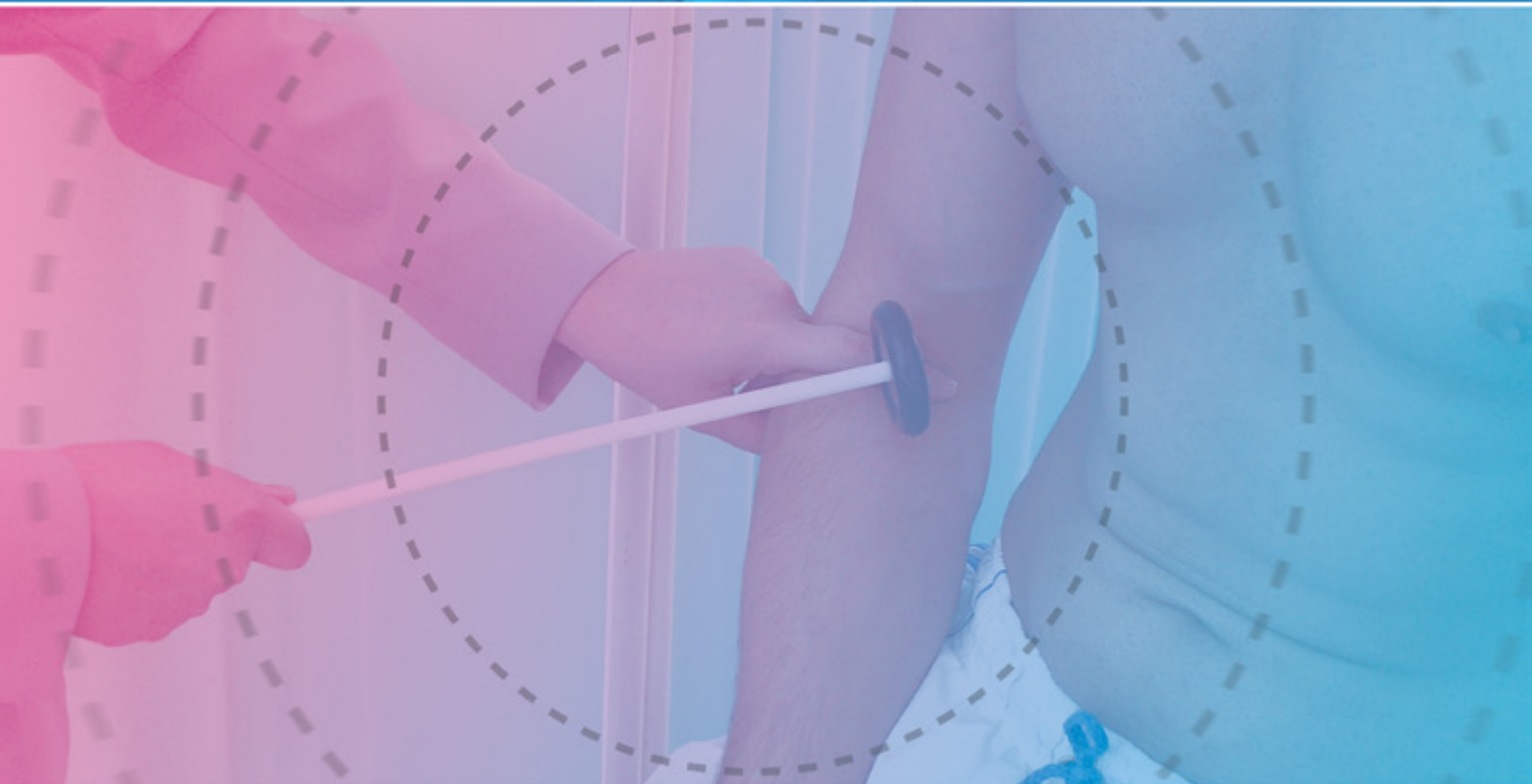# INTERNATIONAL JOURNAL OF
CLINICAL SKILLS

A Peer Reviewed International Journal for the Advancement of Clinical Skills
- 'docendo ac discendo' - 'by teaching and learning'

In this issue:

EIFEL
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Editorial Board for the International Journal of Clinical Skills

Foreword

We want raw ePortfolio data, and we want the data now

Patients trust that healthcare professionals will possess the clinical skills to provide safe and effective treatment. Serious failures of medical care, through the actions of individuals and the inaction of organisations, have shaken that trust and led to a re-examination of the process of registration. In many countries and disciplines, continued registration now depends on the documentation of continuing professional development. Some jurisdictions, such as the UK, have gone further and are planning more comprehensive evaluation of clinical performance for revalidation. In all cases, assessment is based on some form of ePortfolio.

