The role of pharmacists in communicating with women about the risks of valproic acid use in pregnancy: a forum and interview analysis

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Introduction: In the UK, stringent regulations limit the prescribing of valproic acid (VA), a teratogenic drug, to women of childbearing age with pharmacists required to discuss the risks every time they dispense VA to this group of patients [1]. The aims of this study were to understand women’s concerns about the use of VA during pregnancy [2] by searching the online forum Mumsnet as well as identifying, through interviews, which factors help and hinder pharmacists’ ability to discuss the risks of VA with women to appropriately address their concerns.

Method: The Mumsnet forum was searched systematically to identify relevant threads about the use of VA during pregnancy. Five threads were identified and extracted anonymously, containing 63 posts by 28 users. These threads were transferred to Microsoft word and analysed using thematic analysis (TA), for general themes, and discourse analysis (DA), for a more in-depth examination of the use of language to construct social meaning and power relations. Based on the themes generated, an interview schedule was designed to identify the factors that help and hinder pharmacists’ ability to discuss the risks of VA with women and appropriately address their concerns. Telephone interviews were completed with community pharmacists (n = 10) in summer 2018. Participants were recruited through email and snowball sampling. The interviews were transcribed in full and analysed using TA. The barriers and facilitators identified were then classified according to the Capability-Opportunity-Motivation-Behaviour (COM-B) model. Approval was obtained from the university’s research ethics committee as well as from the Mumsnet administrators.

Results: The forum analysis identified three themes: 1) usefulness of Mumsnet as a forum empowering women to share their stories, 2) direct information exchanges taking place to describe women’s specific concerns about VA and the peer advice that was exchanged and 3) women’s portrayal of the healthcare experience and of themselves on Mumsnet, and the empowerment to construct identities. Many women joined a forum thread looking merely for emotional support, reassurance and knowledge of others’ experiences without necessarily seeking advice. The interviews identified different levels of capability to discuss the risk of VA with women and knowledge gaps. Where pharmacists lacked motivation to initiate a discussion about VA, this was because they lacked confidence in this area, perceived their role as limited to merely monitoring physicians’ work or perceived a conversation unnecessary when someone had been on VA long term. Difficulties were expressed when direct contact with patients was not possible (e.g. resident of care home) and when patients failed to ask relevant questions.

Conclusion: Women want to understand the risk of VA in pregnancy, but pharmacists are not necessarily equipped to discuss the risks every time they dispense VA to women of childbearing age. The study suggests a need for professional and regulatory bodies to support pharmacists to improve their knowledge and confidence in this area and become motivated to lead conversations with women at the point of dispensing VA. The study is limited by the small sample sizes in both the forum and interview analyses.

References
1. Medicines and Healthcare products Regulatory Agency. Valproate medicines (Epilim ▼, Depakote ▼): contraindicated in women and girls of childbearing potential unless conditions of Pregnancy Prevention Programme are met [Internet]. 2018. Available from: https://www.gov.uk/drug-safety-update/valproate-medicines-epilim-depakote-contraindicated-in-women-and-girls-of-childbearing-potential-unless-conditions-of-pregnancy-prevention-programme-are-met
2. Epilepsy Society. Worrying lack of knowledge over epilepsy medicine risks in pregnancy | Epilepsy Society [Internet]. [cited 2017 Dec 29]. Available from: https://www.epilepsysociety.org.uk/worrying-lack-knowledge-over-epilepsy-medicine-risks-pregnancy#.Wkk8traB2Rv

Cultural intelligence of MPharm undergraduates

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Introduction: Society is increasingly diverse and health professionals need to be able to provide culturally sensitive services. Pharmacy students need to develop
intercultural competence to provide such services. Cultural intelligence (CQ) can be used as a proxy measure for intercultural competence and has been linked positively with work-related outcomes such as task performance and cross-cultural adjustment [1].

**Aim:** To estimate cultural intelligence of fourth-year MPharm undergraduates at Nottingham University.

**Method:** An online cross-sectional survey, used the previously validated cultural intelligence scale (CQS) [2] with demographic questions, was sent to fourth-year MPharm students in first semester 2017/18. The scale assesses 4 factors of CQ: metacognitive, cognitive, motivational and behavioural using 7-point scales labelled ‘very strongly disagree = 1’ to ‘very strongly agree = 7’. Students were emailed with a personalised link to the survey with 7 weekly reminders. Data analysis used SPSS 24 to determine descriptive statistics and Mann–Whitney U-tests were used to determine associations between CQ factors and demographic characteristics. This study was approved by the ethics committee in the School of Pharmacy (031-2017fr).

**Results:** Ninety-eight of 241 students (40%) completed the online questionnaire. The mean age was 22 years and 80% (n = 77) were female (compared with 73% female in the whole class). About one third of students were from Asian (n = 31, 31%), White (n = 31, 32%) and Chinese (n = 27, 28%) ethnic groups. Data on class ethnicities are not available. The highest mean score of CQ factors was for metacognitive (mean = 5.16, std. deviation = 0.97), followed by behavioural (5.13, 0.92), motivational (4.97, 0.86) and the lowest for the cognitive factor (mean = 3.97, 1.13).

Students who had lived abroad (n = 44, 45) reported higher mean behavioural CQ scores compared with those who had not lived abroad, 5.33 compared with 4.97, respectively (Mann–Whitney U = 877, P = 0.048). No other statistically significant differences between CQ factor scores and gender were found.

**Conclusion:** Students’ scores suggest they are aware of the thinking process when encountering cultural differences (metacognitive CQ). However, their knowledge about different cultures (cognitive CQ) was the lowest scored factor of the four. Students who had lived abroad seem to behave more effectively in cross-cultural situations compared with those who had not.

It is unknown whether students have developed their CQ during their pharmacy course or previously. Students may benefit from increasing their knowledge of other cultures as this could allow them to interact effectively with a culturally diverse patient population in providing health services.

**References**

1. Ang S, Van Dyne L. Handbook of cultural intelligence [electronic resource]: theory, measurement, and applications. Armonk, N.Y.: M.E. Sharpe; 2008. Available from: https://ebookcentral.proquest.com/lib/nottingham/detail.action?docID = 1968841.

2. Ang S, Van Dyne L, Koh C, Ng KY, Templer KJ, Tay C, et al. Cultural intelligence: its measurement and effects on cultural judgment and decision making, cultural adaptation and task performance. Management and Organization Review. 2007;3(3):335-71.

### Exploring the experience of novel psychoactive substances among users from the homeless population: a pilot study

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**Introduction:** Novel psychoactive substances (NPS) have emerged over the last decade as alternative to classical drugs of abuse. The emergence of these substances was continuous at a rate of once a week with over 800 reported substances in March 2018 [1]; despite their control under the NPS Act 2016, NPS popularity diffused to vulnerable members of society (e.g. homelessness) was attributed unique subjective effects associated with them. However, many effects and adverse effects attributed to NPS particularly relating to users’ experiences remain uncovered.

**Aim:** The purpose of this pilot study is to explore knowledge and experience of the homeless population regarding NPS. The specific objectives include the following:

- Identifying the demographic factors of the homeless population using novel psychoactive substances
- Uncovering desired effects sought by users of NPS
- Assessing the adverse effects associated with NPS.

**Method:** A semi-structured questionnaire was distributed to homeless population via homeless shelters (n = 3) between April and August 2018. Eligible participants were those who were rough sleepers and were aged range of 18–64 years old. The questionnaire was divided into five parts that covered the following areas: (1) demographic characteristics of users, (2) NPS use, (3) motivations behind using NPS, (4) desired effects and (5) adverse effects of NPS. Ethical approval for the study was sought from Bournemouth University Internal Ethics Committee (ID 20840). Data analysis was conducted using SPSS v25.

**Results:** A total of 21 questionnaires were completed by users. The majority of participants were males (n = 19), white (n = 18) and heterosexual (n = 17). Participants mainly reported the use of ‘Spice’ via smoking route. Other NPS reported were Black mamba and mephedrone. The main motivation behind consuming ‘Spice’...
was self-treatment of physical conditions and/or experimentation of the psychotic effect(s). Desired effects associated with ‘Spice’ use were calmness, dissociations, hallucinations and sedation. However, adverse effects outweighed positive effects and in five cases required medical treatment. Reported adverse effects were as follows: addiction, aggression, anxiety, loss of consciousness, memory loss, nausea, paranoia and psychosis.

**Conclusion:** The results showed that ‘Spice’ was the most popular NPS, used mainly for self-treatment and/or recreational use. However, it was associated with many adverse effects such as near-death experience that required medical treatment. The aforementioned findings are useful for the healthcare professionals dealing with emergency department admission due to NPS. Furthermore, the findings support legal cases associated with NPS in drug-facilitated crimes or driving under the influence drugs. Few limitations were seen in this study. The first being that the study was based on self-reports by individuals and there was no way to verify the experience they had encountered. Moreover, participants did not specify the NPS derivative present in ‘Spice’. Therefore, future studies should take into account chemical analysis of substances used by participants.

**References**

1. UNODC: More than 800 NPS have been reported to UNODC from over 110 countries and territories from all regions of the world. Unodc.org. 2018 Available from: https://www.unodc.org/LSS/Announcement/Details/2935a8a7-434b-4abf-baa3-e1481ca5e209 last accessed 28-11-2018

2. Novel Psychoactive Substances Act. 2016.

**A comparison of non-medical independent prescribers (NMIPs) and their prescribing in primary care across different health boards (HBs) in Wales: a secondary database analysis**

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**Introduction:** In 2015, HBs in Wales prioritised funding for non-medical healthcare professionals in primary care to train as independent prescribers. This was in response to the Welsh Government Primary Care Plan [1] and implementation of primary care clusters [2], which aimed to increase patient access to treatment and relieve pressure on GPs.

**Aim:** To compare the number of NMIPs, and the number of NMIP prescription items prescribed and dispensed in each HB in Wales.

**Method:** A retrospective secondary data analysis of monthly medicines dispensing data prescribed by NMIPs in each HB was obtained from the Comparative Analysis System for Prescribing Audit (CASPA) (Version 4) from April 2011 to March 2018. The number of NMIPs per HB was obtained from the NHS Wales Shared Services Partnership. Data were analysed descriptively using IBM SPSS (version 25) and Microsoft Excel (version 16.15).

**Results:** The total number of NMIPs who had prescribed at least one dispensed item during this time was 600. The highest number was in Betsi Cadwaladr University HB (BCUHB) \((n = 246; 40\%)\), and the lowest number was in Powys Teaching HB (PTHB) \((n = 33; 6\%)\). Overall, NMIPs/1000 population in Wales was 0.19, with the highest number in BCUHB \((0.36)\) and the lowest in Abertawe Bro Morgannwg University HB (ABMUH) \((0.12)\). The data suggest that BCUHB was an early adopter for NMIPs, whereas PTHB was a late adopter with the number increasing from 2016 to 2018. Other HBs had a larger increase in post-2015 when primary care clusters were implemented.

Overall, the highest percentage of prescribed items by NMIPs was within BCUHB \((30\%; 2.47 \text{ item/population})\), whilst the lowest percentage was in PTHB \((4\%; 1.5 \text{ item/population})\). Over the study time, BCUHB showed an increase in the trend of total prescribed items/100,000 population per year \((235\%)\). In contrast, the prescribing trend in PTHB showed a large increase from 2016 to 2018 \((670\%)\). However, the prescribing trends of all other HBs, except one, showed a large increase between the last quarter of 2015 and 2018. The top BNF chapter prescribed by NMIPs in each HB was cardiovascular, except in BCUHB where it was infection.

**Conclusion:** The number of NMIPs and their prescribing trends have increased in the majority of HBs, particularly since the implementation of primary care clusters. The findings of this study will be shared with the stakeholders in HBs and Chief Pharmaceutical Officer in Wales in order to inform future policies in this area at the local and national level. The CASPA system has few limitations, as it only recorded prescriptions dispensed in community pharmacies in Wales, not those issued by NMIPs that haven’t been dispensed.

**References**

1. Our plan for a primary care service for Wales up to March 2018. Available at: http://www.cpwales.org.uk/getattachment/.

2. Inquiry into Primary Care: Clusters. Available at: http://www.assembly.wales/laid%20documents/cr-ld11226/cr-ld11226-e.pdf.
Gender-based trends in opioid prescribing in a primary care population with recorded diagnoses of depression or anxiety; using a retrospective, cross-sectional analysis of a large dataset

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Introduction: The study examined trends in opioid prescribing across Wales for non-cancer related pain and whether variance existed between genders and the presence of a recorded diagnosis of depression and/or anxiety.

Aim: The study aimed to describe trends in opioid prescribing for non-cancer pain for people with or without recorded diagnoses of depression and/or anxiety (RDDA) between 2005 and 2015, stratified by diagnosis and gender.

Method: Validated NHS read-codes identified prescriptions included in the Secure Anonymised Information Linkage databank (SAIL) for opioid medicines issues in Primary Care Practices in Wales between 2005 and 2015. Validated read-codes were also used to identify an RDDA. A recorded diagnosis of cancer during the study period was excluded. Annual numbers of prescriptions were measured in repeated, annual cross-sections and adjusted for gender-population. Statistical analysis was via Mann-Whitney U test, as data were not normally distributed.

Results: More than twice as many women with an RDDA (median = 59.4) received prescriptions for opioids as men (median = 28.7) and the difference was determined significant (U = 0.000, P = 0.000, r = 0.8).

The difference between the number of opioid prescriptions issued to women (median = 379.8) and men (median = 198.4) with an RDDA was also statistically significant (U = 0.000, P = 0.000, r = 0.8). There were 57% more strong opioid prescriptions for women (median = 42.0) than for men (median = 26.6) although this was not determined significant (U = 38.0, P = 0.151, r = 0.1).

Whilst there was a considerable increase in the number of strong opioid prescriptions issued to women with an RDDA (median = 42.0), there was not a significant difference with the number issued to women without (median = 59.0) (U = 37.0, P = 0.133, r = 0.1).

Table 2. Gender differences in prescription trends of weak and strong opioids with recorded diagnoses of depression/anxiety. Data adjusted to prescriptions per 1000 gender-adjusted population

|                   | Weak opioid | Strong opioid | Total   |
|-------------------|-------------|---------------|---------|
| **Gender**        |             |               |         |
| Male 2005         | 113.1       | 11.6          | 124.6   |
| Male 2015         | 191.7       | 52.7          | 244.4   |
| Median            | 171.8*      | 26.6**        | 198.4***|
| (% change rate)   | 69.5        | 356.0         | 96.0    |
| Female 2005       | 236.4       | 13.5          | 249.9   |
| Female 2015       | 385.5       | 91.1          | 476.5   |
| Median            | 337.8*      | 42.0**        | 379.8***|
| (% change rate)   | 63.1        | 573.0         | 90.7    |

Mann–Whitney U-test results: *U = 0.000, P = 0.000, r = 0.8; **U = 38.0, P = 0.151, r = 0.1; ***U = 0.000, P = 0.000, r = 0.8

Conclusion: SAIL datasets do not currently link to dispensing data. Therefore, an accurate picture of opioid medicines being taken is not possible. However, the substantial increase in opioid prescribing in both genders across Wales mirrors trends reported elsewhere in the United Kingdom and is of concern. Of particular, worry is the greater increase in strong opioid prescribing to women with an RDDA. Both factors have been associated with higher pain prevalence [1,2]. Further research is warranted to determine whether depression/anxiety is the cause or iatrogenic effect of increased prescribing and why women appear particularly susceptible.

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References

1. Tsang A, Korriff Von M, Lee S, Alonso J, Karam E. Common chronic pain conditions in developed and developing countries: gender and age differences and comorbidity with depression-anxiety disorders. 2008;9(10):883–91. Available from: http://www.sciencedirect.com/science/article/pii/S1526590008005750

2. Mazereeuw G, Sullivan MD, Juurlink DN. Depression in Chronic Pain: Might Opioids Be Responsible? Pain. 2018 Jun 13.
Access to patient medical record: Does it facilitate provision of emergency medicines supply by community pharmacists? Views of pharmacists in a pilot scheme

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Introduction: Advances in the role of community pharmacists (CPs) have reinforced the need for access to General Practitioner (GP) records. This is considered an essential first step towards creation of a single patient health record enabling all health and social care professionals to collaboratively provide person-centred care.\cite{1} CPs in Wales are piloting provision of the Emergency Medicines Supply (EMS) service via the Choose Pharmacy IT application. The application links to the Welsh GP record, with patient consent, and allows CPs to view a summary of patients’ medicines, allergies and adverse reactions.

