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100

A national survey to determine the process of conducting medication reviews by Australian consultant pharmacists

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Introduction. Home Medicines Reviews (HMRs) are an Australian government-funded medication review service conducted in the home by consultant pharmacists (CPs – specially trained pharmacists who have received post-registration certification in medication review). Limited data are available to understand how pharmacists conduct HMR services during the various stages of service provision.

Aims. To explore the information gathering and report writing processes of CPs conducting HMR services in Australia.

Methods. A national cross-sectional online survey was used to explore and describe the information gathering activities of CPs during the various stages of a HMR (pre-interview, interview, post-interview, report writing). The survey was developed by the research team and included 5-point Likert-type scales and multiple-choice questions. After face validation and piloting by pharmacists with varied academic and professional expertise, the online survey was advertised through professional organisations to Australian registered CPs who had completed at least one HMR service within the past 12 months.

Results. A total of 269 consented to participate in the survey, which represented 11% of the approximate total 2400 CPs registered in Australia. Most participants were female (n=133, 76.0%) and received their specialised certification through the Australian Association of Consultant Pharmacy (n= 169, 97.1%). Participants reported that medication lists (97.4%) and past medical history (88.1%) of HMR patients are commonly provided in referral letters, but medication lists (100%) and social history (57.8%) is often reported back to referrers in their written reports. The most common evidence-based tools used by participants during report writing included medication adherence scales (22%) and anticholinergic medication burden scales (18.2%).

Discussion. This study explored the extent of information collected by CPs during the different stages of the HMR service provision and identified that CPs provide evidence-based and patient-centred written reports to referrers.

101

A survey on knowledge, attitude and practice of household medicine storage and disposal in three cities of Indonesia

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Introduction. Pharmacy campaigns about medicine use have been run in Indonesia by several organisations at national level. Finding the remaining gaps of proper storage and disposal of household medicines will be beneficial to improve the existing campaigns.

Aims. This research aimed to capture knowledge, attitude and practice related to storage and disposal of household medicines among people in Jember, Yogyakarta and Padang.

Methods. A mini cross-sectional survey with quota sampling was done in three Indonesian cities during June-July 2021. A face-to-face data collection was done by three surveyors per city and data were stored online using mWater.

Results. 89 of 90 participants (98.8%) agreed to participate. Most participants (62, 69.7%) failed to correctly interpret the labels of expiry date and 38 (42.7%) participants did not understand damaging the primary packaging of medicines should be done prior to disposal. Most participants (81, 91.0%) agreed to not share their medicines for others who have similar complaints. Various responses were emerged about the practice of storing syrups in a refrigerator, the disposal of liquid dosage forms through the drainage and the habit of dating the first opening of the packaging of a liquid dosage form.

Discussion. Our study revealed several topics that could strengthen the on-going campaigns, including the correct interpretation of expiry date and the need to damage medicine packaging before disposal. Surprisingly, sharing someone's medicine to close social circles was commonly disagreed by our participants. However, this attitude may not be translated into practice¹. The disposal of household medicines in Indonesia is problematic as a medication return program that can be found in other country² remains limited. Such program was just recently piloted in 15 major cities of Indonesia in 2019. Further works are needed to improve the practice.

1. Bayene K, Aspden T, Sheridan J. Prescription medicine sharing: exploring patients' beliefs and experiences. *J. Pharm. Policy Pract.* 2016;9:23.
2. Yang SL, Tan SL, Goh QL, Liao SY. Utilization of Ministry of Health medication return programme, Knowledge and disposal practice of unused medication in Malaysia. *JPPCM.*2018;4(1):7-11.

102

An exploration of resilience with early career pharmacists: a qualitative study

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Introduction. Resilience assists healthcare professionals to overcome or bounce back from challenges, remain positive in the face of adversity, and allow them to deal with challenging work situations and environments. Little is known about how healthcare professionals, especially early career pharmacists, understand resilience.

Aims. To explore early career pharmacists' understanding of resilience, their strategies to enhance and maintain resilience as healthcare professionals and to identify resilience-fostering programmes they perceive could be implemented during pharmacy studies.

Methods. Three focus groups and twelve semi-structured interviews with a total of fifteen hospital pharmacists and ten community pharmacists (less than three years post-registration) were conducted. Audio recordings were transcribed verbatim and analysed using NVivo®. An inductive thematic analysis was performed to identify the main themes.

Results. The main themes identified were 1) Pharmacists understood resilience as the 'capability to adapt to and learn from challenges and setbacks' 2) Resilience in the workplace was challenged by 'the transition from intern to registered pharmacist', 'workload pressures' and 'working during the COVID-19 pandemic' 3) Professional resilience was supported by 'strong support from workplace management and senior pharmacists', 'social networks within workplaces and private lives' and 'keeping professional boundaries' 4) Pharmacists perceived 'mentorship', 'early exposure to pharmacy placements' and 'constructive role play' as potentially beneficial in building resilience during undergraduates studies and internship.

Discussion. Pharmacists defined resilience constructively and identified challenges testing but also strategies supporting their resilience in the workplace. Workplaces can support pharmacists by monitoring workload increases over extended periods, creating opportunities for peer and mentor support and by allowing pharmacists to implement their personal, individualised resilience maintaining strategies. Universities may consider role play of challenging situations during undergraduate studies and mentorship during internships as resilience enhancing strategies and preparation for potentially challenging careers, as suggested by early career pharmacists.

103

Use of thromboprophylaxis guidelines and risk stratification tools in atrial fibrillation: A survey of general practitioners in Australia

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Introduction. Clinical guidelines produced by cardiology societies (henceforth referred to simply as 'clinical guidelines') recommend thromboprophylaxis with oral anticoagulants (OACs) in patients with atrial fibrillation (AF) who have moderate-to-high stroke risk. However, deviations from these recommendations are observed, especially in the primary healthcare setting.

Aims. To evaluate the self-reported use of AF clinical guidelines and risk stratification tools among Australian general practitioners (GPs), and their perceptions regarding the available resources.

Methods. We conducted an online survey of Australian GPs. Descriptive statistics were used to summarise the findings.

Results. Responses from 115 GPs were included for analysis. Respondents reported various ways of accessing thromboprophylaxis-related information (n=113), including clinical guidelines (13.3%), 'Therapeutic Guidelines@' (37.2%) and Royal Australian College of General Practitioners websites (16.8%). Of those who reported reasons

against accessing information from clinical guidelines (n=97), the most frequent issues were: too many AF guidelines to choose from (34.0%; 33/97), different guidelines for different diseases (32.0%; 31/97), time-consuming to read guidelines (21.6%; 21/97), disagreements between different guideline recommendations (20.0%; 19/97), conflict with criteria for government subsidy (17.5%; 17/97), and GPs' busy schedules (15.5%; 15/97). When assessing patients' risk of stroke (n=112) and bleeding (n=111), the majority of the respondents reported primarily relying on a formal stroke risk (67.0%) and bleeding risk (55.0%) assessment tools, respectively. Respondents reported using formal stroke and bleeding risk assessment tools mainly when newly initiating patients on therapy (72.4%; 76/105 and 65.3%; 65/101, respectively).

Discussion. Among our small sample of Australian GPs, most did not access thromboprophylaxis-related information directly from AF-specific clinical guidelines developed by cardiology societies. Although the majority reported using formal stroke and bleeding assessment tools, these were typically used on OAC initiation only. More focus is needed on formal risk reassessment as clinically indicated and at regular review.

	Ways of assessing risk of stroke (N=112)	Ways of assessing risk of bleeding (N=111)
ENTIRELY rely on clinical judgement as a GP	5.4%	8.1%
MAINLY rely on clinical judgement as a GP, but also use a formal stroke/bleeding risk assessment tool	27.7%	36.9%
MAINLY rely on a formal stroke/bleeding risk assessment tool, but also take into account clinical judgement as a GP	57.4%	51.4%
ENTIRELY rely on formal stroke/bleeding risk assessment tool	9.8%	3.6%

104

Clinical yarning with Aboriginal and/or Torres Strait Islander peoples: – A systematic review of its use and impacts

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Objectives. To explore the use and impact of clinical yarning on Aboriginal and/or Torres Strait Islander Peoples health.

Methods. A one-word search term “yarning” was applied in Scopus, EMBASE, CINHALL, Medline, International Pharmaceutical Abstracts, Australian Public Affairs Information Service-Health and the Aboriginal and/or Torres Strait Islander Health Bibliography databases. Databases were searched from inception to May 20, 2020. We included all studies where clinical yarning had been used as a health intervention. Inclusion and exclusion criteria were developed and applied according to PRISMA systematic review reporting methods.

Results. A total of 375 manuscripts were found from the initial data search. After removal of duplicates and removal of manuscripts based on abstract review, a total of 61 studies underwent full text review. Of these, only five met the inclusion criteria of utilising yarning as a clinical intervention. Four of these studies described consumer self-reported health outcomes, with only one study looking at improvements in objective physiological health outcomes.

Discussion. There is a lack of evidence that clinical yarning has any impact on health outcomes. However, this is not a reason to prevent it being implemented, as any intervention to improve the provision of services for Aboriginal and/or Torres Strait Islander people and make them feel culturally safe within the healthcare setting should be explored. It should be noted that clinical yarning is only one aspect of providing culturally safe care and holistic approaches may be warranted.

Conclusions. Whilst clinical yarning may be a culturally appropriate intervention in healthcare, there are limited studies that have measured the impact of this intervention. Further research may be needed to ascertain the true benefits of this intervention.

105

Community pharmacists administering a blood product: A case study of routine Prophylactic Anti-D in pregnancy in South Auckland, New Zealand

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Introduction. Haemolytic disease of the foetus and newborn is a dangerous complication of sensitisation of a rhesus negative woman. A new recommendation to administer routine antenatal anti-D prophylaxis (RAADP) IM in late pregnancy to reduce sensitisation risk was implemented.

Aim. To describe the development of a model to administer RAADP and support best practice prescribing and appropriate timing of blood tests.

Methods. Those developing and implementing the model prepared this case study.

Results. Administration in community pharmacy was chosen to maximise women’s access, safety and correct storage and administration of the medicine, ensure best practice prescribing, and minimise midwife and blood bank workload and distribution costs. Twelve pharmacies were used to maximise experience and knowledge in each pharmacy and limit distribution costs and blood bank workload. A multi-disciplinary team (midwifery, pharmacy, blood bank, transfusion medicine, and nursing) developed the model and prepared materials and training.

Table 1 Concerns and Management

Concern	Management
Blood test < 48 hours before the first dose of RAADP	Pharmacists to question the woman and manage excursions. Most pharmacies close to laboratory collection centres
Accessibility	Geographical location, adequate parking and extended hours considered in selecting pharmacies.
Need for high quality stock management, administration and reporting. As a new service, pharmacists needed to support best practice prescribing and blood tests.	Provision of extended services (including vaccination) considered in selecting pharmacies. Training for pharmacists and midwives. Pharmacy fridge records checked before stock distributed. A prescribing/administration guideline, pharmacy standard operating procedure and blood bank standard operating procedure were developed, requiring significant input from all disciplines. The team managed queries and checked pharmacy reporting to support implementation. Blood bank staff personally provided the first delivery with further education.

Conclusion. The multi-disciplinary team was key in developing the service using pharmacists for RAADP administration and ensuring appropriate prescribing and blood tests.

106

Towards assessment of pharmacy preceptors: a qualitative study of preceptor and preceptee perspectives

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Introduction. The role of the preceptor is to model professional behaviour and provide feedback on preceptee performance and competence. Preceptor competencies have been identified in the literature, yet the scope and nature of preceptor competency assessment has yet to be established.

Aims. To explore pharmacists' and preceptees' experience of preceptorship and views on assessment of preceptor competencies to inform the development of a best practice model of preceptorship.

Methods. A qualitative study design comprising focus groups and interviews with pharmacists, current pharmacy students and pharmacy interns in New South Wales, Australia was employed. Participants were recruited using a maximum variation sampling strategy. Focus groups and interviews were conducted by trained facilitators using a semi-structured interview guide between July 2018 and January 2020 until data saturation was reached. Data were digitally recorded, transcribed verbatim, coded, and iteratively analysed via inductive thematic analysis to identify emergent themes.

Results. Fourteen focus groups and two interviews were conducted with 50 participants, across rural, regional and urban areas. Emergent themes included the nature of the experiential environment, the influence of the preceptor-preceptee relationship, the value of preceptorship and preceptor evaluation, attitudes to preceptorship and preceptor assessment. The willingness of the pharmacist preceptor to be assessed or rated was related to the motivation for having a preceptee and formal recognition. In metropolitan areas where there is greater availability of preceptees, preceptors preferred to be assessed through student evaluation. In contrast, rural preceptors were willing to be further assessed through peer observation.

Discussion. An assessment framework comprising multi-modal assessment measures and accompanying minimum performance criteria requires development and validation to assure quality of pharmacy preceptorship. Appropriate recognition or accreditation may increase preceptor acceptance of assessment.

107

Conscientious objection (CO) and refusing supply – Australian pharmacists' perspectives

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Introduction. Conscientious objection (CO) is: "[A] practitioner's refusal to engage or provide a service primarily because the action would violate their deeply held moral or ethical value about what is right and wrong" In modern medicine CO is apparent in – a multitude of healthcare situations such as circumcision, termination of pregnancy, contraception, and voluntary-assisted-dying.(1) CO is a highly controversial issue perceived as a freedom of conscience by some (2), or an issue of professionalism/duty of care by others (3).

Aims. This study aimed to investigate pharmacists' decision-making in complex bioethical scenarios around their right to conscientious objection and explore reasons for their choices.

Methods. A mixed-methods analysis of an online, vignette-based questionnaire of Australian registered pharmacists (n=223), about scenarios related to the supply of medication for medical termination, emergency contraception, IVF surrogacy for same-sex couples and voluntary assisted dying.

Results. Approximately half (48%) the respondents believed that pharmacists have the right to CO, while the other half either disagreed/strongly disagreed (40%) or were neutral. (12%). Majority of participants agreed to supply the prescriptions across all four vignettes (78%, 70%, 93% and 72%, respectively). Those who chose not to supply (9% n=20) believed it ethically justifiable to conscientiously object even at the risk of the patient failing to access treatment. Regarding continuity of care, most pharmacists agreed (97% n=217) that continuity of care is necessary for equity of care. Strong self-reported religiosity had a statistically significant relationship with pharmacists' decision making, for medical termination (p<0.001), IVF surrogacy (p<0.001) and VAD (p<0.001).

Discussion. This study revealed views from Australian pharmacists, including workplace challenges and lack of guidance around conscientious objection in pharmacy. Findings highlighted an absence of clear, specific professional frameworks to guide pharmacists who choose to exercise conscientious objection, articulating the decision-making procedures needed to ensure patient safety, equity of access and continuity of care.

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- Smith VP. Conscientious objection in medicine: Doctors' freedom of conscience. *British Journal of Medicine*. 2006;332(7538):425.
- Cantor JD. Conscientious objection gone awry--restoring selfless professionalism in medicine. *New England Journal of Medicine (NEJM)*. 2009;360(15):1484-5.

108

Developing and testing a novel method to explore implicit bias in community pharmacy

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Introduction. Implicit bias is bias shown without conscience. This bias may occur due to factors such as age, race, or gender. Implicit bias has been identified in a variety of health care professionals using Implicit Association Tests, however literature has not examined the use of covert simulated patients or explored implicit bias in practising pharmacists.