"An e-portfolio is a purposeful aggregation of digital items – ideas, evidence, reflections, feedback etc, which 'presents' a selected audience with evidence of a person's learning and/or ability." Sutherland and Powell (2007)

Presenters in the healthcare ePortfolio track at the 8th International ePortfolio Conference, London (July 2010) described a wide range of ePortfolios being used or being developed for allied health, dental surgeons, surgeons, physicians, nurses, medical education, foundation medical graduates. ePortfolios are used by students to evidence acquisition of clinical skills for initial registration, by new graduates to collect evidence of competence for credentialing and by trained staff for evidence of consistent expert performance. As Stuart Cable from the Royal College of Nursing (UK) explained:

"[the ePortfolio] enables nurses to demonstrate their competence in different areas of nursing practice. They are able to capture 'just-in-time' reflections on their practice or a learning experience and then re-present this evidence for different purposes, for example, personal development planning, competence demonstration and educational accreditation of prior learning." (Stuart Cable, Proceedings of the ePortfolio Conference, Maastricht, 2007)

The need for repurposing the same set of collected data across time was confirmed by many of the International ePortfolio Conference presenters: as their careers develop, healthcare professionals will be required to transition across several ePortfolio systems, from those used during initial training, continuing professional development, quality assurance procedures and, at regular intervals, to support reaccreditation processes.

To support evidence of informed and reflective practice, healthcare professionals collect evidence from a variety of sources and data systems, such as patient personal health records, laboratory test analysis, clinical diaries, feedback from peers and patients. Unfortunately, all these different pieces of information are usually stored in independent information silos, making the work of ePortfolio construction and assessment more difficult, notwithstanding that silos make data errors more likely to occur and less likely to be corrected. As most individual ePortfolios also create their own data silos, it reduces the ability to share relevant and critical information across a profession to advance professional practice.

While the initial idea of repurposing ePortfolio data rests on the editing work of an individual compiling a new document, there is an alternative and more radical way of exploiting ePortfolio data: data freedom, i.e. allowing a wide range of online services to exploit raw ePortfolio data.

Imagine a world in which all data created by a healthcare professional when interacting with patients, teachers, colleagues and organisations is securely stored in a Personal Data Store (PDS), creating a 'life log'. Imagine that patients in the healthcare ecosystem have their own personal data stores and can share the contents, under their control, with the people and services they trust. Imagine a world where everyone would be able to choose any health ePortfolio services while being fully interoperable with those used by various institutions with which healthcare professionals interact.

Imagine a world where the performance of students at several medical schools could be confidentially mined to identify best practice for teaching clinical skills. Imagine a service collecting data from the personal data stores of all the staff of a hospital to conduct audit procedures. Imagine another service identifying the need for training and linking it to workshops on particular topics at a conference or a review in a journal. Imagine a service mining anonymous healthcare data collected in personal data stores by a patient's support group. What Amazon® and Google® can do with their global data stores to identify patterns and trends and target advertising, we can do, with personal data stores for the benefit of healthcare, professional education, patient safety and society in general.

Such a world is possible. It was presented by EIfEL at the launch of the Internet of Subjects (www.iosf.org) during the 8th International ePortfolio Conference. The Internet of Subjects supports the programme that Sir Tim Berners-Lee, the inventor of the Internet, called for: *"we want the data raw, and we want the data now!"* To achieve that goal, which is to facilitate reuse, repurposing and exchange of data, we need to achieve the separation of data from the applications and services producing and exploiting it; applications and online services must remain the servants, not the masters, of our personal data.

In the near future institutions will not have to select the ePortfolio platform for their students or professionals; it will be an individual choice. On the other hand, educational institutions, professional communities and public healthcare authorities will have the opportunity to develop a number of innovative services, based on the exploitation of the raw data contained in personal data stores. For example, with an Internet of Subjects, data collected by students and trainees for assessment of progress or by trained staff for revalidation could be used, with permission, for other useful purposes such as quality assurance, needs analysis and career planning.

