

Dimensions of Critical Care Nursing

Senior Nursing Students' Perceptions of their Readiness for Oral Medication Administration prior to Final Year Internship– a quantitative descriptive pilot study --Manuscript Draft--

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| Abstract: | <p>Introduction</p> <p>In the ever-shifting, ever-challenging environment that is healthcare, it is crucial to ensure that new nurse graduates are equipped to deliver care that is safe, of high quality, patient-centred and based upon the best available evidence. Medication management encompasses many responsibilities including patient assessment and evaluation, pharmacology knowledge, medication preparation, drug calculations, medication administration, and patient education about medications. These roles consume a significant portion of a nurse's working day, and are an area of equally substantial concern for students approaching the latter stages of their undergraduate/pre-licensure programmes. The theoretical content on this area, as well as exposure to/hands-on experience in practice can vary from programme to programme. It is nonetheless imperative to ensure that students feel adequately prepared and confident to undertake this responsibility in practice. A recurring stressor reported anecdotally by student nurses within the authors' faculty is the area of medication administration and management, and whether they feel, or are in fact, ready for this responsibility. Listening to and hearing what students have to say in this regard should be one of the key drivers to shaping how best to prepare them so that they are confident and ready for practice. This paper describes a pilot-study of final year students' self-reported level of readiness for oral medication administration in advance of becoming licensed registered nurses.</p> <p>Methods</p> <p>A non-experimental, descriptive pilot study was undertaken to ascertain final year nursing students' perceptions of their preparedness for practice with regard to oral medication administration. A convenience sample of 24 final year students undertaking a four year BSc (honours) in General Nursing programme in one department of nursing in the Republic of Ireland was involved. Participation involved completion of a 17-item likert-type survey on one occasion only. The tool, "Preparedness for Oral Medication Administration Questionnaire", adapted by Aggar and Dawson (2014), originated from a 13-item competency-based assessment tool developed by Fisher and Parolin (2000) to measure student nurses' clinical performance. The current study did not involve any intervention. Data were analysed using IBM Statistical Package for Social Sciences© (SPSS) version 23.</p> |

Results

From a sampling frame of 87 students, 24 students participated in the survey, yielding a response rate of 28%. The total scale score produced in this sample was 63.3 (± 13.1) out of a range of 17 - 102. Higher scores indicate greater perceived levels of preparedness for oral medication administration. This score (63.3) suggests that participants generally perceived that they are not as adequately prepared for their role in the administration of oral medication as they perceive they would need to be. All 17 items on the scale were normally distributed. Individual item means ranged from 2.58 (± 1.1) to 4.71 (± 0.86). Participants' perceptions of their preparedness for specific aspects around oral medication administration were examined more closely by scrutinising individual item means, which provided more detailed findings. The total scale score produced in this sample was 63.3 (± 13.1). This score suggests that participants generally perceived that they are not as adequately prepared for their role in the administration of oral medication as they perceive they would need to be.

Conclusion

This pilot study revealed that students did not feel adequately prepared for their role in oral medication administration. Key contributors to this were pharmacology knowledge acquisition and application, along with lack of opportunities in practice to undertake oral medication administration roles and responsibilities. A streamlined approach to address these challenges involving nurse educators, clinical preceptors and most importantly students, is paramount. Despite the small scale of this single site study, it did provide useful insight into students' perceptions of their readiness for oral medication administration and factors influencing this.

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Senior Nursing Students' Perceptions of their Readiness for Oral Medication Administration prior to Final Year Internship– a quantitative descriptive pilot study.

Keywords: Preparedness for Practice. Oral medication administration. Students' perceptions. Nurse education. Quantitative pilot study.