Aim: The aim of this study was to explore the pharmacists’ perceptions on the impact of having access to the Welsh GP record on the safety of emergency supplies, to inform the roll-out of the service.

Method: An invitation email was sent by a gatekeeper in July 2018 to all 10 pharmacists working in premises with access to the Welsh GP record, with a participant information leaflet and a consent form, inviting them to participate in qualitative, semi-structured interviews. A mutually convenient time for an interview was arranged with CPs who responded, either face-to-face or via phone. The study received ethical approval from Cardiff School of Pharmacy and Pharmaceutical Sciences Research Ethics Committee.

Results: Two interviews were conducted within the time-limits of the project (participants P1 and P2). Interviews were recorded and transcribed \textit{ad verbatim}. Deductive thematic analysis was undertaken looking at use of Welsh GP record. Both pharmacists acknowledged that access to GP record has significantly facilitated their practice.

“Once the patient consents we can access their medication records... which is absolutely amazing.” [P2]

Main areas identified as having benefitted from Welsh GP record access are decision-making, patient safety, and decreased workload for out-of-hours services.

Conclusion: This small-scale study confirmed that community pharmacist access to the Welsh GP record provides CPs with the critical medical information needed to aid their decision-making and, make safe clinical decisions, and reduces workload of other services. A limitation of the study is that no patient views were sought; however, it was not reported by either CPs that a patient had refused access to their record. The results must be interpreted with care, as the sample was very small; however, the initial response was very positive, and the pilot will roll-out to include further CPs.

The Welsh cabinet secretary for health, well-being and sport has stated his support so that all pharmacies with access to the Choose Pharmacy IT system in Wales can access the Welsh GP record by March 2018. Wider evaluation will follow once access has been embedded in all pharmacies.

References

1. Royal Pharmaceutical Society Pharmacist access to the Patient Health Record 2015: https://www.rpharms.com/making-a-difference/projects-and-campaigns/pharmacist-access-to-the-patient-health-record

Improving provision of Medicine Use Reviews (MURs) to medically under-served groups: a baseline/follow-up comparison study investigating the impact of a co-produced digital learning resource

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Introduction: Medically under-served groups (e.g. people with disabilities, from Black, Asian, and Minority Ethnic backgrounds, people from the traveller community) often experience poorer health outcomes and face greater medicine-related problems when compared to the general population. Research has highlighted these inequalities and has indicated that such groups may not be receiving the benefits from medicine support services like ‘Medicine Use Reviews’ (MURs)\cite{1}. There is no requirement or incentive for pharmacy teams to target these patient groups. A digital learning resource was co-produced with patients and pharmacy professionals in order to improve pharmacy professional awareness and engagement with these groups\cite{1}.

Aims: The aim of this study was to investigate the impact of a co-produced digital learning resource on pharmacy professionals’ behaviour change intention and assess whether MURs provision can be improved to under-served groups.

Method: A patient-professional co-produced digital learning resource was developed\cite{1} and made available to all community pharmacy professionals in the Nottinghamshire area. Participants were invited to complete...
a baseline and follow-up (3 months) self-completion online questionnaire. Data were collected on participants’ behaviour change intention, assessed using the Continuing Professional Development (CPD) Reaction Questionnaire. This tool has demonstrated validity and reliability to assess the impact of CPD activities on health professionals’ clinical behavioural intentions [2]. Numbers of MURs performed on medically under-served groups were also collected.

Results: Of the 237 pharmacies approached, baseline responses were received from 149 participants (from 122 pharmacies (majority 81% pharmacists)). Ninety-six participants from 80 pharmacies completed the follow-up questionnaire (62 participants reported completing the learning resource). For those who reported completing the digital learning, paired data revealed statistically significant increase ($P = 0.009$) in the mean change from baseline to follow-up on the construct relating to beliefs about capabilities (Table 1), indicating the improved pharmacy professionals’ confidence to engage with marginalised communities. No statistically significant differences were observed on the remaining 4 constructs. The reported high baseline scores for ‘intention’, ‘moral norms’ and ‘beliefs about consequences’ may have been influenced by social desirability or approval bias. This may have resulted in a ceiling effect meaning differences in scores before and after the intervention could not be detected. The final construct ‘social influence’ relates to how the respondents’ peers are perceived. The well-known notion of organisational pressure to undertake MURs may have resulted in many feeling the service is inefficacious or suboptimal. This view may explain the lack of change with this construct. No statistical significance was detected in the number of MURs undertaken with under-served patients.

Conclusion: This study found that the co-production approach has the potential to positively influence pharmacy professionals’ behaviour change intention. Although actual practice change was not detected, this resource alone may not be sufficient to bring about actual practice change. Nevertheless, this study offers an important step towards recognising and tackling the health inequalities that exist. Organisational change and reforms to MUR policy may be needed to achieve greater traction and further engagement with patients who belong to medically under-served groups.

Table 1: Baseline follow-up comparison of Continuing Professional Development (CPD) reaction questionnaire sub-scales

| Construct variable                        | Baseline Mean (SD) unless otherwise stated | Follow-up Mean (SD) unless otherwise stated | Mean Change (95% CI) | SD   | P-value |
|------------------------------------------|-------------------------------------------|-------------------------------------------|---------------------|------|---------|
| Intention ($n = 62$)                     | 6 (1.5–7.0)*                              | 6 (1.5–7.0)*                              | 0.36 (–0.26, 0.75)  | 1.53 | 0.067   |
| Social influence ($n = 62$)              | 4.30 (1.28)                               | 4.56 (1.12)                               | 0.26 (–0.04, 0.56)  | 1.18 | 0.085   |
| Beliefs about capabilities ($n = 61$)    | 5.39 (1.30)                               | 5.83 (1.03)                               | 0.44 (0.11, 0.76)   | 1.27 | 0.009   |
| Moral norm ($n = 60$)                    | 6.5 (1.5–7.0)*                            | 7.0 (1.5–7.0)*                            | 0.29 (–0.02, 0.61)  | 1.22 | 0.070   |
| Beliefs about consequences ($n = 62$)    | 6.05 (1.12)                               | 6.21 (0.93)                               | 0.16 (–0.13, 0.45)  | 1.14 | 0.271   |

* Median (range)

References
1. Latif, A., et al Giving voice to the medically under-served: a qualitative co-production approach to explore patient medicine experiences and improve services to marginalized communities. Pharmacy, 6 (1): 13.

2. Légaré F., et al Development of a Simple 12-Item Theory-Based Instrument to Assess the Impact of Continuing Professional Development on Clinical Behavioral Intentions. PloS one 2014,9(3): e91013.

What training approaches are used to educate clinicians on the use of electronic prescribing systems? A qualitative study to explore how clinicians were trained to use an electronic prescribing system

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Introduction: As more hospital sites adopt electronic prescribing (ePrescribing) systems, it is important that users are and remain sufficiently competent to use these systems over time. Organisations face challenges in delivering training, including large numbers of healthcare staff, staff resistance or unavailability to attend training, and temporary/short term staff.

Aim: The aim of this study was to explore the training approaches used to educate clinicians on the use of an ePrescribing system.

Method: After obtaining all relevant ethical and organisational approvals, a range of ward staff (e.g. doctors, nurses, pharmacists) and staff involved in the training of clinicians in a UK teaching hospital were recruited. One researcher conducted 33 semi-structured interviews between Mar 2015 and Aug 2016, lasting between 17
and 70 minutes and performed 35 hours of observations of users using the system. Participants were asked about their experiences of using the system and any training they received or provided. These data were analysed using the Framework Approach.[1] Qualitative data analysis software NVivo version 10 was used; a list of themes was developed inductively, and explanations for recurring patterns in these data were sought, refined and presented.

Results: A range of formal and informal training strategies were identified. Foundation doctors received training on the core features of the system during lectures and workshops. They worked through prescribing tasks, including patient scenarios informed by error reports, to address challenges of the system such as: “setting up your patient lists correctly, because we’ve had patient mis-selection” (P33; System Development Team). However, many doctors commented on how the lectures were not particularly useful because they lacked “hands on [exercises] (…) [which was] just not going to work” (P15; Doctor). Non-foundation doctors and pharmacy staff received less core training, consisting of a lecture and demo of the system, or peer training. A specialist training doctor consequently described her experience of using the system as “a baptism of fire” (P8; Doctor). One pharmacist described learning how to use the system through “trial and error” (P6; Pharmacist). Peer training and support was valued because it was “tailored to what you need to do, which differs on each ward” (P18; Doctor); however, this approach was variable and affected by the ward environment and staffing availability. Ancillary training tools, including the hospital intranet and a training manual, were appreciated by users as they could refer to them if they “got stuck” (P16; Doctor); however, due to the length, one user admitted only “skim[ming]” over it (P13; Doctor).

Conclusion: Formal and informal approaches were used to educate users on how to use an ePrescribing system. Tailored patient scenarios were useful; however, variation between the training given to different users resulted in some feeling underprepared. This study was conducted within one hospital, which may limit the generalisability of our findings. Further research should explore the strategies used at other sites and whether this includes e-learning.

References

1. Pope C, Ziebland S, Mays N. Analysing qualitative data. BMJ : British Medical Journal. 2000;320 (7227):114–6.

Using mobile apps for the self-management of type-2 diabetes – Pharmacists’ perspectives

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Introduction: 425 million people in the world have diabetes and 39 million of those reside in the Middle East. Kuwait has one of the highest diabetes rates in the region; 15% of the 3 million Kuwaiti residents have diabetes, mostly type 2. This is likely to increase further given that 74% of the population are overweight and 38% are obese.

Type-2 diabetes management mainly focuses on lifestyle changes as well as the use of oral hypoglycaemic medication, and sometimes injecting insulin. Therefore, self-management is the cornerstone of diabetes care, and a major determinant of micro- and macrovascular outcomes. The use of mobile and wireless technologies (mHealth) to self-manage type-2 diabetes is increasing in popularity among healthcare professionals and patients in developed countries. However, their use in developing countries still lags behind; they are not only less popular among patients, but even healthcare professionals often hesitate to recommend the practice. In particular, pharmacists’ engagement with mHealth is important since they are easily accessible by patients and can improve patient outcomes.

Aim: This study aims to explore pharmacists’ perspectives on using mobile apps for diabetes self-management and identify the barriers and facilitators towards recommending them to patients with type-2 diabetes.

Methods: A qualitative design using in-depth semi-structured face-to-face interviews to explore the perspectives of pharmacists dealing with diabetes patients. This is part of a larger study exploring healthcare professionals, health informaticians and patients’ perspectives. This was approved by the University of Hertfordshire (UK) and the Kuwaiti Ministry of Health (MOH). Purposive sampling was used to recruit pharmacists who deal with diabetes patients and speak English fluently. Participants completed a self-reported survey assessing demographics and smartphone accessibility before the interviews. Interviews were transcribed verbatim and analysed using inductive thematic analysis via MAXQDA software (18.1.0).

Results: Six pharmacists were interviewed: 4 females and 2 males. Five pharmacists worked within primary care diabetes clinic pharmacies, and one worked in hospital. The participants never recommended a mobile app for patients mainly because they lack awareness of the available self-management apps, and how these can help patients self-manage their condition. Other concerns...
include the complexity of apps and being less appropriate to recommend to older patients. The pharmacists were willing to recommend self-management apps if they could test them first, if they are easy to use, and contain accurate information. For an app to be recommended, it has to include information about medication and insulin injection, as well as being user-friendly and containing visual aids.

Conclusion: Healthcare professionals still play a key role in influencing patients’ behaviours. Pharmacists’ interventions in particular can improve medication adherence and improve diabetes outcomes [1]; and their recommendations of mHealth apps can increase patients’ engagement with self-management activities. Kuwaiti pharmacists lack awareness of available self-management apps and this could be addressed through training activities.

References
1. Wubben & Vivian. Effects of pharmacist outpatient interventions on adults with diabetes mellitus: a systematic review. Pharmacotherapy: 2008;28(4):421–36.

Can interactive clinical avatars improve pre-registration pharmacists’ knowledge base?

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Introduction: The variability in pre-registration training experiences [1] and the increasing digital native generation of students [2] encourages the exploration of interactive clinical avatars (ICAs) as a learning tool.

Aim: To quantitatively assess the ability of ICAs to enhance the knowledge base of pre-registration pharmacists compared to non-active case studies.

Method: Following institutional ethical approval, a purposive sample of pharmacist pre-registration trainees (2014–2015) were recruited from the hospital and community sectors via presentations and emails. Those who consented were randomly stratified based on their gender and training sector to receive three ICA or three non-active (control) case studies. Each case was associated with the same pre- and post-quizzes to assess knowledge improvement from completing the cases. Both groups received case studies on the same topics: emergency hormonal contraception (EHC), renal function (RF) and childhood illnesses (CI), only differing in their presentation to allow comparison of the delivery methods.

Participants were emailed a link to the first pre-quiz. Once completed, they were directed to the first ICA or control case study and then onto the associated post-quiz. Trainees had access to each case study for one month and were required to complete all components (case, pre- and post-quizzes) to receive the next case study and associated quizzes.

Answers on the pre- and post-quizzes were marked as ‘correct’ or ‘incorrect’. Results were analysed using descriptive and inferential statistics to determine knowledge improvement from using the cases (pre-to-post). A p-value of ≤ 0.05 was considered significant.

Results: In total, 165 pre-registration trainees were randomly stratified – 83 ICA group and 82 control group. The majority were female (72%), in their early twenties (mean age 23) and completing their training in a community pharmacy (56%). Similar response rates were observed for both groups; the control group had a higher overall completion rate of 44% (n = 36) compared to 33% (n = 27) in the ICA group.

For all three cases, trainees in both groups significantly answered more questions correctly on the post-quizzes (p ≤ 0.05); EHC n = 124 (98%), RF n = 86 (97%), CI n = 26 (96%) apart from the control group for the CI case (P = 0.6); n = 35 (97%). No significant differences were observed in knowledge improvement between the groups for any of the case studies (P > 0.05); EHC n = 100 (79%), RF n = 63 (70%), CI n = 46 (73%). Significant improvements in knowledge were found between the training sectors; the EHC case improved hospital-based trainees knowledge most significantly (P < 0.05); n = 54 (43%), whereas the RF (P < 0.01); n = 52 (58%) and CI (P < 0.05); n = 35 (56%) cases improved community-based trainees knowledge most significantly.

Conclusion: Significant improvements in knowledge were found between the training sectors which may have resulted from the variability in pre-registration experiences and support. No significant differences in knowledge improvement (pre–post) between the groups were found for any of the case study topics, indicating that the ICAs were not a superior learning tool; however, this could be a limitation of the sample size. Both types of case study were an additional resource to ‘usual practice’ which may have impacted individuals’ learning. Further research evaluating ICAs against no intervention is required to determine their effectiveness as a learning tool.

References
1. The General Pharmaceutical Council, Pre-registration Surveys 2014, Surveys of 2013/14 pre-registration trainees and tutors - summary of findings and points for consideration, (https://www.pharmacyregulation.org/sites/default/files/gphc_response_to_2013-2014_pre-reg_surveys_final.pdf)
2. Prensky, M. (2001) ‘Digital natives, digital immigrants part 1’, On the Horizon, 9(5), pp. 1–6.
Interventions to improve adherence to medications for chronic non-malignant pain

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Introduction: Chronic non-malignant pain (CNMP) is one of the most common, expensive and disabling conditions for patients, healthcare system and the workplace [1]. Medication is a fundamental cornerstone of CNMP patients’ care [2] and patient adherence to their medications essential to optimise clinical outcomes [1].