By providing access to raw data in personal data stores (anonymised and under the full control of individuals) to the services of their choice, healthcare professionals and communities would have the foundations to support the development of lively learning communities, for the benefits of their members, patients and society at large. Data collected whilst compiling an ePortfolio is too rich to be limited to a unique usage. We want raw ePortfolio data, we want it now, to contribute amongst other things, to the improvement of the continuing education of healthcare professionals.

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What factors influence decision making by graduate nurses initiating medication?

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Abstract

Aims & Objectives: The aim was to identify the educational, human and organisational factors, which contribute to decision support for nurses in their graduate year. The objective was to provide information for future support in medication management for graduate nurses.

Design: A quantitative analysis of data from a retrospective, exploratory study.

Method: An anonymous survey of graduate nurses in a convenience sample was undertaken. Data collection was at a single point, 9 months into a 12 month graduate program. The survey sought to identify what factors, if any, contribute to graduate nurses' decision-making, for nurse initiated medication. A comparison was made between graduates on 11 different wards in 3 hospitals of an Australian Health Care Network.

Results: The study reveals the positive influence of both human and organisational support for nurses initiating medication and it validates previous research findings.

Conclusion: The findings of this study inform a so far poorly researched area of nursing and highlight the need for further exploration of graduates and their decision-making in medication management.

Introduction

Graduate nurses are practicing independently for the first time. The transition to independent practice potentially impacts critical thinking and decision-making abilities. Medication administration is a key aspect of nursing practice which requires decision-making; this raises the question about how well graduates undertake this responsibility. This study sought to contribute new knowledge about the factors that influence graduate nurses when making decisions in the practice of 'nurse initiating medications'.

The aim of the study was to identify the educational, human and organisational factors, which provide some aspects of decision support for graduate nurses in the graduate year.

The study explored the perceptions of graduate nurses with respect to knowledge, experience, preconceived ideas, pattern recognition or other resources, which contributed to graduate nurses' decision making when initiating medications across various ward settings.

The transition from student to graduate nurse is a period of immense adjustment and adaptation. This transition involves a great change in their role and responsibilities [1 - 4], including adjusting to an unfamiliar working environment, low confidence levels, high expectations and the initial period of role socialization. Such factors may impact on the graduate nurses'

performance and influence their ability to make sound clinical decisions [2, 5].

Critical thinking is a process pivotal to nursing, it being the thought process used for clinical decision making [6]. Nurses are regularly faced with clinical decisions about medication, including patient assessment, planning care, safe administration and evaluation of side effects [1]. Although few studies have examined the critical thinking abilities of graduate nurses, the limited findings suggest that graduate nurses' decision making is inadequate [6]. This raises questions about the reasons behind poor decision making. Reasonable assumptions include the lack of confidence, experience and supervision, and there may be other factors.

The knowledge a nurse acquires is critical in determining how decisions are made [7]. In nursing the two fields of knowledge are practical and theoretical [8]. The level of nurses' knowledge is one variable in effective decision making and may be influenced by organisational factors such as knowledge of policies, procedures and other decisional supports. Bullock and Manias [9, 10] found educational preparedness of graduates was inadequate, especially in the area of pharmacology. Studies revealed that graduate nurses lacked key knowledge required to make clinical judgments about route, timing and interactions of medications, all which are critical to safe administration of these treatments [9, 10].

As a nurse's experience increases, the ability to make sound clinical judgments could also be expected to increase. This idea was supported by Martin's [6] findings that experienced nurses scored higher in critical thinking and decision making ability. By contrast, Lauri and Salantera [8] found that nurses' practical experience did not provide an explanation for nurses' decision making. Although experience is an invaluable tool for building confidence, used in decision making it is not always accurate [11].

Pattern recognition is commonly used as a basis for decisions. However, it may cause the nurse to skip basic steps in essential assessment, which could reveal cues for different intervention and hence inappropriate decisions are made [1].

Dewer et al [12] found that nurses' attitudes and subjective norms are key determinants that predict their decisions to administer medications, for opiates in particular, highlighting the influence of attitudes and beliefs on decision-making.

