketing authorization, the availability time could be potentially prolonged by further 6 months. Medicine donations enabled access to medicines 8 months prior to national reimbursement. If medicine donations were initiated at the time of marketing authorization, the availability time could be potentially prolonged by further 8 months.

Conclusion In Slovenia, there is room for improvement in the extent, availability time and transparency of information on EAPs and medicine donations available to the patients.

PCNE abstract number 605

How to tailor pharmacist-led interventions to the emergency department setting

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Background Medication discrepancies, drug-related problems, and drug-related admissions are common among patients admitted to the emergency department (ED). Early detection of these drug-related issues is crucial as length of hospital stays decreases. Pharmacist-led medication reconciliation and medication review have been found to efficiently identify and solve medication discrepancies and drug-related problems. However, there is lack of studies focusing on how to tailor these interventions to the fast-paced workflow of the ED. This knowledge is essential when designing future studies investigating impact of pharmacist-led ED interventions.

Purpose We aimed to investigate how pharmacist-led medication reconciliation and medication review could be tailored to comply with the fast-paced workflow in an ED setting.

Method We conducted a retrospective review of our four recent studies conducted in the ED: a randomized controlled trial investigating impact of pharmacist-led ED medication review on post-discharge outcomes (n = 807 ED patients), observational studies investigating medication discrepancies (n = 256 ED patients) and drug-related admissions (n = 402 ED patients), and a study investigating ED physicians' work tasks and time-distribution between these tasks (n = 91.4 observation hours). We interpreted the findings from the included studies by scrutinizing prospective and retrospective measurements, i.e., expert panel assessments of the findings, and implementation measurements. Based on this we investigated feasibility and time-efficiency of the intervention methodology, how to tailor the intervention to enhance interdisciplinary collaboration and acceptance of clinically relevant recommendations, and analyzed study limitations.

Findings With regards to tailoring of methodology, time-efficiency was found crucial. Medication reconciliation should therefore be conducted before ED physicians obtain the drug history. To avoid transfer errors, the drug list obtained during medication reconciliation should be directly registered in the medication chart. ED medication review should be focused on identifying drug-related problems that needs to be solved during the short ED stay, e.g. adverse effects, adherence issues, drug monitoring, and drug-drug interactions. Further, the medication review should focus specifically on identifying drug-related admissions early during the ED stay. Some of the chosen outcome measures (e.g., re-admission within 6 and 12 months) in our RCT were found not sufficiently related to the investigated intervention. Time to next unplanned contact with hospital and drug-related readmission may be more suitable outcome measures.

Conclusion Pharmacist-led ED interventions have the potential of increasing drug-related patient safety both during and after hospital stays. Through this retrospective review we have presented how to tailor pharmacist-led interventions to fit the fast-paced workflow of the ED with regards to feasibility, time-efficiency, focus, and outcome measures.

PCNE abstract number 606

Pilot study on feasibility of physician pharmacist practice groups in the french primary healthcare system

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Background This study was conducted as part of a research thesis. The aim of this study was to analyze the feasibility of work groups of general practitioners (GP) and community pharmacists (CP) in France using an empirical based approach to support the theoretical analysis carried out.

Purpose The objectives were to study the feasibility and the potential that work groups between GPs and CPs could represent for the French primary healthcare system through the analysis of the implementation and operation of these work groups in addition to the examination of the obtained feedback from professionnals.

Method We have developed a work group model inspired by those already in existence (in Belgium, Switzerland, and Netherlands). We

recruited 12 meeting leaders who were exclusively pharmacists. This allowed us to form 9 work groups in places with various territorial and organizational characteristics. During a two-year experiment, each work group had to set up five meetings about different topics (such as antibiotics, painkillers, etc.), for which each meeting leader had to follow an e-learning module provided by pharmaSuisse prior to the meeting. We evaluated the experiment through semi-structured interviews, questionnaires for meeting leaders and participants, and on-site observations.

Findings Our results emphasize that this practice is achievable in France through its implementation in sites with different configurations. This feasibility is based on the general satisfaction of the professionals regardless of the site configuration. However, the different dynamics encountered by this practice within the sites allows us to highlight two main points:—the adoption of meeting leader exercise was difficult for the pharmacists due mostly to a lack of time;—certain characteristics of the professionals (such as young age, participation in peer groups) and of the French system (such as integration of this method into a coordinated practice structure) represented levers. Despite the setting up of only a few meeting sessions, our results also show an evolution of GPs' individual practices. In the event of potential diffusion of this method, several parameters would have to evolve to meet the expectations of the professionals and the limits of the experimental model (for instance: co-meeting leaders made up of a physician and a pharmacist; more practical preparation of the sessions, etc.).

Conclusion We can conclude that these work groups are feasible in France but that their generalization would require an evolution of the experimental model and of several structural dimensions of the French system (professional, academic, healthcare organization).

PCNE abstract number 607

Medication review guidelines—Council of Europe's contribution to promote rational and safe use of medicines in Europe

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Background The European Directorate for the Quality of Medicines and HealthCare (EDQM) is a Directorate of the Council of Europe, the continent's leading human rights organisation, in charge of ensuring the basic human right of access to good quality medicines and healthcare in Europe. In March 2020, the Committee of Ministers of the Council of Europe (CoE) adopted Resolution CM/Res(2020)3 on the implementation of pharmaceutical care for the benefit of patients and health services. Among other things, the Resolution recommends that medication reviews (MRs) be performed under the pharmaceutical care process.

Purpose In the light of the above recommendation and taking into account that the MR process has been implemented in different ways and to varying extents across the Council of Europe member States, in 2019 the EDQM's Committee of Experts on Quality and Safety Standards in Pharmaceutical Practices and Pharmaceutical Care (CD-P-PH/PC) agreed to develop a guidance document to assist policy makers, health authorities and healthcare professionals to extend and improve MR in daily practice in Europe.

Method A multidisciplinary working group of pharmacists, academics and representatives of national competent authorities is in charge of drafting a guidance document for pharmacist-led MRs through a combination of face-to-face meetings, circulation of draft text and a consultation with stakeholders.

Findings The guidelines focus primarily on the process of conducting a MR, including the identification and prioritisation of patients who could benefit from the process and the recommended frequency of MRs, how to collect and store related data, and the required professional training. They also foster a common understanding of MR by promoting the harmonisation of terminology. In addition, the guidelines provide insight on how to support the development of this service and to facilitate its implementation at European level. The results of consultation with stakeholders reveals the challenge of creating guidelines for the diverse MR environments of CoE Member states.

Conclusion The MR guidelines will assist key actors in the medication management process to ensure that MR is carried out in a structured and systematic manner and encourage the appropriate and safe use of medications, MR is an important pharmaceutical care tool to promote patient-centred care and its widespread use would support the recognition of pharmaceutical care.

PCNE abstract number 609

Patients' expectations regarding the interprofessional medication management programme ARMIN

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Background The German medication management (MM) programme ARMIN conducted by pharmacists and physicians consisted of a medication review (MR) followed by an on going MM. During the programme, the implementation of MR as a nationwide clinical pharmacy service (CPS) was mandated by law in June 2022 [1]. Since little is known about patients' expectations regarding this new CPS, we explored the expectations of patients with polymedication enrolled in ARMIN.

Purpose To evaluate patients' expectations regarding the interprofessional MM programme ARMIN.

Method A paper-based questionnaire was filled in by community pharmacists on behalf of patients at both the enrolment of patients in ARMIN (initial MR = baseline) and after 6 months of participation. Expectations were assessed with open-ended questions. We aimed to recruit a convenience sample of n = 60 patients. From the answers given, a coding framework presenting the expectations was developed inductively by two independent researchers using content analysis according to Kuckartz [2]. Any differences in categorizing these text fragments were discussed until consensus was found.