Aim: The aim of this study was to systematically review the nature, process and outcomes of interventions to improve adherence in patients prescribed medicines for CNMP. This review also aims to systematically review the use of theories/theoretical framework in the design, implementation and evaluation of interventions of medication adherence in CNMP patients.

Method: Literature search was conducted for the period 2000 through May 2018 using EMBASE, MEDLINE and CINAHL databases, and search was restricted to the English language. The (MeSH) and free-text keyword search terms include medication adherence, patient compliance, adherent, adherence, non-compliant, non-compliance, non-adherent, non-adherence, chronic pain, chronic non-malignant pain, and chronic non-cancer pain. Boolean operators (e.g. ‘OR, AND, NOT’) used.

Result: The search of the three databases resulted in 2651 screened records with a total of 23 studies meeting the inclusion criteria.

A total of four randomised controlled trials (RCT) were identified. Most of the studies (n = 19) were observational studies that focused on interventions to improve patients’ adherence to doctors’ instructions for opioids medications, few have studied non-opioids. None of the studies focused on the adherence to co-analgesic (such as antidepressant, anticonvulsants) to improve adherence among neuropathic pain patients. The adherence measures varied considerably through studies and most of them used patient self-reporting or judgement of doctors. Outcomes considered included dealing with both underuse and overuse, particularly with opiates. Furthermore, other studies used tools that are costly or inaccessible for primary health care such as specialised healthcare provider (nurse or pharmacist). No studies investigated the role of community pharmacists to optimise the medication adherence among these patients. Exploration of patients’ perceptions of treatments and relationships to adherence was absent among these studies. The use of theory-based intervention to improve the medication adherence was limited to only two studies, which were related to cognitive theory and motivational interviewing with modest effect on medication adherence outcomes.

Conclusion: This systematic review has attempted to identify all the studies that aimed to improve adherence amongst CNMP patients. Due to the limited number and the lack of well-designed randomised controlled trials, we cannot draw a firm conclusion which intervention can be used to optimise the use of medication among CNMP patients. Carefully designed randomised controlled trials based on patient and healthcare providers’ views and experiences are needed to generate robust evidence. Use of standard guidelines review process is a key strength, whereas limited date range and language restrictions for inclusions are limitations of this study.

References

1. Kroenke K, Krebs EE, Bair MJ. Pharmacotherapy of chronic pain: a synthesis of recommendations from systematic reviews. Gen Hosp Psychiatry. 2009;31 (3):206–19.

2. Turk DC. Clinical effectiveness and cost-effectiveness of treatments for patients with chronic pain. Clin J Pain 2002;18:355–65.

Mobile apps, cardiovascular disease and medication adherence: a systematic review

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Introduction: Medication adherence (MA) rates for patients with cardiovascular disease (CVD) are reported to be 60% or lower, and approximately 9% of all CVD events in Europe have been attributed to poor adherence [1]. The relatively recent emergence of ‘mobile health’, in particular apps for smartphones and tablet computers, has the potential to improve MA and clinical outcomes.

Aim: This study aimed to determine whether apps are an effective tool to improve MA and investigate the involvement of healthcare professionals in their use, in order to inform the design of a pharmacist-led RCT.

Method: Databases (PubMed, Cochrane Library, CINAHL, PsycINFO, EMBASE, MEDLINE and Google Scholar) were systematically searched for randomised control trials (RCTs) reporting the use of mobile apps to improve MA in patients with CVD. Studies were filtered for English language and duplicates removed. Screening and selection of titles, abstracts and full texts was followed by data extraction and risk of bias assessed using the Cochrane Risk of Bias tool. Ethical approval was not required.
Results: Ten RCTs were included, published between 2013 and 2018. Participant numbers were small for all RCTs (range 24–280, median 60). Most (n = 6) were conducted in developed countries. The range of CVDs targeted was diverse. Most (n = 8) RCTs used MA as the primary outcome measure and two used clinical endpoints. Six studies utilised different forms of self-report to measure MA. Nine were conducted in a secondary care outpatient setting with only one in primary care. Every RCT used a different app, four used a medication reminder function only, four used reminders plus educational support and two used education only. Of the RCTs that reported data sharing with healthcare professionals (n = 9), none specified review by pharmacists. However, one reported pharmacist involvement in RCT set-up. Half of the RCTs (n = 5) showed statistically significant improvements in MA for app interventions. The majority (n = 9) had a high risk of bias.

Conclusion: Poor MA is a long-standing issue yet few strategies show evidence of improving adherence rates in CVD patients. With two-thirds of the UK adult population owning a smartphone [2], the use of apps alongside health support programmes, by both patients and healthcare professionals, has the potential to positively impact MA. Pharmacists, particularly those in primary care (community and general practice) are well placed to guide and support patients in becoming more adherent to their medicines. However, there is little-published evidence for use of apps in primary care or for pharmacist involvement in their use. Further research is required. Limitations of this review include the exclusion of non-English language papers. In addition, the interventions were diverse as were the CVDs being addressed and the measures of adherence used, and hence, findings and conclusions are based on a narrative analysis. The evidence provided by this review shows a tendency towards an improvement in MA but minimal evidence of improved clinical outcomes. Large-scale RCTs are required. This systematic review will inform the design of an RCT using an app alongside structured pharmacist consultations and an educational package to improve MA for patients with atrial fibrillation.

References
1. Chowdhury R, Khan H, Heydon E, Shroufi A, Fahimi S, Moore C, Stricker B, Mendis S, Hofman A, Mant J, Franco OH. Adherence to cardiovascular therapy: a meta-analysis of prevalence and clinical consequences, European Heart Journal. 2013. 34(38): 2940–8, https://doi.org/10.1093/eurheartj/eht295

2. Office of National Statistics. 2015. The communications market report, UK. Available at: https://www.ofcom.org.uk/__data/assets/pdf_file/0022/20668/cmr_uk_2015.pdf (accessed 26 September 2018)

Exploring cost awareness as an influence on prescribing behaviours in secondary care: A mixed methods study

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Introduction: Making clinicians aware of diagnostic test cost at the point of ordering can reduce expenditure[1]. Application of this principle to medicines at the point of prescribing, therefore, has the potential to change prescribing behaviour but evidence for this is minimal.

Aim: This study aims to explore healthcare professional (HCP) opinion on the introduction of a medication cost display onto an electronic prescribing system (EPS) at the point of prescription.

Method: Questionnaires were developed after review of published literature, subjected to academic scrutiny and piloted on 10 HCPs. Final questionnaires were distributed manually and by e-mail to a purposive and convenience sample of HCPs based at an acute hospital site in the West Midlands. Audio-recorded, semi-structured, face-to-face interviews were conducted with 12 prescribing HCPs, transcribed and analysed thematically using the framework method. The study was ethically approved.

Results: 101 questionnaires were completed by a range of HCPs, 82% of whom were prescribers. Approximately half (49%) had been qualified for 6 or more years. Half (50%) rated their cost awareness of medicines as poor and, whilst all of them knew where to find cost information, just over half (55%) felt that they were given insufficient information about it. Two-thirds (66%) considered cost to have little or no impact on their decision to prescribe, dispense or administer a medicine. Almost all (93%) anticipated that displaying medicine costs on the EPS would change hospital drug expenditure.

All 12 interviewees were prescribers with almost half (46%) having prior exposure to a primary care EPS with readily accessible cost information. The majority (n = 10) considered their awareness of medicines’ cost as poor. Reasons for this fell into three main themes, (a) availability of information, (b) evidence-based and patient-centred prescribing approaches and (c) lack of training and education. Only two interviewees felt their cost awareness was good. All participants wanted more cost information but most (n = 7) suggested time constraints prohibited further investigation at the point of prescribing. Most (n = 7) interviewees wanted easily accessible cost information via the EPS and 10 felt that implementing such a system would reduce medication expenditure.

Conclusion: HCPs felt unaware and inadequately informed about the cost of medicines. Counterintuitively, whilst many felt knowledge of medicine cost would not change their practice, most determined that
cost information at the point of prescribing would change hospital drug expenditure. In particular, prescribers anticipated a reduction in spend. Good rational prescribing considers efficacy, safety, suitability and cost. Cost-effectiveness is usually accounted for by local formularies which may explain why most prescribers believed it would not influence their choices. However, this does not account for the anticipated reduction in spend if a cost display was added to the EPS. All HCPs welcomed the proposal to provide more readily available cost information. In this regard, a cost display has the potential to address the perceived lack of cost awareness. This study is limited by the range of questionnaire respondents. Although the majority were prescribers a small minority without prescribing experience may have introduced bias. Previous studies in primary care have shown the introduction of medication costs information within an EPS does not to reduce drug expenditure [2]. This preliminary study which explores perceptions and anticipated behaviours will inform further research into the implementation and impact of an EPS cost display.

References

1. Fogarty AW, Sturrock N, Premji K, Prinsloo P. Hospital clinicians’ responsiveness to assay cost feedback: a prospective blinded controlled intervention study. JAMA Intern Med. 2013. 173(17):1654–5.

2. Ornstein SM, MacFarlane LL, Jenkins RG, Pan Q, Wager KA. Medication cost information in a computer-based patient record system. Impact on prescribing in a family medicine clinical practice. Arch Fam Med. 1999. 8:118–21.

Drug utilisation review of fluoroquinolones in a private hospital in Malaysia

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Introduction: Fluoroquinolones are indicated for the treatment of a number of infections due to their broad-spectrum activity. Uncontrolled antimicrobial use results in emergence of antimicrobial resistance (AMR), as well as unnecessary healthcare costs to patients and healthcare systems. The evaluation of this antibiotic use in Malaysia private hospital settings is an essential measure for assessing and improving the appropriate use of antibiotics. Aims: The objective of this study was to conduct a drug utilisation review of prescribed fluoroquinolones in an outpatient setting of a private hospital located in Kuala Lumpur, Malaysia. We aimed to describe the types and characteristics of fluoroquinolones prescribed, to examine the pattern of fluoroquinolones used and to calculate and compare the Defined Daily Doses (DDD) for each fluoroquinolone with the WHO guidelines.

Research Design and Methodology: The study design used for this study was a retrospective study of drug utilisation of a 260 beds private hospital located in central Kuala Lumpur, Malaysia. The patient demographic and medication information listed in the prescription was then collected from the electronic hospital information system. The list of the patient taking fluoroquinolones antibiotics was then obtained from outpatient prescription record. The patient records were then selected by simple random sampling technique within each month, from January 2017 to December 2017. The full prescription record was reviewed and the data which met the inclusion and exclusion criteria were recorded. Inclusion criteria were prescription containing fluoroquinolones, consumption by patient’s age 18 years and above. Patient records without prescription record or with incomplete information as well as prescriptions from dental clinic were excluded. In this study, the data were recorded as the DDD per 1000 inhabitants per day. The ‘quantity of drug use’ was calculated as follows: $\text{DDD/day} = \frac{T \times 365}{P}$, where T is an estimate of the total quantity of the drug (mg) utilised in the year under consideration, DDD is the DDD assigned for the drug according to the ATC/DDD system, P is the population of health clinics studied, and 365 refers to the 365 days in a year. Data were analysed using IBM SPSS Statistics version 22.0 (IBM Corp., Armonk, NY, USA) and Microsoft Excel version 2010. Data from the patient’s prescription record and demographic profile were assessed using descriptive statistics, such as the mean and standard deviation (SD).

Results: From the total number of outpatient prescriptions in 2017, 228 prescriptions were selected based on the studies requirement. However, due to some incomplete data found, only 200 prescriptions data were used. Out of 200 patients, 51% were males. As for the age distribution, the majority of the patients (30.5%) were in the age group of > 60 years old followed by 18.5% in the age group 40–49 years. Out of 200 prescriptions collected, Ciprofloxacin 250 mg (Ciprobay 250 mg) was the most widely prescribed fluoroquinolone, accounting for 31% of the prescriptions. This was followed by Levofloxacin 500 mg (Cravit 500 mg) 25% and Moxifloxacin 400 mg (Avelox 400 mg) 18.5%. Ofloxacin (Tarivid 100 mg) was only 4%. In term of calculation based on DDD, the four most utilised fluoroquinolones were Levofloxacin 500 mg (0.049 DID) followed by Moxifloxacin (0.03 DID), Ciprofloxacin 500 mg (0.028 DID) and Ciprofloxacin 250 mg (0.024 DID). The least antibiotics utilised are Ofloxacin 100 mg (0.0069 DID). From the study, the most common infection found was the respiratory infection. Fluoroquinolones drug consumption percentage was found highest among patients with respiratory infection (47.5%), followed by those with
gastroenterology infection (25.5%) and genitourinary infection (22.5%). The total fluoroquinolones antibiotics used for the outpatient department in the study hospital are 0.1409 DID. Our study reported that the DDD, for all the class of fluoroquinolones complied with the recommended WHO DDD except for Ciprofloxacin 250 mg and Levofloxacin 250 mg. In this case, DDDs of oral Ciprofloxacin tablet was 500 mg and Levofloxacin tablet was 250 mg, whereas the recommended WHO DDD of oral Ciprofloxacin tablet are 1000 mg and Levofloxacin 500 m. This indicates that the particular drugs were used for a different indication such as surgical prophylaxis, renal dosing adjustment or people with lower body weight.

**Conclusion:** The most frequently prescribed fluoroquinolones are ciprofloxacin, followed by levofloxacin and moxifloxacin. Nevertheless, based on DDD, Levofloxacin 500 mg was the most utilised antibiotics in the included samples. Overall, it can be said that the usage of fluoroquinolones in the studied hospital is relatively low, as evident of the success of antimicrobial stewardship implementation.

**Assessment of insulin-related knowledge among healthcare professionals in a secondary care hospital in the United Kingdom**

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**Introduction:** Despite numerous strategies introduced to promote the safe use of insulin, insulin-related medication errors persist. Healthcare professionals’ lack of confidence and knowledge regarding insulin use may contribute to insulin errors.

**Aims:** The aim was to examine the knowledge and self-reported confidence of a range of healthcare professionals regarding insulin products and administration in hospital. Objectives included:

- Identifying specific knowledge gaps amongst healthcare professionals regarding insulin use.
- Determining correlations between insulin knowledge, self-reported confidence level, professional group and years of experience.
- Describing healthcare professionals’ experiences of previous involvement in insulin-related medication errors, and their recommendations for improving insulin safety.

**Method:** A 16-item online questionnaire was prepared in light of locally reported insulin-related incidents and was sent via email to all healthcare professionals employed at a large teaching hospital in the North of England over a 4-week study period (n = 6,000).

Responses were invited from registered healthcare professionals who were involved in prescribing, validating or administering insulin to patients. Ethical approval from the hospital was not required for this service improvement project. Informed voluntary consent was implied by anonymous completion of the questionnaire.

Multiple-choice questions (MCQs) addressed insulin dosing, administration and duration of action. Open-ended questions allowed respondents to describe their experience and opinions on improving insulin safety. Data were generated via the online questionnaire platform and descriptively analysed by a single researcher using Microsoft Excel 2016. Answers to MCQs were considered correct if they were complete and contained all correct options. Qualitative data were inductively and thematically analysed. Findings were confirmed by an independent pharmacist to increase rigour.

**Results:** Respondents included 36 nurses, 33 pharmacists, 16 junior doctors, 4 consultants, 18 pharmacy technicians and 2 others (n = 109). Pharmacists achieved the greatest percentage of mean correct answers overall (49%), followed by consultant doctors (38%), pharmacy technicians (37%), junior doctors (34%), nurses (32%) and others (13%). Nurses and junior doctors were particularly challenged by questions regarding higher-strength insulin, and questions involving insulin administration times and duration of action were answered poorly by all professions.

Respondents were mainly ‘slightly confident’ in their knowledge and use of insulin. Confidence level positively correlated to performance, but a number of years’ experience did not result in higher confidence or performance.

Twenty-nine (27%) respondents reported being involved in an insulin medication error, the most common of which included the wrong insulin product being prescribed. Most respondents considered educational strategies and greater availability of accessible resources as the best strategies to improve insulin safety.