Graduates have been found to resource three main areas when making decisions about medication: experienced nurses, medical staff and pharmacists [4]. Aitken et al [5] found negative support during the graduate year led to a lack of coping. In contrast positive support increased confidence, which in turn improved communication. A recent study on graduate nurses in resuscitation, supports this notion, where graduates were found to cope with the ambiguity of a resuscitation situation, when well supported by the team [13]. This supports the role of preceptors in developing competency in graduate nurses. Preceptors have been found to contribute to graduates' appropriate use of resources and increased nurses initiating medications [2].

According to the Royal College of Nursing Australia (RCNA) [14], policies and protocols are resources that nurses are required to use to ensure safe, effective practice and delivery of medications. Graduate nurses may experience difficulties in their graduate year, however, the use of protocols have been found valuable in increasing autonomy and improving judgements [4].

Aitken et al [5] found a major problem with graduate nurses delivering medications – their unawareness of the need for continual monitoring of patients. Another issue identified was not using vital signs to assist decision making, when withholding medication. Graduate nurses have been found to wait for clinical manifestations rather than acting to prevent problems [5, 15]. These problems could be positively influenced by experience, resources and other support to assist decision making as suggested by previous studies. Lim's [16] study undertaken in New Zealand revealed further ambiguity in regards to the effectiveness of graduate nurses decision making ability for safe prescribing of medication. This supports the notion that further investigation into the area of nurse initiated medication and graduate nurses is required as very few studies specifically look at these areas.

Methods

Data Collection
Data collection took place at a single point in time via a survey. The survey was constructed with reference to the literature and consultation with nurse experts. It included 'tick box' answers to questions about demographics, nurse initiated medications and human, organisational and educational factors associated with decision making. The survey included opportunities to add comments or for alternative answers. Surveys were distributed to 3 hospital campuses of one Australian Health Care Network. Nurse Unit Mangers (NUM's) were approached and agreed to distribute the surveys. Surveys were distributed to 11 different wards across the 3 hospitals.

Subjects
The population was graduate nurses from a major metropolitan Health Care Network in Australia, aged 21 years and over. The convenience sample included nurses in the 2006 graduate nurse program with less than 9 months experience as a Registered Nurse, Division 1 working an average of 20 hours a week or more. The study excluded private hospitals or wards, part time graduate nurses working less than 20 hours per week, and those nurses with more than 9 months experience.

Ethics
Ethics approval was gained from both the network and the university at which the researcher was enrolled, in a reciprocal arrangement. The NUM's of wards were contacted for permission to carry out the study. The graduate nurses were informed in writing about the aim of the study, the fact that their participation was voluntary and that all information would remain anonymous. The research was carried out in accordance with the Declaration of Helsinki (2000) of the World Medical Association.

Data Analysis

Originally the choice of statistical tests which were to be undertaken, comprised non-parametric testing on data that was nominal and ordinal levels of measurement. Spearman rank order correlation was to be used to test for the existence of a relationship between two ordinal variables. However, due to only a reasonable response rate, meaning a low representativeness of the target population, a design decision was made to change the statistical analysis. The response rate was 43%, however, a power analysis was not undertaken due to difficulty accessing the entire population of 125 graduates, and therefore frequency distributions were used for statistical analysis.

Results

Descriptive Data

The descriptive statistics summarise several elements of the data set. The first is age of the participants:

Age (years)	Number of participants
21 – 25	9
25 – 29	0
29 – 39	1
39 – 49	1
49 +	1

75% of participants were aged between 21 to 25 years and 25% were above 25 years of age.

Of the 12 participants, 3 had previously been trained in another profession. For the remaining 9, this was their first professionally trained job. Of those with previous training, only 1 was aged between 21-25 years.

The participants worked in a range of different clinical areas during the graduate year. At the time of this study survey, the participants were working within the following disciplines:

Clinical Discipline	Number of participants (%)
Emergency Medicine	8
Paediatrics	8
Orthopaedics	8
Rehabilitation	17
Surgical	17
Medical Wards	42

In summary, the typical respondent was aged 21-25 years, in their first professional role and working on a medical ward.