Introduction

In the ever-shifting, ever-challenging environment that is healthcare, it is crucial to ensure that new nurse graduates are equipped to deliver care that is safe, of high quality, patient-centred and based upon the best available evidence. Medication management encompasses many responsibilities including patient assessment and evaluation, pharmacology knowledge, medication preparation, drug calculations, medication administration, and patient education about medications. These roles consume a significant portion of a nurse's working day, and are an area of equally substantial concern for students approaching the latter stages of their undergraduate/pre-licensure programmes. The theoretical content on this area, as well as exposure to/hands-on experience in practice can vary from programme to programme. It is nonetheless imperative to ensure that students feel adequately prepared and confident to undertake this responsibility in practice. A recurring stressor reported anecdotally by student nurses within the authors' faculty is the area of medication administration and management, and whether they feel, or are in fact, ready for this responsibility. Listening to and hearing what students have to say in this regard should be one of the key drivers to shaping how best to prepare them so that they are confident and ready for practice. This paper describes a pilot-study of final year students' self-reported level of readiness for oral medication administration in advance of becoming licensed registered nurses.

Methods

A non-experimental, descriptive pilot study was undertaken to ascertain final year nursing students' perceptions of their preparedness for practice with regard to oral medication administration. A convenience sample of 24 final year students undertaking a four year BSc (honours) in General Nursing programme in one department of nursing in the Republic of Ireland was involved. Participation involved completion of a 17-item likert-type survey on one occasion only. The tool, "Preparedness for Oral Medication Administration Questionnaire", adapted by Aggar and Dawson (2014), originated from a 13-item competency-based assessment tool developed by Fisher and Parolin (2000) to measure student nurses' clinical performance. The current study did not involve any intervention. Data were analysed using IBM Statistical Package for Social Sciences© (SPSS) version 23.

Results

From a sampling frame of 87 students, 24 students participated in the survey, yielding a response rate of 28%. The total scale score produced in this sample was 63.3 (± 13.1) out of a range of 17 - 102, Higher scores indicate greater perceived levels of preparedness for oral medication administration. This score (63.3) suggests that participants generally perceived that they are not as adequately prepared for their role in the administration of oral medication as they perceive they would need to be. All 17 items on the scale were normally distributed. Individual item means ranged from 2.58 (± 1.1) to 4.71 (± 0.86). Participants' perceptions of their preparedness for specific aspects around oral medication administration were examined more closely by scrutinising individual item means, which provided more detailed findings. The total scale score produced in this sample was 63.3 (± 13.1). This score suggests that participants generally perceived that they are not as adequately prepared for their role in the administration of oral medication as they perceive they would need to be.

Conclusion

This pilot study revealed that students did not feel adequately prepared for their role in oral medication administration. Key contributors to this were pharmacology knowledge acquisition and application, along with lack of opportunities in practice to undertake oral medication administration roles and responsibilities. A streamlined approach to address these challenges involving nurse educators, clinical preceptors and most importantly students, is paramount. Despite the small scale of this single site study, it did provide useful insight into students' perceptions of their readiness for oral medication administration and factors influencing this.

Background Literature

Healthcare professionals must be responsive and adaptable to meet the challenges of patient care and the complexities of a demanding healthcare environment. The need for safe health care practitioners has never been greater. There are well documented cases from the healthcare arena in the media highlighting suboptimal levels of patient care delivery¹⁻⁵. Such poor care provision has the real potential to adversely affect patient outcomes. National and global efforts to improve quality and safety of patient care currently guide practice and encourage us to examine our practice and competence more fervently. It is therefore incumbent on healthcare organisations to ensure that their employees, particularly frontline staff, are capable and competent to undertake their duties. Nurses comprise a significant proportion of employees in the healthcare system. This places an important responsibility on those charged with preparing nurses for practice to ensure, that upon graduation, their students are confident and competent to practice safely, effectively and efficiently in the clinical environment⁶. This requires a wide repertoire of knowledge, skills and attributes to enable them to respond and adapt to the complexities of clinical practice.