**Conclusion:** This study allowed for a broad assessment of insulin-related knowledge that could help inform strategies to improve insulin use in hospital. Obtaining responses from a convenience sample was cost-effective and efficient, but did not allow for calculation of an accurate response rate. Interprofessional, collaborative development of the questionnaire may have increased its content validity. This study is the first of its kind to demonstrate insulin-related knowledge of pharmacy technicians and may support their collaborative involvement in promoting the safe use of insulin in hospital.
Poster Walk 4

Investigating student experiences and perceptions of simulation-based education as a teaching method for pharmacy undergraduate education at the University of Portsmouth

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Introduction: Simulation-based education potentially enhances learning more than traditional teaching. The General Practice Five Year Forward View [1] alongside the Pharmacy Integration Fund funded extended clinical pharmacist roles not previously commonplace. Such changes require adaptation and innovation in curricula. Aims: To identify undergraduates’ experiences and perceptions of simulation-based education in the MPharm at Portsmouth. To understand the effect simulation has on students’ perception of the pharmacist role, describe the effect simulation has on learning and elicit how students engage with simulation when compared to other teaching methods.

Methods: Ethical approval was gained before a year one undergraduate simulation workshop was delivered over three years, incorporating high-fidelity manikins and simulated patient actors. An inductive mixed-method approach was undertaken, utilising purposive sampling of all students attending the simulation. A fourteen-point questionnaire containing open questions, Likert scale and ranking questions was developed, piloted and self-administered at the end of the simulation, annually for three consecutive years. Six semi-structured focus groups were conducted one week after the simulation to compare and confirm findings.

Numerical questionnaire results were analysed using descriptive statistics and Chi-square hypothesis testing. Free-text responses from the questionnaire and focus group data were analysed using thematic analysis.

Results: From a total of 397 students registered on the MPharm, 296 questionnaires were completed, $n = 296$ providing a response rate of (76.5%). 99% ($n = 296$) of respondents indicated that simulation is a useful way of learning about communication, 99% ($n = 296$) of respondents felt that simulation was useful when learning about drug-device counselling.

87% ($n = 296$) respondents felt simulation was useful when learning about drug-dose calculations, but further examples were needed alongside discussion of methods. 15% ($n = 36$) students stated calculations could be learned anywhere.

Respondents reported preparing differently for simulation and 94% ($n = 285$) respondents indicated they wanted more simulation. Focus group respondents stated preparing more rigorously for simulation compared to traditional workshops and appreciated that simulation fostered active learning, and allowed demonstration and application of knowledge and skills. Simulated patients were seen as important, and placing them in a simulated environment added perceived reality to the experience.

Respondents observed staff commitment to simulation being extensive, but valued 1-2-1 feedback on their consultations and being directly relevant to assessment. Respondents wanted at least one simulation per year involving communication, with a simulated patient, in a simulated environment meeting learning outcomes for the relevant year of the MPharm. Neither gender of respondents nor year of data collection affected Likert scale responses from the total population sampled.

Conclusion: Simulation was reported as being acceptable and useful, but traditional teaching methods were required to outline theory and knowledge prior to simulation. This study, although only from one institution hosting a range of simulation facilities obtained similar findings to established medical nursing and pharmacy literature. Further simulation workshops have been introduced at Portsmouth as a result of these findings. Use of simulation-based education in pharmacy education should be further explored with standards set for best practice.

References

1. NHS England, P. H. E., Health Education England, Monitor, Care Quality Commission, NHS Trust Development Authority The NHS Five Year Forward View [Internet]. 2014.

The impact of structured education on hospital pharmacists about the knowledge of adverse drug reactions and their reporting methods in Saudi Arabia: a randomised controlled trial

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Introduction: Adverse drug reactions (ADRs) are a major public health problem. An ADR is defined by the Medicines and Healthcare Products Regulatory Agency (MHRA) as ‘an unwanted or harmful reaction experienced following the administration of a drug or a combination of drugs under normal conditions of use and which is expected to be related to the drug’. [1] Evidence suggests that majority of healthcare professionals including pharmacists have limited knowledge about ADRs in Saudi Arabia. [2] To the authors’ knowledge, no study has been conducted to assess the impact of educational intervention on the knowledge and understanding of ADRs by hospital pharmacists.
Aims: To assess whether the educational intervention will lead to an improvement in the awareness of participants about ADRs and their methods of reporting.

Method: This study was a 3-month randomised controlled trial conducted in Makkah region in Saudi Arabia between January 2018 and March 2018. The study had two groups (an active or intervention group and a control group). Participants in both groups were required to complete an online questionnaire about ADRs and their methods of reporting. The questionnaire was developed using the format and style of a questionnaire used in a previous study [3]. The questionnaire was piloted on a sample of six pharmacy students. Participants were assessed at baseline and at the 12-week follow-up to measure the difference in the Mean knowledge score about the ADRs and their methods of reporting. Participants in the intervention group electronically received a structured information sheet about ADRs two weeks after their first assessment. At the same time, a separate information sheet containing information about CORONA virus was sent to the control participants.

Results: A total of 46 participants were included in the study (25 male and 21 female). At baseline, no statistically significant differences were found between the participants in the intervention and the control groups. There was a significant improvement in the Mean knowledge score of intervention participants from 7.67 at baseline to 11.22 at the 12-week follow-up (P = 0.01). The mean knowledge score of control participants remained unchanged at 6.71 during both baseline and follow-up assessments. Compared to control participants, there was also greater improvement in the percentage of intervention participants who were aware of ADR reporting methods (13.6% at baseline)) to 94.4% at 12-week follow-up.

Conclusion: This study was limited by the use of non-validated information sheets that were delivered to study participants. Nevertheless, the findings of this study suggest that ADR-specific education can improve the knowledge and understanding of pharmacists about ADRs and their methods of reporting.

References

1. MHRA. Adverse Drug Reactions. http://www.mhra.gov.uk/Safetyinformation/Howwemonitorthesafetyofproducts/Medicines/TheYellowCardScheme/Informationforhealthcareprofessionals/Adverisedrugreactions/index.htm (accessed 01 October 2018).

2. Abdel-Latif MM, Abdel-Wahab BA. Knowledge and awareness of adverse drug reactions and pharmacovigilance practices among healthcare professionals in Al-Madinah Al-Munawwarah, Kingdom of Saudi Arabia. Saudi Pharm J, 2015. 23(2):154–61.

3. Cheema E, Haseeb A, Khan TM, Sutcliffe P, Singer DR. Barriers to reporting of adverse drugs reactions: a cross sectional study among community pharmacists in United Kingdom. Pharmacy Pract, 2017. 15(3): 931.

Exploring the impact of pharmacist-led feedback on insulin prescribing

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Introduction: Insulin is a common and high-risk medication with insulin prescribing errors prevalent in hospital settings. Doctors have reported a lack of feedback on prescribing previously, and whilst pharmacist-led feedback has recently been reported to improve prescribing outcomes, evidence supporting the use of feedback to support insulin prescribing is limited.

Aim: The aim of this research was to explore the impact of pharmacist-led feedback on insulin prescribing error frequency and behaviour.

Methods: This was a mixed methods study in a UK teaching hospital. Prospective prescribing audits were undertaken by eight pharmacists over a four-week period for control (n = 12) and intervention (n = 12) group doctors on hospital wards (two control and two intervention) matched for patient turnover and prescriber grade.

Eight pharmacists were trained in data collection with four pharmacists trained in the delivery of constructive insulin prescribing feedback. Feedback was provided both verbally and in writing to the intervention group by the trained pharmacists. Feedback was provided individually and collectively for shared learning at monthly intervals for three months (April–June 2018). Insulin prescribing was then re-audited over a four-week period with data analysed using chi-squared tests.

Doctors who had received feedback were invited via e-mail to participate in semi-structured interviews to explore the impact of the intervention on their insulin prescribing. Interviews were digitally recorded, transcribed verbatim, checked for accuracy and analysed thematically using a framework approach.

NHS research approval was obtained (IRAS 248203).

Results: Prescribing data were collected on 156 insulin prescriptions. Error frequencies were similar at baseline (P = 0.213) between control (42 errors / 36 prescriptions) and intervention groups (37 errors / 47 prescriptions). Post-intervention, there was a significant reduction (P = <0.05) in error frequency (10 errors / 50 prescriptions) in the intervention group with a non-significant difference in the control group (34 errors / 23 prescriptions), an overall improvement in change in insulin prescription error rates of 89.7% between groups.

Ten doctors were interviewed. Feedback was reported as essential to support the development of prescribing competencies, with feedback valued, and considered feasible. The intervention was reported to provide an opportunity to ask questions and consolidate knowledge, whilst raising awareness of insulin errors and their causation, and other professionals’ roles within the
team. Several doctors reported an increased confidence in their insulin prescribing.

Avoiding negative feedback was described as a motivating factor on their prescribing, whilst doctors consistently described critically reflecting both on and in action to guide and support their insulin prescribing.

Doctors agreed that feedback could reduce insulin prescribing errors and described a more mindful approach to prescribing, with greater information and feedback seeking behaviour, and enhanced teamwork with pharmacists and specialist nurses reported

Conclusion: Feedback on insulin prescribing is valued with positive influences on prescribing. However, the influencing factors are complex and multifactorial including enhanced knowledge, error awareness, critical reflection and social interaction. Whilst this is a small sample and single-site study, there is potential to optimise insulin prescribing outcomes with larger studies needed to explore this further.

An evaluation of a ward pharmacy technician hospital discharge transcribing service

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Introduction: Discharge prescribing is a high volume, error-prone task required of hospital doctors, with interventions required to reduce errors. Pharmacy technicians are undertaking advanced roles in hospital settings with a recent study describing their role in transcribing discharge medications, with lower error rates reported compared to doctors. However, there are no known studies reporting the views of healthcare professionals of this service.

Aims: The aim of this study was to evaluate the views of doctors, nurses, pharmacists and pharmacy technicians of a pharmacy technician discharge transcribing service.

Methods: This study was undertaken in an acute teaching hospital. A 25-item survey was designed reflecting the service process, pharmacy technician role and potential outcomes. The survey was piloted prior to dissemination.

Self-administered surveys were distributed to all doctors (n = 23), nurses (n = 78), pharmacists (n = 19) and pharmacy technicians (n = 9) working with the service on five hospital wards. Questions combined 5-point Likert scale and open-ended statements after each section. Completed surveys were returned to the researcher via ward pharmacists.

Data were entered into SPSS v24 and analysed descriptively with mean and median responses calculated for each question. Free-text responses were analysed thematically by the researchers. As this was an evaluation of an existing service, ethical approval was deemed unnecessary.

Results: Sixty-seven (52%) participants responded with 19 (100%) pharmacists, 9 (100%) pharmacy technicians, 15 (65%) doctors and 24 (31%) nurses completing the survey. All staff groups valued the service and agreed that it was useful, with 94% of participants agreeing that the service improved teamwork on the wards. Some (3.0%) respondents agreed that technicians should not be transcribing medications although 89.6% of respondents believed the service should continue with 79.1% agreeing it should be implemented on all hospital wards. Most (82.1%) participants agreed that the service saved them time, with 86.6% agreeing it was likely to reduce discharge prescription errors.

Thematic analysis revealed three emergent themes: i) impact of service on patient care, ii) impact of service on clinical team and iii) sustainability of service. Participants reported potential cost savings and reduction in errors although some staff felt discharge processing times were not improved and time savings limited to doctors, whilst some pharmacists reported transcribing errors were still occurring. Some participants questioned the place of the service when electronic prescribing is implemented, although advanced that pharmacy technician roles could be utilised elsewhere.

Conclusion: The sample size is small but is representative of the staff numbers on the intervention wards. Response rates suggest pharmacy staff may be over-represented. This is a potential limitation, with lower response rates for doctors and nurses potentially reflecting shift patterns.

This survey has demonstrated that transcribing of discharge medications by technicians is valued by the clinical team with potential benefits for patient safety and workflow. Whilst this service offers potential to improve the discharge process, there is some uncertainty surrounding its future role with electronic prescribing, and is likely to vary depending on the operating system.

Interventions to reduce anticholinergic burden in adults aged 65 and over: A systematic review

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Introduction: The global population is ageing. Older people have more morbidity and are often on polypharmacy regimes with high anticholinergic burden (ACB). A high ACB is linked to adverse events such as mortality, poor physical functioning, dementia, cardiovascular disease and falls, and interventions are needed.

Aim: The aim was to review the literature to identify and describe studies of the effectiveness and efficiency of interventions designed to reduce the ACB of adults (≥65 years), on polypharmacy regimes, compared with usual care, assessed with any outcome measure. The specific research questions were as follows: What is the content of the intervention? Is the intervention clinically effective? Is the intervention cost-effective?

Method: Eligible papers were those describing a Randomised Controlled Trial (RCT), Controlled Clinical trial (CCT) or Pre–post non-randomised intervention (PPI) studies published in English from January 2010 to March 2018. Search terms included MeSH terms and terms related to anticholinergics AND adverse effects. Databases searched included CINAHL, Ovid MEDLINE, EMBASE and The Cochrane Central Register of Controlled Trials (CENTRAL). All titles, abstracts and full papers were assessed independently in duplicate. Risk of bias for RCTs was assessed by the relevant Cochrane Collaboration tool. CCTs and PPIs were assessed by Clinical Appraisal Notes and checklists from the Scottish Intercollegiate Guideline Network (SIGN).

Results: The search yielded 5862 records. Eight publications (4 RCTs and 4 PPIs) from Australia(2), Norway (1), Spain(1), the Netherlands(1), the United States(2) and the United Kingdom(1) were eligible and included. No RCT complied fully with the risk of bias criteria, and one study met only one criterion. Blinding of participants and outcomes had the lowest compliance. All PPIs were well conducted with minimal risk of bias. Studies were conducted in the community(2), hospitals (4), nursing homes(1) and retirement villages(1). Pharmacists, either individually or as part of a team, provided the intervention in the majority of studies (7/8). Most (7/8) involved individual patient medication review followed by feedback to the prescriber. One study was an audit and feedback intervention. A majority of interventions (7/8) reduced anticholinergic burden with a reduction in Anticholinergic Drug Scale (ADS) (1). Anticholinergic Risk Scale (ARS) (3) and Drug Burden Index (DBI)(2) and improved Medication Appropriateness Index (MAI)(1). Physicians accepted 50% (95%CI 37–63%) of recommendations in one PPI study. One RCT showed no effect. No study included a cost measure.

Conclusion: The review identified eight studies reporting interventions to reduce ACB in elderly patients. The providers were primarily pharmacists using patient-specific approaches. The majority demonstrated that the interventions reduced ACB effectively. Most studies had methodological limitations. Limitations of the review are that the search may not have identified all eligible papers, and due to the heterogeneity of the studies, a meta-analysis was not possible. The implications are that pharmacists may be well placed to provide an ACB reduction intervention. To our knowledge, this is the first systematic review of interventions aimed at reducing ACB in older adults and highlights the need for development and testing of pragmatic clinical and cost-effectiveness trials in community, as well as specific patient, populations at high risk of harm from ACB.

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Introducing a longitudinal ward placement into the hospital pre-registration year: pharmacist, nurse and doctor perspectives

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Introduction: Hospital pre-registration pharmacist training commonly consists of 2–3 week rotations through different areas. Longitudinal placements may have benefits over short rotations, allowing development of enhanced patient-centred skills(1). This study explored the views of healthcare professionals on introducing a longitudinal ward placement for hospital pre-registration pharmacists. Data analysis is ongoing and these results are preliminary.

Aims: With respect to a longitudinal ward placement:

- Design a longitudinal ward placement
- Describe perceived barriers and enablers to implementation

Methods: Participants were identified based on their job role, approached via gatekeepers and recruited using convenience sampling. Seven focus groups and one interview were conducted with healthcare professionals at hospitals across the East of England. One focus group was conducted with each of the following groups: chief pharmacists (n = 4), hospital diploma tutors (n = 3), pre-registration managers/tutors (n = 5), a ward pharmacist and nurse (n = 2), ward nurses (n = 2) and doctors (n = 3). Two focus groups were conducted with newly qualified pharmacists with less than two years of experience (n = 13). One interview was conducted with a consultant (n = 1).