Inferential Data

The total number of graduate nurses in this study was 12; of those, 10 participants had initiated medications and 2 had not. The remainder of the data collected from the survey pertained to

nurse initiated medications, therefore the remainder of the results outlined will be from the 10 graduates who had initiated medication.

The categories of medications able to be initiated by nurses at the three hospitals in the network include aperients, analgesics, emergency response medications and oxygen (defined as a medication in most hospital protocols). Figure 1 shows the number of participants who initiated each of these medication categories, for example, 100% of the 10 participants had initiated analgesics. Participants identified three other medications that they had 'nurse initiated', including protective cream, Mylanta and zinc cream.

Figure 1: Types and frequency of nurse initiated medications
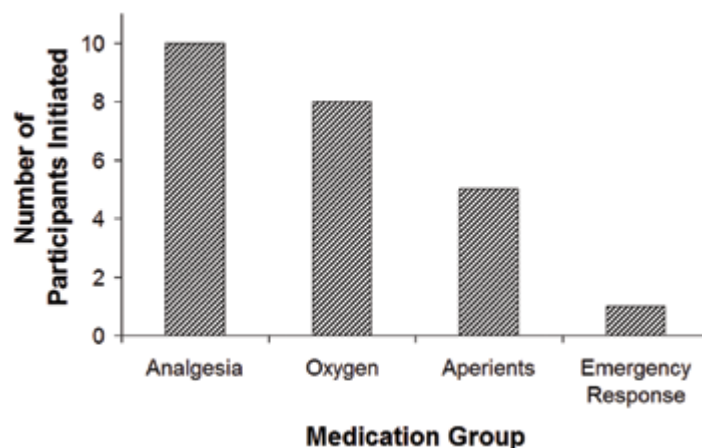
As shown in Figure 2, of the participants that had initiated medications, 40% had never initiated a change to any medication route. In contrast, 70% of the participants had initiated changes to medication intervals.

Figure 2: Changes to medication route and interval
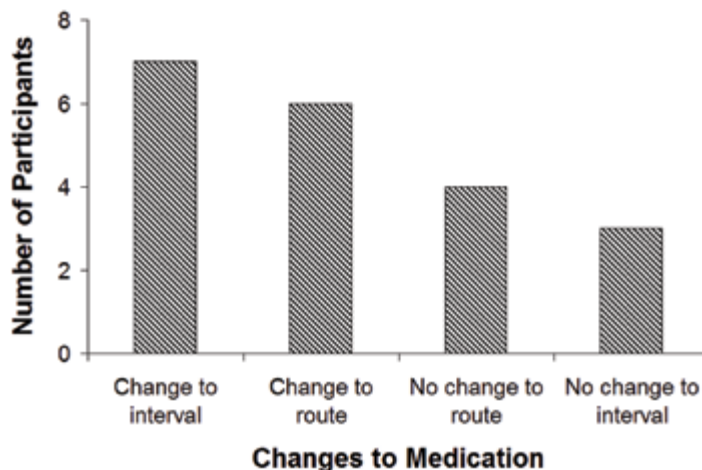
When surveyed about patient assessment during initiation of medication, all participants assessed their patients at some stage during the process of administering 'nurse initiated' medications, but one indicated that it depended on what medication was being

'nurse initiated'. 8 participants always assessed their patients before administering medications; 6 also always assessed them after administration. Only 1 participant assessed 'occasionally before' and 2 'occasionally after' administration. The reason behind why assessment was undertaken during initiation of medications were for 'effectiveness', reported by all participants, and for 'side effects', reported by 7 out of 10 graduates.

Other types of decision supports utilized by the graduates whilst initiating medication include: Monthly Index of Medical Specialties (MIMS – an electronic or paperback resource which includes information about medications, uses, side effects, contraindications), preceptors, other nurses, other graduate nurses, doctors and pharmacists (Figure 3).