For students undertaking pre-registration or pre-licensure nurse education programmes who are soon to seek registration or licensure as qualified nurses, the prospect of entering this environment can be a daunting one. Ensuring that these students emerge from their programmes of education competent to fulfil the requirements of their role as registered/licensed nurses, in addition to meeting the expectations of the many stakeholders in the healthcare arena is crucial. Of equal importance is ensuring that the students feel adequately prepared and confident to meet these expectations, a concern that is frequently articulated by student nurses themselves. A recurring stressor reported anecdotally by this cohort within the authors' faculty is the area of medication administration and management and whether they feel or are, in fact, ready for this responsibility. The notion of readiness for practice among this cohort has been a feature of nursing discourse for some time.

The 'new to practice' recently qualified nurse is confronted with new and varied challenges and expectations⁶⁻⁸. The clinical environment is high-pressured and very stressful. While they will have experienced this environment as students, upon graduation they will enter it as qualified registered nurses holding full accountability for their actions and/or omissions. The setting, the team and the type of work undertaken in the area may also be new to them, further compounding the challenges they may face. Some of the challenges confronting newly qualified nurses include integration into a new setting/team, the expectations of their colleagues and their employer, their perceived competence to fulfil the requirements of the role, with particular concerns around areas such as patient caseload management, interprofessional communication and medication management^{6,9-13}. Medication management, as described previously, has been recognised as an on-going

concern in nurse education, particularly from a patient safety perspective and presents a significant challenge to those who support student nurses both in educational and clinical settings¹⁴⁻¹⁷. It is therefore an area where much focus and attention within nurse education curricula, both from a clinical and academic perspective, is warranted^{14,16,18}. This is not a new concern, and indeed is one that nurse educators have grappled with. In their pursuit to address this challenge, nurse educators continue to seek and employ new innovative methods to prepare students, including simulations, online content and new lecture material each year. It is important to investigate the student perspective to further inform and underpin any curricular changes going forward.

Readiness for Practice

Graduate nurses' readiness for practice on completion of their undergraduate programmes has been the subject of much debate globally, particularly since the transition of nurse education from the apprenticeship model of preparation to a university based programme of preparation^{6,8,10,19,20}. In 2010, Wolf et al. conducted a qualitative exploration of the meaning of new graduates' "readiness for practice" that sought the perspectives of nurses with varied experience in clinical nursing, nurse education and the nurse regulatory sector by way of fifteen focus group interviews, was undertaken²⁰. Their findings provide valuable insight into the different stakeholders' views and offered what could be perceived as an operational definition of the notion of what readiness for practice means. Their findings suggest that a graduate ready for practice is one who is "competent to provide safe client care", capable of "adapting to new and changing circumstances in health care" and who possesses "a balance of doing, knowing and thinking to ensure safe care"^{20(p9)}. It is also suggested that such readiness for practice equips graduates to meet the needs of local, national and global health care systems. This mirrors the standard required of graduate nurses by the Nursing and Midwifery Board of Ireland who state that upon graduation, the newly registered nurse must be capable "to deliver safe, high quality, compassionate, ethical, legal and accountable practice across the life spectrum and in diverse health care settings"^{21(p16)} an expectation also reflected in the Nursing and Midwifery Council's, (NMC, UK) professional code of conduct for nurses and midwives²², and indeed in the American Nurses Association (ANA)²³ "Scope and Standards of Practice" guidelines. It is therefore incumbent on those charged with the responsibility of preparing new nurse graduates, to ensure that students emerge from their programmes of nurse education in possession of such "readiness" for professional practice. This is clearly in the interest of the graduates themselves but even more so in the interest of public safety. Of key concern to us as nurse educators therefore are the views of our students who are embarking upon the final stages of their nurse preparation programmes. They will soon emerge into the world of clinical practice where expectations of their role and capabilities from key stakeholders are high. Despite a dedicated pharmacology module in Year 2 and a threading through of pharmacology content into nursing interventions modules through a spiral curricular model

within the institution, medication administration and medication management remain an enduring source of apprehension for students. This, coupled with the ever-increasing complexity of medication management, the constant emergence of new drugs and their associated regimes, poly-pharmacy and its implications for patients and nurses alike, along with the concerns expressed by our own students, particularly in relation to their role in medication management as new graduate nurses, provided the impetus to explore this area further among final year nursing students at our institution.