Aims. To develop and pilot a novel mixed-method to explore implicit racial bias by community pharmacists.

Methods. Four female actors of different racial and ethnic backgrounds (East Asian, Middle Eastern, South Asian, Caucasian Australian) completed 32 simulated patient visits at eight community pharmacies in Sydney, Australia between February-March 2019. Actors provided scripted requests for assistance with symptoms or products relating to women's health ailments (dysmenorrhea, cystitis, emergency contraception, vaginal thrush) at a rate of one visit per pharmacy per week. Visits were audio-recorded. Brief, semi-structured interviews were conducted with actors immediately post-visit to capture the 'consumer' experience. Transcriptions of visits and interviews were transcribed verbatim and analysed through discourse analysis, using frames of 'caring', 'neutral', or 'abrupt'.

Results. Analysis of 32 pharmacy encounters revealed that consultation length, number of products sold, and number of questions asked did not significantly differ between visits. Discourse analysis enabled identification of potential differences between pharmacists when responding to actors of different racial and ethnic backgrounds.

Discussion. This novel method proved feasible. Future work could adapt this method to a variety of practice settings and practitioners. Future studies could also explore other types of implicit bias, such as age, gender, or weight. Through the identification of the presence of implicit bias and how it manifests in practice, interventions and curricula can be developed to address the role of implicit bias in health care disparities. Further work is warranted to generate valid and representative results.

109

Compliance of community pharmacists with COVID-19 health protocols

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Introduction. Pharmacists as health workers in community pharmacies have a high risk of transmitting the COVID-19 virus. During the COVID-19 pandemic, the number of infections among pharmacists increased due to direct contact with the public and COVID-19 patients who visited pharmacies.

Aims. This study aimed to determine the compliance level of pharmacists with the COVID-19 health protocols and its correlations to the level of knowledge, organizational environment, and self-efficacy.

Methods. The study was designed as mixed-method research with a sequential explanatory strategy among pharmacists working in community pharmacies in the Special Region of Yogyakarta, Indonesia. The participants were selected with simple random sampling in quantitative research with questionnaire data collections and purposive sampling in qualitative research with interviews. The quantitative data were analysed statistically to identify factors that correlate to the level of compliance, while the qualitative data were used to explain the results obtained in quantitative research.

Results. A total of 262 pharmacists participated in this study. Most of them were in a medium level of compliance (65.66%), followed by the high level (19.1%) and the low level (15.3%). Statistical analysis on organizational environment factors and self-efficacy showed a significance value ($p < 0.05$) with a Pearson Correlation value of 0.463 and 0.409, respectively. The level of knowledge showed no significance correlation to the level of compliance ($p > 0.05$). Meanwhile, the interview with 9 respondents showed that the implementation of COVID-19 health protocols in community pharmacies was quite good but required more consistent efforts and supporting facilities from the pharmacy owners.

Discussion. These findings showed a correlation between organizational environmental factors and self-efficacy with the compliance level of pharmacists to the COVID-19 health protocols. Improving environment factors and self-efficacy may increase the level of pharmacist's compliance with the health protocols.

110

Connecting the dots of care: Linking Aboriginal and Torres Strait Islander people with diabetes care in hospital using hospital pharmacists

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Introduction. Diabetes is a common diagnosis for Aboriginal and/or Torres Strait Islander peoples.

Aims. To identify how an urban hospital pharmacist can detect if Aboriginal and/or Torres Strait Islander peoples admitted into hospital have diabetes or have a higher chance of getting diabetes.

Methods. Aboriginal and/or Torres Strait Islander peoples admitted to hospital, between July – September 2021 were identified. A hospital pharmacist visited consenting patients, checking random blood glucose and glycosylated haemoglobin (HbA1c). Patients with HbA1c > 6.5% (not known diabetes) or 7% (known diabetes) were referred for endocrinology review during admission. Results and diabetes plans were shared with their GP. Two days after discharge, the pharmacist telephoned each participant to gauge their views on diabetes care provided during their hospital stay.

Results. Seventy-two patients were eligible for inclusion, 67/72 (93%) consented to take part (female 27, male 40; aged 21-87 years). Sixty-one (91%) patients had HbA1c < 6.5. Of these, 4/67 (6%) had an HbA1c between 6 to 6.4. They were contacted and/or their general practitioner to suggest a yarn about how diabetes could be prevented. Six of the 67 (9%) qualified for endocrine review, 5 had known diabetes, one was newly diagnosed. None were previously known to endocrinology. All patients telephoned were satisfied with their diabetes care.

Discussion. We have developed, implemented and pilot tested a pharmacist led screening service. Hospital pharmacists can help detect diabetes in Aboriginal and/or Torres Strait Islander peoples, ensuring linkage to endocrinology review and improved care during admission.

111

Evaluating informal caregivers' needs in managing medicines for people receiving cancer treatment in Australia

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Introduction. Informal caregivers are family members, relatives or friends who support the care and overall wellbeing of loved ones in need. In the context of cancer treatment, informal carers often assume this role instantaneously and may not necessarily have the capacity or capability to manage these responsibilities. Medicine management responsibilities have been linked to negative impacts on the mental and physical health of cancer caregivers. However, the nature of the activities that carers undertake, and their support needs, are poorly understood.

Aims. To evaluate informal caregivers' support needs in medicine management for people receiving cancer treatment.

Methods. An online national survey was conducted between November 2020 and June 2021. Participants were recruited through targeted social media advertising on Facebook, Twitter and LinkedIn inviting them to complete a 21-item survey. The survey ascertained their responsibilities as a caregiver, their capabilities in medicine management, and their specific health service needs to better manage the medicines of their loved ones.

Results. A total of 192 participants completed all items in the survey. Almost all respondents (93%) felt confident in their capability to manage their loved one's medicines, 85% of respondents reported they can recognise side effects, with 79% reporting they can manage the side effects appropriately. Despite these positive results, 51% of participants feel they need extra support with managing medicines: 20% require more support in collecting prescriptions or medicines, 42% require more support to recognise side effects, and 45% with medicines information provision. In terms of preference of who caregivers would like to receive this support, medical specialists were the highest ranked, followed by pharmacists and general practitioners.

Discussion. This study has shed light on the key medicine management roles informal carers play in supporting their loved ones who are receiving treatment for cancer. Given the workload of medical specialists, there is a need for future research to explore how pharmacists can better support cancer caregivers in their medicine management roles.

112

Development of a performance-based pharmacy payment framework for Australia

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Introduction. Rising healthcare costs have led healthcare payers to seek improved performance and better value. Pharmacists in Australia are funded for dispensing on a fee-for-service basis. To date, neither their performance or the outcomes of their dispensing have been assessed in determining their level of remuneration.

Aims. This work sought to assess the impact on pharmacists' practice of the current dispensing payment model and determine whether a performance-based pharmacy payment model (PBPPM) may be an appropriate alternative.

Methods. Using an adaptation framework, interviews were conducted with individuals from five strata of the socio-ecological environment of community pharmacy in Australia to evaluate the current PBS model, determine the fit of key components of PBPPM in an Australian context, and assess the feasibility of using a PBPPM for PBS dispensing. Thematic analysis of the results was used to determine the benefit of changing the current funding model and to assess the potential application of a PBPPM. Based on the outcome, inductive reasoning was applied to develop an alternate quality-focused PBS funding framework.

Results. The current model is perverse. It encourages pharmacists to dispense quickly rather than commit time and apply expertise to improve outcomes in accordance with each patient's requirements. Pharmacists' payments for dispensing should be time-based and risk-related, based on patient and medication factors. A preferred model would separate payment for commercial and technical aspects of dispensing from professional aspects. Supplementary payment should support pharmacists to incorporate processes recognised to enhance the quality use of medicines.

Discussion. The current fee-for-service model is not appropriate for either patients or the profession. A PBS funding framework that supports greater delivery of services focused on quality is proposed. Payment adjustments linked to performance outcomes should not be included until patient outcome measures with strong specificity and correlation to pharmacists' services are developed.

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113

Effect of promotion and Covid lockdowns on uptake of funded maternal Pertussis vaccination in pharmacies

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Introduction. Maternal pertussis vaccination (MPV) prevents pertussis in infants. From late 2016, one New Zealand district extended funding of MPV to community pharmacy. Promotion from April to October 2018 included emails to pharmacies and midwives, two phone calls to each pharmacy suggesting how to increase MPV uptake, social media targeting pregnant women, distributions to pharmacies of posters, key points documents, t-shirts, and quizzes for staff with prizes.

Aim. To explore the uptake of funded pertussis vaccination in pharmacy over time including effects of promotion and COVID-19 lockdowns.

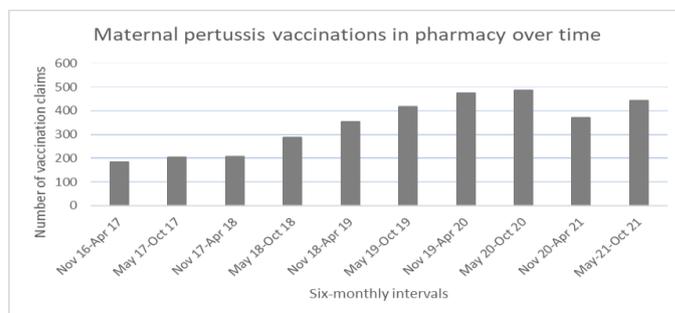
Methods. Five years of pharmacy claims data for MPVs were analysed and twelve pharmacists, 18 women eligible/recently eligible for MPV and 11 midwives were interviewed.

Results. Of 82 pharmacies in the district, 38 (47%) provided vaccinations. Provision of pertussis vaccination expanded during and after a six-month promotion campaign.

Pharmacists valued phone calls from the research group with information about MPV and recommendations for increasing uptake. Prompted by these calls, some pharmacists contacted midwives to inform them of funded MPV availability in the pharmacy (appreciated by midwives) and recommended MPVs to women getting folic acid or iodine prescriptions during pregnancy. Having pharmacy staff informed about MPVs and posters displayed reminded staff to recommend it. Two pharmacists in non-vaccinating pharmacies lacked MPV knowledge and used no MPV materials.

Women seemed to be more influenced by health care professionals' conversations about MPV than other promotion including social media. MPV uptake in pharmacy was 31% greater March to May 2020 (before and during the first COVID-19 lockdown) compared with the same time the previous year. No substantial increase was seen in later lockdowns.

Conclusion. Promotion appeared to have a sustained effect on uptake of MPV beyond that of the promotion period with indications of behaviour change. Verbal discussions were important for women and health care professionals.



114

Identification of key medicine safety interventions for Australian pharmacists**Mr John Jackson¹**¹*Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, Parkville, Australia*

Introduction. With the declaration of Medicine Safety as a national health priority in Australia in 2019, the pharmacy profession requires a strategy to tackle medicine-related harm and empower pharmacists to improve medicine safety.

Aims. To identify priority areas in medicine safety relevant to pharmacists and determine a key intervention by pharmacists in each priority area.

Methods. An expert advisory group identified 20 domains within the themes of professional functions, consumer / patient factors, life stages, medicines, and resources, in which pharmacists could potentially improve medicine safety. A subsequent workshop of pharmacists evaluated each domain using prevalence, risk and level of pharmacist engagement. A poll identified five priority domains which were allocated to sub-groups within the workshop to scope potential interventions within pharmacists' scope of practice relevant to their allocated domain. Each group selected a preferred intervention based on the effort required to implement and the likely impact of each intervention. The preferred interventions were described using a common 9-point instrument.

Results. In descending priority, the selected domains are polypharmacy, health literacy, geriatrics, high risk medicines and potentially inappropriate medicine use. The preferred interventions in the respective domains are; primary care embedded pharmacists, improved counselling, medication review with follow-up, pharmacist workforce capacity building to increase confidence, and pharmacists' engagement in on-going medication management. Factors common to the implementation of these interventions include workforce capability and capacity, regulatory changes, enhanced communication, access to patient records, and remuneration.

Discussion. All five interventions are enhancements of current practise and the implementation factors align with prior work that identified macro-environmental changes required to adopt enhanced roles. (1)

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116

Evaluation of impact of educational intervention on knowledge, attitude and practices of ambulatory patients regarding antibiotic use**Dr Shobha Rani Hiremath¹, Dr Shankar Prasad R², Ms Bindu V¹**¹*Director, Professor and Head, Bangalore, India, ²Medical Director, Bangalore, India, ³Research Scholar, Bangalore, India*

Introduction. Inappropriate use of antibiotics leads to the Antibiotic Resistance (AMR) which is a global health challenge. The lack of Knowledge regarding antibiotic usage, preconceived ideas they may have towards it (Attitude) and wrong practices are all the contributors to AMR.

Aims. To assess the Knowledge, Attitude and Practice regarding antibiotic use using a standard questionnaire before and after patient education and evaluate the impact of educational intervention.

Methods. The study was carried out at the outpatient department of the Tertiary care hospital. KAP questionnaires were administered to the enrolled patients and the data was collected at baseline as well as after patient education. The difference in the KAP before and after the intervention was evaluated using student paired t-test.

Results. The results showed that majority of the patients had poor Knowledge, Attitude and Practice regarding antibiotic use. Nearly 80% of the patients did not have the knowledge about what antibiotics are and about AMR. 72% preferred to take antibiotics to prevent viral infections like cold and flu. 86% of the patients believed that they can stop the medicine once they felt little better, 82% purchased antibiotics without prescription, 81% of patients did not take the antibiotics as prescribed and did not finish the course, and 95% of patients self-medicated. The differences in KAP after the intervention were highly significant ($p < 0.001$).

Discussion. Educational intervention helps in creating awareness about appropriate antibiotic use, AMR and consequences of AMR. Clinical pharmacy students and professionals can play a key role in promoting the Rational Use of antibiotics in the hospital as well as community. This contributes to global capacity building.

117

Development of a reflective practice toolkit designed to support student learning and capacity to work respectfully with Aboriginal communities

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Introduction. Students training to be healthcare professionals come from diverse, heterogeneous backgrounds with regards to their understanding, experiences and perceptions of Aboriginal people. To enhance student practice and professional development, they may benefit from training to promote cultural learning to engage, communicate and work respectfully with Aboriginal people.

Aims. To develop a Toolkit designed to support pharmacy student learning and capacity to work respectfully with Aboriginal communities.

Methods. To inform the inclusions of the Toolkit, a three-phase project was completed. Phase 1 and 2 included pre-test and post-test student surveys and student and clinical partners' focus groups (n=2); (i) student perceptions (n= 12); (ii) clinical partners (n=7). This provided the basis for the pharmacy students' and external clinical partners' perceptions of experiences and views of possible Toolkit inclusions. Phase 3 included a Stakeholder consultation group including Aboriginal elders from the university and community (n=8).

Results. Three phases of the project generated views from different perspectives (students, clinical partners and Aboriginal elders) of what should be included as resources for the development of the Toolkit. Toolkit inclusions: (i) Counselling videos related to 'Closing the Gap' processes; (ii) Reflective practice prompts before, during and after placement; (iii) Map of Aboriginal countries on the Australian continent; (iv) Student workbook for preparation of placement (such as research into significant sites, historical walks, understanding Aboriginal colloquial terminology); (v) Clinical placement manual; (vi) Reflective practice models and resources.

Discussion. Ensuring students are aptly prepared using practical learning tools such as the reflective practice Toolkit may enhance the development of culturally safe future pharmacy workforce and facilitate improvements in health inequalities. Furthermore, the Toolkit has the potential to be adapted for other health professional education.