Findings Seventy-nine patients (54% female) with a mean number of 10.1 medications at baseline (median: 9; range: 5–26) were recruited by 17 community pharmacies. The coding framework with 4 domains was further divided in categories and subcategories. At baseline, n = 127 text fragments on expectations were evaluated with the following expectations most often stated: conducting a "medication safety check" (n = 26), "drug reduction (deprescribing)" (n = 18), "increased safety (with regard to the drug therapy)" (n = 14), and an "improved understanding" (n = 12). After 6 months, n = 122 text fragments were categorized, most often with (partly) fulfilled expectations, e.g.: "therapy optimization" (n = 19), "improved understanding" (n = 10), and "better care by a pharmacist-physician-team" (n = 14). The most unfulfilled expectations were: "therapy optimization" (n = 8), "drug reduction" (n = 8), and solving "current drug-related problems" (n = 7). Fourteen patients had no (specific) expectations at baseline. Furthermore, expectations were fulfilled that

had not been expected at the beginning, such as "improved adherence" (n = 3) or "increased awareness" (n = 3).

Conclusion Most patients stated expectations, mainly from the clinical, but also from the humanistic domain. Patients indicating not having any expectations might not be well-informed about the service in ARMIN. Furthermore, the assessment of patients' expectations by the pharmacists was included into the remunerated CPS "Medication Review for Patients with Polymedication". Nevertheless, more research is needed to adjust the CPS to patients' expectations as well as strategies to inform patients about what they can expect. [1] Schulz et al. Int J Clin Pharm. 2022. [2] Kuckartz. Beltz Juventa. 2018.

PCNE abstract number 610

Assessing the appropriate use of proton pump inhibitors and possibility of their deprescribing in hospitalized adult medical patients

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Background Proton pump inhibitors are among the most frequently prescribed drugs and their use in various settings and countries have been shown to often be inappropriate. Unnecessary use represents a risk of long-term side effects and risk of potential drug interactions.

Purpose Our study aimed to describe the characteristics of treatment with proton pump inhibitors in adult medical patients, hospitalised in a teaching hospital in Slovenia and assess the possibilities of deprescribing proton pump inhibitors.

Method We conducted a prospective observational clinical study in 120 adult patients taking proton pump inhibitors. Our study included randomly selected patients who were hospitalized in general medical wards and had been prescribed proton pump inhibitors before hospital admission. Data were obtained from hospital records and a thorough interview with patients. First, the validity of the indication at initiation, the appropriateness of the treatment duration and dose used were evaluated in each patient and then the possibility of deprescribing was considered. The use was assessed as in line with treatment guidelines only if all the categories were concordant with the recommendations.

Findings Of the 120 patients included treatment with a proton pump inhibitor was in accordance with guidelines in only 39% of patients. In 24% of patients, the indication for proton pump inhibitor use was invalid, and 22% and 15% of patients were taking a proton pump inhibitor at a higher dose or for a longer period than recommended, respectively. Inappropriate dose was mostly seen in patients who were taking proton pump inhibitor as prophylaxis alongside nonsteroidal anti-inflammatory drugs (43%), whereas prolonged use was most common in patients being treated for gastroesophageal reflux disease or dyspepsia (27%) ($p < 0.001$). Deprescribing could be undertaken in 61% of patients, as discontinuation in 38%, and dose reduction in 23%. A deprescribing possibility was noted more frequently in patients prescribed proton pump inhibitors for peptic ulcer disease, Helicobacter pylori infection, or without a valid indication ($p < 0.001$), as well as in patients taking a double or higher dose of a proton pump inhibitor ($p < 0.001$).

Conclusion Deprescribing of proton pump inhibitors may be undertaken in almost two-thirds of hospitalized patients, underpinning the need for regular reassessment of proton pump inhibitor therapy. Hospitalization may serve as an opportunity to initiate proton pump inhibitor deprescribing interventions.

PCNE abstract number 611

Unpacking medication review interventions in community pharmacies and exploring their heterogeneity: A systematic review

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Background Community pharmacists play a key role in ensuring medication safety by providing patient-centred pharmaceutical services such as medication reviews. Because studies on effectiveness of medication reviews in community pharmacies are often inconclusive, we hypothesized that they have not been standardized and varied so widely in study design, intervention delivery, and outcome measures that conclusions are difficult to draw.

Purpose We sought to examine the heterogeneity in study characteristics and outcomes of medication review interventions in community pharmacies.

Method A systematic review (PROSPERO: CRD42022336452) was conducted to identify randomised controlled trials (RCTs) of medication review interventions in community pharmacies. MEDLINE and Cochrane Library were searched for articles from January 2016 until July 2022. Publications were eligible if the intervention comprised a medication review intervention as defined by the Pharmaceutical Care Network Europe (PCNE). In addition, studies were checked for supplementary interventions delivered along with a medication review. Information on patient selection, outcome, and outcome measurements was extracted and frequencies analyzed.

Findings Of 231 retrieved search results, 27 studies (30 articles) were included. Most studies had a drug-class-specific or disease-specific patient selection criterion, whereby drugs associated with an increased risk of falling, diabetes type 2 or cardiovascular diseases were most frequent. Moreover, 48% of the studies [13/27] included patients aged 60 years or older and 37% [10/27] polypharmacy patients (using 4 drugs or more). In addition to a medication review, 21 of 27 studies comprised supplementary interventions, such as distribution of educational material and training, monitoring of laboratory values, or follow-up visits with feedback provision by community pharmacists. About 50 different outcomes were extracted and subsequently grouped in the following six categories: medication use (e.g., drug-related problems) [5/27], patient-reported outcome measures (e.g., health-related quality of life) [12/27], disease- or medication-related risk scores (e.g., cardiovascular risk) [4/27], surrogate parameters (e.g., blood pressure, Hb1Ac) [10/27], safety outcomes (e.g., hospitalization, mortality) [9/27], and other outcomes [15/27]. Within each outcome, just a few were assessed with the same measurement instrument or method.

Conclusion Available studies on the effectiveness of medication reviews in community pharmacies vary substantially precluding a purposeful comparison to obtain the evidence needed. Methods to standardize study design, outcome measures, and outcome measurement instruments should be defined and consistently used in future studies. In a next step, we will map outcome results to study characteristics to identify the most effective intervention or patient selection component.

PCNE abstract number 612

Do drug-related problems detected within an interprofessional medication management programme result in changes in medication plans?

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Background ARMIN adresses patients with polymedication in an interprofessional medication management service jointly conducted by pharmacists and physicians. Although the intervention focusses on detecting and solving drug-related problems (DRP), little is known about DRPs' association with changes on patients' medication plans (MPs).

Purpose To analyse the potential of different types of DRPs resulting in changes on patients' MPs during the initial medication review (MR) in ARMIN.

Method We aimed to recruit a convenience sample of n = 60 patients. Discrepancies and changes regarding information about the patients' medication were detected by comparing (1) the patient-stated medication documented by the pharmacist during the brown bag review versus (2) the provisional MP prepared by the pharmacist and (2) versus (3) the consolidated MP checked by the physician. Changes were classified by the MedTax taxonomy [1]. We further rated associations between DRPs and changes on the MPs into three categories: valid, unclear, or no association by rating each association content-related based on pharmacists' documentations.

Findings In 79 patients (54% female), recruited by 17 community pharmacies, 420 DRPs were detected during the initial MRs. Most often, DRPs related to dosage (n = 126; 30.0%), drug-drug interactions (DDI; n = 84; 20.0%), and indications (n = 79; 18.8%). Among the medications with detected DRPs, 335 (79.8%) changes on the MPs were observed: 204 DRPs (60.9%) had a valid association, for 14 (4.2%) an association was unclear, and 117 (34.9%) had no association. Only valid associations were included in the further analysis: DRPs regarding dosage often resulted in changes of the dosing regimen (n = 96; 76.2%), most often related to wrong administration with respect to food (n = 47), solved by explanations to the patient during brown bag review. In contrast, DDI were seldom associated with changes on the MPs (n = 4; 4.8%), because these usually resulted in raising awareness among patient and/or physician. Overall DRPs regarding indication (n = 79) had the highest rate (n = 72; 91.1%) of valid changes, most often resulting from unknown indications (n = 66), which were then added to the MPs.

Conclusion More than 60% of DRPs detected by pharmacists during the MR in ARMIN resulted in changes on patients' MPs. These changes resulted in an improved quality and completeness of information on MPs as well as in changes in drug therapy. [1] Almanasreh et al. Res Social Adm Pharm. 2020.