Senior Internship: An Educational Model for Practice Preparedness

The current four-year full time nursing degree programme in Ireland requires all students in their final year to complete a 36-week rostered placement (senior internship) in clinical practice. This prolonged clinical exposure/experience is the final phase of the students' programme of nurse education, encompassing the final 36 weeks of year 4. At this point, students have concluded all theoretical components of their nursing programme. Such strategic placement of this internship is designed to enable the student to consolidate and apply the theory and practice experience accrued up to that point while still enjoying the support structures available to them as students. It introduces senior students to the role of the staff nurse and the associated heightened responsibilities that brings, including administration of medication. It also provides a transition period for the student as they move towards preparing for their role in practice as a registered nurse. To this end, for the duration of their internship, these students become fully rostered members of the nursing team and paid employees of the health service. Although these students continue to receive support and guidance from registered nurses, during the senior internship placement, they are no longer 'supernumerary' in status. 'Supernumerary' in the Irish context means that the students are "surplus to the staffing requirements for the health care setting during the supernumerary period of the programme" ^{21(p135)}. As senior internship students, they are expected to play a full role as part of the rostered nursing team, taking responsibility for patient caseloads within the unit under the auspices of their clinical preceptors. This includes working nights, contributing to multi-disciplinary team decision-making, and taking responsibility for planning, implementing and evaluating care for a caseload of patients, including medication administration, under the direction of a registered nurse. Registered Nurses working in academic teaching hospitals affiliated with a higher education institution take on the role of clinical preceptors to undergraduate student nurses in the clinical environment. In preparation for this role, registered nurses undertake dedicated preceptorship training provided by the higher education institution. This role does not attract remuneration and is considered to be part of the standard overall remit of registered nurses in Ireland.

In the first semester of the final year of the programme, and immediately in advance of commencing the senior internship placement, students undertake one final 8-week clinical placement. This is the final supernumerary placement of their programme. It serves as a

springboard for the senior internship, affording students a final opportunity to identify their learning needs and improve their capability in pertinent skills and areas of nursing practice before taking on the heightened responsibility of the senior internship. In previous years, anecdotal feedback from students following clinical placements highlighted medication management / oral medication administration as a real cause for concern and source of anxiety among this cohort during this final supernumerary placement. In an effort to ensure that we, as nurse educators, are adequately preparing and equipping the students for the challenges of practice at this level and beyond, we felt it timely to elicit formally the perceptions of final year nursing students of their preparedness for practice with particular focus on medication administration, following completion of this 4th year supernumerary placement and in advance of embarking on their internship placement.

Study Design

A non-experimental, descriptive pilot study was undertaken to ascertain final year nursing students' perceptions of their preparedness for practice with regard to oral medication administration. A convenience sample of final year general nursing students in the authors' school of nursing, who had just concluded their aforementioned final 8-week supernumerary placement and who were soon to commence their 36-week senior internship placement was involved. Participation involved completion of a 17-item likert-type survey on one occasion only. In addition, two open-ended questions were included to afford students the opportunity to elaborate on their survey responses if they wished and to voice any other areas of their practice that they had concerns regarding. This study did not involve any intervention. It was felt that this was an optimal time to engage with this group about the issue of oral medication administration and to elicit any concerns they may have in advance of their 36-week internship. This paper reports on the findings of the quantitative survey. The qualitative findings will be reported in a subsequent publication.