118

Pharmacist and pharmacy staff knowledge, attitude and practice of wound care in the community setting: A cross-sectional survey

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Introduction. Community pharmacy is uniquely positioned as a first port of call for wound care. There is limited evidence detailing wound care management in Australian community pharmacies.

Aims. To assess wound care knowledge, attitude and practices of pharmacists and pharmacy staff in the Australian community setting.

Methods. A national online cross-sectional survey targeting community pharmacists and pharmacy staff in Australia was performed. The attitude and practice behaviour section comprised 9 and 14 Likert-type items respectively. The knowledge section comprised 36 items with a combination of open-ended, true/false, and multiple choice questions and three case vignettes.

Results. Preliminary results indicate 58 completed records out of 95 respondents. Most participants (91.4%) agreed/strongly agreed that wound care is an important aspect of community pharmacy. Despite a majority of participants (62.1%) agreeing that they have the confidence in providing wound care advice, perceived skills in the assessment (75.9%) and management (70.7%) of wounds in the pharmacy, they also perceived the need (82.8%) and would partake (82.8%) in further wound care education. The majority of participants assessed wounds (67.2%) and provided wound care products (81%) in the pharmacy on at least a weekly basis, yet 65.5% of participants rarely or never physically performed wound management. The knowledge section reflected overall poor performance, only 12.1% of participants correctly identified all dressing types and its use in the relevant section.

Discussion. Australian pharmacists and pharmacy staff play a frequent and active role in wound care in the community setting. However, reported behaviour reflects that survey participants are not practicing to the full extent of their scope of practice. There is a clear and present need for further education to build capacity of the pharmacy workforce in the field of wound care.

119

Perinatal women's acceptability of community pharmacist-led perinatal depression screening: a qualitative study

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Introduction. In Australia, 1 in 5 women are affected by perinatal depression (PND) and yet approximately 20% of perinatal women are not mental health screened in the perinatal period (1). Despite being accessible and trusted primary care providers that are increasingly mental health first aid trained, pharmacists are not formally recognised as PND screening providers.

Aims. This study aims to explore perinatal women's acceptability of community pharmacist-led PND screening.

Methods. The research team designed the semi-structured interview guide based on outcomes from a systematic review on the acceptability of PND screening (2) as well as the development and psychometric evaluation of a questionnaire exploring attitudes towards PND screening (3). Interviews were conducted with Australian perinatal women until data saturation was reached. Data was inductively and thematically analysed against the Consolidated Framework for Implementation Research.

Results. Perinatal women (n=41) were accepting of pharmacist-led PND screening, acknowledging that improving visibility of the pharmacists', particularly regarding their role in mental health would facilitate service acceptability. Perceived barriers to pharmacist-led service acceptability and accessibility included a pharmacies' perceived lack of privacy, time constraints and potential out-of-pocket costs.

Discussion. Current healthcare infrastructure is unable to meet the growing demand for PND care. Perinatal women are accepting of community pharmacist-led PND screening, highlighting an opportunity for pharmacists to support existing PND screening providers in supporting perinatal women.

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120

Implementation of pharmacist-led opioid stewardship in a general practice: an effectiveness-implementation study

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Introduction. Embedding a general practice pharmacist (GPP) into the interdisciplinary team and implementing stewardship activities are two potential innovative approaches to improving the use of opioids in primary care.

Aims. To describe the strategies employed in implementing pharmacist-led opioid stewardship in a general practice and to determine its effectiveness

Methods. A mixed-method hybrid effectiveness-implementation study was conducted. The innovation was opioid stewardship implementation facilitated by the embedded GPP. Strategies comprised instigation of a practice-wide opioid policy, iteratively developed by the GPP and endorsed by GPs, and development and use of localised patient resources (e.g., opioid handouts, patient-GP agreements, individualised tapering plans), to guide conversations, review, and tapering of opioids, if appropriate. Patient-GPP consultations incorporated medication reconciliation, non-opioid and non-pharmacological advice, and initiation of management plans. Effectiveness was evaluated through pre-post, quantitative analysis of opioid doses [standardised to oral morphine equivalent daily dose (oMEDD)] at baseline, six- and nine-months review and opioid prescribing for the cohort at the study end. Enabling strategies were determined from qualitative analysis of semi-structured interviews with GPs (10) and practice personnel (3), patient records and study field notes.

Results. The GPP had consultations with 100 patients, with data from 92 contributing to final analysis. The cohort baseline median oMEDD, 44.5mg (IQR 30-90mg), was significantly reduced at six and nine months to 13.5mg (IQR 0-40mg) and 7mg (IQR 0-30 mg) at 9-months ($p < 0.0001$). The mean overall oMEDD reduction at the study end was 66%, with 42% no longer prescribed regular opioids. GPP factors facilitating weaning included providing patient-centred care, applying pharmaceutical knowledge, and investigating modifiable reasons for opioid use. Stewardship principles (localised organisational policy, collaboration, promotion of leadership and culture change, advancement of clinical expertise and practice, patient engagement, monitoring performance data and feedback) enabled implementation.

Discussion. This study contributes to growing research investigating optimum methods for reviewing and deprescribing opioids to doses that pose lower risks of harm. The innovation utilised systems-based strategies to embed GPP-led change and a patient-centred approach, which is generalisable to other primary care settings.

121

Influencing the pharmacy profession by building the capacity of pharmacist education providers

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Introduction. A key objective of the Australian National Regulation and Accreditation Scheme (NRAS) is to enable the continuous development of a flexible, responsive, and sustainable health workforce and to enable innovation in the education of, and service delivery by, health practitioners. The Australian Pharmacy Council (APC), as the appointed accreditation authority for pharmacy, is responsible for ensuring pharmacy programs are compliant with Standards designed to address this objective. APC uses evidence-based strategies to develop future-focused accreditation standards which build the capacity of pharmacist education providers and enables innovation.

Aims. To outline how APC influences and impacts the pharmacy profession through accreditation.

Methods. APC works closely with stakeholders to review and update accreditation standards for Australian pharmacy degree and intern training programs. Strategies have included best practice literature reviews, expert input, and stakeholder consultation.

Results. A ground-breaking set of Accreditation Standards was implemented in 2014, focusing on outcomes rather than inputs and enabling degree providers to adopt greater flexibility and innovation in curriculum design and provide relevant evidence demonstrating the quality and compliance of their programs. In 2020, the focus was extended to include both outcomes and processes and was for the first time underpinned by the principle of social accountability which acknowledges the importance of public good in addition to avoidance of harm. A suite of documents was developed to highlight performance as the key outcome of pharmacist education, and emphasis was placed on producing pharmacists equipped to adapt to as-yet-unimagined roles in the health care system of the future.

Discussion. Education programs are influenced and shaped by the accreditation standards that they must meet. Accreditation authorities play a significant role in influencing the current and future practice of health professionals by having an impact on their education and training.

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123

Psychometric (Rasch) testing of a professional identity scale for pharmacy students

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Introduction. The Macleod Clark Professional Identity Scale (MCPIS-9) is a tool to assess Professional identity (PI) in pharmacy students.¹ Despite validation, a recent review found it had undergone limited psychometric testing.²

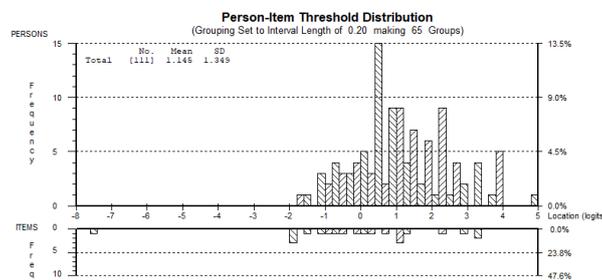
Aims. To examine the construct validity of the MCPIS-9 using Rasch analysis.

Methods. Undergraduate pharmacy students across all year levels completed an adjusted MCPIS-9 with a seven point strongly disagree/ strongly agree response scale and specific referral to the pharmacy profession. The fit of the MCPIS-9 to the polytomous Rasch model was evaluated using RUMM2030.

Results. The MCPIS-9 was completed by 109 pharmacy students. PI scores were positively skewed, ranging from 27 to the maximum of 54 (mean: 43±6.8). Initial assessment of the MCPIS-9 fit to the Rasch model identified severe miss-targeting and disorder thresholds; these were not improved by collapsing response categories. Consequently the mid-point was removed and response categories collapsed into 4. There was evidence of response dependence for the negatively worded questions. The two questions relating specifically to students were most redundant and removed. Unidimensionality of the 7-item scale was explored using principle components analysis of the residuals. Investigation of the 2 highly positive items and 3 highly negative items using a t-test showed the number of responses that differed by more than 5% was 6.5% (95CI 2.5% to 11.4%) of responses indicating unidimensionality. The resulting scale showed good fit to the Rasch model with a non-significant item-trait interaction total $\chi^2=10.3$ (df=14, $p=0.74$) and PSI=0.74. Targeting is reasonable except for one threshold on an item that had no disagree responses.

Discussion. The high Cronbach's α reported for the MCPIS-9² is artificially inflated by the response dependence between 3 of the items. There is a large positive skew to responses that can be controlled by removing the mid-point and collapsing categories. In future, consideration should be given to using a 7-item tool with an even number of response categories that may also be tested in health professionals as well as students.

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124

Prevalence and predictors of opioid use before orthopaedic surgery in an Australian setting: a multicentre, cross-sectional, observational study

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Introduction. Opioid analgesics are commonly used by patients awaiting orthopaedic surgery and preoperative opioid use is associated with a greater burden of postoperative pain, suboptimal surgical outcomes and higher healthcare costs.

Aims. This study aimed to examine the prevalence of total opioid use before elective orthopaedic surgery with a focus on regional and rural hospitals in New South Wales, Australia.

Methods. This was a cross-sectional, observational study of patients undergoing orthopaedic surgery conducted between April 2017 and November 2019 across five hospitals that included a mix of metropolitan, regional, rural, private and public settings. Preoperative patient demographics, pain scores and analgesic use were collected during pre-admission clinic visits, held between two and six weeks before surgery.

Results. Of the 430 patients included, 229 (53.3%) were women and the mean age was 67.5 years (standard deviation 10.1 years). The overall prevalence of total preoperative opioid use was 37.7% (162/430). Rates of preoperative opioid use ranged from 20.6% (13/63) at a metropolitan hospital to 48.8% (21/43) at an inner regional hospital. Multivariable logistic regression showed that the inner regional setting was a significant predictor of opioid use before orthopaedic surgery (adjusted odds ratio, 2.6; 95% confidence interval, 1.0 – 6.7) after adjusting for covariates.

Discussion. Opioid use prior to orthopaedic surgery is common and appears to vary by geographic location. Given its use is associated with worse postoperative outcomes, rigorous efficacy studies involving different geographic locations are required to determine whether opioid tapering prior to surgery can reduce harm.

125

Student-led medication histories in hospital: Analysis of student and preceptor feedback

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Introduction. Roles of Australian pharmacy students within hospital placements is often limited; under-utilising the knowledge and skills obtained during tertiary studies. Taking a medication history is an Entrustable Professional Activity (EPA) students can perform as part of the Medication Reconciliation (MedRec) process.

Aims. To evaluate a student-led MedRec program from the perspective of students and pharmacist preceptors.

Methods. In 2019, 70 students volunteered to take medication histories across 6 participating hospitals; one full-day shift per week over 10 weeks. Students submitted reflective portfolios and focus groups/interviews were held with students and preceptors independently and data gathered were analysed for emergent themes.

Results. In total, 49/70 students gave consent for their reflective portfolios to be reviewed; 32 students participated in 5 focus groups, and 23 pharmacists participated in a further 6 focus groups/interviews. Emergent themes included: 1. Student preparedness to perform tasks; 2. Real-life complexities; and 3. Preceptors overwhelmed by added clinical load. Students felt prepared for the task and gathered confidence over time. These data were validated by preceptors although many preceptors believed students could only be trusted with the task after 4-6 weeks of experience. Students reported that they struggled with the dynamic and "real" environment of the hospital including difficulties conversing with all patients or not having the clinical pharmacist with them all the time. Preceptors believe reviewing students' medication histories were time-consuming often compromising their usual workflows.

Discussion. Refinement of the program over time may allow universities to modify on-campus learning to better prepare students for the complex environment which may allow preceptors to gather trust in students' abilities earlier. Preceptors and students may require more structured approach to setting realistic goals together throughout the MedRec program so that preceptors can better control their workload whilst maintaining the ongoing support for students' professional training and development.

126

Pharmacists' acceptability of perinatal depression screening in community pharmacies: A content analysis

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Introduction. Perinatal depression (PND) screening facilitates the early detection of people at risk of PND. There have been calls to incorporate screening in primary care settings, which can include community pharmacies.

Aim. The aim of this study was to examine pharmacists' perspectives regarding community pharmacist-led PND screening, with a specific focus on their acceptability of PND screening and training needs.

Methods. An online questionnaire was advertised to pharmacists in Australia who are registered with National, and/or state-based pharmacy organisations. The questionnaire was based on previous work (1) and explored pharmacists' acceptability of PND screening in community pharmacy and their training and resource needs. Using content analysis, questionnaire responses were coded and categories and/or themes were developed. Codes and themes were then mapped to the seven constructs within the theoretical framework of acceptability (2).

Results. There were 149 pharmacist participants, of those (n=135, 90.6%) perceived PND screening in pharmacies as acceptable and beneficial. However, there were concerns about limited knowledge of PND screening processes and the time required to deliver PND screening in community pharmacy. Four themes relevant to acceptability were identified: the benefit of PND screening, accessibility, resources, and system and policy changes. Participants highlighted that pharmacist-specific training should include topics such as communication, perinatal mental illness and PND screening tools (including interpretation and explanation of scores). Furthermore, community pharmacists require a range of resources including training material, reimbursement, referral options and support networks to assist pharmacy-led PND screening.

Discussion. This study provides information on the benefits and limitations of community pharmacy-led PND screening, from pharmacists' perspectives. Findings can be used to guide the development of pharmacists training, as well as the delivery and evaluation of community pharmacist-led PND screening.

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127

Simulation-based education in the therapy of serious infections

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Introduction. Simulation-based education (SBE) provides safe and effective learning opportunities for health professional students by utilising goal-based role-play with a simulated patient to replicate the clinical setting but with no risk to a real patient.

Aims. To develop two authentic video simulations requiring appropriate antibiotic selection in response to diagnosis, available therapeutic evidence and patient-specific factors and to evaluate their impact on student learning.

Methods. Two scenarios (tuberculosis and polymicrobial infection) were developed with expert input and filmed using professional actors and a small film crew. All students enrolled in a second year pharmacy program (n=123) were invited to attend SBE tutorials utilising the videoed scenarios. Evaluation was via validated pre- and post-tutorial questionnaires.

Results. Of 123 students invited to participate, pre- and post-tutorial questionnaires were completed by 97 (78.9%) students for tuberculosis and 75 (61.0%) for polymicrobial infection; 74 (60.2%) completed the tuberculosis evaluation and 53 (43.1%) completed the polymicrobial infection evaluation. A statistically significant difference between pre- and post-tutorial questionnaire scores ($p < 0.001$, Wilcoxon signed-rank test) was noted. A majority reported the tuberculosis (63/74; 85.1%) and polymicrobial infection SBE activities (50/53; 94.3%) were outstanding or excellent. Most (71/74; 95.9% tuberculosis and 50/53; 94.3% polymicrobial infection) agreed that the tutorial learning activities helped them to acquire critical thinking skills (logical thought processes to help make clinical decisions and formulate a solution) and that the SBE session was useful to help them learn better (73/74; 98.6% tuberculosis and 51/53; 96.2%). Almost all participants (92.0-96.2%) agreed that they would like more SBE activities in the future.