PCNE abstract number 613

The APIMedOlder web application for health professionals to manage potentially inappropriate medications prescriptions in older adults: a usability study

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Background As the proportion of the older population increases, the demand for health systems resources also arises. E-health technology can be used to help health professionals and to offer ready access to information and resources.

Purpose We have developed an online web application, the API-MedOlder, which allows health professionals to search if a drug is classified as a potentially inappropriate medication or not in older adults according to the Portuguese version of the EU(7)-PIM list. Therefore, this study aims to assess the usability of the APIMedOlder tool.

Method A questionnaire, based on the System Usability Scale (SUS), was distributed among 15 healthcare professionals (5 pharmacists, 4 physicians, 3 pharmacy technicians, and 3 nurses), to fully explore the website. Descriptive statistical analyses were conducted to determine if the online application was overall well-designed and highly usable through the SUS. To measure the internal consistency of the applied survey, Cronbach's alpha (CI95%) was calculated.

Findings The SUS final scores ranged from 75 to 100 points, and the mean value was 87.17 with a standard deviation of 9.70 corresponding to the classification of "Best imaginable". An internal consistency of $\alpha = 0.881$ (CI95%: 0.766–0.953) was achieved.

Conclusion The overall evaluation of the developed tool was positive. The APIMedOlder web application showed to be a clinical decision support system tool easy to use and well applicable in clinical practice.

PCNE abstract number 615

Exploring analgesic prescribing and deprescribing practices in hospitalised patients with communication difficulties

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Background Use of analgesics is generally based on patients self-reporting of pain. This is more challenging in patients with communication difficulties unable to self-report. Currently, there is a paucity of literature exploring deprescribing with focus on analgesic medication in this vulnerable population group.

Purpose Explore prescribing and analgesic deprescribing practices in hospitalized patients unable to self-report their pain due to communication difficulties.

Method We retrospectively analyzed prescriptions and medical notes of patients hospitalized in three hospital clinics of University Clinical Center of Kosovo (UCCK): nephrology, neurology and pediatrics. Data were collected for inpatients who had an analgesic prescribed during the period of January-June 2022. In addition to demographic data, we collected and analyzed information such as date of hospital discharge, diagnosis and evidence of analgesic prescribing and administration. We then matched this information against deprescribing of analgesics during hospitalization and at the point of patients' discharge from the hospital. Microsoft excel was used to aggregate and compare the data.

Findings A total of 103 patients who had analgesics prescribed were reviewed. The average age was 68 years for the adult population group unable to communicate (mainly due to dementia) and 12 months for the preverbal pediatric population group. Over half of these patients (54%, n = 59) were hospitalized for 7 days or more. There were a total of 112 instances where analgesic medications were prescribed. Of these, majority were paracetamol [87% (n = 97)] and diclofenac [11% (n = 11)]. In 37.5% (n = 42) of analgesic prescribing instances there was no evidence of documentation of analgesic administration or deprescribing. In most cases [44% (n = 49) analgesics were administered on when required basis. Analgesic deprescribing was done mainly at point of hospital discharge [61% (n = 68)]. Only two cases were discharged from the hospital with evidence of analgesic medication appearing on the discharge summary and none of these medications were new for discharged patients. Prescribing and deprescribing decisions were not done based on use of validated observational pain assessment tools. No significant differences were identified in relation to analgesic use practices in relation to patients age, medical conditions or gender.

Conclusion This study highlights the need for improvement of documentation and pain assessment practices during analgesic prescribing and deprescribing in hospitalized patients with communication difficulties who are unable to self-report pain. Considering a very small proportion of patients discharged with a prescribed analgesic medication, our findings suggest the need to further explore pain management follow-up after hospital discharge to ensure optimization of their care.

PCNE abstract number 616

Genotyping Patients with Adverse Drug Reaction or Therapy Failure: Database Analysis of a PGx Case Series Study

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Background Pharmacogenetics (PGx) is an important aspect of clinical pharmacy with the potential to increase efficacy and safety of pharmacotherapy. However, information from PGx testing is still not well integrated into clinical practice.

Purpose To facilitate the use of PGx information for medication optimization, we conducted a case series where PGx information from a panel test covering 30 genes were integrated into medication reviews. The aim of the study was to describe the patient population that may benefit the most from receiving PGx information.

Method In an observational study (ClinicalTrials.gov NCT04154553, 2019–2021 in Switzerland) we recruited patients experiencing Adverse Drug Reactions (ADRs) and/or Therapy Failure (TF) with substances known to be affected by pharmacogenetics. Patients for PGx testing were recruited in outpatient and inpatient settings. Study pharmacists collected anonymized data from the individual patient history, the referring physician's documents and the results of the PGx testing, harmonized the unstructured data in interprofessional consensus discussions and transferred the data to a structured database. Then, we descriptively analyzed gender, age, diagnoses according to ICD-10 code, current medication, results of genotyping, suspected substances, confirmed substances, and associated genes.

Findings The population of the observational study consists of 142 patients, mainly female (66%) with a median age of 52 years. A majority of the included patients had a main diagnosis of a mental or behavioral disorder (ICD-10 = F, 61%). The number of prescribed medicines reached a median of 6 per person, resulting in a majority of patients with polypharmacy ($\geq$ 5 prescribed medicines, 65%). Patients were included into the study based on a total of 559 suspected Drug-Gene-Interactions (DGI), of which 324 DGI (58%) involving 64 drugs showed an association with one of the variations covered by the PGx panel test. In addition to the DGI, potential Drug-Drug-Interactions (DDI) were also identified in the current medication of the patients. Overall, 148 potential DDI caused by 73 different drugs were determined. In the follow-up interviews after 6 months of the PGx test, we assessed 173 medication changes based on the PGx information in 67 patients (62% of the study population).

Conclusion The analysis of the data from this study provided valuable insights for the optimization of further activities in the context of PGx in clinical pharmacy. Our results indicate that patients with polypharmacy, patients with circulatory diseases and patients with mental or behavioral disorder are suitable target groups for PGx testing.

PCNE abstract number 618

Theoretical roots for the development of a 2-step adherence consultation for community pharmacies including electronic monitoring

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Background Non-adherence is a worldwide problem and the majority of the patients take their medications not as prescribed. Consequences of poor adherence are ineffectiveness of the treatment, poor health outcomes, and increased health care costs, among others. To assess medication-taking behavior, electronic monitoring represents the gold standard in research but is rarely integrated into daily practice. Although some services exist to improve medication adherence in community pharmacies, such as the delivery of a pillbox, and are rooted in behavioral theory, none uses electronic monitoring.

Purpose To delineate a consultation for community pharmacies aimed at optimizing medication adherence (initiation or implementation) and including the use of electronic monitoring.

Method A pragmatic literature search was conducted in PubMed and on official health webpages in January 2022 with the terms and synonyms "pharmacy consultation", "adherence service", "pharmacy adherence consultation". We developed theoretical reflections around published individualized adherence programs, such as Herborg's et al. (Denmark, 2008), Hilbink's et al. (Netherlands, 2016), and the necessity-concerns framework from Horne et al. (UK, 2013). Completeness of the themes was checked according to the framework on patients' lived experience with medicines (PLEM). We created a consultation that empowers pharmacists to screen for non-adherence up to to propose tailored solutions. Questions for use in the consultation were developed from existing key questions.

Findings The new adherence consultation consists of a first and a second session 4 weeks later. The three topics (i) knowledge, (ii) expectation from, and (iii) concerns about the medicine are inquired during the first session, which ends with the dispense of an electronic monitoring device, and verbal consent. The second session includes the three topics (iv) problems with the initiation of therapy, (v) feedback and discussion of the electronic monitoring results (after downloading), and (vi) prioritization of goals and SMART interventions.

Conclusion A 2-step adherence consultation fits into the new role of community pharmacists and seems feasible in daily pharmacy-routine in Switzerland. First evaluations of its acceptance by patients will be obtained in 2023.

PCNE abstract number 619

Medication discrepancies after a hospital stay in patients with multiple long term conditions

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Background Problems in the communication between sectors in the healthcare system poses a challenge to safe medication treatment for patients with multiple long term conditions (MLTCs). One consequence might be that the patient does not receive the intended medication treatment after hospital discharge.