A semi-structured topic guide explored; types of activities that could be conducted, supervision arrangements and perceived barriers/enablers to introducing a longitudinal placement. Written informed consent was obtained.

The focus groups and interview were audio-recorded, transcribed verbatim and thematically analysed(2). Ethical approval (service evaluation) was granted by the University of East Anglia.

Results: Preliminary results have been identified which include; current training environment, control over...
training, design of placement, perceived placement enablers and barriers.

Pre-registration tutors and chief pharmacists believed that the current model of training was sufficiently preparing pre-registration pharmacists for practice. Newly qualified pharmacists perceived their training to be lacking in certain key areas, notably clinical decision-making. Hospital diploma tutors believed that the introduction of a longitudinal placement could improve the skills and confidence of trainees, better preparing them for practice.

Pre-registration tutors and chief pharmacists perceived that the introduction of a longitudinal placement would result in a loss of control over training and expressed a desire to maintain the current model.

Placement design preferences varied, most consistently participants wanted defined placement objectives in place.

Perceived enablers were more frequently discussed amongst newly qualified pharmacists and ward staff and included; acceptance into the ward team, development of interpersonal skills and availability of learning opportunities. Perceived barriers were most frequently discussed by pre-registration tutors and chief pharmacists and included; risk to patient care, additional workload for ward staff and ward staff not understanding the role of a pre-registration pharmacist.

Conclusion: Given the role of pre-registration tutors in managing training, there may be a reluctance from some to adopt a different approach. Ward staff and newly qualified pharmacists showed the greatest eagerness to realise the potential of a longitudinal ward placement for pre-registration pharmacists.

This placement has the potential to better prepare pre-registration pharmacists for extended patient-centred roles through enhanced skill and knowledge development. Design and implementation of a longitudinal ward placement should take into consideration the barriers articulated by participants whilst also incorporating appropriate activities and guidance that will create valuable learning opportunities.

References
1. Thistlethwaite JE, Bartle E, Chong AAL, Dick ML, King D, Mahone S, et al. A review of longitudinal community and hospital placements in medical education: BEME Guide No. 26. Med Teach. 2013;35 (8):e1340–64.

2. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol. 2006;3(2):77–101.

Investigating patient safety culture using the open comments section of the Safety Attitudes Questionnaire (SAQ)

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Introduction: Safety culture – the way in which an organisation contemplates and prioritises safety – is measured using surveys such as the Safety Attitudes Questionnaire (SAQ) (1). These surveys calculate healthcare providers’ ‘scores’ in several dimensions of safety culture. However, few qualitative studies have been carried out to investigate the underlying causes of these scores.

Aim: The purpose of this study was to qualitatively analyse the open comments section of an SAQ which was circulated throughout an Irish hospital (2). The hospital scored below the international benchmark in the domain ‘Working Conditions’. This study aimed to explore the factors contributing to these results to gain better insight into the safety culture of the hospital.

Method: The SAQ was distributed, by hand and electronically, to all employees, both clinical and non-clinical, in a large Irish teaching hospital in January 2018. The questionnaire contained an open comments section in which respondents were asked ‘What are your top three recommendations for improving patient safety in your clinical area?’ These comments underwent thematic analysis according to Braun and Clarke. Ethical approval for this study was granted by the local ethics committee.

Results: Of the staff members who completed and returned a questionnaire (\(n = 768\)), 550 respondents (275 nurses, 125 doctors, 51 HSCPs, 24 HCAs and 75 ‘other’) completed the open comments section, providing a total of 1375 comments. Five themes emerged from the data, three major – Staffing Issues, Patient-Focused Care, and Hospital Environment – and two minor – Safe Reporting Culture and Training & Education. Illustrative quotations are detailed in Table 1.

Conclusion: To our knowledge, this is the first time that qualitative methods have been used to describe patient safety culture in an Irish hospital. Several patient safety issues were identified. Poor staffing levels, inadequate infrastructure and lack of support from management were seen as barriers to patient safety, and there was a strong sense that patient safety was not being prioritised in the hospital. Respondents felt that patient safety could be improved by providing better opportunities for training and education, and by promoting a safe error reporting culture.
Table 1: Emergent Themes and Supporting Quotations

| Theme                                | Supporting Quotations                                                                                                                                 |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Staffing Issues                      | ‘Staffing levels are inadequate to safety treat patients.’ (SN60) ‘Increased staffing, sick cover for staff especially at weekends/ nights. Dangerous at present.’ (16) ‘Need more senior staff, poor staffing leads to delayed patient care on the regular, lack of experience of junior staff compromises patient care’ (SN135) |
| Patient-Focused Care                | ‘Less emphasis on patient turnover, beds etc., more on actual patient care’ (SN77) ‘Prioritise patient safety all the time’ (SN112) ‘Communication between nursing staff and medical staff, need more effort to ensure patient safety’ (CNM33) |
| Hospital Environment                | ‘Better working facilities and computers and more storage space’ (HSCP24) ‘Having no patients on trolleys and especially on wards- less crowded, cluttered clinical areas’ (CNS13) ‘Better understanding by hospital management of what actually happens on ground level. Better input by hospital management to support current staff and new staff’ (CNS3) |
| Safe Reporting Culture              | ‘Non blame-laying systems of reporting errors’ (SH09) ‘Culture of teaching when errors occur’ (SH08) ‘Continuous training & reassessment of all clinical staff’ (133) ‘Better planning and notice of education days/courses’ (SN7) |
| Training and Education              |                                                                                                                                                      |

Abbreviations: SN = Staff Nurse, i = intern, CNM = Clinical Nurse Manager, HSCP = Health and Social Care Professional, CNS = Clinical Nurse Supervisor, SHO = Senior House Officer.

A noteworthy limitation is that, due to distribution methods, not all hospital staff were reached and a response rate could not be calculated. Particular strengths of this study are the large number of comments that were analysed, and the anonymous nature of the survey, which provided rich data that may not have been achieved in other settings.

This qualitative study fortified the quantitative results of the SAQ, identifying the need to improve hospital working conditions and the relationship between clinical staff and hospital management. This study has provided valuable insight into the safety culture of a large hospital, which will be useful in the design of future patient safety initiatives.

References

1. The Health Foundation. Measuring Safety Culture, 2011. https://www.health.org.uk/sites/health/files/MesuringSafetyCulture.pdf

2. Gleeson L, Tobin L, Crowley EK, Delaney A, O’Mahony D, Byrne S. Safety Culture in a Large Acute Irish Teaching Hospital: The Safety Attitudes Questionnaire. Int J Clin Pharm. 2018; In Press.

Lipid management services in primary care: A study of service effectiveness around identification of eligible patients and their evidence-based management

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Introduction: Elevated blood cholesterol (hypercholesterolaemia) is a risk factor for the development of cardiovascular disease (CVD), a major cause of morbidity in the UK. Treatment of hypercholesterolaemia with cholesterol-lowering medication provides a cost-effective way of reducing the population burden of CVD; however, the asymptomatic nature of hypercholesterolaemia means early identification of patients requiring treatment is of vital importance. Patients with inherited lipid metabolism disorders such as familial hypercholesterolaemia (FH) are at risk of developing CVD, with up to half of untreated patients experiencing a cardiovascular event by the age of 60. [1] Dudley Clinical Commissioning Group commissioned a review of the management pathways for patients with FH and hypercholesterolaemia, and this investigative work was to understand the suitability of the current information systems to support population segmentation in addition to determining the population eligible for treatment prior to improving the management of these conditions.

Aim: The main aim of the study was to retrospectively review the patients treated with lipid-lowering therapy and their achievement of evidence-based serum cholesterol targets for prevention of cardiovascular disease.

The objectives were to generate appropriate database search algorithms to identify the target population, and to analyse the data generated by the searches using Excel software. Due to the nature of this project as an audit involving anonymised patient data, ethical approval was not deemed necessary.

Methods: The database used for this project was EMIS (Egton Medical Information Systems); the electronic
anticipate that is reflective of lipid management across a group, and therefore no baseline reading in some instances. We notes may have contributed to a loss of historic data. Data are likely to be an over-estimation associated with data storage. Considering the findings, a current lipid management service provision in Dudley, the total number of records searched was 320,098. 15,816 patients were identified on secondary prevention with an elevated cholesterol but without a diagnosis of FH; 65% (n = 10,276) of these did not meet targets. Analysis could not be performed on primary prevention patients with a diagnosis of raised cholesterol but without a diagnosis of FH due to IT limitations. For patients with FH, 70% (315/446) of patients taking primary prevention and 66% (61/93) taking secondary prevention did not meet targets. Overall, 65% (10,652/16,355) of patients on lipid-lowering treatment for the prevention of CVD in Dudley did not meet evidence-based targets.

Conclusions: These results highlight shortcomings with current lipid management service provision in Dudley, as well as with data storage. Considering the findings, a target value for cholesterol levels may be more practical to achieve than the current target of percentage reduction. Data are likely to be an over-estimation associated with difficulties in data procurement. NICE guidance requires a baseline cholesterol reading when considering lipid targets, and conversion from paper to electronic notes may have contributed to a loss of historic data and therefore no baseline reading in some instances. We anticipate that is reflective of lipid management across a wider population than Dudley.

References

1. Neil HA, Seagroatt V, Betteridge DJ, et al. Established and emerging coronary risk factors in patients with heterozygous familial hypercholesterolaemia. Heart. 2004; 90: 1431–7

2. NICE. Cardiovascular disease: risk assessment and reduction, including lipid modification. Available from: https://www.nice.org.uk/guidance/eg181 [Accessed 04/10/18]
randomised in situ simulation design to determine whether user testing results in fewer administration errors in a ward environment.

References

1. Erskine D, Haylor J, Keeling S, Nicholls J. An assessment of the information provided to support healthcare staff to administer injectable medicines. Poster presented at: UK Medicines Information Practice Development Seminar. 2014 Sep 12; Birmingham, UK.

2. Raynor DK, Veene PD, Bryant D. The effectiveness of the Summary of Product Characteristics (SmPC) and recommendations for improvement. Ther Innov Regul Sci. 2013 48(2):255–65.

Poster Walk 6

Operating a patient medicines helpline service: exploring current practice in England using the RE-AIM evaluation framework

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Introduction: Hospital-based patient medicines helpline services (PMHS) provide a means of accessing medicines-related support following discharge. However, it is unknown how many National Health Service (NHS) Trusts currently provide a helpline, nor how they are operated.

Aim: The RE-AIM evaluation framework (Reach, Effectiveness, Adoption, Implementation and Maintenance [1]) was used to obtain key data regarding the provision and use of PMHS in NHS Trusts in England. This included the extent to which the delivery of helplines meet with Royal Pharmaceutical Society endorsed national standards (pertaining to helpline access, availability and promotion; [2]).

Method: Ethical approval was obtained from the University of Bath. An online survey was sent to Medicines Information (MI) and Chief Pharmacists at all 226 acute, mental health, specialist and community NHS Trusts in England, between February and May 2017. One response was sought per Trust. MI Pharmacists were identified via the UK Medicines Information network online directory. Survey questions were developed to reflect the national standards and the RE-AIM dimensions. Non-responders were sent the survey twice further and were subsequently contacted to establish whether their Trust provided a helpline. Data were analysed using SPSS.

Results: Of 226 NHS Trusts, 202 completed the survey (89%). The remaining 11% of Trusts answered whether or not they operated a PMHS. Adoption: 52% of Trusts reported providing a PMHS (n = 117/226). Reach: Helplines were predominantly available for discharged inpatients (98%, n = 110/112), outpatients (95%, n = 106/112) and carers (93%, n = 104/112), and to a lesser extent, the local public (22%, n = 25/112)). The median number of enquiries per week was five (n = 107). Implementation: For helpline access, 54% of Trusts reported complying with all ‘satisfactory’ standards (n = 58/108) and 26% reported complying with all ‘commendable’ standards (n = 28/107). For helpline availability, the percentages were 86% for the ‘satisfactory’ standards (n = 92/107), and 5% for the ‘commendable’ standards (n = 5/107). For helpline promotion, the percentages were 3% for the ‘satisfactory’ standards (n = 3/100) and 40% for the ‘commendable’ standards (n = 43/108). One Trust reported complying with all standards. Maintenance: Helplines were operated for a median of six years. Effectiveness: Main perceived benefits of helpline use included patients avoiding harm, and improving patients’ medication adherence.

Conclusion/discussion: Hospital-based patient medicines helpline services are provided by approximately half of NHS Trusts in England. However, the proportion of mental health and community Trusts that provide a
helpline is less than half of that of the acute Trusts. Adherence to the national standards could generally be improved, although the lowest adherence was regarding the promotion of helplines. Recommendations for improving the use of helplines include increasing the number of promotional methods used, the number of ways to contact the service and the number of hours that the service is available.

References

1. Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: The RE-AIM framework. Am J Public Health. 1999;89(9):1322–7.

2. Wills S. Medicines helplines for hospital patients: National standards. UK: Royal Pharmaceutical Society; 2014.

Factors affecting the adoption of mobile apps for self-management of type 2 diabetes: A systematic review

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Background: Diabetes is a complex chronic condition that requires both high-quality clinical care and effective self-management. People with diabetes are required to manage many aspects of diabetes by themselves on a life-long basis. The potential of mobile apps to improve diabetes self-management practices and even patients’ outcomes is well established in the literature. However, the factors that affect the adoption of self-management apps among type-2 diabetes patients and healthcare professionals (HCPs) are not as clear.

Aim: To identify the factors affecting the adoption of mobile apps for the self-management of type-2 diabetes among patients and HCPs.

Methods: Six electronic databases were searched for articles published from 2008 to 2018; these include the following: PubMed, CINAHL, Cochrane Central, ACM digital library, IEEE Explore digital library and Scopus. The search included qualitative and quantitative studies published in English in peer-reviewed journals and involved patients with type-2 diabetes, healthcare professionals and caregivers reporting on the factors affecting their use of self-management apps. Thematic analysis was undertaken for data synthesis.

Results: From the literature search, 1208 articles were identified. Of these, 27 articles met the inclusion criteria. The findings were categorised into patients and HCPs’ perspectives. Most of the app activities reported by patients include diet tracking, blood glucose monitoring and exercise tracking (16/27). Patients’ age was reported in seven studies as a key factor affecting adoption. Technology illiteracy (7/27), lack of knowledge and awareness of self-management Apps (6/27), time constraints and a busy schedule (5/27) were the main barriers towards patients’ adoption of self-management apps. However, if self-management apps are user-friendly (8/27), provide social networking with patients and HCPs (8/27), have visual aids (7/27) and immediate feedback from HCPs (6/27), patients are more willing to adopt them. HCPs are more likely to recommend apps if they report patient's status, and have remote monitoring and remote feedback (2/27). The lack of knowledge about apps, workload, lack of time and lack of resources were the main barriers reported by HCPs for not recommending self-management apps (2/27).

Discussion & conclusions: This review highlights the factors affecting the adoption of self-management apps among patients and HCPs. Lack of awareness and knowledge of self-care management apps, as well as the need for maintained interaction, even in a virtual environment, to sustain feedback and monitoring activities seem to be common among HCPs and patients. The latter factor is particularly key since it has been shown to improve diabetes outcomes [1]. This review has limitations. The factors have not always been explicitly reported and the authors discussed how to label them. Furthermore, only peer-reviewed articles were included in this review. However, our findings will be useful to diabetes app developers who can identify the factors that can influence users’ intention to leverage the benefits of diabetes self-management apps.

References

1. Kelley et al. The influence of the patient-clinician relationship on healthcare outcomes: a systematic review and meta-analysis of randomized controlled trials. PloS one. 2014;9(4):e94207.