Instruments

A survey tool "Preparedness for Oral Medication Administration Questionnaire", developed by Aggar & Dawson²⁴, emerging from earlier work by Fisher & Parolin²⁵ was used to measure student nurses' perceptions of their preparedness for oral medication administration. Permission to use and reproduce this tool was sought from and provided by the scale authors (Aggar & Dawson). The reliability of this tool has been documented, previously achieving a Cronbach Alpha of 0.89²⁴ indicating good internal reliability. The Cronbach Alpha achieved in this current sample was 0.91, further supports its internal reliability. This tool is a 17 item, 6 point likert-type scale with possible responses on individual items ranging from strongly disagree to strongly agree (individual item scores

ranging from 1 to 6), yielding a lowest possible total scale score of 17 and a highest possible total scale score of 102. Higher scores indicate greater perceived levels of preparedness for oral medication administration. Items in the scale addressed areas such as medication calculations, medication knowledge, patient assessment and evaluation before, during and after medication administration, for example.

Ethical Considerations

Ethics approval to conduct the study was obtained in advance from the research ethics committee of the higher education institute in which the study took place. Data collection took place in the higher education institution after the students returned from their final supernumerary clinical placement and in advance of commencing their 36-week internship placement. It was not necessary therefore to obtain ethics approval from the clinical site. Students were assured that participation in this study was entirely voluntary and whether or not they participated would not affect their grades. The survey was completely anonymous and no identifying information was sought.

Sample and setting

All final year BSc in General Nursing students (87) who had recently completed the final 8-week supernumerary clinical practice placement and were scheduled to undertake the senior internship placement (a mandatory part of the programme) were eligible for inclusion in this pilot study. The only exclusion criterion was students who did not successfully complete the preceding final 8-week supernumerary clinical practice placement, of which there were none. An invitation including information about the study was emailed to these students upon completion of the final 8-week supernumerary clinical practice placement, informing them about the study. They were advised that participation in the study was entirely voluntary, responses would be anonymous, with no identifying information sought, and that their participation or non-participation would have no impact on their assessment outcomes. No incentive was provided to students for their participation in the study. They were also advised that they could contact the researchers or the relevant research ethics committee should they have any question(s) about the study or their involvement in it. Following an explanation about the study, the questionnaire was made available specifically to the cohort of interest. This was at the end of a scheduled class. A sealed container was provided in a secure location where students could return questionnaires, completed or otherwise. Return of completed questionnaires was deemed to be consent to participate.

Data Analysis

Quantitative data including demographics were analysed using IBM Statistical Package for Social Sciences (SPSS) version 23. Data analysis included descriptive statistics such as tests of normality, internal reliability testing, measures of central tendency and dispersion, and generation of a total scale score. There was only one item with missing values and this was excluded pairwise as necessary. All variables under scrutiny were found to be normally distributed.

Results

Out of a sampling frame of 87 students, twenty-four students participated in the survey, yielding a response rate of 28%. The total scale score produced in this sample was 63.3 (± 13.1), which is substantially lower than the scores yielded by the scale authors²⁴ in their study groups (84.7 and 88 respectively). Higher scores indicate greater perceived levels of preparedness for oral medication administration. This score (63.3) suggests that participants generally perceived that they are not as adequately prepared for their role in the administration of oral medication as they perceive they would need to be. All 17 items on the scale were normally distributed. Individual item means ranged from 2.58 (± 1.1) to 4.71 ($\pm .86$) (see Table 1). This indicates that even those items with higher mean scores only rated in the "somewhat agree" category, suggesting perhaps a lack of confidence and conviction on the part of the students in oral medication administration. Participants' perceptions of their preparedness for specific aspects around oral medication administration were examined more closely by scrutinising individual item means, which provided more detailed findings. These results will now be presented and subsequently discussed.