Purpose The aim is to investigate the frequency and type of medication discrepancies between the medication list in the discharge summary from the hospital and the patients' actual medication use 1–2 weeks after hospital discharge.

Method Home-dwelling patients with MLTCs $\geq$ 18 years using minimum 4 medicines for a minimum of 2 separate conditions were invited to participate. The invited patients were both responsible for their own medicine management and/or received assistance from a homecare nurse. After given written informed consent, patients were included 1–3 days prior to discharge from hospital. The patients were included from two geriatric wards and one internal medicine ward at a hospital in Oslo, Norway. The study pharmacists (master's and PhD-students), were trained in medication reconciliation according to the Integrated Medicines Management (IMM) model. Medication discrepancies between the medication list obtained by structured medication reconciliation medication use 1–2 weeks after hospital discharge. and the medication list in the discharge summary were identified.

Findings Currently, 9 patients (female = 2) have been included. The median age was 76 years (range 51–93). Five of the included patients received help to administer their medications by homecare nurses after hospital discharge. The median number of conditions was 8 (range 5–13). The median number of prescribed medications in the discharge summary was 10 (range 4–15), including both regular and on demand medications. The median number of medications in use after the medication reconciliation was 9 (range 5–14). All included patients had at least one medication discrepancy after hospital discharge, and the median number of discrepancies were 4 (range 1–9). The total number of medication discrepancies identified was 33.

Conclusion The preliminary results indicate that multimorbid patients have a high risk of medication discrepancies after discharge from hospital. Despite the increased awareness of the importance of obtaining a complete medication list, the results indicate that the information flow regarding medications still is insufficient and requires further improvement.

PCNE abstract number 620

Assessing patients' behavior towards Package Information Leaflet (PIL)—a preliminary study

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Background Package Information Leaflet (PIL), as printed mandatory information enclosed in every medicinal product in Poland, is an important information source for patients to use their drugs correctly and safely. Unfortunately, it is widely believed that patients do not use the leaflets appropriately; however, not many studies analyze this aspect.

Purpose The aim of the presented study was to assess some aspects of patients' behavior towards Package Information Leaflets use in Poland.

Method We performed a preliminary study using an anonymous questionnaire with a five-point agreement Likert scale developed in the Department of Social Pharmacy Jagiellonian University Medical College. The questionnaire consisted of 11 statements analyzed as two domains (five regarding patients' behavior towards leaflets and six regarding opinions about leaflets—data not shown). The questionnaire was distributed on paper to adult patients recruited as volunteers in community pharmacies in Krakow by researchers as well as in electronic format to JU students. Data were collected between April 2019 and December 2021 and analyzed quantitatively and, in part, qualitatively.

Findings There were 385 respondents from Krakow participating in the study (69% were women), 18–26 years old (49%), and above 65 years old (16%). Only about 47% of patients declared to "always read the entire package drug leaflet," and simultaneously, about 70% indicated that "sometimes the leaflet is too long to read it entirely at one time." About 25% of respondents did not agree with the statement, "I always keep the package information leaflet (throughout using of the drug)." Up to 84% of respondents declared not to "reread the leaflet if drug and its usage are known (e.g., re-purchase)." Similarly, 84% of the respondents declared to "skip the irrelevant and/or unrelated parts while reading the leaflet." Interestingly, patients who declared always read the whole leaflet simultaneously admitted (93%) that they skip unrelated or irrelevant information or familiar information in the case of well-known drugs ($p < 0.01$).

Conclusion Our findings showed that patients do not properly use the Package Information Leaflets. Furthermore, we pointed out specific mistakes made by patients using leaflets. Moreover, patients' answers were contradictory indicating inconsistency of respondents. Results may indicate that patients education by pharmacists should be focused not only on medicine but also on using drug leaflets properly.

PCNE abstract number 621

Documentation of Drug-Related Problems in Danish hospital pharmacy

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Background Clinical pharmacists in the Danish hospital pharmacies identify and solve Drug Related Problems (DRP) on a daily basis. Documentation in the patient's record is standard care, but registration of the DRP for the purpose of analyzing trends and documenting the outcome of clinical pharmacist services is rarely done.

Purpose The purpose of the study was to find an international and validated DRP classification system that is suitable for use in Danish hospital pharmacies. Furthermore, to translate and validate a Danish version of the chosen system.

Method A survey was performed among all Danish hospital pharmacies to learn which system, if any, was used to classify DRP. A scoping review of the literature was done to identify published and validated DRP classification systems used by hospital pharmacists internationally. After choosing a classification system, a Danish version was made using forward–backward translation by two native Danish-speaking pharmacists and two native English-speaking pharmacists that were experienced clinical pharmacists. Finally, the Danish version of the DRP classification system was validated by 10 clinical pharmacists each rating the same 20 standardized DRP-cases. Interrater reliability was calculated using Cohen's Kappa statistics.

Findings The survey among Danish hospital pharmacies revealed that no DRP classification system was currently used consequently. The scoping review found 121 studies where pharmacists used a DRP classification system in hospitals. The most used system by far was the Pharmaceutical Care Network Europe (PCNE) DRP classification system (49% of all studies) followed by the system by Cipolle et al. The PCNE DRP Classification System uses a hierarchical structure that is made up of the 5 main domains; Problem, Cause, Intervention, Acceptance and Status of the DRP, each with subdomains. The PCNE DRP Classification System V9 was chosen and translated to Danish. The translation process was straight forward and there were no major discrepancies between the two Danish translations nor the two English back-translations. Furthermore, the original English version and the back-translated English version correlated. The validation showed fair to substantial interrater reliability ($\kappa = 0.35$–0.63, $p > 0.05$).

Conclusion The PCNE DRP Classification system was chosen as it has been widely used in many settings internationally including hospital pharmacy, and covers domains such as problem, intervention, accept and outcome, that are important to the hospital pharmacists. The validation of a Danish translation was successful with fair to substantial interrater reliability. Thus, the Danish version of the PCNE DRP classification system can be implemented for use in hospital pharmacy where needed.

PCNE abstract number 622

Views of German and Swiss pharmacists towards the dispense of biopharmaceutical medicines before and after the COVID-19 pandemic

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Background The use of biosimilars instead of original biologicals should help to reduce healthcare costs. However and overall, biosimilars did not reach a market uptake as expected. Their low acceptance by healthcare professionals may be caused by skepticism and low confidence due to knowledge gaps about biosimilars and their regulatory approval process.

Purpose To investigate pharmacists' views and information needs regarding biologicals and biosimilars in 2020 and 2022.

Method A 17 item-questionnaire was developed that evaluates knowledge, frequency of dispensing, views on substitution and information sources of biologicals/biosimilars. An online survey was created in REDCapTM. The survey link was sent via email to 28 Swiss cantonal pharmacists' associations for dissemination to their members, and to 3,000 German community pharmacies in February 2020 (before) and August 2022 (after the COVID-19 pandemic). Descriptive statistics were calculated. Chi-Square test was used to compare categorical variables.

Findings A total of 764 individuals took part in the survey (390 in 2020; 374 in 2022) with similar demographics. Due to normal personnel fluctuation, different participants may have participated in both years. The views of German (DE) and Swiss (CH) participants did not differ significantly between both years. Pharmacists were equally familiar with the term biosimilar (DE: 70% vs CH: 75%) and most felt sufficiently informed to dispense them (DE: 43% vs CH: 45%). In 2020, 37% of all participants were confident in handling patient queries regarding a therapy with a biological. This changed in 2022, with significantly less German and more Swiss participants showing confidence with patients' queries (27% vs 44%; $p < 0.01$). Overall, the least confidence was observed for the substitution with a biosimilar in both years and countries (DE: 15% vs. CH: 30%). The pandemic had neither influence on most pharmacists' interest in biologicals/biosimilars (DE: 60.0% vs CH: 55.5%; ns) nor on their readiness to assume more responsibility (DE: 45.3% vs CH: 52.5%; ns). Additional training on the topic was welcomed by more than 80% of Swiss and German pharmacists.

Conclusion The views of German and Swiss pharmacists regarding biologicals/biosimilars did not change significantly between 2020 and 2022. An influence of the COVID-19 pandemic cannot be shown. The majority of German and Swiss pharmacists feel still little confident in the dispense and especially the substitution of biopharmaceutical medicines. More training on this topic is desired.