Discussion. SBE activities are a novel method to enhance students' learning experience. They encourage students to consolidate their knowledge about antimicrobial agents and engage them in selecting appropriate antibiotics to treat infectious diseases.

128

Simulated schizophrenia role-plays for pharmacy students: Co-design and content validation by mental health stakeholders

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Introduction. Simulated patient role-plays are effective for assessment of Mental Health First Aid skills, among pharmacy students. Mental health consumers are involved in mental health education delivery, however consumer involvement in curriculum co-design is lacking, as is research describing the development of educational material specifically relating to caring for people living with schizophrenia and their carers.

Aims. This project aimed to co-design, content validate, pilot test and face validate simulated schizophrenia role-plays with mental health stakeholders, for use in pharmacy curricula.

Methods. Three simulated schizophrenia role-play cases and marking rubrics were co-designed by mental health consumers and the research team. Then, mental health stakeholders engaged in a two-round process to content validate the educational material. The first round involved completing a survey to calculate the item content validity index (I-CVI) scores for relevance and clarity, content validity ratio (CVR) scores for item essentiality and overall scale content validity index (S-CVI/Ave and S-CVI/UA) scores for each role-play case and rubric. Analyses of scores and feedback comments informed item revisions and discussions at the second-round content validation panel meeting. The finalised educational material was pilot-tested and face validated with Master of Pharmacy (MPharm) students.

Results. Two mental health consumers participated in co-design. Nine mental health stakeholders participated in content validation. Each item in all three role-play cases showed excellent content validity for relevance and clarity, and eleven items were revised for essentiality. Item revisions were discussed and re-rated at the content validation panel meeting, until consensus was reached. MPharm students (n=15) participated in the simulated schizophrenia role-plays, which were positively received for relevance to future practice.

Discussion. Partnering with mental health stakeholders has enabled the co-development of authentic, content and face valid educational material to meet the needs of pharmacy students and people living with schizophrenia and their carers.

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129

Simulated mental health first aid assessments involving role-plays with mental health consumers: Evaluating pharmacists' performance and experiences

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Introduction. Healthcare professionals, including pharmacists, can recognise and assist people experiencing mental health crises. Despite this, little is known about how pharmacists assist and engage with people presenting with signs of mental health crises.

Aims. To examine the language used during suicidal assessments in simulated patient role-plays (SPRPs) by pharmacists trained in Mental Health First Aid (MHFA) and explore their experiences of the challenges of providing support to people living with mental illness or experiencing a mental health crisis.

Methods. As part of a training program designed to upskill pharmacists to support people living with severe and persistent mental illness, 55 MHFA-trained community pharmacists participated in audio recorded SPRPs of three crisis (suicide and mania) scenarios enacted by mental health consumers. Pharmacists were assessed on the language used during suicidal assessments. Post-SPRP, reflective debrief discussions with mental health consumers, peers and a facilitator, were analysed using inductive thematic analysis.

Results. The majority of pharmacists asked about suicidal ideation using appropriate, direct terminology. Qualitative analyses yielded three inter-related themes: (i) Relationship with the consumer was seen as a facilitator, which if supported by (ii) Appropriate verbal and non-verbal communication, could help with the (iii) Challenges with crisis assessment. Challenges included difficulties associated with initiating conversations about suicide and mania as well as anticipating how consumers may respond to direct questioning.

Discussion. While pharmacists demonstrated the correct use of language in asking about suicide post MHFA training, pharmacists felt uncomfortable initiating conversations around suicide, lacked confidence during crisis assessments and reflected on the difficulty in using non-stigmatising language. Future training, opportunities to practice and support for pharmacists should involve co-design and co-delivery with mental health consumers to ensure realistic, authentic learning and practice experiences.

Funding/Registration. This activity received grant funding from the Australian Government Department of Health. Registration: ACTRN12620000577910.

130

A community pharmacy implementation logic model for opioid optimisation service development and implementation in Pakistan

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Introduction. Self-medication and unsafe use of medications are major public health concerns in developing countries including Pakistan (1). Community pharmacists (CPs) play a large role in medicine optimisation and disease management in developed countries but extended patient-oriented services in community pharmacies are still in nascent stages in Pakistan.

Aims. This study aimed to identify barriers and facilitators and develop strategies towards developing and implementing role of CPs in the optimisation of opioids to ensure patient safety in the management of CNMP.

Methods. In-depth semi-structured interviews of purposively sampled pharmacy policymakers (n=11) and people with CNMP (n=14) and focus groups with doctors (n=31) and CPs (n=36) were done in Pakistan in 2020. Data were inductively analysed using reflexive thematic analysis (2) using N-Vivo 12. Case study observations were carried out in 6 community pharmacies between September–November 2020 and analysed using a cross case synthesis method using explanation building technique. The data were mapped to an adapted implementation science framework (3) and realist inspired analytical techniques were used to understand mechanistic changes of strategies leading to improved implementation of services and improved safety of opioids. Ethical approval was obtained from University of Nottingham, UK and Hamdard University Islamabad, Pakistan.

Results. Numerous barriers and facilitators were identified across a range of social ecological levels. A community pharmacy implementation logic model for opioid optimisation service development was created. The model identifies strategies for developing and implementing role of CPs included designing compatible intervention within existing systems, CP remuneration models, improving regulatory systems, favourable laws and policies, support and advocacy of policy makers, pharmacist representation on government policy making level, initiatives to improve public awareness and improved CP knowledge, skills and motivation.

Discussion. The implementation logic model targets current multi-level pharmacy practice barriers and provides a clear pathway for policy makers, towards effectively developing and implementing extended pharmacy services in Pakistan.

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131

Survey of Australian hospital pharmacy departments – how are we caring for Aboriginal and/or Torres Strait Islander inpatients

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Introduction. There are limited data describing the role of hospital pharmacists caring for Aboriginal and/or Torres Strait Islander inpatients.

Aims. To determine roles and initiatives provided by Australian Hospital Pharmacy Departments in providing medicine management services to Aboriginal and/or Torres Strait Islander people admitted to Australian hospitals.

Methods. Mixed method (online survey + telephone semi-structured interviews). The survey was emailed to Directors listed in the Society of Hospital Pharmacists of Australia Directory (January 2019). Follow-up telephone conversations were digitally recorded and continued until theme saturation. Recordings were transcribed verbatim and thematically analysed.

Results. 69 responses were received from 313 pharmacy departments (Response Rate = 22%), Of these, 20 (29%) pharmacists agreed to a semi-structured interview. All hospital categories, states and territories were represented: Metropolitan (33,48%); regional (22, 32%); rural (12, 17%) and remote (2, 3%). Over half surveyed (64%) had specific processes for Aboriginal and/or Torres Strait Islander inpatients. Program outcome measurement was low (10, 14%). Survey results and qualitative interviews revealed work is being done under the broad themes: culturally safe care; provision of culturally appropriate medicines information; chronic disease management; continuum of care; managing funding models. Potential outcome measures and future plans were proposed.

Discussion. Several sites have pharmacy initiatives. Results have identified the pharmacist's role in providing services for Aboriginal and/or Torres Strait Islander people, not included in the literature however, outcomes of these services were not routinely assessed. Wider knowledge, evaluation and measurement of the impact of these services on health outcomes and equity is needed and would allow hospital pharmacy teams to better tailor initiatives to meet the needs of Aboriginal and/or Torres Strait Islander people.

132

Student-led medication histories in hospitals during the COVID-19 pandemic: Analysis of student and preceptor feedback

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Introduction. Taking a medication history is an Entrustable Professional Activity (EPA) pharmacy students can perform as part of the Medication Reconciliation (MedRec) process. Since 2018, an annual student-led MedRec program was initiated across various metropolitan hospitals. However, the COVID-19 pandemic in 2020-2021 impacted pharmacy workflows forcing changes to the program.

Aim. To evaluate the feasibility of the MedRec program during the COVID-19 pandemic from the perspective of pharmacy students and their pharmacist preceptors.

Methods. In 2020-2021, 34 students volunteered to take medication histories across 5 participating hospitals. Focus groups/interviews were held with students and preceptors independently and data gathered were analysed for emergent themes.

Results. The 34 students recorded medication histories for approximately 400 patients. A total of 9 focus groups (n=27 students, n=14 pharmacists) and 14 individual interviews (n=3 students, n=11 pharmacists) were conducted. Emergent themes included: student preparedness; real-life complexities; and overwhelming clinical load for preceptors. Students felt prepared and gathered confidence over time. Preceptors believed that some students took longer than previous years for the entrustment process, with communication skills sighted as the main barrier. Some perceived this may be due to the online learning environment, where students had less practice at in-person classroom simulation. Adhering to pandemic restrictions such as wearing masks and social distancing were considered minimally burdensome to students.

Discussion. Despite the pandemic, pharmacy students were able to provide a clinical service to hospital inpatients. However, the pandemic did impact on the number of students experiencing these placements (e.g. 2018, n=91) and disruption to classroom learning may have impacted student skill development. Further, preceptors were also under pressure during this time with other priorities such as vaccinations. Future pandemics are inevitable, and universities and hospitals will need to continue working together to prepare students for EPA's and to set realistic expectations.

133

Reasons for non-adherence to atrial fibrillation thromboprophylaxis prescribing guidelines in Western Australia: A qualitative descriptive study of general practitioners' views

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Introduction. A significant proportion of the atrial fibrillation (AF) population attending Australian primary care is not receiving guideline-adherent oral anticoagulant (OAC) treatment.

Aims. To explore reasons for non-adherence to thromboprophylaxis guidelines in AF from the perspectives of general practitioners (GPs) and to map these reasons to the Capability, Opportunity, Motivation-Behaviour (COM-B) model to identify potential opportunities to support practice change.

Methods. An exploratory qualitative descriptive study among GPs practising in Western Australia was conducted using semi-structured interviews, from November 2020 to February 2021. The Framework Method was employed to facilitate thematic analysis, using NVivo software. Interview responses were also mapped to the COM-B model.

Results. Nine of the 10 GPs initially consented participated in the semi-structured interview (Male = 56%, median age = 52 years, data saturation reached with 6 participants). Two themes emerged from analysis of the interview transcripts: (1) GPs' decision-making process and (2) Patient refusal to take OACs. The COM-B model mapping identified behavioural factors that could impact adherence: capability (GPs' knowledge and understanding of guideline recommendations, difficulty balancing risk-benefit), opportunity (bulk and presentation of the guidelines, focus of the guidelines on only single disease conditions, time for reading multiple guidelines, difficulty accessing specialists, patients' refusal to take OACs), and motivation (GPs' perceptions on the role of guidelines, subjective assessment of patients' risk of bleeding, GP's emphasis on risk of bleeding than risk of stroke, perception on the safety and efficacy of aspirin).

Discussion. GPs identified various reasons contributing to non-adherence to thromboprophylaxis guidelines in patients with AF. Multifaceted interventions should consider behavioural opportunities to improve adherence, including education and training, electronic decision support, clinical audits by allied health professionals, partnership between general practices and local hospitals, and cardiologist-led interventions to support GPs. Further studies are needed to capture patients' reasons for refusing OACs. (Published recently: <https://doi.org/10.1016/j.thromres.2021.10.025>).

... it's a catch 22. Because if you don't give them an oral anticoagulant, they're going to get a stroke; if you give them an anticoagulant, they run the risk of bleeds. ... So irrespective of which drug you're using, they are at a higher risk for bleed. (GP1)

Time for, I mean, every problem has a set of guidelines. It comes in a great big booklet of several hundred pages. So I'm trying to keep across all of that really, is impossible, actually. (GP3)

They [guidelines] are ...massive. ...they've laid it all out with all the evidence and intermingled with the actual decision. So it would have been nice to just have a one page of these are the guidelines, and then all the evidence afterwards. (GP4)

Guidelines are there to guide us. It's not a rule, it's not a, you know, it's not set in stone, and it just helps us to decide. (GP5)

134

Status of Aboriginal and Torres Strait Islander people's cultural safety/competence education in Australian pharmacy schools

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Objective. The aim of this study was to explore academics views on Aboriginal and/or Torres Strait Islander Health and Cultural Competence teaching in pharmacy schools to inform recommendations for future curricula.

Methods. 18 pharmacy schools in Australia were contacted, and interviews conducted with Heads of school or their delegate/s. The interviews covered what the school was doing regarding the new APC accreditation standards, what they had taught in the past and how they were implementing new content and further ideas for improvement. Audio recordings of interviews were transcribed verbatim via an online transcription service. Transcripts were thematically analysed and coded according to the framework approach and the Aboriginal and Torres Strait Islander Health Curriculum Framework. Coding was facilitated using NVivo software

Results. Thoughts and ideas from interviewees were coded under eight principles of the health curriculum framework and each sub coded into four frames: - Contextual, Diagnostic, Evaluative and Strategic. Many Interviewees expressed that the current content throughout Aboriginal health and cultural safety/competence was lacking and cited many barriers that have led to the lack of development. They expressed multiple ideas for how new curricula could embed cultural safety/competence and ideas for sustainable change moving forward.

Discussion. Whilst the Aboriginal and Torres Strait Islander Health Curriculum Framework was introduced in 2014, its dissemination to individuals teaching pharmacy curricula appears to be poor. Despite this, the Australia Pharmacy Council guidelines are well known to most educators. It is apparent that pharmacy schools are at different stages in their development of Aboriginal and Torres Strait Islander Health curriculum design and implementation and future resources should be developed and made available.

Conclusion. Whilst cultural safety/competency was taught in the pharmacy schools, disparities in teaching were identified and ideas for future improvements were uncovered.

135

Top 10 unanswered questions about quality use of medicines in people living with dementia

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Introduction. People living with dementia often have multiple co-morbidities which lead to polypharmacy and medicine-related problems. Achieving quality use of medicines (QUM) in people living with dementia is a global patient safety challenge. In the past, research questions about medicines for people living with dementia have been led by drug companies or researchers, with little involvement of consumers and clinicians.

Aims. To identify the Top 10 unanswered quality use of medicines questions for people living with dementia, as determined by consumers (people living with dementia, carers, family/friends) and healthcare professionals (clinicians).

Methods. The James Lind Alliance Priority Setting Partnership method was used. A national qualitative survey and interviews with stakeholders asked consumers and clinicians what questions they have had about medicine use in people living with dementia. Responses were used to generate summary questions which were then cross-checked with the published literature to determine if they have already been answered. A second survey followed by an online workshop with consumers and healthcare professionals was conducted to prioritise the unanswered questions, resulting in a Top 10 list.

Results. In our first survey, we received 545 questions from 151 consumers and 77 clinicians. These were summarised into 68 unique summary questions, and, after evidence checking, 67 unanswered questions. Our second survey (171 consumers and 67 clinicians) identified the top 16 questions and finally, 17 consumers and clinicians identified and ranked the Top 10. The highest priority questions were around shared decision making, healthcare professional knowledge and skills, and transitions of care.

Discussion. Targeting future research efforts towards these identified consumer- and healthcare professional-priorities will ensure that clinically relevant research is being undertaken and funds are being directed to the most urgent areas of need.

136

The implementation of an osteoporosis medication management intervention in community pharmacy: A pilot study

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Introduction. Osteoporosis in Australia is undertreated despite effective pharmacotherapy due to poor patient adherence and limited medication management services.