Figure 3: Decisional supports used by participants
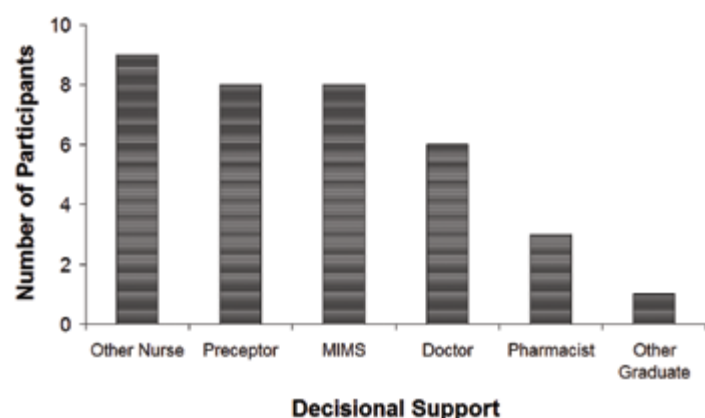
Six participants reported that confidence in using information technology (IT) influenced their use of resources such as accessing protocols, MIMS online or other electronic sources of help, whereas four participants said that their confidence in using IT had no impact. 8 of the 10 participants in the study reported that when initiating medications they referred to the hospital protocol.

The graduates in this study reported that they all drew upon information from practical, theoretical or patient's knowledge when initiating medication. The three types of knowledge were all used by 80% of the participants. All of the participants reported that their area of work was supportive in offering human help to make decisions regarding nurse initiated medications. All reported they were confident to ask others for help in making decisions regarding nurse initiated medication.

This next section reports on participants' comments gathered from survey questions. The themes are divided into organisational, educational and human.

2 out of the 10 participants who had 'nurse initiated' medication did not refer to the protocol. However, both of them sought other resources for guidance. One sought *"direction for nurse initiated medication instructions on back of drug sheet"* and the other *"asked more experienced staff for help and clarification"*. Those surveyed showed that they had positive experiences in their use of hospital protocol for nurse initiated medications.

For example, one participant wrote that on her *"first shift of grad year I was given time to look up policies and procedures- this was one of the first policies I looked at"*. Two participants commented that there were posters around the wards about nurses initiating medications that were useful.

The influence of confidence in using IT, to resource additional decisional supports was not definitive; the raw data suggests that only 60% of participants in the study indicated that confidence did impact their use of IT resources. Further comments reiterate this conflict, one participant stated that *"MIMS is especially useful – easy and straight forward"* to use whereas another expressed the opinion that *"if I didn't know how to access it quickly I probably would just ask a colleague"*.

All the wards in the study were reported to be supportive in offering human help to graduates making decisions about nurse initiated medications. In most participants' experience, hospital staff were found to be especially helpful when making decisions; for example, *"senior staff are always available to answer any questions/queries – especially the NUM"*. Only one participant had a negative experience towards getting help with nurse initiated medications stating that *"as a graduate I have never been told what meds I can or cannot give. I had to find this out for myself"*. This participant did, however, tick the response indicating that the ward was supportive in offering human help.

It appears evident through the comments that although there was overall a positive response regarding support and confidence to ask for help when nurses initiate medications, some participants in this study would prefer not to undertake the task. Some comments included *"I make sure to exhaust available resource persons (senior staff, doctors) before initiating"* and that *"it is still an area that many nurses don't utilise. They would rather call the Resident Medical Officer"*.

Discussion

Through this study new information has been gained in relation to factors which influence graduate nurses' decision making practices when nurses initiate medications. The results have reiterated some information previously found in other studies and identified additional factors.

Progressive design decisions ensured data quality and the strength of the research method. Limitations include the low response rate and therefore the inability to generalise the results to a wider population and make definitive inferences about relationships between variables tested in the study.

Heslop et al [17] found that prior to commencement of their graduate year, students were unprepared for working and communicating with doctors. However, 60% of the graduates in this study resourced doctors for assistance in decision making when nurses initiated medication. This suggests that the period of adjustment and gaining of confidence to successfully communicate with doctors is well underway by the ninth month of the graduate year.

In this study all environments were reported to provide support in both human and organisational forms. All participants were

found to utilize either protocols or other staff members when making decisions. This supports the findings of Aitken et al who concluded that in different working environments, availability and access to support for decision making influences the decisions being made [4].

In previous studies, what resources graduates used when making decisions about medication where inconsistent. The results in this study were congruent with Aitken et al [4] who found graduates resourced more experienced nurses, medical staff and pharmacists. Other supports utilised by participants in this study included preceptors and other graduates.