PCNE abstract number 623

Virtual learning before and during the COVID-19 pandemic: A mixed methods study of Pharmacy students

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Background It is a challenge for pharmacy courses worldwide to combine theoretical knowledge with practical skills to equip students for their future practice. Computer-based simulation offers a way of building a bridge between theory and practice. In recent years, digital simulation has expanded rapidly as a new technique of virtual learning. The digital platform "Pharmacy Simulator" proposes computer-based encounters with virtual patients to train clinical and communication skills in a community pharmacy setting. However, during the COVID-19 pandemic, while students were digitally resilient and endured the endless challenges of online lectures, many were dealing with Zoom and screen fatigue.

Purpose To investigate pharmacy students' acceptance of Pharmacy Simulator before and during a pandemic situation. This abstract focuses on students' self-assessment and confidence in counselling after playing the scenarios on Pharmacy Simulator.

Method Two cohorts of Master of Pharmacy students at The University of Western Australia played two scenarios on Pharmacy Simulator in 2019 (anaphylaxis and salbutamol) and 2021 (anaphylaxis and vaccination). A mixed-method analysis was performed with data from (i) qualitative semi-structured interviews carried out in 2019 pertaining to participants' acceptance of Pharmacy Simulator and in 2021 (ii) a questionnaire with 25 items derived from the interviews. The interviews were transcribed verbatim into electronic format with the data management assistance MAXQDA and analyzed inductively using the Framework Method. Questionnaire responses were analyzed in Microsoft Excel using descriptive statistics. Open-ended questions were evaluated inductively.

Findings Data were collected from 20 interviews and 31 answered questionnaires. In 2019, participants reported that Pharmacy Simulator was a fun, engaging, and straightforward learning tool and, therefore, user-friendly. They reported the feedback at the end of the session to be most valuable. The platform was perceived to fill the gap between the theory from lectures and community pharmacy practice. In 2021, participants "agreed" (median: 4, on a 5-point Likert scale) with seven statements about Pharmacy Simulator's usability, such as it being a helpful tool for acquiring new knowledge. Participants' confidence in counselling regarding the scenario topics improved. One participant stated, "It taught me more [...] through trial and error".

Conclusion Pharmacy students reported similar acceptance levels of Pharmacy Simulator before and during the COVID-19 pandemic. The use of simulation during virtual patient encounters seems to facilitate the transfer from theory to practice, independently of learning conditions that were predominantly screen-based.

PCNE abstract number 625

Adverse effects associated with long-term anticholinergics exposure among older adults with intellectual disabilities: a longitudinal cohort study

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Background The long-term use medication with anticholinergic activity is associated with adverse effects including decline in cognitive function, physical function, increased risk of dementia and Alzheimer disease in general population. Older adults with intellectual disability are exposed to a higher anticholinergic burden in comparison to the general population.

Purpose The aim of this longitudinal study is to examine adverse effects associated with long-term anticholinergic exposure among older adults (aged $\geq$ 40) with intellectual disabilities.

Method This longitudinal study is conducted using data provided by the Intellectual Disability supplement to the Irish Longitudinal Study on Aging (IDS-TILDA). The study examined participants involved in wave 1 (2010–2011) and wave 4 (2019–2020). The IDS-TILDA recruited older adults aged $\geq$ 40 with intellectual disability registered on the Irish National Intellectual Disability Database (NIDD), in Ireland. A modified version of Anticholinergic Cognitive Burden (ACB) scale used to quantify anticholinergic burden. The participants will be categorised into 3 groups, no exposure (ACB = 0), mild exposure (total ACB = 1–4) and high exposure (total ACB $\geq$ 5). The study examined any association between high ACB and reported physical and cognitive adverse effects. IDS-TILDA granted ethical approval from the Faculty of Health Sciences, Trinity College Dublin and the Health Service Executive.

Findings There were 753 participants recruited in Wave 1 of whom 506 (67%) of them has continued and participated in Wave 4. Death was the reason for around 2/3 of the attrition. Almost all (98%) of the participants provided medication data. In both waves, about 70% of participants who provided medication data were exposed to at least one medicine with anticholinergic activity (total ACB scored $\geq$ 1). The number of participants exposed to a high anticholinergic burden (total ACB score $\geq$ 5) has decreased by approximately 3% in wave 4 (wave 1 = 29%, wave 4 = 26%). Comparing medication classes, antipsychotics was the highest class reported with 36.1% of the total ACB in waves 1 and 2. The second most reported therapeutic class was anti-epileptics (17.8%) followed by anticholinergic (11.2%) and antidepressants (10.1%) in wave 4.

Conclusion A large proportion of older adults with intellectual disability are still being exposed to a high anticholinergic burden. Additional research is required to examine the possibility of anticholinergic deprescribing to reduce exposure and its adverse effects.

PCNE abstract number 626

Developing a healthcare service for patients experiencing late effects of cancer—a new role for community pharmacy?

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Background More than 50% of cancer survivors experience a range of late effects following their disease and treatment, e.g. fatigue, chronic pain or lymphedema. Unfortunately, current models of follow-up care do not adequately target late effects. Since community pharmacists are the most publicly accessible healthcare professionals (HCPs) and evidence-based patient-centered pharmacy services can improve health and health-related quality of life, community pharmacies have the potential to contribute to an intervention targeting late effects of cancer (LEC).

Purpose To develop a cross-sectional and interdisciplinary health care service (HCS) targeting late effects of cancer, which includes participation of community pharmacies.

Method The study uses appreciative inquiry to develop the HCS, preceded by an exploratory phase to collect data to support the development phase. We only report results from the exploratory phase. This phase consisted of two questionnaire studies (on patients' needs and experiences with LEC and pharmacy staff's knowledge of cancer and interest in the HCS) and an actor analysis based on semi-structured interviews with HCPs from late effect clinics and municipal cancer rehabilitation centers.

Findings In total, 354 cancer patients from the Patient Panel of the Danish Cancer Society responded to the questionnaire. Three of four reported experiencing LEC and lack of counselling; 23% did not discuss symptoms with HCPs. Half the respondents stated they would participate in a free-of-charge HCS on LEC at their community pharmacy. Further, 134 community pharmacy staff members typically rated having 'very little' or 'some' knowledge on the cancer-related topics in the questionnaire. Lack of knowledge was rated as the most significant barrier to counselling cancer patients in community pharmacies. Pharmacy staff found it 'important' or 'very important' to learn more, and 49 pharmacies expressed interest in participating in the development of the HCS. Preliminary results from the 12 interviews used for the actor analysis showed that few clinicians screened for LEC, but they agreed that collaboration between multiple HCPs is essential for successful management of LEC.

Conclusion Preliminary results from both cancer survivors and HCPs involved in cancer care supported the development of a HCS for cancer survivors experiencing LEC. Results from the exploratory phase reveal that cancer survivors suffer from unresolved LEC and that there is a potential for including community pharmacies in a cross-sectorial and interdisciplinary HCS targeting such late effects. The next phase in the project is the co-creation of the HCS with community pharmacies, patients, GPs, municipalities and hospitals.

PCNE abstract number 627

Impact of collaborative practice between pharmacists and general practitioners as a key for medication mismanagement of elderly cardiovascular patients

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Background Patients with established cardiovascular disease (CVD) often have multiple medications that increase the risk of prevalence of drug therapy problems (DTP), subsequently leading to unfavourable clinical outcomes and treatment failure. By providing Comprehensive Medication Management (CMM), pharmacists assess patients' medication-related needs, identify and prevent DTP, develop individualized care plan for each individual patient and evaluate and monitor outcomes. Thus, the CMM services delivered at the primary care level in collaboration with general practitioners can address this problem and by optimizing therapy improve patients' clinical outcomes and health-related quality of life (HRQoL). Studies have shown that patients with chronic diseases have the greatest benefit from the CMM services.

Purpose The objective of this study was to evaluate the impact of CMM services on healthcare utilisation, cardiovascular risk factors and HRQoL among older patients with established CVDs.