Aims. To evaluate the acceptability of a medication management intervention for osteoporosis in community pharmacy, to inform a future larger-scale study.

Methods. Australian community pharmacists were trained to delivery an osteoporosis medication management intervention. The intervention was delivered to patients with diagnosed osteoporosis, and after 4 weeks, the patient was followed up by the research team. Outcomes measured were pharmacists' competency in service delivery, pharmacists' and patients' perceptions of service, changes in patients' self-reported adherence and beliefs about their osteoporosis medications

Results. Five community pharmacies completed a total of 24 interventions over a 6-week trial period. Patients rated perceived service quality at a median score of 6.33/7 for both face-to-face (n=12) and telepharmacy (n=12) interventions. Pharmacists reported that providing the intervention is worthwhile for patients and provides professional satisfaction. The main barriers to service delivery were time and workload, particularly relating to the COVID-19 pandemic. There were no significant changes in patients' self-reported adherence and beliefs about their osteoporosis medicines.

Discussion. An osteoporosis medication management intervention in community pharmacies can be feasible and acceptable for both patients and pharmacists. The proceeding study should consider greater remuneration for service delivery, mandatory training of all pharmacists, inclusion of non-English speaking participants, and a longer follow up period of 12-24 months.

137

The impact of COVID-19 on clinical research at Australian and New Zealand universities: a qualitative study

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Introduction. The COVID-19 pandemic has resulted in the implementation of social distancing measures, travel restrictions and infection control measures which have introduced a myriad of challenges when conducting clinical research.

Aims. To explore the impact of the COVID-19 pandemic on clinical research, specifically across accredited medicine, nursing, and pharmacy program providers in Australian and New Zealand universities.

Methods. An exploratory qualitative study was conducted with a purposive sample of participants, whereby representatives from all providers of accredited medicine, nursing and pharmacy programs across Australian and New Zealand universities were invited to participate in semi-structured interviews. An interview guide was developed based on the findings of a systematic review exploring guidance on the conduct of clinical research during the COVID-19 pandemic. Interviews were transcribed verbatim and underwent inductive thematic content analysis.

Results. Interviews were conducted between August-October 2021, with 16 participants from 17 program providers (n=4 medicine, n=7 nursing, n=6 pharmacy) across Australia and New Zealand. Major themes of (1) immediate and (2) broader research impact encapsulated six subthemes regarding clinical research: (1.1) Essentiality of Research; (1.2) Modifications to Research; (1.3) Funding and Changes to Research Focus; (2.1) Collaboration; (2.2) Research Workforce; (2.3) Differences in impact depending on context.

Discussion. The impact of the pandemic on clinical research conducted within medicine, nursing and pharmacy program providers at Australian and New Zealand universities included consequences such as a decreased quality of research, lack of collaboration, basic disease research neglect and a loss of the research workforce. However, positive impacts of the pandemic on research were also identified, including increased accessibility to research through removed paywalls and a sense of solidarity within the scientific research community. Implications of the experiences identified in these interviews should be considered, to enhance and ensure long-term sustainability of crucial clinical research.

138

The effectiveness of computerised clinical decision support systems on deprescribing inappropriate medications in older people: A systematic review protocol

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Introduction. Older people worldwide are increasingly exposed to inappropriate polypharmacy. Recent studies have investigated implementing computerised clinical decision support systems (CCDSS) as part of an intervention in multiple settings, including pharmacist-led medication review, to deprescribe inappropriate medications.

Aims. This systematic review of studies that investigate the effectiveness of CCDSS interventions in deprescribing inappropriate medications in older people aims to understand the quality of evidence, effects on prescribing and clinical outcomes, and factors associated with effectiveness.

Methods. A systematic search from inception to January 2022 will be conducted in PubMed, Embase, CINAHL, International Pharmaceutical Abstracts, Cochrane Library, IEEE Xplore and Web of Science to identify relevant studies. Eligibility criteria includes studies of any design and in any setting, that report the evaluation of a CCDSS intervention which aimed to facilitate deprescribing or medication review, or improve appropriateness of prescribing for people aged 65 or more. Deprescribing will be defined as discontinuation and/or dose reduction of regular, short term and as needed (PRN) medications. Any clinical outcomes and process markers reported by the studies will also be recorded. Relevant tools will be used to assess quality and risk of bias of included studies, depending on the design of the study: the Cochrane Collaboration's Tool for assessing risk of bias in randomised trials for randomised controlled trials; the ROBINS-I (Risk Of Bias In Non-randomised Studies - of Interventions) for nonrandomised controlled studies; the National Institutes of Health's Quality Assessment Tool for Before-After (Pre-Post) Studies With No Control Group for quasi-experimental before and after studies; and the Newcastle-Ottawa Scale (NOS) for assessing observational studies.

Results. This review has currently identified 5802 records after removing duplicates, with 234 studies found to be suitable for full-text review (as reviewed by three authors). Preliminary analyses have identified different variations of CCDSS implemented into multifaceted interventions, and differing therapeutics targets.

Discussion. Further work will synthesise the available evidence around the potential role of CCDSS in deprescribing inappropriate medications and improving prescribing and clinical outcomes.

139

The Carer Assessment of medication management guidance for people with dementia at Hospital discharge (CATCH) tool: A national cross-sectional survey

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Introduction. Medication management for people with dementia is often complex and a major contributing factor to adverse events after discharge from the hospital. Carers play an important role in overseeing medication activities for the person with dementia, therefore there is a need to understand the overall medication management guidance provided to carers at discharge.

Aims. To develop and distribute a tool to evaluate medication management guidance provided to carers of people with dementia at hospital discharge.

Methods. The Carer Assessment of medication management guidance for people with dementia at Hospital discharge (CATCH) tool was developed using mixed methods conducted over two stages. Stage one was conducted using item generation and content validation involving experts and consumers. Stage two involved pre-testing using cognitive interviews with carers of people with dementia. The CATCH tool will be disseminated nationally. Briefly, a cross-sectional design will be adopted, using a survey comprising of the CATCH tool and open-end questions. Electronic and hardcopy distribution of the survey will occur Australia wide through advertisement through organisations, such as StepUP for Dementia Research and Dementia Australia. Inclusion criteria will be carers responsible for managing the medications of the person with dementia, and the person living with dementia has had at least one discharge from the hospital to either their home or a residential aged care facility.

Results. The CATCH tool consisted of 30 questions capturing information on all aspects of medication management guidance conveyed at hospital discharge for carers of people with dementia. The preliminary findings from survey will be presented.

Discussion. The survey findings will identify targets for improvements and inform the design of interventions to improve the delivery of medication management guidance at discharge and beyond.

140

Utilization of traditional healers and health-seeking behavior on low socio-economic status community in Gunungkidul, Indonesia

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Introduction. The availability of various types of treatment besides biomedical health services indicates that the community has its unique health system constructed by socio-cultural conditions. Even though access to biomedical health services is easy through national health coverage, low-income communities still choose traditional health services.

Aims. The study aims to explore the health system and health-seeking behavior of a low-income community in Gunungkidul and investigate the factors influencing the community to use traditional health services.

Methods. This study used qualitative methods with a phenomenology approach. Semi-structured in-depth interviews were conducted on seven residents, four traditional healers, and three community leaders in a poor community in Gunungkidul regency, Indonesia. Data analysis was carried out through data reduction with thematic content analysis.

Results. The health system in the environment determines the community's health-seeking behavior pattern. The health system is shaped by geographic, demographic, economic, and socio-cultural conditions. Individuals with their profiles will interpret health and illness based on the health system they believe. Factors that encourage individuals with low socio-economic profiles to choose traditional health services include accessibility, cost, perceived effectiveness, service quality, influence of others, socio-cultural and religious reasoning.

Discussion. Utilization of traditional health services in people with low socio-economic status is an effort to try all healing methods to achieve health amid financial limitations. Policymakers need to be aware of increasing the accessibility of biomedical healthcare facilities and increasing collaboration with traditional health services. In contrast, health professionals need to be understood that the community has its health system, and there are obstacles for people from low socio-economic status communities to seek treatment

141

Community pharmacists' acceptability of screening for depression among older adults: A qualitative study

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Introduction. Approximately 10%-15% of older adults (≥65 years) experience late-life depression (LLD). LLD is often diagnosed late, impacting the quality of life of older adults with depression. Pharmacists are well-placed to recognise consumers potentially at risk of LLD, thereby supporting the timely identification and treatment of LLD.

Aim. To explore community pharmacists' acceptability of pharmacist-led depression screening for older adults.

Methods. Pharmacists were recruited through promotional emails from the Pharmaceutical Society of Australia (national professional pharmacists' organisation) and social media platforms. An interview guide was developed to gauge pharmacists' perspectives on the early intervention of depression. Semi-structured interviews explored pharmacists' attitudes towards potential roles in providing depression screening services, previous experience using depression screening tools, and knowledge and awareness of recommended guidelines. Inductive analysis was used to identify common themes, which were then divided into subthemes. Each subtheme was categorised as either a barrier or facilitator and mapped to the Capability, Opportunity, Motivation-Behaviour (COM-B) model, which suggests that behaviour change is influenced by these three factors.

Results. Fifteen pharmacists were interviewed, 12 of which were female and 11 of which practiced in a metropolitan area. Four key themes were identified, including Training Needs, Environmental Factors, Pharmacists' Roles, and Organisational Support, which were further divided into 16 subthemes. Five subthemes were mapped to Capability, eight to Opportunity and three to Motivation. Barriers included lack of time and privacy, and lack of remuneration, while facilitators included training, pharmacists' accessibility, and rapport with consumers.

Discussion. The findings of this study may facilitate the development of pharmacist-led depression screening services and may ultimately increase the early identification and treatment of LLD. However, appropriate referral and remuneration pathways are needed. Future studies may explore the development of standardised guidelines and a funding scheme to provide remuneration for pharmacists delivering screening services.

142

Using cluster analysis to describe burnout characteristics of pharmacists during COVID-19

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Introduction. COVID-19 has seen pharmacists reporting a high level of burnout and work-related stress. Cluster analysis is a statistical method used to determine the interaction of variables on a particular outcome.

Aims. To use cluster analysis to determine which variables are associated with burnout in pharmacists, and describe various profiles to better understand pharmacists at risk of burnout.

Methods. An online survey was sent to Australian pharmacists in 2020 measuring burnout and possible related factors. A two-step cluster analysis was performed on the results.

Results. A total of 647 responses were analysed using cluster analysis that resulted in the formation of two distinct clusters, with 10 distinct variables being important predictors of the cluster formation (Figure 1). The first cluster- 'The affected pharmacist' represented a community pharmacist with high burnout scores, experiencing incivility and rudeness, increased workload and working overtime. The second cluster 'The business-as-usual pharmacist' represented a profile of a hospital pharmacist without an increase in workload, not experiencing incivility, and reporting sufficient precautionary measures in their workplace.

Discussion. The distinct profiles of the affected community pharmacists who were busy, burnout and uncertain and the less affected, business-as-usual hospital pharmacists that have been discovered through the use of cluster analysis are a reflection of the lived-experience of the pharmacist community working through COVID-19. Whilst there are other ways to report the factors associated with burnout in pharmacists, no other forms of multivariate analysis have the advantage of considering the whole person experience rather than just the numbers. These profiles help to illustrate the factors that have affected pharmacists and their burnout during COVID-19 and will help pharmacists who might identify with one or another of the profiles to consider their own experience and risk profile.

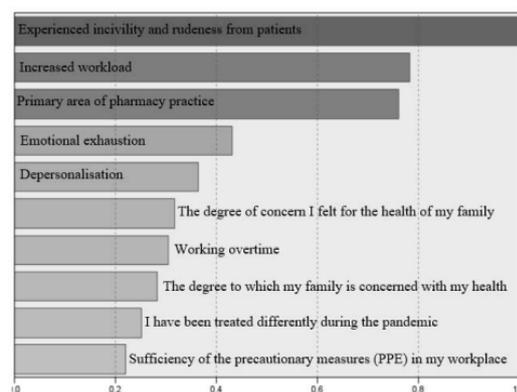


Figure 1: Variables by predictor importance

143

Bridging the gap between physical and mental illness in community pharmacy (PharMIbridge): Implementation of a cluster-RCT during the COVID-19 pandemic

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Introduction. Physical comorbidities contribute to the significant life expectancy gap between consumers living with severe and persistent mental illness (SPMI) and the general population. As medications are a major treatment modality for many mental and physical illnesses, pharmacists are well-positioned to provide mental and physical healthcare services.

Aims. To describe the implementation of a Cluster Randomised Controlled Trial (C-RCT) testing the effectiveness of an individualised, pharmacist-led support service for people living with SPMI focusing on medication adherence and the management of physical comorbidities (*PharMIbridge*), compared to usual care (medication management service; MedsCheck).

Methods. Community pharmacies in four Australian regions were randomised to the *PharMIbridge* Intervention Group (IG) or Comparator Group (CG). Participating pharmacy staff received Blended-Mental Health First Aid training. While IG pharmacists received training on adherence, goal setting, motivational interviewing, managing physical health concerns and complex issues relating to psychotropic medication, CG pharmacists received no additional training. IG pharmacies were supported by consumer and pharmacist mentors. The COVID-19 pandemic necessitated various adaptations to be able to continue the C-RCT implementation.

Results. Fifty-nine community pharmacies were randomised to IG (n=28) or CG (n=31), across four trial regions. Consumer participant recruitment and service delivery ran from September 2020-December 2021. In total, 169 (IG) and 163 (CG) consumers completed baseline data collection. COVID-19 impacts included changes to trial regions, switching to online training for mentors, filming of expert trainers remotely, the inability to conduct site visits supporting implementation, and delays in data collection.

Discussion. The COVID-19 pandemic presented significant challenges to implementing the *PharMIbridge* C-RCT. However, by being flexible and adapting as required, the research team and partners were able to implement the C-RCT in line with the study protocol.¹ *PharMIbridge* pharmacists were able to provide crucial support to people living with SPMI during the challenging COVID-19 pandemic.

Funding/Registration. This activity received grant funding from the Australian Government Department of Health. Registration: ACTRN12620000577910.

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144

Australian pharmacist's anti-doping knowledge and skills in assisting athletes avoid unintentional ingestion of prohibited substances

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Introduction. The World Antidoping Agency (WADA) prohibited list places strict limitations on which medicines (and substances) an athlete may consume in and out of competition in an effort to control doping/cheating and for athlete safety reasons. Yet, breaches of the WADA code still occur. The International Pharmacy Federation in 2014 declared that pharmacists have an important role in assisting athletes. Surveys of pharmacists have indicated varying levels of knowledge as well as recognition of pharmacists' responsibility in assisting athletes' informed decision-making.

Aim. To examine the knowledge and skills of Australian pharmacists about counselling and advice-giving in relation to the use of prohibited medications in sport.

Method. Using a pseudo-patient study design the researcher/athlete contacted 100 pharmacies by telephone requesting advice about taking salbutamol inhaler (WADA prohibited, with conditional requirements) for exercise-induced asthma, following a set interview protocol.

Results. Findings indicated majority of pharmacists had limited knowledge of whether a substance was prohibited for use by elite athletes. Less than 25% of the pharmacists were able to provide comprehensive anti-doping advice to the athlete, with another 46% providing only minimal advice. 47% referred the caller to a suitable resource to seek antidoping information. Significantly, 32% of pharmacists not only gave incorrect or no anti-doping advice, but also could not identify credible sources of antidoping information.

