THE IMPACT OF A BEDSIDE MEDICATION SCANNING DEVICE ON ADMINISTRATION ERRORS IN THE HOSPITAL SETTING: A PROSPECTIVE OBSERVATIONAL STUDY

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Introduction: The medication administration process is complex and influenced by interruptions, multi-tasking and responding to patient's needs and is consequently prone to errors.[1] Over half (54.4%) of the 237 million medication errors estimated to have occurred in England each year were found to have taken place at the administration stage and 7.6% were associated with moderate or severe harm. The implementation of a Closed Loop Medication Administration solution aims to reduce medication administration errors and prevent patient harm.

Aim: We conducted the first evaluation to assess the impact of a novel optical medication scanning device, MedEye, on the rate of medication administration errors in solid oral dosage forms.

Methods: We performed a before and after study on one ward at a tertiary-care teaching hospital that used a commercial electronic prescribing and medication administration system and was implementing MedEye (a bedside tool for stopping and preventing medication administration errors). Pre-MedEye data collection occurred between Aug-Nov 2019 and post-MedEye data collection occurred between Feb-Mar 2020. We conducted direct observations of nursing drug administration rounds before and after the MedEye implementation. Observers recorded what they observed being administered (e.g., drug name, form, strength and quantity) and compared this to what was prescribed. Errors were classified as either a 'timing' error, 'omission' error or 'other' error. We calculated the rate and type of medication administration errors (MAEs) before and after the MedEye implementation. A sample size calculation suggested that approximately 10,000 medication administrations were needed. Data collection was reduced due to the COVID 19 pandemic and implementation delays.

Results: Trained pharmacists or nurses observed a total of 1,069 administrations of solid oral dosage forms before and 432 after the MedEye intervention was implemented. The percentage of MAEs pre-MedEye (69.1%) and post-MedEye (69.9%) remained almost the same. Non-timing errors (combination of 'omission' + 'other' errors) reduced from 51 (4.77%) to 11 (2.55%), which had borderline significance (p=0.05) however after adjusting for confounders, significance was lost. We also saw a non-significant reduction in 'other' error types (e.g., dose and documentation errors) following the implementation of MedEye from 34 (3.2%) to 7 (1.62%). An observer witnessed a nurse dispense the wrong medication (prednisolone) instead of the intended medication (furosemide) in the post-MedEye period. After receiving a notification from MedEye that an unexpected medication had been dispensed, the nurse corrected the dose thus preventing an error. We also identified one instance where the nurse correctly dispensed a prescribed medication (amlodipine) but this was mistakenly identified by the MedEye scanner as another prescribed medication (metoclopramide).

Conclusions: This is the first evaluation of a novel optical medication scanning device, MedEye on the rate of MAEs in one of the largest NHS trusts in England. We found a non-statistically significant reduction in non-timing error rates. This was notable because incidents within this category e.g., dose errors, are more likely to be associated with harm compared to timing errors.[2] However, further research is needed to investigate the impact of MedEye on a larger sample size and range of medications.

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PHARMACY AND PRESCRIBING PRACTICE

ASTROPHARMACY: EXPLORING THE PHARMACIST'S ROLE IN SPACE TRAVEL

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Introduction: Significant alterations occur in human physiology and the way medications function in space (1). Understanding the efficacy and pitfalls of pharmacological intervention and developing space-related pharmacy services is therefore integral to ensuring a sustained presence for human spaceflight. In contemporary society, the pharmacist plays a significant role in a person's health. However, pharmacist input towards the spaceflight participant's health is minimal to nil.

Aim: T o explore stakeholder perspectives towards the role of Astropharmacy in the space sector.

Methods: Pharmacists (n = 18) across the globe and space sector participants (n = 18) from governmental, commercial, and space tourism sectors participated, via 27 qualitative interviews and three focus groups. Participants were recruited via purposive and snowball sampling. A six-step thematic analysis was used and mapped into the Job Characteristics Model (JCM). JCM is a theory within work design, aiming to promote work experiences and personal outcomes. There are five job dimensions – skill variety, task identity, task significance, autonomy, and feedback which influence three psychological states required for a well-designed job. The three psychological states are meaningfulness, responsibility, and knowledge of work results, which lead to positive work and personal experiences (2).