Method This quasi-experimental study that was performed at the Croatian primary care ambulatory clinic included patients aged 65 to 80 years. Patients were divided into intervention (65 patients) and control groups (68 patients) and were followed-up for one year. Pharmacists provided face-to-face consultations to patients from the intervention group. Groups were compared with regards to the clinical parameters (blood pressure, HbA1c, LDL, TC), healthcare utilisation (hospital admission, emergency visits, unplanned GP visits) and HRQoL. The Euro-Quality of Life Questionnaire 5 Dimensions 5 Levels (EQ-5D-5L) was used to measure the HRQoL at baseline (initial visit) and 12 months following CMM services.

Findings The CMM intervention significantly improved systolic blood pressure ($p = 0.038$), diastolic blood pressure ($p = 0.001$), total cholesterol ($p = 0.014$), low-density lipoprotein cholesterol ($p = 0.005$), and glycosylated haemoglobin ($p = 0.045$) in comparison with the control group. The number of hospital admissions and unplanned GPs visits were 3.35 (95% CI 1.16–10.00) and 2.34 (95% CI 1.52–3.57) times higher in the control group compared to the intervention group, respectively. Following the CMM intervention, 65 patients reported significant improvement in dimensions "self-care" ($p = 0.011$) and "usual activities" ($p = 0.003$), whereas no significant change was found in the "mobility" ($p = 0.203$), "pain/discomfort" ($p = 0.173$) and "anxiety/depression" ($p = 0.083$) dimensions and the self-rated VAS scale ($p = 0.781$).

Conclusion This study demonstrated that pharmacists providing CMM services can significantly contribute to better clinical outcomes and lower healthcare utilisation, thus potentially contributing to total healthcare savings. At the same time, the obtained results indicated that CMM services may improve patients' HRQoL.

PCNE abstract number 628

Developing, organizing and running the School-Medicine-Theme Day—a community pharmacist activity

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Background The children of today are the medicine users of tomorrow. Their use of medicines is increasing, they lack knowledge about medicines, are very autonomous in their handling of medicines and do not talk much about medicines with their parents, all resulting in drug-related problems. Thus, medicines education has been carried out in more than 90 Danish primary schools by pharmacy interns between 2011 and 2018 in two-hour sessions. In 2016, the activity was developed to be carried out by community pharmacists and expanded in length to last an entire day, the so-called School Medicine Theme Day (SMT). Until summer 2023 the SMT will take place in 80 school classes all over Denmark. Developing, organizing and running the SMT requires a lot of interdisciplinary and logistic efforts—efforts that pharmacists in other countries might as well learn from, if they plan to run a similar activity.

Purpose The purpose of the presentation is to describe the development, organization and content of the SMT in order for pharmacists in other countries to learn from the Danish experiences.

Method A long row of methods and methodologies were and are used for developing and organizing the SMT, such as pilot testing, dialogues, interviews, workshops, interdisciplinary project team and steering committee meetings, participant-oriented observations, recruitment through external and internal presentations and social media.

Findings Interdisciplinarity (involvement of teachers, didactically trained persons etc.), sufficient funding, patience, communication and strict time management are some of the ingredients in creating a successful SMT. The presentation will elaborate further on all these ingredients. The SMT itself consists of 11 different educational hands-on activities, including a "medicine at home"- exercise, medicines Bingo, questionnaire on chronic pain for school children, video clip -based dialogue, medicines relay, presentations, PowerPoints, exercise regarding pain threshold, role play, package inserts exercise and drug release experiments. The presentation will describe and discuss these educational activities.

Conclusion The presentation will describe lessons learned when it comes to developing a health promoting community pharmacy activity for school children, striving towards making the medicine users of tomorrow more knowledgeable, skilled, and competent to act than the medicine users of today. Additional information: The project is funded by the Novo Nordisk Foundation.

PCNE abstract number 629

Urinary tract health in the male population in the Republic of Serbia—part I

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Background Lower urinary tract symptoms (LUTS) significantly affect the quality of life of men, with a prevalence of 60% to 84%, which increases with age. However, a relatively small percentage of affected men seek advice or treatment for their symptoms. The etiology most often associated with LUTS in men is benign prostate hyperplasia, one of the most common predisposing pathologies for urinary tract infections (UTIs).

Purpose To examine the occurrence and characteristics of LUTS and the attitudes of the male population in the Republic of Serbia.

Method The International Prostate Symptom Score questionnaire (IPSS) was used to assess the frequency of LUTS. It is a validated, reproducible scoring system for assessing disease severity and response to therapy. The questionnaire consists of 2 questions with demographic data and 8 closed questions. Respondents estimate the frequency of symptoms on a scale from 0 to 5. The questionnaire was distributed electronically, and the research was conducted between May and June 2022. The respondents were a randomly selected group over the age of 18. Data were processed using IBM SPSS.

Findings The research included 207 respondents. According to age, the respondents were classified into 5 groups: ages 18–25 (16.9%), 26–35 (15.9%), 36–45 (16.4%), 46–55 (18.4%), 56 or more (32.4%). According to the level of education, the respondents were grouped into 5 groups: primary school (3.4%), secondary school (36.7%), higher school (14.0%), faculty (40.1%), and postgraduate studies (5.8%). More than half of the respondents (52.7%) reported that during urination, they felt that the bladder was not emptied. The frequency of this symptom according to age was as follows: 8–25 (20.0%), 26–35 (27.3%), 36–45 (35.3%), 46–55 (71.1%), 56 or more (80.6%). 72.4% of the respondents reported symptoms of frequent urination, while 32.4% of respondents had negative attitudes, such as unsatisfactory or unpleasant feelings or resentment, about the feeling that would be produced by the knowledge that the state of urological problems will not change for the rest of their lives.

Conclusion A high prevalence of LUTS was observed in the male population in the Republic of Serbia. Although the symptoms are most prevalent among older respondents, the number of younger respondents with LUTS symptoms is not negligible. Education of patients about prevention, therapy, and possible complications of LUTS is needed, especially among young men. It is necessary to further investigate the causes of the symptoms, as well as the attitudes of patients about them.

PCNE abstract number 630

Urinary tract health in the male population in the Republic of Serbia—part II

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Background Urinary tract infections (UTIs) are among the most common bacterial infections, mainly affecting the female population. The annual incidence of UTI in the male population aged 17–79 is 2.2%, while 12% of men reported symptoms of urinary infections at least once. Lower urinary tract symptoms (LUTS) are risk factors for developing urinary infections in the male population.

Purpose To analyze the occurrence and treatment of UTIs in the male population of the Republic of Serbia.

Method A quantitative, non-experimental cross-sectional study was conducted during the winter of 2020/21 on the population of males over 18 in the Republic of Serbia. Respondents voluntarily and anonymously filled out an online questionnaire, which was distributed using the snowball technique. The questionnaire consisted of 29 questions grouped into 6 domains. For the purposes of this paper, questions from the first 3 domains related to socio-demographic and health characteristics, general information about UTIs and the use of antibiotics in patients with UTIs symptoms were addressed. This study was approved by the Ethics Committee for Biomedical Research of the Faculty of Pharmacy, University of Belgrade. Data were processed using IBM SPSS.

Findings The research included 171 respondents. According to age, the respondents were classified into 5 groups: ages 18–25 (30.4%), 26–35 (32.7%), 36–45 (12.3%), 46–55 (8.2%), 56 or more (6.4%). According to the level of education, the respondents were grouped into 5 groups: primary school (1.2%), secondary school (33.3%), higher school (4.6%), faculty (42.5%), and postgraduate studies (16.7%). The prevalence of UTIs was 18.7%. The symptoms of the largest number of respondents with UTIs (46.9%) interfered with their normal activities to a small degree. Most respondents, 59.4%, believe these symptoms are not severe, and 51.3% did not ask anyone for help. For the treatment of UTIs, antibiotics were used by 46.9% of respondents. In 6.7% of cases, the antibiotics they used were dispensed at the pharmacy without prior consultation with a doctor. The most used antibiotics were ciprofloxacin (23.1%), amoxicillin/clavulanic acid (15.4%), and doxycycline (15.4%). Herbal products were used by 59.4%, while 18.8% of participants did not use any therapy.

Conclusion The male population showed a high prevalence of UTIs. It seems that most do not perceive it as a serious health problem, which can have the effect of worsening symptoms. Therefore, it is necessary to carry out education, and community pharmacists, as the most accessible health professionals, can play an important role.