Discussion. Pharmacists, by training, can play a role in providing accurate medication-related information to athletes which can assist in avoiding unintentional ingestion of prohibited substances. There appears to be however, a knowledge gap preventing pharmacists from undertaking this new scope of practice. Specific inclusion of sport pharmacy in education and national standards of professional practice will ensure ongoing competence. Formally expanding scope of practice to incorporate sport-based pharmacy advice will clarify willingness and ability to engage in this relatively new and important healthcare service by pharmacists.

Chicago hub short oral presentations

200

Māori and medicines adherence – Indigenous voices and the pharmacists' role in achieving medicines access equity in Aotearoa New Zealand

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Introduction. Māori experience inequities in medicines access compared to non-Māori. Little evidence exists regarding Māori and medicines adherence. Pharmacist effectiveness in improving medicines adherence is known¹ yet pharmacists' role in adherence support and achieving medicines access equity for Māori is understudied.

Aims. To explore Māori experiences of medicine adherence and non-adherence, and pharmacists' role in supporting adherence.

Methods. Eligible participants (Māori, 18 years plus, accessed medicines from pharmacy in last three years) took part in online or in-person focus groups (included short presentation, facilitated discussion, questionnaire). Participants could contribute in English and Māori. Data was thematically analysed using a general inductive approach, informed by kaupapa Māori theory² and situated in social, cultural, political and historical Māori contexts.

Results. Sixty-two participants (71% female, median age range 35-44, median number medicines=2.0) took part in 13 focus groups (September 2021-February 2022). Four themes were identified: Māori wellbeing - medicines as a component of holistic wellbeing; whanaungatanga (relationships); knowledge; and *whānau* (family and support network) advocacy and problem solving.

Discussion. Improving medicines adherence improves clinical outcomes and this study privileged Māori voices to better understand adherence, and pharmacists' role in supporting Māori to experience the best possible medicine-related outcomes. Adherence is particularly relevant for Māori who experience inequities in access to quality health care across the spectrum of clinical contexts, and are likely to experience earlier onset of chronic co-morbidity than non-Māori. Pharmacists can support medicines adherence by developing authentic and caring relationships, providing good quality information, and supporting Māori to exercise autonomy through informed decision-making regarding medicine treatment.

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201

Identifying vaccination deserts: The availability and distribution of pharmacists with authorization to administer injections in Ontario Canada

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Introduction. Allowing pharmacists to immunize has been associated with improved vaccination rates; however, little is known whether areas with little to no access to this service ('vaccination deserts') exist.

Aims. To determine the geographic availability of pharmacists with authorization to administer injections in the province of Ontario, Canada.

Methods. Ontario College of Pharmacists' registry data was used to identify patient care-providing pharmacists in community pharmacies who had completed injection certification. Number of hours worked were converted into full-time equivalents (FTEs). Practice site(s) were mapped by postal code and presented by Public Health Unit (PHU) area. Communities were further categorized as urban or rural, and northern or southern, with ratios of FTEs/1000 population calculated for both injection-trained and non-injection-trained pharmacists.

Results. 74.6% of Ontario's practicing community pharmacist are authorized to provide injections. Northern PHUs had slightly better access to immunization pharmacists (0.61 FTEs/1000 overall vs 0.56/1000 in the south), while rural communities had lower availability (0.41 FTEs/1000) than urban communities (0.58 FTEs/1000). PHUs with greater population size and density had greater availability of pharmacist immunizers, while PHUs with greater land area were more likely to not have any immunization pharmacists present (p<0.05).

Discussion. As pharmacists increasingly become preferred vaccination providers, awareness of disparities related to access to pharmacy-based immunization and collaboration with public health and primary care providers to address these geographic vaccination deserts will be required to ensure equitable access.

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202

Community pharmacy provision in England during COVID-19: learning for future pandemic preparedness

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Introduction. The COVID-19 pandemic placed increased pressure on community pharmacy in England e.g. a 22% increase in dispensing volume in March 2020 (1), and changed the scope of services with the emergence of new services such COVID-19 test distribution, vaccination and extensive medicines delivery (2). These changes should be explored to learn how pharmacy could and should respond to any future pandemic.

Aims. To explore community pharmacy service provision in England during the COVID-19 pandemic for future pandemic preparedness. **Methods.** Telephone interviews with 9 pharmacists (including 4 managers and 2 owners), 1 dispenser and 9 patients between April and September 2021, from a mixture of rural, semi-rural or city settlements. Interview schedules (for providers/patients) were informed by literature and piloted. Transcripts were analysed thematically. **Results.** Providers (pharmacists and dispenser) and patients contributed 8 and 6 themes respectively. Some examples, providers described changes in prescribing habits e.g. patients being given several inhalers for the first time in years, with such changes considered a cause of medicines shortages. Although providers felt more trusted by General Practice [GP] and vice versa, double standards were suggested: "we were being asked to take patient's blood pressure... why couldn't the surgery [GP]?". Patients also described service double standards "you couldn't see a doctor, but you could see a nurse to have a blood test". Regarding medicines use, the only change described by patients was self-monitoring blood pressure at home and informing GP of readings.

Discussion. Differences in how different professionals provided care should be further explored to ensure an effective and equitable service delivery in any future pandemic. To support appropriate medicines use and supply chains, protocols should be developed to guide pharmacy services and healthcare more broadly.

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203

African-born persons living with HIV in Minnesota at the intersection of culture and US healthcare system

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Introduction. African-born people have been disproportionately affected by HIV/AIDS in Minnesota. Previous studies have demonstrated pharmacist's roles in adherence to the Antiretroviral (ART) regimen. Little is known about pharmacist's role in adherence and non-pharmacological interventions of African-born persons living with HIV[PLWH] when interacting with the U.S. healthcare system.

Aims. To uncover the experiences of African-born PLWH who receive ART medications and their interactions with the U.S. healthcare system.

Methods. Narrative Interviews were used as a qualitative approach for this study. Conceptual frameworks were used in designing the interview guide. Recruitment via fliers for in-person interviews with African-born PLWH in Minnesota continued until saturation was achieved. Conventional content analysis was used to analyse the data. Dedoose, a qualitative software program facilitated the data analysis. Codes were inductively derived, and similar codes were grouped into categories.

Results. Fourteen participants were from seven different African countries. Eight of the participants were diagnosed and started treatment for HIV in the U.S., while the remaining did so in their country of origin. The findings revealed two major themes.

Theme 1: Lessons from interacting with the U.S. healthcare system. Participants are still learning how to use the US healthcare system. They rely mostly on physicians for medical advice. Participants seemed unaware of the pharmacist role in their medication management.

Theme 2: Diagnosis secrecy. Participants faced the dilemma of revealing their secret to their loved ones and friends. The fear of disclosing the secret with the healthcare professionals, including pharmacists, was expressed by the participants.

Discussion. Participants seemed willing to better understand and use the healthcare system for their own benefits. Participants are not using the pharmacists as a key resource for medication information and might not seek pharmacist's advice on ART or non-pharmacological options. Pharmacists could use this opportunity to engage this population to maximize outcomes.

204

Predicting confidence to manage symptoms and seek medical care in patients taking oral oncolytic therapy

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Introduction. Oral oncolytics have transformed cancer care by allowing patients to self-administer cancer treatments. Although convenient, these drugs cause side effects that require frequent monitoring. Importantly, patients must now recognize and assess their symptom severity and comprehend and use symptom management strategies.

Aims. To assess the relationship between symptom severity and patients' confidence to manage their most bothersome symptom and patients' confidence to seek medical care for any symptom.

Methods. The Michigan Oncology Quality Consortium (MOQC) created a 19-item patient reported outcome measure (PROM) survey to assess symptom severity, confidence to manage symptoms, and adherence to therapy. Symptoms are rated from 0 (none) to 10 (worst possible), and confidence is rated from 0 (not confident) to 10 (confident). MOQC-PROM surveys were completed across multiple sites in Michigan from July 2016 to December 2018 by adult patients taking an oral oncolytic. Patients' first completed PROM was analysed (n=653) using simple linear regression.

Results. Patients that reported experiencing more severe symptoms of tiredness, shortness of breath, lack of appetite, tingling/numbness, constipation, pain, drowsiness, depression, anxiety, nausea, and overall well-being had statistically significantly lower confidence to manage their most bothersome symptom ($p<0.05$). The largest effect sizes were observed for depression ($b_1=-0.39$) and anxiety ($b_1=-0.36$); for each one-point increase in depression symptom severity, confidence score decreases by 0.39. Confidence to seek medical care for any symptom was significantly lower ($p<0.05$) in patients rating symptoms of pain, depression, anxiety, and mouth sores as more severe, and the largest effect size was observed for mouth sores ($b_1=-0.27$).

Discussion. A better understanding of symptoms that predict confidence to manage symptoms will allow clinicians to identify patients that require more education and/or support during cancer treatment. Future research should explore ways to enhance confidence and how to use a confidence measure in clinical settings to provide optimal treatment.

205

Pharmacists' views of their roles: Results from a national survey

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Introduction. Pharmacists' roles have advanced but it remains to be seen if pharmacists' perceptions of their roles have evolved alongside these expanded opportunities.

Aim. Examine pharmacist role perceptions in the medication use process (MUP).

Methods. Cross-sectional survey design with a Qualtrics online pharmacist panel. A 15-item survey was developed using a role theory framework to explore pharmacist role perceptions in the 5-step MUP: prescribing, transcribing, dispensing, administering, and monitoring, and in direct patient care services and interprofessional collaboration. Data collected included pharmacist characteristics and perceptions regarding effectiveness of and best choice for improving the MUP step (Likert-type responses) and open-ended questions explaining rationale for responses. Descriptive and content analysis were performed.

Results. A panel of 205 pharmacists, representative of practicing U.S. pharmacists in terms of age, gender, and ethnicity, completed the survey during October-November 2021. Half the sample (42.9-59.5%) believed that prescriptions are written error-free, patients use their medications as directed most of the time and are monitored and followed-up as needed. Pharmacists believed that patients first connect with them about health-related problems, and can best help patients with counselling, taking medications as directed, and medication-related monitoring. Pharmacists selected staffing, working conditions/environment, and time to be the best choices to reduce medication dispensing errors; open-ended comments additionally showed themes such as pharmacist burnout, competing demands, technology, and insurance. Almost all respondents (97.7%) agreed that pharmacist-physician collaboration is important to improve patient care/outcomes; pharmacists believed that lack of time and appropriate setup, as well as interprofessional communication challenges were barriers to collaboration.

Discussion. Pharmacists believe their roles have evolved to align with changes in expanded opportunities. This study is part of a larger project that examined physician and patient perceptions of pharmacist's roles. Clarity in role expectations amongst these stakeholders is critical to optimizing the pharmacist's role on the healthcare team.

206

Patient contributions to a multi-state virtual stakeholder engagement advisory group for PatientToc™

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Introduction. Mixed stakeholder engagement has enriched research projects by including advice from both patients and providers. The question is whether similar processes used for face-to-face interaction might be applicable for virtual stakeholder meetings, particularly when mixed groups are composed of distant patients and providers. The PatientToc™ study provides a case study.

Aim. To describe the process and outcomes of a virtual advisory group composed of patients, pharmacists and pharmacy techs from three states.

Methods. The process for the PatientToc™ *virtual advisory meeting* was informed by a toolkit¹ designed to facilitate effective participation of patient and provider advisors. Similar to in-person mixed groups, the PatientToc™ advisors began each meeting together in the same virtual room. The PI (MS) shared her screen and offered an overview of the project's status, progress, and meeting goals. Importantly, in subsequent meetings she explained how the advisory group's advice had been used by the project. After this orientation to promote open discussion, patients and pharmacy staff were separated into two different virtual rooms along with at least one facilitator per room. Ground rules for confidentiality, respectful listening, and sharing were adopted by each group. Facilitators posed questions designed to inform PatientToc's design and implementation. Questions with any IRB implications were excluded. After each group finished discussing questions, they came back together in one room to summarize their recommendations.

Results. Patients offered useful advice about PatientToc's pamphlets, items and instructions. For example, they wanted PatientToc to facilitate discussing their health condition with a pharmacist, not just a single medication. Participants said they could use PatientToc online at home, in a car, during a medication home delivery, or at a pharmacy.

Discussion. The same principles in the earlier toolkit for *in-person mixed* advisory groups worked well with the *virtual* groups across states. They may have potential across countries.

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207

Overcoming defensive responding in the estimation of prescription stimulant misuse

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Introduction. Extant literature indicates that the prevalence of non-medical use of prescription stimulants (NMUPS) has been increasing among young-adult college students. Previous estimates of NMUPS may be biased due to reluctance to disclose sensitive and potentially illegal behavior in self-report format. The crosswise randomized response technique (CRRT) helps estimate the true prevalence for sensitive behaviors such as NMUPS by providing respondents increased anonymity.

Aims. (1) Estimate the prevalence of NMUPS in the college student population using the CRRT; and (2) estimate the difference in prevalence of NMUPS measured using CRRT and direct self-report (DSR).

Methods. This study employed a cross-sectional, randomized experimental design conducted among undergraduate students using Qualtrics. Eligible respondents randomized to the CRRT group were presented a non-sensitive question along with the NMUPS question and had to indicate whether their responses were 'same' or 'different' to both questions. In the DSR group, the non-sensitive question, 'being born in the first 10 days of the birth month', was asked directly along with a direct self-report question for NMUPS. Respondents were also asked a series of questions that assess demographic and other characteristics that are expected to be risk factors for NMUPS. All respondents were given a \$5 gift card in return for their participation.

Results. Of the 1,326 respondents who completed the survey, 16.9% individuals self-reported having ADHD, 47.9% were underclassmen, 52.1% upperclassmen, along with 66.6% females and 78.1% White. The prevalence of NMUPS in the DSR group was 18.6%, while prevalence in the CRRT group was 32.5% (estimated using an established algorithm). Difference between the two rates was found to be statistically significant ($p = 0.003$).

Discussion. This study represents a significant advancement for prevalence estimation of sensitive behaviors such as NMUPS. Further research is needed to evaluate prevalence in larger samples and to identify drivers of NMUPS.

208

Usability testing of PatientToc™, an electronic patient reported outcomes tool: lessons learned

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Introduction. PatientToc™ is a tablet-based application that captures patients' reported outcomes in community pharmacies. Patients review their medication profile embedded in PatientToc, update it when necessary, and report medication adherence and concerns. Being developed for older adults, special attention was made to be user friendly and time sensitive.

Aim. To ensure the acceptability and feasibility of PatientToc™ before beta testing in pharmacies, a lab-based usability study was conducted with standardized patients at The School of Pharmacy at the University of Wisconsin-Madison.

Methods. To explore patients' experiences using the app, a coding protocol was developed guided by the Framework for Usability and User Experience. Usability sessions were conducted individually with 6 older standardized patients. Patients followed a scenario they were given earlier and did a "think aloud" process while proceeding through PatientToc™. An instructor took notes using the coding protocol and asked questions as patients viewed screens. The usability session was videorecorded for later analysis. After completing PatientToc™, patients were debriefed for in-depth information. Rapid qualitative analysis was conducted based on the usability testing notes and patient debriefs.

Results. Patients had positive views about PatientToc™. They perceived it as feasible and useful. Although each usability session lasted around 45 minutes, patients reported they didn't feel it was time intensive. Several issues were identified to improve user experience and data quality which include visual clutter, inconsistency of alignment of questions and font size, inappropriate answer space for date of birth, difficulty navigating droplists, and identifying questions with multiple answers. Skipping free-standing instructions and reluctance to answer sensitive questions were also observed.