An evaluation of the opinions of Foundation trainee doctors’ postgraduate safe prescribing education in an acute teaching hospital

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Introduction: Prescribing is an error-prone activity with higher prescribing error rates reported for Foundation grade doctors. Recent national guidance recommends a
practical prescribing induction to support junior doctors, focusing on safe prescribing, with the opportunity to build a relationship with pharmacists outlined, and the need for regular feedback on prescribing from pharmacists recommended. However, little is known on the opinions of Foundation grade doctors of their safe prescribing education or pharmacist involvement in this training.

**Aim:** The aim of this project was to evaluate the opinions of Foundation year trainee doctors’ on their postgraduate safe prescribing education.

**Method:** This survey was undertaken in a large UK teaching hospital. A survey was developed based on the Foundation training curriculum and safe prescribing guidance. Questions consisted of 5-point Likert scale and open-ended statements with question themes including prescribing inductions, ongoing prescribing education, prescribing confidence, feedback and pharmacist involvement in prescribing education.

Self-administered surveys were distributed to all Foundation year 1 (FY1) and 2 (FY2) trainee doctors working in the hospital during clinical skills teaching session. There were a total of 80 eligible participants (n = 40 FY1 and n = 40 FY2 trainees) at the time of the service evaluation. Surveys were returned and collected after teaching.

All data were input into SPSS v23 and analysed descriptively with median responses reported for each question. The survey was exempt from NHS ethical approval and was registered with the local survey department.

**Results:** Forty-nine participants responded with 31 (63%) FY1 doctors and 18 (37%) FY2 doctors completing the survey, an overall response rate of 61%.

Trainees agreed that they received a prescribing induction at the beginning of their Foundation training (88% n = 43), but neither agreed nor disagreed that this was adequate. In contrast, trainees disagreed (76%, n = 37) that they had received a local safe prescribing induction to each ward area, with trainees agreeing (65% n = 32) that current prescribing education could be improved.

Trainees felt confident prescribing in most areas except in pregnancy, breast-feeding, paediatrics and liver impairment, but would welcome more training and agreed that additional teaching was needed on adverse drug reactions, narrow index medications and drug interactions.

Trainees reported (69%, n = 34) receiving feedback on their prescribing from pharmacists but would like more feedback (71%, n = 35). Additionally, trainees agreed (82%, n = 40) that they wanted more pharmacist-led safe prescribing education but that it needed to be more practical (84%, n = 41) with local ward-based inductions (84%, n = 41) needed.

**Conclusion:** Foundation trainees feel confident prescribing but would welcome more prescribing education. The results suggest that a more social and experiential approach to prescribing education would be valued, supported by enhanced pharmacist-led feedback and ward-based teaching. Whilst this is a small sample size and single-site survey, these findings add to what little is known on postgraduate prescribing education and can be used to optimise pharmacist-led prescribing education. Finally, this survey has not evaluated preparedness to practice on graduation and any service redesign could explore the potential impact on this and prescribing error rates.

**The role of primary care pharmacist in the management of chronic illnesses in young people aged 10–24 years: a systematic review**

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**Introduction:** It is known that the transition of care between childhood and adulthood for people with chronic disease can be difficult. Pharmacists are well placed to support this transition.[1]

**Aim:** This review aims to explore the current role of primary care pharmacists in the management of chronic illnesses in young people aged 10–24 years.

**Method:** Systematic search of four databases: MEDLINE, EMBASE, Cochrane Library and CINAHL using MeSH and Emtree terms covering three main themes: pharmacist, young people and chronic illnesses. Inclusion criteria: articles identifying the role of primary care pharmacists in the management of chronic illness and its acute manifestations in young people aged 10–24 years. Exclusion criteria: articles on secondary care. Chronic conditions such as disability. Acute disease. Articles were critically appraised using CASP tools.

**Results:** Search results yielded 1862 publications and after reviewing titles and removing duplicates, 24 full-text articles were assessed for eligibility and eight were included in the review. These studies were conducted in the UK (3), USA (3), Netherlands (1) and Chile (1). All of the articles made reference to community pharmacists. Seven of them included original research studies (1 observational, 2 survey, 2 qualitative interview, 2 intervention). The remaining article was a literature review. Two intervention studies utilised pharmacists to manage specific chronic illnesses (asthma and metabolic disease). Both showed significant improvements in young people’s quality of life and knowledge about their disease and its treatment. Some research studies gathered the opinions of pharmacists (3) and young people (1) based on their experiences. The predominant issue identified by pharmacists was lack of communication with young people because of parents collecting prescription items. In one study [2], around half of participants stated this to be the main cause of medication-related problems, which mainly evolved around medication non-adherence in young people. Community pharmacists identified many roles that they felt were of high
priority to their practice when dealing with young people. These included supporting young people to develop generic healthcare skills, counselling and building trusted relationships directly with young people, helping young people to find credible health information and provision of specialist services [1,2].

**Introduction:** Two-thirds of asthma deaths in the UK could be prevented by better management, according to findings from the 2015 National Review of Asthma Deaths (NARD) [1]. Innovative approaches should be adopted to improve asthma management through cooperation between the GP practice and other healthcare practitioners [2]. In order to improve asthma management and control, the current levels of asthma control and management need to be evaluated in order to determine enablers for change.

**Aim:** This study aimed to explore the issues concerning the management of adult asthma patients within primary care and to identify opportunities for improvement.

**Method:** This study involved a total of 17 semi-structured, face-to-face or telephone interviews with stakeholders including, pharmacists, an asthma consultant and a service commissioner. Thematic analysis of the interview transcripts was performed using NVivo. The data analysis resulted in 8 key themes, and the key themes were divided into subthemes. All the themes and subthemes impacted asthma control and management, as well as enablers for improvement. LJMU Research Ethics Committee (REC) approval (18/PBS/004) was obtained on 9th Apr 2018 for this study, which is the first phase of the PhD.

**Results:** Overall, participants felt that many adult asthma patients within their healthcare settings are poorly controlled and for several reasons including poor inhaler technique, overtreatment and under treatment, poor medicine adherence – especially with preventer inhalers, patient education and the current diagnosis pathway. The participants suggested that better asthma management and control could be achieved through better communication between healthcare settings, information sharing and multidisciplinary work. This could lead to better diagnosis and monitoring of asthma patients. Interviewees felt that there were opportunities to utilise pharmacy resources to improve asthma management and control by targeting certain adult asthma patient groups. Participants were recruited from one county in the North West of England, which limited the generalisability of the research findings. Interviews were conducted over the telephone, and this is another key limitation of the study as trust and rapport is difficult to build through the lack of non-verbal communication.

**Conclusion:** Although asthma care and management are considered suboptimal, there is potential for improvement. The findings of this study will be used to inform the next phases of a wider programme of work leading to the development of a new care model for asthma patients. The new care model will be evidence based, patient-targeted and will be based around multidisciplinary teams.

**References**

1. Royal College of Physicians. Why asthma still kills: The National Review of Asthma Deaths (NRAD) Confidential Enquiry report. London: RCP; 2015.

2. Craske M, Wright D, Blacklock J, Matthews H, Dean T, Farrow T, et al. Testing annual asthma reviews for those who fail to attend: proof-of-concept study. The Pharmaceutical Journal. 2018;8(10):243–9.
Poster Walk 7

Pharmacist interventions in prevention of cardiovascular diseases in general practice: a systematic review of randomised controlled trials

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Introduction: Hypertension, diabetes and dyslipidaemia are significant risk factors leading to CVDs which continues to be a leading cause of death worldwide [1]. General Practice (GP) is the first and most common point of contact for patients with healthcare professionals. Developing more roles for pharmacists in GP could be part of the solution for tackling the current crisis facing GPs [2]. Pharmacists working in GP surgeries are integrating their expertise’ and skills to help improve the quality of care for both patients and the healthcare system.

Aim: This study aimed to determine the current role of general practice-based pharmacists in the prevention of CVDs and to what extent pharmacist interventions can be effective in improving clinical, humanistic and economic outcomes.

Method: A systemic search of the literature was undertaken in eight electronic databases: PubMed (NCBI), Ovid MEDLINE (1946), EMBASE (1974), PsycINFO (1967), Cochrane library (Wiley), CINAHL Plus (EBSCO) (1937), SCOPUS (ELSEVIER) and Science Citation Index Expanded (Web of Science Core Collection) (1900) from inception to February 2018. Studies were included if they were randomised controlled trials or cluster-randomised trials assessing the effectiveness of interventions delivered in general practice by only or mainly a pharmacist. The pharmacist interventions were included if they were patient-focused interventions including at least one of the medical cardiovascular disease risk factors, mainly hypertension, type 2 diabetes mellitus and dyslipidaemia. Studies were included if they had a comparison with usual care. The risk of bias in included studies was assessed using the Cochrane risk of bias tool.

Results: A total of 1536 articles were initially identified, with 20 meeting inclusion criteria. 13 studies were conducted in patients with diabetes, 7 studies in patients with hypertension, 2 studies in patients with dyslipidaemia and two trials studied patients with hypertension and diabetes together. All studies included had a low risk of reporting bias and high risk of bias was 25% for detection and 10% for attrition. Performance bias was unclear in 15 of the included studies. The most frequent interventions were medication review in all studies (100%) followed by medication management (90%) and then patient educational interventions (75%). Practice-based pharmacist interventions showed a positive effect on reduction of blood pressure, HbA1c; the prediction of 10-year CHD risk and by the enhancement of lipid profiles during the follow-up period in the intervention groups from baseline to final follow-up and/or compared with control groups. In addition, Practice-based pharmacist interventions also had a positive effect on medication adherence in all trials. Lastly, only 4 studies conducted an economic analysis. Practice-based pharmacist interventions evidenced to be cost-effective.

Conclusion: This systematic review provides evidence that general practice-based pharmacist can deliver several direct multifaceted interventions. These interventions can have a positive impact on reducing CV events in patients with hypertension, diabetes and dyslipidaemia. In addition, practice-based pharmacists can have a positive impact on humanistic outcomes. We did not search for unpublished studies and studies published in languages other than English. Further research is required to establish the cost-effectiveness of pharmacist interventions in GP surgeries.

References
1. WHO. Cardiovascular diseases (CVDs) 2017 [Available from: http://www.who.int/mediacentre/factsheets/fs317/en/]
2. Roland M, Everington S. Tackling the crisis in general practice. BMJ. 2016;352.

The structures, processes and related outcomes of clinical pharmacy practice as part of the multidisciplinary care of patients with chronic kidney disease: a systematic review

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Introduction: Key roles for clinical pharmacist caring for patients with chronic kidney disease (CKD) include the following: medication management, managing complications, pharmacist-led clinics and independent prescribing. Since the publication of a review by Salgado et al, which reviewed the literature to 2010, the prescribing practice is continually developing and embedding into clinical pharmacy practice. Moreover, the model of care and advancement in practice is changing and evolving. Hence, there is a need to update the review.

Aim: The main objective of this review is to critically appraise, synthesise and present the available evidence for the structures, processes and related outcomes of
clinical pharmacy practice in caring for patients with CKD.

Method: The systematic review protocol was developed and published on PROSPERO database at the Centre for Reviews and Dissemination. Search databases were PUBMED, SCOPUS, CINAHL and IPA. Included studies were summarised and quality assessment carried out by using Downs and Black tool for controlled studies and the mixed methods appraisal tool for assessing the quality of non-controlled and descriptive studies. Data were extracted and synthesised descriptively. Screening, quality assessment and data extraction were performed by two independent researchers.

Results: The search retrieved 2,678 potential articles, of which 37 met the inclusion criteria. Thirteen studies used controlled designs of which five were randomised. Pharmacists identified 4,244 drug-related problems in 2,650 patients and made 2,537 recommendations with acceptance rates up to 95%. Pharmacists’ interventions (as reported in the controlled studies) led to clinical, humanistic and economic outcomes. Significant improvement in the measurement of parathyroid hormone PTH (16.1% in the control arm vs. 46.9% in the intervention arm; \( P < 0.001 \)) was reported. Almost 46% of patients in the intervention arm achieved blood pressure (BP) target (mean home BP \( \leq 135/85 \) mmHg) compared to only 14.3% of patients in the control arm (\( P = 0.02 \)). Comparing CrCl between discharge and admission in both the control and intervention groups (5.1 ± 0.9 vs. 6.4 ± 1.0 \( P < 0.01 \)) showed improvement in the intervention group.

Conclusion: There is some evidence for the outcomes of pharmacists’ intervention in patients with CKD but this is generally of low quality and insufficient volume. The existing evidence is in favour of pharmacists’ involvement in the multidisciplinary team to provide care to patients with CKD. Yet more high-quality research in this area is warranted.

References
1. Salgado T, et al. NDT. (2012), 27: 276–292
2. Al Raiisi F, et al. PROSPERO 2017 CRD42017065258 : http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42017065258

An exploration of factors influencing health managers’ acceptance of eHealth services in the Kingdom of Saudi Arabia

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Introduction: Kingdom of Saudi Arabia (KSA) is a country with one of the largest land masses and difficult geographical terrain in the Middle East. The accessibility of advanced health services, especially for people in rural areas, has been considered one of the main health challenges. Health services across the country are accessible through three categories of providers. The Ministry of Health (MOH) which is the dominant health provider responsible for 60% of all health services and facilities. Private health sector and other government-run health authorities are the providers for the remaining 40%. Many initiatives to embrace technology in healthcare were launched by the MOH to advance the level of acceptance. One of the initiatives was the ambitious eHealth national strategy which was launched in 2011 to govern eHealth projects across the country and set consistent standards, policies and procedures for the practice activities. This study is sponsored by the MOH as part of a bigger plan to involve stakeholders in the digital transformation.

Objective: The overall aim of this study is to explore the main factors that influence health managers’ acceptance of eHealth services in KSA.

Methods: 1st phase systematic review (SR): Based on a PRISMA-P guided protocol [1] published with CRD Prospero, five databases were searched for studies published between 1993 and 2017. One reviewer performed the search; two reviewers screened the titles and abstracts. Exclusions were recorded with reasons. Tools appropriate to study design were applied independently by two reviewers to assess the quality of included studies.

2nd phase survey: An online questionnaire in both Arabic and English language was designed around the Unified Theory of Acceptance and Use of Technology (UTAUT) model determinants [2]. Professionals with a health managerial role from multiple disciplines such as health professions, management and health IT were invited to take part in the study. Ethical approval had been gained. Participation links were distributed across a range of social media platforms. SPSS V21 was used for data analysis.

Results: 1st phase SR: After duplicates were removed, 110 papers were screened, and 15 studies met the inclusion criteria. From these 15 papers, 39 factors were identified as influencing varying levels of eHealth adoption and acceptance in KSA. These were grouped into six clusters: 1 – Organizational, 2 – Technical, 3 – Professional, 4 – Cost effectiveness, 5 – Educational and 6 – Social, Behavioural and Cultural. These clusters show similarity with existing technology acceptance theories.

2nd phase survey: Findings showed that the top influential factors to acceptance and use of eHealth services from the perspectives of health managers are as follows: (i) Availability of operational resources (75%), (ii) Trust in confidentiality, security, and data privacy (70%), (iii) Availability of qualified human resources (69%), (iv) ICT infrastructure and readiness (68%) and (v) The quality of eHealth systems and applications (66%).

Conclusion: Findings from the SR and survey phases have drawn a clearer picture of the key challenges in accepting and using eHealth services from health managers’ perspectives in KSA. Further work in the third
phase will explore the identified main factors across KSA through in-depth interviews.

References

1. Moher D, Shamseer L, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P). Systematic reviews 2015; 4(1), pp. 1.

2. Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D., 2003. User acceptance of information technology: Toward a unified view. MIS quarterly, pp. 425–478.