PCNE abstract number 631

Implementation of a re-prescription service in Danish community pharmacies: An electronic survey

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Background The pharmacist re-prescribing service was introduced in Denmark in 2019. The service allows prescribing pharmacists to renew prescriptions of a limited number of medications. The prescription can be renewed (valid 7 days), and the next renewal has do be made by a general practitioner before the pharmacist can represcribe again.

Purpose To describe relevant topics and extent for delivery of re-prescribing service in Denmark.

Method Twenty-two pharmacies invited persons in the target group of re-prescription to participate in an electronic survey. The overall criterie was that the patient had to take the defined medicines for re-prescription, and they had to be stable in their treatment. Data collection was completed by internship pharmacist students from the University of Southern Denmark and the University of Copenhagen. There were 26 questions in the domains: Demografic data on pharmacy, pharmacist and patient, details on the encounter, formality, process of re-prescribing and additional services. Quantitative data was collected in RedCap and descriptive analyses was completed.

Findings A total of 119 customers consented to participate in the study, of whom 110 had an inquiry resulting in a re-prescription. Top three drug classes inquired about were oral contraceptives (46.6%; n = 51), antihypertensive agents (28.1%; n = 31), and inhalation medications for asthma (16.4%; n = 18). A proportion of customers requested a re-prescription outside normal pharmacy opening hours (42.3%; n = 50). For 97.3% (n = 107) of the prescriptions, the prescribing pharmacists used less than 5 min on the process. 93.6% of the customers were satisfied or very satisfied with the service.

Conclusion The pharmacist re-prescribing service was mainly used for oral contraceptives and antihypertensive agents. The workload for the prescribing pharmacist was low and the pharmacy customers were satisfied with the service. For further implementation of the service, more dissemination of information about the service is needed.

PCNE abstract number 632

Assessing the suitability of using the PCNE classification system to identify drug related problems in non-hospitalized patients with COVID-19

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Background Timely and adequate selection of pharmacotherapy during the COVID-19 pandemic is essential to ensure optimal patient

outcomes. Therefore, careful consideration to timely identification and prevention of drug related problems (DRPs) is needed.

Purpose Assess the suitability of applying the Pharmaceutical Care Network Europe (PCNE) during identification and classification of DRPs in patients with COVID-19.

Method This was a retrospective study during which we reviewed prescriptions of non-hospitalized adult patients following their diagnosis with COVID-19. Prescriptions were written during March 2020 and July 2022. The PCNE classification system Vs. 9.1. was used to identify and classify DRPs. A purposive sampling approach was employed to identify study participants. Internationally known COVID-19 guidelines, valid at the time when prescriptions were written were consulted to facilitate identification and classification of DRPs. The DRPs were reviewed by two pharmacists independently. In addition to full medication history, key information sources used during the DRP identification and classification process were laboratory results, diagnostic related information and patient interview (when additional clarification was needed).

Findings We reviewed medications of 20 non-hospitalized patients diagnosed with COVID-19, of which 12 were not vaccinated at the time of diagnosis. Average patient age was 49 years. In total, we identified 59 DRPs in 18 out of 20 patients enrolled in the study. The average number of DRPs was 2.95 per patient. Using the PCNE classification system, 50.86% (n = 30) of problems fell under 'other' domain (unnecessary drug-treatment) followed by 'treatment safety' (adverse drug event possibly occurring), 28.9% (n = 17). In total, 63 DRP potential causes were identified with most of them (69.84%, n = 44) falling under the 'drug selection' domain followed by 'dispensing' domain (26.9%, n = 17). For the PCNE 'drug selection' domain, a total of 61.36% (n = 44) belonged to 'inappropriate selection according to guidelines/formulary' subcategory. For the 'dispensing' domain, subcategory 'necessary information not provided or incorrect advice provided' was the most prevalent (76.47%, n = 13). Key medications involved in DRPs were anticoagulants, antibiotics and corticosteroids.

Conclusion The PCNE classification system was suitable for identifying DRPs in non-hospitalized patients diagnosed with COVID-19. The considerable amount of DRPs identified highlight the necessity of pharmacist involvement and medication review to ensure optimal management of patients with COVID-19. Larger studies focused on pharmacists involvement in reviewing medications of patients with COVID-19 are needed to ascertain the implications of this activity for daily pharmacy practice.

PCNE abstract number 633

A practical guide to the assessment and evaluation of content validity

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Background The evaluation of content validity is a critical and complex step in the development process of instruments frequently used to measure complex phenomena and constructs in pharmacy and healthcare practice and research.

Purpose To define content validity and discuss it within the context of other types of validity and reliability measures, explain the quantification of the various content validity indices; describe key stages of conducting content validity, and provide a practical guide for evaluating and conducting the content validity.

Method This is a narrative review of the assessment and quantification of content validity.

Findings Content validity provides evidence about the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct for a particular assessment purpose. Four essential components of content validity have been discussed in the literature; domain definition, domain representation, domain relevance, and appropriateness of test construction procedure. Content validity relies on using a panel of experts to evaluate instrument elements and rate them based on their relevance and representativeness to the content domain. It is a three-stage process that includes; the development stage, judgment and quantifying stage, and revising and reconstruction stage. Several indices have been discussed such as the content validity ratio (CVR), content validity index (CVI), modified–Kappa, and some agreement indices. A practical guide describes the process of content validity evaluation is provided.

Conclusion Content validation processes and content validity indices are essential factors in the instrument development process, should be treated and reported as important as other types of construct validation, especially when the instrument is used to measure health outcomes or to guide a clinical decision making. Evaluating content validity merits a rigorous assessment process.

PCNE abstract number 634

Identification of Resources and Problems of elderly, multimorbid Patients with the Life and Vitality Assessment

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Background Elderly patients can be affected by different health- and drug-related problems and a holistic approach is needed to tailor healthcare interventions to their needs. In the PACT study (German Ministry of Education and Research; grant: 01GL1728), the 'Life and Vitality Assessment' (LAVA) was used to evaluate the priorities and problems of 200 multimorbid, elderly patients using at least one drug. With this instrument patients prioritize 25 different aspects of their lives (e.g., "joy of living" or "living situation") by classifying them as either "very important", "important" or "not important" for their life. In a second step, patients rate their current satisfaction with all aspects rated to be "very important", on a ten-point scale.

Purpose The objective of this study was to identify patients' problems and resources based on their satisfaction rating with very important aspects of their life.

Method To classify the aspects of life as either problem or resource for each individual patient, the range of the ten-point scale actually used by the patient for the assessment of satisfaction was considered and divided into thirds. All terms positioned in the upper third were defined as resources of a patient and all terms in the lowest third as problems. For example, if a patient rated all aspects with 5 to 10 points, aspects with 5 or 6 points were considered as problem and the ones with 9 or 10 points as resource.

Findings A total of 164 patients (51.8% female) were eligible for analysis. Patients were on average 68.6 ± 8.1 years old, used 6.5 ± 3.7 drugs and had 5.6 ± 3.1 diagnoses. On average, patients classified 11.5 ± 3.9 aspects as "very important" and, thus, rated their satisfaction in this regard. The most frequently reported problem areas of life were "Body Weight" (rated by 57.7% of the patients who classified this aspect as "very important" in the lowest third of the

scale), "Sleep Quality" (52.4%), "Physical Health" (46.9%), "Pain" (45.0%), and "Number of drugs" (43.3%). The most frequently identified resources were "Family" (76.6%), "Religion/Faith" (75.8%), "Partner" (74.3%), "Independent Decision-Making" (72.6%) and "Mental Health" (68.1%).

Conclusion The results show that despite patient-individual differences, there are aspects of life that are perceived as problem by many patients and others rather as a resource. Of note, health related problems were often classified as problem indicating that these could be improved by health care interventions.

PCNE abstract number 638

Potential harmful excipients in off-label drugs for pediatric patients: a matter of concern?

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Background Fifteen years after the publication of the European Pediatric Regulation (1901/2006/EC), a pre-post study published in 2021 reported that the number of off-label prescriptions written by pediatricians in the primary health care setting was over two million per year in Spain.