Discussion. The visual presentation of questionnaires administered through PatientToc™ is important as it can impact peoples' engagement and quality of information they provide. Patients' feedback was utilized to refine the visual design of PatientToc™ before its launch to pharmacies.

209

The identification and management of drug-related problems in the emergency department: a narrative review

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Introduction. Drug-related problems (DRPs) "actually or potentially interfere with desired health outcomes" (1) and include adverse drug reactions and medication errors. Up to 28% of ED visits are due to DRPs (2), with up to 87.7% considered preventable (3). In the UK, the cost of drug-related hospital admissions is an estimated £466million per annum. Despite their impact on health outcomes and substantial cost, to date there has been no review of how DRPs are identified and managed in ED.

Aims. To investigate how DRPs are identified and managed in ED. **Methods.** Eight databases e.g. PubMed were systematically searched for global literature about the identification and management of DRPs in ED. From abstract screening, 406/9,102 search results were potentially relevant and 112 met the inclusion criteria e.g. concerned ED DRPs. **Results.** Only one tested intervention was found, where a pharmacist reviewed 59 patients with heart failure/COPD in ED and identified and supported management of 82 potential DRPs. Negative outcomes due to DRPs e.g. poor BP control, were significantly reduced per patient (0.95 versus 1.44; p=0.01). Other literature described opportunities to identify and manage DRPs but were untested e.g. pharmacists advising clinicians on drug therapy and counselling patients, or education interventions for clinicians. Challenges to DRP identification were also described, including how the clinical effect of DRPs is often non-specific e.g. diarrhoea, and so can be mistaken for a symptom of disease.

Discussion. DRPs cause nearly a fifth of ED visits, yet only one specific intervention for their identification and management in ED has been tested. Although in a limited patient cohort, an ED pharmacist did reduce negative outcomes of DRPs compared with routine practice (no ED pharmacist). Further interventions should be developed and tested to identify and manage DRPs in ED, with the aim of improving health outcomes and reducing costs.

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210

Medication use and self-management behavior in Muslim patients diagnosed with Type 2 Diabetes Mellitus (work in progress)

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Introduction. The Muslim population in the US constitutes 2.15 million adults. This group needs attention from researchers and medical providers due to healthcare disparities and the lack of knowledge about factors that influence their health behavior. Diabetes mellitus (DM) disproportionately affects people from minority and underserved populations.

Aims. 1. To establish stakeholder informed research with the Muslim community using a community-engaged research process. 2. To conduct a qualitative study to explore factors related to type 2 diabetes (T2D) self-management behavior and medication use.

Methods. For the stakeholder engagement approach, we will conduct longitudinal, blended advisory group discussions with patients diagnosed with T2D, clinicians, pharmacists, and refugees case coordinators. We will conduct 3 stakeholder meetings over one year, each meeting will last for 90 minutes. To explore factors in the second aim, we will apply the social cognitive theory (SCT) to diabetes self-management behaviors in Muslim patients including religious and sociocultural factors. We will conduct semi-structured one-on-one interviews with 30 Muslim male and female patients diagnosed with T2D. Participants will be ≥ 18 years, diagnosed with T2D for at least 6 months and use oral medications and/or insulin for diabetes treatment. We will use maximum variation sampling to recruit people who speak different languages from diverse racial/ethnic backgrounds to capture the heterogeneity in this community. We will recruit 5 participants who speak Arabic, Rohingya, Pashto, English, Somali, or Urdu languages. Two trained researchers will independently conduct directed content analysis to analyze the transcripts using NVivo software. The directed approach to content analysis will enable us to use SCT to guide our analysis and to extend beyond this theoretical framework to include other possible factors that may arise.

Discussion. This is the first step in a stream of research to develop health interventions that foster behavioral changes to improve diabetes management in this patient population.

211

An ethnographic exploration of the medicine use of community dwelling older adults with sensory impairment in Scotland

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Introduction. The prevalence of sensory impairment (visual and/or hearing) increases with age. Older people with sensory impairment (OPwSI) are at increased risk of suboptimal therapeutic benefits and medicine use-related harm.

Aims. To explore the challenges OPwSI experience and the strategies they employ to manage their medicines.

Methods. An ethnographic approach was developed to explore OPwSI's medicine use practices. Due to COVID19 restrictions, participants collected data about their own medicine management, using a range of media including videos, photographs, voice recordings and diary notes. In addition, they participated in remote semi-structured interviews with a researcher to provide greater depth of information and to facilitate data interpretation and analysis. Data were coded using comparative analysis to generate themes and sub-themes.

Results. In total, 13 individuals participated: visual impairment (4), hearing impairment (4), dual impairment (5); mean age: 75 years (range 65-89); and nine females. Participants used an average of 11 (range 5-22) medicines. Participants developed elaborate, individualised strategies, customised to their home environment and personal medicine regimens. These involved bespoke storage systems, fixed routines of medicine administration and other strategies. Whilst the use of high-tech assistive technologies was limited, many participants deployed low tech tools e.g. medicine boxes, pill cutters and repurposed containers to facilitate medicine management. Despite familiarity with their medicines and having developed personalised strategies, daily medicine use involved dealing with many uncertainties and ambiguities. None of the participants reported substantial involvement with, or input from, their community pharmacists or other healthcare professionals.

Discussion. OPwSI are diverse in their abilities, skills and preferences and require different tools for their medicine management. It is important that pharmacy personnel and other health and social care providers work in partnership with OPwSI and enable them to manage their medicines, by offering accessible services, technological aids and addressing individual needs.

Basel hub short oral presentations

300

Development and evaluation of an e-learning curriculum on drug-related problems for community pharmacists

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Introduction. One in five patients in Germany experiences drug-related problems (DRPs) when receiving prescribed drugs, including drug interactions or administration errors. Community pharmacists (CPs) are the last instance to verify home-dwelling patients' ability to apply their drugs correctly and they can prevent DRPs by providing solution-oriented counselling. Hence, continuous training on relevant DRPs is essential.

Aims. To develop and evaluate a multicomponent e-learning curriculum for CPs to detect and prevent DRPs.

Methods. Relevant DRPs that occur frequently and can be prevented by CPs were identified via literature search and a Delphi-survey among six healthcare professionals. For each selected DRP, an e-learning module was developed consisting of an educational video, theoretical/practical exercises (e.g. documenting patient cases), and knowledge tests. After having pretested the first module, the curriculum was piloted in 2018 including feedback for each module. A German Chamber of Pharmacists supported the project.

Results. A 10-module curriculum was developed addressing DRPs such as wrong eye drop administration or drug-food-interactions of levodopa. Within 24h, 200 CPs registered, of whom 56% (n=112) successfully completed all modules. About one third (34%, n=60) dropped out within the first module (one quarter even never accessed the homepage). Across all modules, participating CPs on average indicated to highly appreciate the curriculum, i.e. 81% stated it is very well suited to quickly identify patients who might experience DRPs, 83% were able to derive appropriate solutions for their patients, 87% felt more competent in patient counselling, and 81% could easily integrate the contents into practice. About 95% of CPs would recommend participation to their colleagues, and almost all participants would continue to apply the content learned in patient counselling.

Discussion. Due to positive feedback, the curriculum was established as an official training measure by the Chamber of Pharmacists. Currently, analyses are conducted to determine how many DRPs were identified and resolved by CPs.

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301

Community pharmacists' perception on the follow-up of frail patients using food supplements: new avenues for multidisciplinary collaboration

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Introduction. Malnutrition, a state resulting from the lack of uptake or intake of food/nutrients leading to impaired physical and mental functions, affects particularly the elderly. Oral nutrition support, where the inclusion of oral nutritional supplements (ONS) for increase of nutritional intake are included, has been shown to be an essential approach in early intervention for high-risk malnutrition.

Aims. This study aimed to characterize the experiences of community pharmacists, with the counselling and follow-up of patients using Oral high protein and/or hypercaloric food supplements (FS).

Methods. A qualitative, observational, cross-sectional study was performed. To this end, an interview script was developed, and applied to a convenience sample of community pharmacists obtained by the snowball sampling technique. As inclusion criteria, the pharmacists contacted had to work in community pharmacy, in rural or urban settings, with a minimum of three years of professional experience. All interviews were subject to audio recording for later transcription. The final sample was constituted by 19 pharmacists from 19 different pharmacies.

Results. Three quarters of respondents stated that their pharmacy has Nutrition Consultations, provided by nutritionists. The counselling of these FS occurred, in most cases, at least once a week. All respondents considered important to monitor the patient using FS. However, only 11% said they perform this monitoring proactively to assess the effectiveness of the FS. Barriers to the provision of follow-up, such as lack of time and a lack of a tailored information system, were mentioned. When oncology patients seek FS, the majority of the interviewees considered that they should immediately refer patients to a doctor, reflecting a feeling of insecurity in counselling these patients.

Discussion. The results of this study allow us to conclude that it is easier for the pharmacist to give advice on FS than to continue the follow-up after that advice. Respondents believe that even if there were a consultation performed by a nutritionist, which may or may not be a service provided by the pharmacy, it would be important to have a counselling consultation by pharmacists in order to facilitate and formalize patient monitoring. New studies should focus on exploring the interaction between pharmacists and nutritionists, developing a set of outcomes of interest to monitor these patients.

302

Explorative research on health literacy and self-care behaviours among Malaysian type 2 diabetes patients

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Introduction. Type 2 diabetes (T2D) is a chronic metabolic condition which is associated with high blood sugar. In Malaysia, 1 in 5 adults are diagnosed with diabetes. Limited health literacy among diabetes patients may result in poor self-care management and diabetes outcome.

Aims. This qualitative research explored the perception of pre-diabetes and newly diagnosed T2D patients (≤ 5 years) on disease knowledge and management in empowering self-care behaviours to delay or prevent disease progression.

Methods. 18 T2D and 4 pre-diabetes patients were recruited through purposive sampling from online platforms and 2 public health clinics. They were interviewed individually using semi-structured interview via Microsoft Teams or telephone call. All interviews were audio-recorded, translated to English language and transcribed verbatim. The data obtained were coded and categorised into themes using reflexive thematic analysis.

Results. Four major key themes were identified which are accessibility to reliable resources, mental health, self-awareness and overcoming barriers to self-care.

Discussion. Most of the patients felt that having sufficient access to reliable information and services is important to ensure the information gained is sufficient to practise self-care. Getting to see the same healthcare professionals (HCPs) is also important to stay consistent due to the continuing care received. Being diagnosed with diabetes can affect a patient's mental health due to the drastic changes that they need to make, hence continuous support from family, peer and HCPs helps in empowering self-care behaviours. Patients who have a good understanding about their diabetes, for example, the target blood glucose level to achieve, and fear of developing complications develop the sense of self-awareness to practise self-care. Overcoming the barriers that patients faced to self-care for example, lack of support, difficulty finding information and having the thought that self-care is hard also need to be addressed to improve their diabetes outcome.

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303

Development of a new mHealth app for the monitoring of medication adherence

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Introduction. With the democratization of smartphones and their permanent proximity to their users, mobile health (mHealth) applications (app) allow new approaches to target medication use behaviour (adherence). In addition, an app can deliver appropriate adherence estimates that could be shared with healthcare providers.

Aims. The aim is to develop an app with features rooted in literature that is not a medical device. The core elements should include the recording of the medication intake, visualisation over time, calculation of appealing metrics and consumer-to-healthcare provider (C2B) data export. Ultimately, data should be interpreted by pharmacists or other healthcare providers during an adherence consultation.

Methods. Google Play Store and Apple Store were searched for existing adherence apps. Their features were listed and compared. Frameworks for app's development and users' experiences with apps were retrieved from literature through a pragmatic search on PubMed.

Results. Hundreds of apps exist already to support adherence in various diseases. The four key features include alerting (to take medicines); tracking (medicine intakes); indicating (amount of medicine left)/reminding (to refill), and storing (medicine information). None allows data export to healthcare providers in view of professional interpretation. According to Nebeker's framework¹, the key challenges in developing an app are interoperability and integration; compliance and regulation; privacy and security, and usability, especially for elderly patients. Patients' experience highlight the need for visualizing the data in charts and a pragmatic execution of the tasks, among others. We have developed a smartphone app whose central part is the current medication plan. The daily doses are grouped at predefined intake times. Clicking an icon at the moment of the intake records a timestamp. Taking adherence and correct dosing days are calculated. Encrypted data can be exported via email. Patient can modify all settings.

Discussion. We selected a robust development of our app to support its adoption by patients. The next step will be to evaluate the app with polymedicated adult patients in primary care.

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304

Development of quality indicators for community pharmacies; a qualitative study

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

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

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

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

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

305

Factorial survey methodology to inform pharmacy adherence interventions: comparison of two international studies

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Introduction. Factorial surveys are becoming an increasingly used method to study how healthcare professionals make clinical decisions, and have recently been applied to inform the design of pharmacy adherence interventions.

Aims. To describe the factorial survey design, and to compare the insights derived to inform a medication adherence intervention from two international studies

Methods. Two separate factorial surveys were conducted on community pharmacists in the Republic of Ireland (2017) and New York, USA (2020) to understand factors determining adherence monitoring within the clinical workflow. A factorial survey is a quasi-experimental design defined by the presence of factorial vignettes, which allow the effect of contextual factors within the pharmacy, on clinical decisions, such as adherence monitoring, be determined. The vignettes were designed with input from practising pharmacists and piloted before finalising. The Theory of Planned Behaviour was employed as a conceptual model; pharmacists behavioural, normative and control beliefs were elicited from validated standardised questionnaires such as the Medication Monitoring Attitude measure (MMAM) and from novel questionnaires, and were also tested for influence on adherence monitoring.

Results. The surveys were administered online, and completed by 258 and 350 community pharmacists in Ireland and the USA, respectively. Both studies identified contextual factors from the vignettes such as time-pressures within the community pharmacy and the number of days late the patient collected their repeat prescription to influence adherence monitoring. Further, pharmacists with positive behavioural and normative beliefs towards adherence monitoring, including highly positive attitudes to medication monitoring, were more likely to monitor adherence. Conflicting findings were also observed, with control beliefs positively associated with adherence monitoring in the US study only.

Discussion. Using the factorial survey methodology these studies highlighted that addressing both contextual factors as well as pharmacists beliefs may improve the success of implementing novel adherence interventions in the community setting.

306

Exploring patient participation in an interprofessional medication management program in primary care

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Introduction. Medication review and management programs (MMP) can improve medication-related, clinical, and patient-reported outcomes [1,2]. Since 2016, approximately 4500 patients have participated in an interprofessional MMP in two German federal states.

Aims. To investigate patients' experiences of the MMP.

Methods. This was a cross-sectional self-administered postal survey among patients who participated in the MMP. The multi-part questionnaire comprised questions about patients' motivation for participation, perceived benefits, and suggestions for improvement, among others. Single/multiple choice and Likert scale questions were used. Data collection took place between 12/2020 and 04/2021. Descriptive statistics were applied.

Results. The response rate was 50.6% (n=2405/4757). 245 questionnaires were excluded due to >30% missing answers. Patients were 73 years old (median, IQR 66-81) and 52.4% female (n=2160). Patients' top three reasons for participation in the MMP were (i) having received general practitioner's (GP) recommendation (70%), (ii) wanting community pharmacists and GPs to know their entire medication (40%), and (iii) receiving a comprehensive medication review (34%). For 24% of the patients, GP's recommendation was the only reason for participation. Overall, 34% of the patients reported a benefit because of the MMP participation, 31% indicated to have no benefit but were already satisfied before participation, and 15% reported they had no benefit. The majority of the patients would participate again (58%), primarily to have their medication checked (66%), to receive additional care (56%), and to use their medication more safely (49%). However, 38% of the patients would not participate again unless the benefits of the MMP were better explained (50%) and they perceived greater benefit (27%).