Tools for assessing professionalism: a review of the literature

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Introduction: This paper is a part of a larger research project to analyse the complexities of assessing professionalism. Rather than seek to analyse what professionalism is, this paper focusses on extracting and reviewing assessment tools which the authors claim to measure professionalism. Aims: The aim of this review was to identify and categorise tools from the literature, which have been developed and tested in medical, nursing, midwifery and pharmacy undergraduates. Method: The search terms included among others; tool, measure, professionalism and health care. A systematic search of the literature dating from 2000 has been undertaken and titles and abstracts were reviewed using the exclusion and inclusion criteria. The research team filtered the retrieved abstracts for full-text reading. Articles were included if they met the following initial criteria; they included a measurement or assessment tool, claimed to be measuring professionalism, were developed for healthcare undergraduates, and are designed for peer, tutor or self-assessment. The analysis included categorising the types of tools being tested in healthcare students, and the article description of what they claim to be measuring under the umbrella of professionalism. Results: The initial search yielded 13,850 articles, following review, 171 were identified for full screening. Preliminary analysis and categorisation suggest most commonly, tools use self-assessment questionnaires 1,2 with attributes being measured via a Likert scale 2. Many of the authors have used professional bodies’ codes of practice, with several American authors developing tools for medical students using the American Board of Internal Medicines six tenets of professionalism, and in the U.K., the General Medical Council code of Practice. Articles may describe separate facets of professionalism such as communication, or more complex attributes such as empathy or altruism. In addition to the development of novel tools, established tools such as the Jefferson scale of Empathy are being tested in healthcare students with direct reference to professionalism. We have yet to review an article which considers the General Pharmaceutical Council standards for professional practice in their assessments. Conclusion: Of the articles reviewed, it is apparent that tools are being developed to assess a range of elements under the heading of professionalism, many describing complex attributes. The research team is most interested in the complex tools and the challenges of assessing such traits in undergraduates. Screening of the articles will continue with the aim of developing a toolkit of assessments based on emerging evidence. The review has included tools designed for certain healthcare professionals, we acknowledge this as a limitation, and also that not all research relating to relevant assessment tools may have been published.

Examing the impact of hospital-based patient medicines helpline services. A systematic review with narrative synthesis

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Introduction: Patient medicines helpline services (PMHS) have been established in many National Health Service (NHS) Trusts within the UK to support patients who have questions about their medications. However, to date, a review of the literature has not been conducted, which brings together the available evidence as to the impact of PMHS.

Aim: The aim of this systematic review was to address the question ‘What is the available evidence regarding the impact of PMHS?’ The RE-AIM evaluation framework (Reach, Effectiveness, Adoption, Implementation, and Maintenance (1)) was used to select studies and organise findings.

Method: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses was used in the planning, conducting and reporting of this review. The protocol
was registered with PROSPERO on 10 October 2017 (CRD42017075165). Searches were conducted using Medline, EMBASE, CINAHL, Scopus, and Web of Science, up to 11 August 2018. Forward and backward citation searches were conducted for all included studies. Grey literature was searched using a comprehensive range of sources. Study findings were synthesised in a narrative synthesis. Study risk of bias was assessed using the AXIS tool (2).

Results: Forty-one studies were identified for inclusion (all cross-sectional designs), thirty-eight of which addressed PMHS in the UK. Adoption: The most recently conducted study to examine the percentage of NHS Trusts that provide a PMHS found that 52% of 227 Trusts in England provided a PMHS in 2017. This percentage is similar to that found in a study published 10 years earlier. Reach: On average, PMHS answer five calls per week, and one study found that most patients had not heard of the service. Implementation: Adherence to the UK Medicines Information network’s national standards for operating a PMHS could be improved, particularly regarding helpline promotion. Maintenance: In 2017, on average PMHS in England had been running for 6 years (range = 1–24). Where a PMHS ceased operating, reasons of lack of resources and use were cited. Effectiveness: PMHS are perceived as positive (e.g. satisfaction ratings are typically excellent), and patients report several positive outcomes of using PMHS (e.g. feeling reassured and improved health). PMHS can address medicines-related errors, and their use can potentially prevent harm to patients (48% of calls pertain to issues that have the potential to cause harm).

Conclusion: Findings suggest that PMHS are a beneficial source of support for recently discharged hospital patients and their carers. However, the findings suggest that the adoption, reach and implementation of PMHS show room for improvement, and overall, there was a high risk of bias in the included studies. More high-quality research is needed to build the evidence base regarding the impact of PMHS so that healthcare organisations are better able to decide whether to establish their own.

References
1. Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: The RE-AIM framework. Am J Public Health. 1999;89(9):1322–7.
2. Downes MJ, Brennan ML, Williams HC, Dean RS. Development of a critical appraisal tool to assess the quality of cross-sectional studies (AXIS). BMJ Open. 2016;6(12).

Poster Walk 8

The NIHR Chemotherapy Pharmacy Advisory Service (CPAS) – first 10-year review

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Introduction: There are a number of pharmacy issues which can delay delivery of clinical trials including: queries regarding dose adjustments and dose capping, supply of drugs and missing pharmacy drug safety information. The Chemotherapy Pharmacy Advisory Service (CPAS) was established in 2008 to help investigators address these protocol problems with the aim of streamlining and speeding up the set-up of cancer clinical trials and subsequent recruitment. CPAS is a multidisciplinary review panel of 54 members including haematology and oncology clinicians, pharmacists, pharmacy technicians and research nurses from NHS Trusts across the UK. Members are required to have a minimum level of experience in cancer clinical trials. CPAS reviews adult and paediatric protocols involving all types of anti-cancer systemic therapy +/− radiotherapy for all cancer types and all trial phases of treatment. Each research protocol submitted to CPAS is reviewed by up to 5 panel members, and their comments are categorised against a set of standard criteria. A report is collated by the CPAS Pharmacy Advisor and returned to the Chief Investigator

Aim: We undertook a review of the first 10 years of CPAS to assess the volume and type of work being undertaken. We also wanted to assess the benefits of the service to investigators.

Method: All protocols and pharmacy manuals submitted for CPAS review between January 2008 and December 2017 were assessed for funder, phase of study and type of investigational medicinal product being tested. Activity was recorded by year. The number and types of comments generated for each review were collated and the proportion incorporated into the final protocol determined.

Results: Over its first 10 years, CPAS reviewed 274 research protocols and 88 pharmacy manuals, median 30 (range 27–57) per year. Most trials are CRUK-funded.

Analysis of reviews conducted during 2016 and 2017 identified that 56% were for phase II trials, 19% phase I/II, 15% phase III (15%) and 8% phase 1 and 2% phase II/III. The most common IMPs being tested were a biological targeted agent including immunotherapies (59%) and cytotoxic chemotherapy combined with radiotherapy (29%). An average of 16 major comments was fed back to the Chief Investigator on each protocol with a further 13 general comments also made. On average, 75% of the major comments were accepted and the
suggested changes subsequently incorporated into the final protocol before the trial opened.

Conclusion: CPAS activity has been relatively consistent each year since its inception. A high percentage of the reviewers’ comments are adopted into the protocol, suggesting that the service is contributing to efficient set-up and successful delivery of cancer trials.

An evaluation of the Emergency Contraception enhanced community pharmacy service provided in Wales

E. Mantzourani, S. Alzetani, R. Hayward, R. Deslandes, A. Evans, L. Hughes, C. Way, and K. Hodson

Introduction: Unplanned teenage pregnancy rates in Wales are amongst the highest in Europe. In 2011, the Welsh Government introduced an emergency contraception (EC) service in community pharmacies to help tackle this. This service meant EC medication could be supplied from community pharmacies via a patient group direction, free of charge to the user.

Aim: The study aimed to evaluate this EC service across Wales between August 2012 and July 2017.

Method: Quantitative secondary data analysis of a database of all anonymised EC service consultations was carried out using IBM® SPSS and Excel®. Data collected, using a pre-defined form, included the number of EC consultations over time, day of consultation and time since unprotected sexual intercourse, patient characteristics and the outcome of the consultation. Descriptive and statistical analysis was used to evaluate the data. Ethics approval was not required.

Results: EC was supplied in 98% of the 181,359 consultations analysed. The age of users ranged from 13 to 59 years, with 20- to 24-year-olds accessing the service the most (30%). Most consultations took place within 24 hours of unprotected sexual intercourse (68%). Monday had the highest number of recorded consultations (26%), and the service on that day was less likely to have been accessed within 0–24 hours. Delayed EC requests were more likely to be observed with aged under 16 EC service users ($P < 0.001$).

Conclusion: Although there can be issues with the quality of data in some secondary analysis of databases, in this study the use of a pre-defined form provided confidence that all EC consultations in the community pharmacy were documented as the pharmacy would not have been reimbursed without submitting the required information.

The service provided timely access to EC and sexual health advice for a range of ages. Further work is required to identify the seemingly limited uptake of the service on a Sunday. Results confirm the valuable role of community-based services in enhancing patient care.

An evaluation of the Community Pharmacy Flu Vaccination Service in Wales over the last five years (2012–2017)

R. Deslandes, S. Baker, K. Price, E. Mantzourani, L. Hughes, C. Way, A. Evans, and K. Hodson

Introduction: Influenza (‘Flu’) is a contagious viral infection most prominent between October–April resulting in approximately 600 deaths/year in the United Kingdom. Annual vaccination is recommended as the most effective prevention strategy with a target of 75% vaccination uptake in certain patient groups, those aged over 65 being the largest group. Before 2012, immunisation was conducted in General Practice but vaccination rates remained low. To assist in reaching the target, NHS Wales introduced the Flu Vaccination Programme, allowing community pharmacists to administer the vaccine in certain patient groups.

Aim: The study aimed to evaluate the commissioned community pharmacy flu programme in Wales since its introduction.

Method: Quantitative secondary data analysis was carried out on all anonymised records of flu vaccine provision from community pharmacies across Wales. Data collected, using a pre-defined form, included the number of flu vaccinations over time, patient characteristics, eligibility criteria and reasons for utilising the service. The data were analysed descriptively using IBM SPSS® and Excel®. Ethical approval was not required.
**Results:** A total of 67,714 vaccinations were administered. The number of vaccinations increased each season with 1,568 in 2012/13 up to 26,889 in 2016/17. Most vaccinations were for female patients (58%) and in those aged 65 and over (56%). The most popular reason for receiving a vaccination at a community pharmacy was due to not needing to make an appointment (39%).

**Conclusion:** Although there can be issues with the quality of data in some secondary analysis of databases, in this study the use of a pre-defined form provided confidence that all vaccinations administered in the community pharmacy were documented as the pharmacy would not have been reimbursed without submitting the required information.

Community pharmacists are now providing 4% of the total flu vaccinations in Wales. It is notable that uptake is particularly high in one of the targeted specific patient groups, the elderly. This upward trend will hopefully continue as public awareness of this valuable service increases.

### Prescribing trends over time by non-medical independent prescribers (NMIPs) in primary care settings across Wales: a secondary database analysis

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**Introduction:** In 2015, the Welsh Government developed a plan to improve primary care services in Wales.[1] This included training non-medical healthcare professionals as independent prescribers. In addition, the primary care clusters were implemented in late 2015 in Wales.[2] Many of these clusters chose to employ independent prescribing pharmacists to help improve patient care and overcome some of the issues caused by the shortages of GPs.

**Aim:** The aim of this research was to identify the number of NMIPs and the associated trend of items prescribed and dispensed in primary care settings in Wales.

**Method:** A retrospective secondary data analysis was carried out on monthly medicines dispensing data prescribed by NMIPs and the number of NMIPs in primary care in Wales from April 2011 to March 2018. Dispensing data were obtained from the Comparative Analysis System for Prescribing Audit (CASPA) (Version 4). The number of NMIPs was obtained from the NHS Wales Shared Services Partnership. The data were analysed descriptively using IBM SPSS (version 25) and Microsoft Excel (version 16.15).

**Results:** In total, 600 NMIPs had prescribed at least one item that had been dispensed during this time period. The majority of NMIPs were nurses (n = 474), followed by pharmacists (n = 104). Over the study period, the number of independent nurse prescribers increased by 108% and pharmacists by 325%. Pharmacists had the largest increase in numbers from July 2015 to March 2018 (240%).

The number of items prescribed by NMIPs as a proportion of the total number of items prescribed in primary care in Wales increased from 0.57% in 2011 to 1.7% in 2018. This accounts for approximately 1% of the total items prescribed in primary care during the study period. The trend of total prescribed items/100,000 population per year by NMIPs increased over time (200%), especially, between the last quarter of 2015 and March 2018 (90%). The top BNF chapters in which NMIPs prescribed were cardiovascular (16%), infections (14%), central nervous system (13%), respiratory (11%) and endocrine (8%). The main group of medicines that NMIPs prescribed were antibacterial (17%), analgesics (7%), bronchodilators (6.5%), diabetes (5.4%) and antihypertensives (5%). The trend of total prescribed items/100,000 population per year from these chapters and group of medicines increased over the study time, with the largest increase between the last quarter of 2015 and March 2018.

**Conclusion:** The findings from this study show that the number of NMIPs in primary care in Wales is increasing as well as their prescribing of medicines, with the largest increase for pharmacist prescribers occurring post-2015. This suggests that the Government’s recommendations of utilising NMIPs in primary care have been implemented.[1,2] The CASPA system has the limitation of only recording prescriptions dispensed in community pharmacies in Wales. Therefore, prescriptions issued by NMIPs that haven’t been dispensed were not captured by the system.

### References

1. Our plan for a primary care service for Wales up to March 2018. Available at: http://www.cpwales.org.uk/getattachment/.  
2. Inquiry into Primary Care: Clusters. Available at: http://www.assembly.wales/laid%20documents/cr-lid11226/cr-lid11226-e.pdf.

### What benefit does a specialist pain pharmacist bring to patients being treated by a chronic pain team? A pre- to postintervention study

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**Introduction:** Chronic pain is estimated to affect between 33% and 50% of the UK population [1]. This study measured changes recorded in patient’s pain scores and analgesic use between two successive consultations with the specialist pharmacist in a chronic pain team.
**Aim:** The aim of this research was to determine whether a specialist pharmacist consultation, in a chronic pain team, brought patient benefit in terms of analgesia, reduced side effects and better understanding of their use of analgesics.

**Method:** Patients with chronic pain, referred to the South Staffordshire chronic pain service, were invited to participate in the study. Patients completed the Brief Pain Inventory (BPI) and the Leeds assessment of neuropathic symptoms and signs (S-LANSS) before clinic appointments. During the consultation, analgesic efficacy and use were recorded. This was repeated at a follow-up consultation four months later. The pharmacist’s intervention included pain assessment, medication review and patient education. Any changes required in prescribed medication at first appointment were communicated to the patient’s GP for action. Data from pre- and postquestionnaires and consultations were compared to ascertain whether there were any significant changes. Ethical approval was obtained.

**Results:** Of 100 patients recruited to the study, 55 (37 female, 18 male) attended both appointments and completed both questionnaires.

At the second clinic appointment, there was a significant reduction in mean ‘worst pain’ element of the BPI pain score of 0.5, 8.4 to 7.9 ($P = 0.023^*$). The mean BPI ‘relief from treatment’ score increased from 41% to 51% ($P < 0.001^*$), the number of patients regarding their analgesia as ‘ineffective’ reduced from 43% to 13% ($P = 0.003^*$) and the perceived duration of effective analgesia lengthened ($P = 0.004^*$).

In terms of analgesic efficacy, at their second appointment, more patients reported that their mild/moderate opioids were ‘more effective’ ($P = 0.006^*$). Patients also reported perceived increase in analgesic efficacy of other groups of analgesics, although these changes were not significant.

Patients attitudes to taking analgesics changed between appointments in the following ways: fewer patients thought that they needed a stronger analgesic (57% visit 1, 37% visit 2, $P = 0.002^*$), fewer patients thought that they needed to take more analgesia than they were prescribed (33% visit 1, 21% visit 2, $P = 0.004^*$), fewer patients thought that they were taking too much analgesia (46% visit 1, 31% visit 2, $P = 0.004^*$) and fewer patients felt that they needed more information about their analgesic medicines (76% visit 1, 45% visit 2, $P = 0.001^*$). Wilcoxon signed-rank* and NcNemar’s** statistical tests were used in the analyses. Although the number of patients reporting troublesome side effects reduced, this change was not significant.

**Conclusion:** These results suggest that, within the timeframe observed, the specialist pain pharmacist’s role in medication review and patient education around medicine use within a chronic pain team can have a positive effect both upon patients’ pain scores by improving their understanding of the appropriate use their analgesia resulting in greater analgesic efficacy. Further work would be required to understand whether these perceived outcomes were sustained.