Purpose To determine whether the drugs most frequently prescribed off-label also contained potentially harmful excipients that could imply an additional safety risk in the Spanish pediatric population.

Method This is a descriptive observational study of the excipients in the labelling of off-label drugs prescribed for the population aged 0 to 17 years in the primary health care setting in Spain. These excipients were examined through the Medicine Online Information Center of the Spanish Agency of Medicines and Medical Devices, and then a classification of excipients that were contraindicated in the pediatric population was carried out, identifying those that required special monitoring as well as those that were harmful. Qualitative variables (ATC code, pharmaceutical form, name and role of the excipient in the formulation) and quantitative variables (total number of prescriptions, drug dose, acceptable daily dose of the excipient (threshold), quantity of excipient per dosage unit) were also recorded for each drug prescribed off-label.

Findings More than 3 million off-label prescriptions were analyzed. 45.1% of them were for drugs containing one or more excipients that represented a potential added safety risk for the pediatric population. It is worth noting that the safety threshold of some excipients depends on patient weight, which is an issue of utmost importance in the pediatric field. The excipients strictly contraindicated in pediatrics found in the prescriptions analyzed were the following: sodium benzoate, benzyl alcohol, propyl parahydroxybenzoate, methyl parahydroxybenzoate and ethyl alcohol. The drugs that contained some of the excipients mentioned were methylprednisolone aceponate and terbinafine as topical preparations, oral paracetamol and budesonide, which accounted for 19.6% of the total prescriptions analyzed. On the other hand, acetylcysteine 4% syrup (200 mL bottle) was the only drug analyzed that contained two of the strictly contraindicated excipients mentioned, representing 0.5% of all prescriptions.

Conclusion There is a potential safety problem in the pediatric population because, on top of the prescribing of drugs that are off-label, some of these contain excipients that could be contraindicated or not recommended in pediatrics, so the suitability of their use should be evaluated. The study results should help raise awareness of this issue and promote the development and licensing of safe medicines for children in primary health care.

PCNE abstract number 640

Counselling first hand: Understanding the customer and yourself through mentalizing—promising results from evaluation of an education programme

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Background One of the core activities at community pharmacies is counselling patients on medication to support correct use and to contribute to health promotion. Dialogue is known to be key to ensure patient-centred counselling, but studies show that pharmacy workforce rarely include patients' perspectives in counselling, especially if they sense that the patient or they themselves will be emotionally affected. A theory-driven education programme was developed with the aim to increase the pharmacy workforce's mentalizing abilities and enable them to be aware of and navigate their own and patients' emotions in a counselling situation. The topics in the programme include the mentalizing mindset, mentalizing communication and pharmacy practice. The 2,5 ECTS programme was developed in Denmark and tested in Denmark and the Netherlands. The programme was developed with a user-driven workshop format that included perspectives from patients, pharmacy workforce and proprietors.

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

Method In Denmark, 28 participants from 11 community pharmacies participated. A mixed methods design based on the Kirkpatrick levels of evaluation inspired the evaluation. Data comprised written reports with 36 qualitative questions answered by participants upon completing the programme, as well as quantitative measurement of their Level of Emotional Awareness, their Job Satisfaction Measure before and after the programme and a Course Experience Questionnaire after the programme.

Findings The qualitative evaluation revealed three themes: 1) "Awareness of emotions and communication skills is an important element when mentalizing is the goal", 2) "It's far more than just a dispensing situation—I now tune into the patient", 3) "Don't have to hide behind the screen any longer". The quantitative evaluation showed: 1) a significant increase in awareness of mental states ($p < 0,001$), 2) a significant improvement of job satisfaction regarding salary ($p = 0.01$), prospects ($p = 0.04$) and standards of care ($p = 0,004$), 3) that most participants agreed (48.8%) and strongly agreed (39.1%) that they were satisfied with the education programme.

Conclusion The education programme promoted the participants' awareness of mental states and mentalizing communication skills, enabling them to centre the interaction around the patients' perspectives. The results are promising to support pharmacy workforce to act truly patient-centred in counselling desk meetings and to prevent or reduce job-related stress and burnout.

PCNE abstract number 641

Process evaluation of the INTENSE study aimed at improving adherence to antidiabetic or antihypertensive medication in the Netherlands and UK: a mixed-methods study

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Background The ImproviNg Treatment adhErence iN people with diabeteS mEllitus (INTENSE) study is a randomised controlled trial in community pharmacies in the Netherlands and UK aimed at improving medication adherence in patients with T2DM. Patients (N = 70) were followed-up for six months. The intervention group (N = 34) received a consultation with the pharmacist. Barriers to medication adherence were assessed using the adapted Quick Barrier Scan questionnaire. At the consultation which intervention modules would fit the patient best was discussed using shared-decision making. The intervention modules included (I) brief messaging, (II) a clinical medication review (CMR), (III) medication schedule, (IV) reminding messaging, (V) a medication dispensing system, (VI) smart messaging support (SMS), (VII) referral to the GP (VIII) unguided web-based self-help application for low mood.

Purpose This process evaluation reports on the implementation of the INTENSE study.

Method A mixed-methods design. Quantitative data included patients demographics and satisfaction with the intervention collected with a phone call. Qualitative data included interviews among pharmacists and patients. Fidelity, dose and reach were assessed using the MRC process evaluation framework of complex interventions. Normalisation of the intervention was assessed using the Extended NPT.

Findings Study participation was limited due to COVID-19 measures and administrative issues in the UK. All supportive interventions were accepted by the patients in an equal manner with the exception of the SMS and the unguided self-help application for low mood. The latter intervention was selected in 14 patients but only completed in 2. SMS was accepted by only 2 patients and not started by any. The brief messaging option was started by 15 patients of whom 5 after one month specifically asked to stop the support because of various reasons. In general, all patients that received a CMR, a medication schedule, a GP referral or a medication dispensing system were satisfied with the consultation. Several patients using reminding messaging asked for continuation of this service after study end. Most pharmacists welcomed the use of additional modalities to support non-adherent patients. The selection process was deemed too time consuming and therefore reached insufficient patients. The intervention could not be normalised in daily practice.

Conclusion Barriers were the selection procedure of patients, the obligatory research-related informed consent procedure and difficulties in reaching out to this non-adherent population. Facilitators were the intervention materials and a relatively limited per patient time investment. Research on non-adherence in patients with T2DM needs research designs eliminating individual consent procedures and simplified, directly applicable selection methods.

PCNE abstract number 642

Teach the Teachers—Workplace based training in clinical pharmacy using patients as a learning resource

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Background Clinical pharmacy is expanding as a discipline across Norway, including rural areas. Clinical pharmacy teaching is variable in Norwegian universities and in practice settings. Workplace based training is independent from universities and is the responsibility of the employer. Structured teaching using real patients is uncommon. The research group for clinical pharmacy at the University of Oslo wants to support clinical pharmacy development.

Purpose We aim to improve and strengthen workplace based training in clinical pharmacy in Norway through collaboration at a national level.

Method We invited managers from each region to select experienced committed clinical pharmacists to participate in a face to face seminar as an initial step in forming a group to support future national collaboration. An experienced colleague (MK) was invited to help design and lead a two day "Teach the Teachers" seminar which was attended by eleven pharmacists representing all regions in Norway. Day one consisted of a mix of lectures, group work, and plenary discussions around how to set learning objectives, being a role model and how to give and receive feedback. Day two addressed using patients as a learning resource, and four patients (user representatives) participated. Role play was undertaken in groups where the participants got to play both "a trainer" and "a pharmacist in training". Here they got practical experience in designing tailored learning objectives, presenting the learning objectives to the patients and the pharmacists in training, conducting the training session with the patient, and giving and receiving feedback. The patients also gave their feedback to the "pharmacists in training".

Findings Course evaluation from the participants showed that this was a constructive method to further increase their awareness of how to set learning objectives focusing on patients' perspectives. The patients provided positive feedback from their experience and were supportive of this type of training. The participants agreed to share their experiences from implementing changes in their own practice in a follow-up meeting to be held digitally.

Conclusion Key learning outcomes from the seminar were the knowledge and skills to apply learning objectives in clinical teaching and the added value real patients can bring as a learning resource. Future collaboration with the eleven regional representatives will support clinical pharmacy development in Norway.