Results: Three key themes were generated: medication management, medication research, and regulation/licensing. Medication management encompassed safeguarding the space traveller's health, like space tourists, by conducting medication reviews (pre-and post-flight), medication advice (digital astro-telepharmacy information services during

spaceflight) and developing personalised medication. Medication management also included ensuring shelf-life and continuous medication supply for deep space exploration. Medication research included novel drug development, innovative manufacturing, and understanding clinical applications of the pharmacokinetic and pharmacodynamic changes of medications in space. Innovative manufacturing like 3-D printing raises questions regarding the need for regulations/licensing of medications use and manufacturing in space. Based on the JCM our findings indicate that Astropharmacy possesses diverse duties eliciting meaningfulness, with clear responsibility and observable workplace results promoting task significance, and both the medication and patient focus promoting task identity. Autonomy was blurred within Astropharmacy as a degree of autonomy is needed due to the field's novelty, but workforce regulations by governmental space agencies are expected. Lastly, workplace feedback can be achieved in Astropharmacy through performance reviews.

Conclusion: The Astropharmacy role is perceived to involve medication management, medication research and regulation/licensing of medications for space. The work design of astropharmacy is well-reflected in the JCM, implying that a novel and energising opportunity for the pharmacy profession is forthcoming. Although the data generated by qualitative research are not generalizable to other settings, these themes represent the first study to investigate the space sector qualitatively in the context of pharmacy, providing rich foundational data for future research. Consequently, the amalgamation of two previously distinct workplace domains may be a conceivable reality for the future of pharmacy practice.

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A QUALITATIVE EXPLORATION OF PHARMACIST PRESCRIBING FOR PATIENTS WITH CHRONIC KIDNEY DISEASE IN THE UNITED KINGDOM

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Introduction: Chronic Kidney Disease (CKD) has a high risk of mortality, frequent hospitalisation and reduced life expectancy. Clinical pharmacy services have potential to contribute significantly to the multidisciplinary team. In the UK Government policies prioritise development of pharmacist prescribing and the GPhC highlight changing health services that increasingly use pharmacist prescribers.

Aim: To explore the development, implementation and evaluation of pharmacist prescribing for patients with Chronic Kidney Disease (CKD) in the UK.

Method: This phase of a doctoral research programme used a phenomenological qualitative semi-structured interview approach. It involved 48 pharmacist prescriber members of the UK Renal Pharmacy Group (UKRPG) who had agreed to further research after an online survey. The development of the theory based semi-structured interview tool followed a rigorous iterative process using findings from a systematic review in the first phase [1] and results from a survey in the second phase.[2] The tool was designed using the Consolidated Framework for Implementation Research (CFIR) and reviewed independently for face and content validity by an expert panel. Think aloud testing and piloting completed the development process. A date / time for an audio-recorded telephone interview was arranged following receipt of signed consent. All interviews were transcribed verbatim naturalistically. NVivo® 11 was used for data management and analysis. Interview data were analysed thematically, guided by the CFIR, initially by two team members independently. The Francis method of checking for data saturation was used. Ethical approval was granted by RGU School of Pharmacy & Life Sciences Ethics committee.

Results: Fourteen pharmacists of the 48 agreed to participate. Demographic details included: 11 female, 7 had >16 year experience in profession, all had secondary care as main practice setting and 8 had > 11years as a prescriber. The interviewees were generally very positive about their prescribing practice and they articulated that they were prescribing in a variety of settings. They used mainly independent prescribing in both inpatient and/or outpatient settings and prescribing in clinic settings for CKD associated anaemia / epoetin clinics. CFIR helped identify themes related to facilitators and barriers to advancing prescribing practice (Table 1). There was enthusiasm for the future development of prescribing practice including further establishment of clinics and taking responsibility for groups of patients. Interviewees indicated awareness of systems for evaluating their prescribing activity.

Conclusion: This work provides valuable information relating to the current status of and needs for the development of pharmacist prescribing practice in the UK. It fills a gap shown from previous work [1] around availability of information on structures, process and monitoring of outcomes of this specific growing aspect of clinical pharmacy practice. Main strengths include consideration of aspects of trustworthiness throughout the research process aided by theoretical underpinning with CFIR and the focus on specialist pharmacist prescribers. Major limitations include low number of participants with consequent potential for recruitment and social desirability biases and lack of transferability of findings. Further 'deep dive' case study work will help explore the practice of leading edge advanced and consultant level practitioners to learn even more about practice development.