Studies by Aitken et al and Cullem et al found, that generally nurses avoid the use of printed mediums to aid decision making and prefer to ask a more experienced staff member [4, 18]. Contrary to this, 80% of the participants in this study referred to protocols; one graduate who did not, referred to the drug chart instructions on nurse initiated medications, and therefore this could be determined as equivalent. As the previous studies were not specific to graduate nurses this may introduce the notion that graduates are more open to using protocols and other printed mediums for support when making decisions.

Results from the study show that 80% of participants utilised MIMS for support when initiating medications. These findings could be due to graduates having recently been in the university system where students are regularly required to access printed and online media for information.

In exploring the relationship between experiences and nursing practice, of the 3 nurses who participated in the study that had previous professional training, 2 had 'nurse initiated' medication. Both drew upon theoretical and practical knowledge, when making decisions regarding initiating medications. This suggests that other professional experience is an influential factor in decision making by graduate nurses initiating medication. These outcomes could be due to the fact that both of these graduates were greater than 25 years of age, reasoning that age influences decision making. Therefore, the consideration is that this result could be due to 'extra life knowledge' and experience that these 2 participants have, as a result of age and other professional training.

It has been found that knowledge is associated with education and that overall the university educated graduates have a high level of knowledge, yet make poor decisions [6]. The participants in this study all used some form of knowledge when undertaking the task of initiating medications whether practical, theoretical or gaining information from patients. All undertook some form of assessment when performing the task. This suggests that they utilised their knowledge base to determine the need for assessment. This contradicts the findings by Aitken et al [5] that graduates had a limited knowledge about the need to record outcomes, the need for continual monitoring in regard to the use of medications and that graduate nurses are perceived to have an overall deficit in pharmacology knowledge and competency to provide nursing care [9, 10, 19]. It also suggests that these participants are competently using their knowledge to make decisions to perform the task of initiating medications.

Previous studies have revealed that the impact of being able to use IT to support decision making remains incongruous. This study was also unable to determine whether nurses' confidence in using IT directly influenced their use of resources to aid in decision making. A number of participants in this study revealed their confidence to use IT impacted their use of electronic policies and MIMS, yet there was a mix of age ranges and reasons behind this. None of the responses showed a repetitive pattern in which to demonstrate a relationship between the reasons why confidence in using IT impacted its use.

A significant issue that emerged from this study was the type of medications that were 'nurse initiated' by the participants. It showed that all were comfortable to initiate analgesia and most administered aperients and oxygen. The area that was least often initiated was emergency response medications. An explanation for this could be lack of confidence in decision making as supported by Ranse and Arbons [13] study of graduate nurses in resuscitation situations. Aside from this point, it is sensible to question other reasons behind this. As a profession are we not allowing our novice nurses to participate in emergency situations and learn valuable skills? Are our new graduates reluctant to be involved in the emergency calls in our hospitals and if so why? Is it due to lack of perception of need or training? It could also be that the need for aperients and oxygen is much more frequent than the need for emergency response medications.

This study, although small, has revealed new information about the factors that influence graduate nurses' decision making when considering nurse initiated medication. It suggests that the working environments are supportive in offering human help when making decisions around initiating medication. This could explain why so many of the participants had undertaken to initiate medications and done so with confidence. Although outside the scope of this study, patient outcomes and satisfaction are likely to be enhanced through the time saved by graduate nurse medication initiation and administration.

The findings in this study have informed an under-researched area of nursing and highlighted the need for further exploration of graduate nurses and their decision making in medication management. The need for further research in this area is supported by Lim's [16] recent study in relation to safe decision making in graduates prescribing medication.

An area that remains uncertain as to its impact on decision making is the use of IT and nurses' abilities to use it to resource decision making aids. Therefore, this is an area that could be further explored, if it is a hindrance to decision making, why and in what ways can this be improved? Recommendations are also made for more research into the impact of age, knowledge and experience on decision making.

Conclusion

This study produced new information in an important area, through identifying the factors which currently influence decision making for graduates in the sample. This will inform coordinators of both undergraduate and graduate programs. Further research opportunities into this area are vast, including

decision making by graduate nurses in the management of clinical conditions such as chest pain, mental health crisis and cardio pulmonary arrest. The study is likely to inform medication management policy and contribute to nursing resource management in acute hospitals.

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