**Reference**

1. Fayaz A. Croft P, Langford RM et al. Prevalence of chronic pain in the UK: a systematic review and meta-analysis of population studies. BMJ Open 2016;6:e010364.https://doi.org/10.1136/bmjopen-2015-1.010364

**Poster Walk 9**

**An exploration of community pharmacists’ views on the need for, type and content of a tool to support engagement with patients who may be homeless**

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**Introduction:** Homelessness remains a global public health concern.[1] A prior survey indicated the need for pharmacist training and coverage of the topic of homelessness around minimising the impact of medicines use, referring for social support, confidence in broaching the subject with patients, support and guidelines for practice.

**Aim:** To explore community pharmacists’ views on the need for, type and content of a tool to support their engagement with patients who may be homeless.

**Method:** A semi-structured interview schedule was developed based on existing literature, survey results [2] and a theoretical framework, the COM-B model, which explores capability, opportunity and motivation for a behaviour. Community pharmacists from England and Scotland who had taken part in a survey consented to take part in a follow-on digitally recorded telephone interview. Each was transcribed then coded using a framework approach. Ethical approval had been gained.

**Results:** Capability: Interviews (n = 12) conducted November-December 2017 found all participants felt capable of improving their approach when engaging with patients who may be experiencing homelessness. All felt a support tool should be developed.

**Opportunity:** They welcomed the opportunity to contribute to the content and format of a support tool. They also thought there were opportunities to better cover the topic at undergraduate level and continuing professional development.
Motivation: Some suggested role play to improve confidence and all felt motivated to signpost to support services if provided with up-to-date local information.

Conclusion: This small sample of community pharmacists perceive that they are capable, motivated and have the opportunity to better engage with patients considered to be homeless. However, this was a small cohort and further research is indicated to inform support tool design.

References
1. Scottish Public Health Observatory (2017) Homelessness. Available from: http://www.scotpho.org.uk/life-circumstances/homelessness/key-points [Accessed 29 May 2017]

2. Paudyal V, MacLure K, Buchanan C, Wilson L, McLeod J, Stewart D. (2017) When you are homeless, you are not thinking about your medication, but your food, shelter or heat for the night': behavioural determinants of the homeless population adherence to prescribed medicines. Public Health (epub ahead of print). https://doi.org/ 10.1016/j.puhe.2017.03.002

Training and sustaining in primary care – a qualitative study of learning from participation in an exchange scheme between the UK and China

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Introduction: Primary care services are being developed in Ningbo, China. As a first step, an exchange scheme was established to compare primary care systems in the UK and China.

Aim: The aim of this study was to evaluate learning from the exchange scheme. This included identification of outputs, group dynamics, role development and the personal learning of each of the participants.

Method: Seven individuals (5 UK and 2 Chinese) took part in the exchange scheme, and all seven were included as participants in the evaluation. Qualitative data were collected at three points during the four-month scheme:

aAt the beginning of the scheme in October 2017, individual face-to-face interviews were conducted with the seven participants whilst in the UK. The semi-structured interviews lasted between 30 and 60 minutes. A translator was used as required. Participants were given an information sheet and signed consent forms.
bParticipants kept a reflective journal which informed the development of interview questions for each participant. A second round of interviews was conducted with all participants using ‘Skype’ or ‘Wechat’ ‘apps’ from December 2018 to January 2018, whilst the participants were in China.
cA focus group was held with the five UK participants in February 2018 on their return to the UK. After the focus group, a final interview was held with one of the two Chinese participants. The other was not available for interview.

The interviews and focus group were audio recorded, transcribed and then analysed using thematic coding. All data sources were synthesised together at the end.

Results: The participants were as follows: a GP educator in China, a specialist and educator in China, a GP and senior educator in UK, a GP in UK, a research assistant in UK, a GP trainee in UK and a health visitor in the UK.

Participants reported developing significantly during the exchange programme. Their learning centred around: clinic-based teaching methods; different healthcare systems; living and working in a different culture and developing research project skills. This learning led to opinion changes, a sense of reinvigorated purpose and opening up of new horizons.

The value of personal experience in learning was demonstrated and adopted into revised teaching methods in China. The value of grass-roots clinicians taking an active role in collaborative leadership to improve healthcare systems was shown through the energy and achievements of the exchange. UK participants reported renewed morale and energy in the face of current difficulties in the UK primary care system [1].

A limitation of the study was the small number of participants; however, all of the participants in the actual exchange were included. A further challenge was conducting interviews via a translator and online ‘apps’.

Conclusion: Experiencing healthcare systems in a different country can produce significant learning and professional development, in addition to reinvigorating a sense of professional purpose. Thus, exchange programmes should be considered as a valuable means of training and sustaining the primary care workforce.

Reference
1. Fletcher, E. Abel, G. Anderson, R. Richards, S. Sailsbury, C. Gerard Dean, S. Warrent, F. C. J. (2017). Quitting patient care and career break intentions among general practitioners in South West England: findings of a census of general practitioners. BMJ Open.
Systematic review of drug-related problems prevalence among in-hospital patients with chronic kidney disease

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Introduction: Drug-related problems (DRPs) are a major and recurring issue in-hospital patients which may result in life-threatening harms. Patients with chronic kidney disease (CKD) are at risk of DRPs because of several factors. Recognition of these factors would help in identifying patients at risk.

Aim: To investigate DRPs prevalence among hospitalised patients with CKD, in addition to risk factors, patients’ characteristics and most common drug classes.

Method: A systematic search of the literature was conducted through eight databases using three main keywords which are drug-related problems, hospitalised patients and chronic kidney disease; PubMed (USNLMD), Cochrane Library (Wiley), Web of Science (Core Collection), Scopus (ELSEVIER), EMBASE, PsycINFO, Medline and CINAHL plus (EBSCO). Studies were included when they are investigating any of DRPs type among in-hospital patients (i.e. from admission to discharge) along with data collected on CKD patients. Studies whether investigating DRPs as a reason for admission/readmission, or the primary focus was on pharmacokinetics were excluded. Also, reviews, meta-analyses, grey literature and Abstract-only publications were also excluded. Searches were limited to studies with human participants and those conducted in the English language. Two reviewers critically appraised the included studies independently using a developed tool to examine the prevalence studies quality across different designs. Protocol for this systematic review has been registered in the International Prospective Register of Systematic reviews (PROSPERO): (CRD42018096364). [1]

Results: 1756 unique titles were identified; 17 studies have met the inclusion criteria. Most of the studies (n = 12) focused on dosing problem; only 10 of them represented a need dose adjustment or inappropriate dose. The rest (n = 5) included DRPs (n = 1), ADR (n = 1), AE (n = 1) and DDIs (n = 2). The prevalence of DRPs ranged from 33.3% to 62.0% in these 5 studies. Antibiotics, H2-antihistamine and oral antidiabetics (metformin) were the most common drug classes involved in DRPs. Factors that showed significant association with DRP occurrence included severity of renal impairment (6 studies); increased number of medication (3 studies); and length of hospital stay ≥ 5 days (2 studies).

Conclusion: This systematic review of a limited number of studies provided an estimation of DRP prevalence in hospitalised patients with CKD of between 33% and 62%. However, there is heterogeneity in study design, case detection and definitions. Future studies should address gaps identified.

Reference
1. Wadia Alruqayb, Vibhu Paudyal, Anthony Cox. Drug-related problems in hospitalised patients with chronic kidney disease: a systematic review protocol. PROSPERO 2018 CRD42018096364 Available from: http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42018096364 (accessed on the 1st June 2018)

Workplace factors and job satisfaction of hospital pharmacists in a Welsh hospital setting: a qualitative evaluation

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Introduction: Hospital pharmacists provide vital services to the National Health Service (NHS); however, research suggests that pharmacists’ job satisfaction is low in some parts of the UK, which has led to pharmacists leaving the hospital to work in primary care settings.

Aims: This study aims to understand the workplace factors within the NHS that can affect hospital pharmacists and their job satisfaction.

Method: Previous research has mainly utilised quantitative methodologies, whilst this study adopted a qualitative approach to explore workplace factors and job satisfaction in one health board (HB) in Wales. Following University Ethics approval, an email was sent out to approximately 75 hospital pharmacists working within the HB’s main hospitals, inviting them to take part. A purposive sampling framework was used to recruit pharmacists with a range of characteristics in terms of age, number of years registered, sex, number of working hours a week, agenda for change band and length of time in current role. Nine hospital pharmacists took part in a face-to-face semi-structured interview, which was audio recorded. The interview was guided by an interview schedule asking questions about each workplace factor identified by the Health and Safety Executive Management Standard’s Indicator Tool (HSE-Tools and Templates; HSE Indicator Tool)[1], as well as questions regarding job satisfaction. Interviews were transcribed verbatim for subsequent thematic analysis.

Results: A number of themes emerged, for example, pressures surrounding discharge medication and workload, feeling supported, feeling as if others do not understand or appreciate the role of a hospital pharmacist, which in turn related to issues regarding the uniform worn. Global job satisfaction was generally positive. However, satisfaction with each job facet varied, for example, poor recognition of role and high workload pressures lowered job satisfaction, whilst receiving support-increased satisfaction. In addition to this, it was found that participants felt that raising the profile of pharmacists, easing pressure, improving
communication and promotion of change within pharmacy, could help to improve their job satisfaction.

**Conclusion:** Results were mostly consistent with previous research. However, this evaluation highlighted concerns that some staff raised about wearing a uniform that does not easily distinguish pharmacists from other members of the hospital pharmacy team. Job satisfaction appears high for most participants, but can vary day-to-day depending on the different workplace factors such as demands, role and support. Despite the intention to interview a range of pharmacists, most were of a similar age, due to a low response rate, since all those who expressed an interest were interviewed. Nonetheless, these suggestions for improving job satisfaction should be taken into consideration by both the NHS and other researchers to help bolster job satisfaction for this population, in face of the increasing pressures they encounter.

**References**

1. HSE- Tools and Templates; HSE Indicator Tool (2017). Retrieved on 15th February 2017, from http://www.hse.gov.uk/stress/standards/downloads.htm

**Exploring patient safety culture in Kuwait hospitals: A qualitative study of healthcare professionals’ perspectives**

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**Introduction:** Patient safety is defined as ‘the avoidance, prevention and amelioration of adverse outcomes or injuries stemming from the process of health care’ [1]. A positive patient safety culture offers continuous training of healthcare professionals and monitoring to their progress, encouraging communication and teamwork, and paying attention towards high-risk procedures in routine work. Several countries in the Middle East (including Kuwait) have recently shown more interest towards improving patient safety culture.

**Aim:** The purpose of this study was to explore the views of the Kuwaiti healthcare professionals on the patient safety culture in Kuwait governmental hospitals. The specific objectives include the following:

- To explore factors that affect patient safety culture.
- To identify strengths and weaknesses of patient safety culture at two major hospital and areas for improvement.
- To provide recommendations for healthcare professionals to improve patient safety culture.

**Method:** Semi-structured interviews were conducted at two hospitals in Kuwait between February and June 2018. A purposive sampling of 20 healthcare professionals: being six physicians, six pharmacists, six nurses and two members of the patient safety committee. Eligible participants were healthcare professionals who were full-time, had at least one-year experience of working at the hospital and had good level of English. The interview guide was developed based on initial quantitative results using the hospital survey on patient safety culture developed by the Agency for Healthcare Research and Quality (AHRQ) [2]. The study was approved by the Ethics Committee at the University of Hertfordshire and the Standing Committee for Coordination of Health and Medical Research at the Kuwaiti Ministry of Health. Additionally, informed consent was sought from participants prior to the study who were made aware of their ability to withdraw from the study at any time. Interviews were conducted in the English language, audio-recorded and then transcribed using verbatim transcription. The transcribed interviews were exported to NVivo for Mac where thematic analysis was applied.

**Results:** All 20 interviews were included in the data analysis. The themes that emerged from the interviews demonstrated main facilitators and major barriers to implementing patient safety culture. The three main themes were ‘management’, ‘regulations and procedures’ and ‘healthcare professionals’. Management was a critical facilitator to better implementing patient safety initiatives via managerial support which ensured safe environment, monitoring and resources. Major barriers that influenced patient safety culture were interaction between staff, staff competency and lenient regulations related to implementing hospital policies and incident reporting system. Moreover, understaffing and punitive response to error were major areas of weakness.

**Conclusion:** The present study provided better understanding on the facilitators and barriers to implementing patient safety culture in Kuwait hospitals, which should be considered by hospitals’ management teams in policy development. Despite being conducted in two hospitals with proven track record and reputation for implementation of patient safety, the results of this study cannot be generalisable to all Kuwait hospitals. Also, the trustworthiness of the findings has not been confirmed by another method; yet, internal consistency among interviewees supported the validity of the findings.

**References**

1. Vincent, C. (2010). *Patient safety.* (2nd ed.). UK: John Wiley & Sons.

2. Agency for Healthcare Research and Quality (2018). Surveys on patient safety culture research reference list. *Agency for Healthcare Research and Quality.* Retrieved February, 24, 2018, from https://www.ahrq.gov/sops/quality-patient-safety/patientsafetyculture/resources/index.html#H_africa
Sacubitril/Valsartan (Entresto™) hospital uptake: a UK multi-centre study

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Introduction: Approximately 1.37% (900,000 people) of the UK population suffer from Heart Failure (HF).[1] HF has an approximate mortality rate (in patients >55 years old, 15-year timeline) of 39% for females and 71% for males, respectively. In this project, we investigated prescribing of a recently launched dual drug therapy for HF called Entresto™ (sacubitril/valsartan). The PARADIGM-HF study, conducted in 2014 on 8442 patients, found that sacubitril/valsartan significantly improved patient outcomes. The medication reduced deaths from cardiovascular causes from 16.5% to 13.3% (P < 0.001), and rehospitalisation by 21% (P < 0.001), when compared to enalapril the current first-line therapy.[2]

Aim: This study investigated clinically relevant real-life data regarding sacubitril/valsartan prescribing patterns to guide provision of cardiac centre services and optimise the treatment of HF patients in accordance with national NICE guidelines (TA388).

Method: A multicentre retrospective study on the use of sacubitril/valsartan was conducted at three large cardiac centres in the West Midlands. HF clinical databases were accessed to gather information from the start of prescribing sacubitril/valsartan up until June 2018 at each hospital. The following patient information was collected: NYHA functional class, LVEF, blood pressure data, heart rate, eGFR, potassium and sodium levels as well as patients’ baseline medication and prior HF medication. Furthermore, data on sacubitril/valsartan treatment were gathered: side effects, readmission, discontinuation and observations during patient appointments. Mean and standard deviation for frequency data and X² test was performed using SPSS. The study was ethically approved.

Results: 118 HF patients with reduced ejection fraction were included in the study. The study found that a high proportion of prescribers adhered to NICE guidelines for sacubitril/valsartan treatment; 99% of patients had a New York Heart Association (NYHA) functional class of at least II; 82% had a left ventricle ejection fraction (LVEF) of under 35%; 100% received an angiotensin-converting enzyme (ACE) inhibitor or angiotensin II receptor blocker (ARB) before commencing sacubitril/valsartan. A non-significant relationship between adherence to the NICE guideline and patient hospital readmission was found (NYHA, P = 0.908 and LVEF, P = 0.705). Total prescribing of sacubitril/valsartan varied from 25 to 218 patients, lower than expected compared to the NICE guidance resource tool, which predicted 253–494 patients per hospital trust.

Conclusion: The prescribing of sacubitril/valsartan generally adhered to NICE guidance; however, the total number of eligible patients was lower compared to the NICE resource tool. Investigations into safety and scope of application of sacubitril/valsartan are required to increase prescribing to meet the predicted number of patients who could benefit in accordance with the NICE resource tool.

References

1. Office for National Statistics (ONS), 2011. Ethnicity and National Identity in England and Wales: 2011

2. McMurray JJ, et al, Angiotensin-neprilysin inhibition versus enalapril in heart failure N Engl J Med 2014;371: 993–1004.