Discussion. Although the overall response was positive, many patients were not (fully) aware of the potential benefits of participating in the MMP which in turn could explain their call for greater benefit. Potential MMP advantages should be better explained to patients.

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307

Pharmacy student knowledge of online pharmacy use and the impact of education

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Introduction. Currently, there is no set of standards for integrating the patient safety risks of online pharmacies into Doctor of Pharmacy (DoP) degree curricula in the United States. As a result, many pharmacists are unable to recognize the differences between a legal and illegal online pharmacy, or educate patients on the dangers of online pharmacies. **Aims.** The objective of this study was to assess gaps in student pharmacist knowledge, and the practical impact of adding education on online pharmacies in a DoP program.

Methods. A pre and post survey design was developed. Data was collected through an electronic questionnaire distributed to pharmacy students in their second professional year (P2) to evaluate student knowledge gaps at baseline and after their education on illegal online pharmacies.

Results. A total of 102 students responded to the pre-survey, with 93 (91%) consenting to participate. Out of 100 respondents to the post-survey, 84 (84%) students consented. Approximately 87% (81/93) indicated some awareness of prescription medications being purchased online. Most students (89%, 77/86) stated that they do not believe the University has provided adequate curriculum on illegal online pharmacies and counterfeit medications. After receiving education on the relevant topics, 64% (55/85) stated they now felt their education was adequate.

Discussion. Although pharmacy students are aware of the existence of illegal online pharmacies, they were not aware of the significance of this patient safety issue, or how to accurately identify suspicious websites. These topics are important in an internet-based economy, and should supplement more traditional substandard/falsified medicine training. It is imperative that pharmacy programs around the world incorporate formal education on the risks illegal online pharmacies pose to patient and medication safety in society today.

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308

Using machine learning methods to predict all-cause somatic hospital admissions and readmissions in adults: A systematic review

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Introduction. Machine learning (ML) is currently extensively used for predicting hospital admission and readmission.

Aims. To summarize and evaluate ML methods used for predicting all-cause hospital admissions and readmissions and to suggest recommendations for future work.

Methods. Four databases (PubMed, Embase, Web of Science, and CINAHL) were searched for literature from their inception dates to November 2021. Four other databases (ProQuest, OpenGrey, WorldCat, and MedNar) were searched for grey literature.

Results. Of 6,388 citations reviewed, 96 (54 for predicting readmissions and 42 for admissions) citations were included. Most studies were retrospective. Major groups of variables used were demographic, administrative, clinical, medical history, inpatient medication use, clinicians' notes, and utilization of health care services before admissions variables. Area Under the ROC curve (AUC) is the most used evaluation metric. Bagging and boosting tree-based algorithms are frequently used and usually yield good discriminative performance. The use of neural networks is gradually increasing. Nine studies used Natural language processing (NLP) of clinical notes for prediction. Generally, reporting in these types of studies needs to improve especially in pre-processing steps, describing population characteristics, hyperparameter tuning, model calibration, and handling of imbalanced data and missing values.

Discussion. ML algorithms mostly outperformed regression and constantly outperformed risk prediction scores. Despite the rapid development in the field, we are still far from the generalizability of ML models in clinical settings. Data privacy regulations, un-unified data formats, external validity, the wide variety of data preparation steps are all obstacles in the way of generalization. The models must provide patient-level interpretation to allow implementation into clinical practice. We recommend adopting institution-specific ML models in the next coming years. To increase the quality of reporting in ML studies, an ML-specific reporting checklist is needed. We recommend the use of longitudinal prescription databases to further improve these models.

309

The quality of over-the-counter medication counselling in Finnish pharmacies – A simulated patient study

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Introduction. Use of OTC medicines is often associated with drug-related problems. Safe self-medication requires quality counselling by pharmacists.

Aims. To assess the quality of OTC medication counselling in Finnish pharmacies

Methods. The simulated patient methodology was used with three

scenarios: the patient requesting specific brand name Burana[®] (ibuprofen, OTC-medicine), or Pronaxen[®] (naproxen, BTC-medicine), and the patient requesting a nasal spray. A random sample of 150 pharmacies was selected from all Finnish community pharmacies. The pharmacies were visited twice, and finally, altogether 292 visits were completed. A scoring criteria for the quality of medication counselling were developed for each of the scenarios: poor (1-2 points), moderate (3-4 points), or high (5-6 points).

Results. Only a few pharmacies (n=29) performed high quality medication counselling. The quality of counselling was classified moderate or high in 50% of the cases for Pronaxen[®] and Nasal spray -scenarios. In the Burana[®]-scenario, counselling quality was poor in all pharmacies (n=18) or there was no counselling at all (n=65). Symptoms were often asked from those customers who requested a nasal spray (93%). In the scenario with a direct product request of OTC -pain medicine, the most frequently asked questions were related to contraindications and drug interactions (56%). The most often given instructions varied between the scenarios, being follow up in Burana[®] and Nasal spray -scenarios (17% and 70%, respectively) and how to use the medicine in Pronaxen[®]-scenario (63%).

Discussion. OTC -medication counselling is rarely performed with high quality and there is variation in the quality of counselling depending on the medication. There is room for improvement in medication counselling and in assessing the need for and suitability of treatment, especially when a patient requests the OTC medicine by a brand name.

Scenario	Quality of counselling
Burana [®] (ibuprofen)	Poor or absent
Pronaxen [®] (naproxen)	Moderate
Nasal spray	Moderate

310

Pharmacy services tailored to patient's health needs - design of a tool to assist pharmacists in simple medication review

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Introduction. Medication reviews focuses on detecting drug-related problems and recommending interventions. A tool that assists the pharmacist in processing data from the patient's electronic medication records and flags patients at risk or in need of pharmacy services can improve the effectiveness of medication reviews and, consequently, the provision of tailored services.

Aims. To perform a simple medication review on patient's medication records and identify clusters that enable the definition of an algorithm to tailor pharmacy professional interventions.

Methods. Exploratory retrospective observational study performing a simple medication review to electronic patient records. A convenience sample was used, extracted from the database of EMR of a community pharmacy located in the district of Lisbon, Portugal. The inclusion criteria were: records of continuous therapy in 12 months (June 2017-July 2018); use of two or more chronic prescription medications. Statistical analysis used a two-step cluster to identify common characteristics among patients.

Results. The medication review included 55 patients. 54.5% were female and 45.5% were male. The median of age was 68 years [IQR: 55.0 – 77.0]. The median number of drugs used per patient was 5.0 [IQR: 3.0 – 7.0]. The variables included in the model for the two-step cluster analysis were severity degree of interactions, severity degree of contraindications, Beer's criteria, number of drugs used and medical condition with measurable biomarkers. Four clusters and one outlier patient were identified. Grouping patients into clusters, enabled their prioritization and subsequent suggestion of pharmaceutical interventions according to their health needs.

Discussion. To provide more and better professional services, community pharmacists need tools that analyse information, processing data easily, quickly, and continuously. This clustering will provide the foundation for the design of a criteria-based algorithm likely to be automated, which will assist community pharmacists in providing better care for chronic patients

Author index

By surname with abstract reference number

A			
Ahmad Azhari, Azrina Ely	302	Alves, Emilia	301
Ailabouni, Nagham	135	Aly, Mariyam	117
Ali, Asma	210	Anderson, Anneka	200
Allemann, Samuel	303	Anderson, Claire	130, 302
		Arnet, Isabelle	303
		Askar, Mohsen	308

B			
Bartlett, Andrew	106	Boček Eknes, Emilia Maria	300
Barwick, Anna	123	Bond, Christine	139
Bentley, John	207	Bongo, Lars Ailo	308
Bereznicki, Luke	133	Broadfoot, Kirsten	211
Bhutkar, Renu	137	Brown, Rachel	200
Birkness, Katharine	126	Burke, Alexander	104, 134
Bittmann, Janina A.	300	Burke, Rosemary	125, 132

C			
Carter, Stephen	126, 136	Chenoweth, Lynn	135
Carter, Stephen	119	Cheung, Daisy H K	118
Castelino, Ronald	111	Chewning, Betty	206, 208, 210
Cernasev, Alina	203	Choy, Yvonne	105
Chaar, Betty	107, 108, 144	Clark, Bronwyn	121, 134
Chai, Jim	302	Collins, Ashleigh	124
Chalmers, Leanne	103, 127, 133	Collins, Jack	108, 129, 137, 143
Chen, Timothy	119, 120, 126 139, 304	Cross, Amanda	100
		Czarniak, Petra	127

D			
Daley, Scott	110	Do, Linda	125, 132
Deweerd, Pauline	110	Donegan, Rachel	105
Dillon, Paul	305	Duff, Jed	124

E			
Eickhoff, Christiane	306	El-den, Sarira	119, 126, 128, 129, 137, 141, 143

F			
Farris, Karen	204	Fuchs, Andreas	306
Fitzpatrick, Sally	117	Fuzesi, Peter	211

G			
Gandhi, Ankesh	202	Gilmartin-Thomas, Julia	135
Gani, Andayana Puspitasari	140	Gisev, Natasa	111, 141
Gardner, David	119, 126	Gnjidic, Danijela	139
Gauld, Natalie	105, 113	Gounder, Dhana	105
Gauthier, Alain	201	Grant, Cameron	113
Gebreyohannes, Eyob Alemayehu	103, 133	Greenbaum, Deborah	144
Gide, Duha	141	Greenwood, Daniel	202, 209
Gill, Manpreet	105	Gregório, João	301, 310

H			
----------	--	--	--

Haefeli, Walter E.	300, 306	Hikaka, Joanna	200
Haenny, Andreas	303	Hilmer, Sarah	135, 138, 139
Halimi, Syafiqah Nadiyah	102	Hinks, Amanda	105
Halvorsen, Kjell Herman	304	Hiremath, Shobha Rani	116
Hämeen-anttila, Katri	309	Holsbø, Einar	308
Han, Jayoung	305	Houle, Sherilyn	201
Harrison, Reema	111	Howe, Anna	113
Haua, Robert	200	Hu, Jie	143
Hawthorne, Deborah	100	Hudson, Mariana	200
Hertig, John	307	Hussain, Syed	202

I

Iqbal, Ayesha	130	Isaac, Sami	107
---------------	-----	-------------	-----

J

Jackson, John	112, 114	Jeon, Y	139
Jacob, Sabrina Anne	211	Johnston, Karlee	142
Jakobsen, Ann Helen	304	Jordan, Margaret	120
		Jyrkkä, Johanna	309

K

Kalisch Ellett, Lisa	135	Klingenberg, Anja	306
Kaufmann-Kolle, Petra	306	Knaggs, Roger David	130
Khan, Sohil	111	Knapton, Cath	113
Kim, Eunhee	205	Kouladjian O'Donnell, Lisa	100, 138

L

Lampert, Anette	300	Lennon, Marilyn	211
Langford, Aili	138	Levy, Russell	125, 132
Larson, William	203	Lewis, Penny	209
Law, Anandi	205	Liu, Shania	124
Lee, Kenneth	100, 103, 133	Lucas, Cherie	104, 117
Lee, Kylie	110	Lucida, Henny	101
Lee, Ya Ping	127	Luetsch, Karen	102
Lee, Yee Lam Elim	141	Luong, Jammie	205

M

Macaden, Leah	211	Mey, Amary	111
MacKenzie, Megan	108	Miranda, Alina	127
Mackler, Emily	204	Moecker, Robert	300, 306
Manon, Sunny	136	Moles, Rebekah	104, 108, 110, 119, 125, 126, 128, 131, 132, 134, 136, 144
Marshall, Vincent	204	Mueller, Uta	306
Maundu, Josephine	121, 134	Muin, Fathul	109
McIntosh, Brendon	200	Mullan, Judy	120
McLachlan, Andrew	107, 144	Murphy, Andrea	119
McMillan, Sara	129, 143	Murphy, Andrea	126
Mercadante, Amanda	205	Murray, Amy	125

N

Nastiti, Christofori Maria Ratna Rini	101	Ng, Ricki	129, 143
Naufal, Ahmad	140	Nguyen, Tuan Anh	135
Naylor, Justine	124		

O			
O'Reilly, Claire	119, 126, 128, 129, 137, 141, 143	Oddie, Morgan	124
Ong, Jocelyn	125, 132	Okoro, Olihe	203
		Ou, Kevin	141
P			
Page, Amy	100	Pewhairangi, Kevin	200
Parore, Nora	200	Pham, Lily	119, 126
Parsons, Kiran	127	Phuong, Jonathan	136
Patanwala, Asad	124, 125, 132	Power, Tamara	104, 117
Patel, Bhavini	131	Prabandari, Yayi Suryo	109
Patel, Tanisha	209	Pratama, Antonius Nugraha Widhi	101
Peden-McAlpine, Cynthia	203	Procailo, Kelly	204
Penm, Jonathan	124, 125, 132		
Petousis-Harris, Helen	113		
Q			
Qudah, Bonyan	208	Quirke, Lyntara	135
R			
R, Shankar Prasad	116	Reddy, Apoorva	208
Radford, Jan	103	Reeve, Emily	135
Raduescu, Corina	119, 126	Reis, Ligia	310
Ramachandran, Sujith	207	Rizvi-Toner, Amna	204
Ranelli, Paul	203	Roennfeldt, Helena	129, 143
Raynes-Greenow, Camille	119, 126	Roubin, Rebecca	144
		Rowett, Debra	102, 121
S			
Saini, Bandana	134	Smith, Annetta	211
Salter, Sandra	103, 133	Soo, Garry	125, 132
Sawan, Mouna	135, 139	Spark, Joy	123
Schaefer, Patrick	300	Spencer, Kate	121
Schneider, Carl	106, 118, 108, 125, 132	Stalder, Bettina	303
Schommer, Jon	203	Steinke, Douglas	209
Schulz, Martin	306	Stevens, Jennifer	124
Seidling, Hanna M.	300, 306	Stewart, Adele	120
Shafiee Hanjani, Leila	138	Stewart, Victoria	143
Siitonen, Piia	309	Strowel, Clara	126
Sluggett, Janet	135	Study Group, ARMIN	306
Småbrekke, Lars	304, 308	Suckling, Benita	124
		Sutherland, Joanna	124
		Svendsen, Kristian	308
		Sykes, Graeme	105
T			
Tan, Edwin	135	Timony, Patrick	201
Tavares, Patricia	301	Toh, Li Shean	130
Teu, Talalelei	105		
U			
Um, Irene	106, 118	Ung, Tina	128
		Unni, Elizabeth	305
V			
V, Bindu	116	Viardot, Alexander	110

W

Waite, Nancy	201	Wibowo, Heribertus Rinto	101
Walpola, Ramesh	111	Widayanti, Anna Wahyuni	109, 140
Warr, Harriet	202	Wien, Katharina	300
Watson, Margaret	211	Wilkinson, Glenys	121, 134
Weissenborn, Marina	300, 306	Williams, Aleena	131
Welch, Susan	104, 110, 131	Williams, Megan	117
Welsh, Tomas	211	Wilson, Dale	208
Wheeler, Amanda	129, 143	Worley, Marcia M	205
Whitfield, Karen	102	Wurmbach, Viktoria S.	300