Eighty-eight percent of participants agreed to varying degrees that they had been adequately prepared with knowledge for safe administration of medications, with this item achieving a mean score of 4.12 (± 1.15). 45% of students felt that they were adequately prepared in medication calculations (3.29 ± 1.04) with 55% of students feeling inadequately prepared in this aspect. A striking 76% of students reported that they did not have confidence in applying pharmacology knowledge to practice (2.58 ± 1.10) and similarly, 76% of students reported that their nursing programme to date had not adequately prepared them with medication education by integrating theory with practice (2.74 ± 1.13). Only 24% of students felt that their education around medication prepared them sufficiently for the application of pharmacology knowledge and the integration of theory and practice in this area (2.58 ± 1.10). In relation to knowledge of legislation underpinning medication administration 54% of students felt that they were inadequately prepared (3.33 ± 1.27), with only 46% feeling adequately prepared. With regard to knowledge of policies/procedures underpinning medication administration, most of which would be informed by legislation

but locally interpreted and administered, 55% of the study sample considered they were inadequately prepared (3.54 ± 1.10).

With regard to opportunities to supervise patients taking medication, 63% of students felt that they had adequate learning opportunities to practice oral medication supervision of patients taking meds (3.50 ± 1.50) while 37% of students did not. However, when asked about opportunities to have their own practice in medication administration supervised, 55% of students felt that they were inadequately supervised in medication administration overall (3.29 ± 1.49). In relation to their perceived abilities around unsafe practice, 66% felt that they were adequately prepared to respond to instances of unsafe practice (3.79 ± 1.14) but 37%, almost 4 out of every 10 students, did not feel prepared to respond to such instances. An overwhelming 79% felt adequately prepared to clarify instructions and to question interventions which appeared inappropriate (4.33 ± 1.20). However, 42% of students stated that they are unable to utilise resources such as the “British National Formulary” or the “Monthly Index of Medical Specialities” effectively (3.88 ± 1.22).

In relation to the planning of oral medication administration, 64% of students felt that they were adequately prepared to administer medications appropriately and on time (3.79 ± 1.18), while 36% of students did not. In relation to patient monitoring, 71% of students felt adequately prepared to monitor the patient’s condition before, during and after medication administration (4.04 ± 1.04), which means that 29% of these final year students do not feel capable of monitoring a patient’s condition around medication administration. Following administration of medication, 62% of students felt that they were adequately prepared to assess the effectiveness of medication in achieving outcomes (4.00 ± 1.18), leaving 38% of students who consider themselves unable to assess the effectiveness of medication.

With regard to communicating with other members of the healthcare team on aspects concerning medication administration, a large cohort of the students (75%) felt that they are adequately prepared for this role (4.33 ± 1.13). An integral component of safe medication administration includes establishing and accurately maintaining client records, and 92% of students felt that they are adequately prepared for this responsibility (4.71 ± 0.86).

Table 1: Preparedness for Oral Medication Administration Questionnaire© – Individual Item Mean Scores

| | Statement | Overall Agree | Overall Disagree | Total Mean Score |
|------|---|----------------------|-------------------------|-------------------------|
| | In terms of oral medication administration competence my nursing program has prepared me: | | | |
| Q 1 | To be proficient in medication calculations | 45% | 55% | 3.29 |
| Q 2 | To have confidence in applying pharmacology knowledge in practice | 24% | 76% | 2.58 |
| Q 3 | With adequate learning opportunities to practice oral medication supervision (supervising patients taking their meds) | 63% | 37% | 3.50 |
| Q 4 | With adequate supervision in medication management | 45% | 55% | 3.29 |
| Q 5 | With medication education by integrating theory and practice | 24% | 76% | 2.74 |
| Q 6 | With knowledge for safe administration of medications | 88% | 12% | 4.13 |
| Q 7 | With knowledge of legislation pertinent to medication administration. | 46% | 54% | 3.33 |
| Q 8 | With knowledge of policies & procedures on medication administration. | 45% | 55% | 3.54 |
| Q 9 | To respond appropriately to instances of unsafe practice | 66% | 34% | 3.79 |
| Q 10 | To clarify unclear instructions | 79% | 21% | 4.33 |
| Q 11 | To question interventions which appear inappropriate | 79% | 21% | 4.13 |
| Q 12 | With the ability to communicate effectively with individuals of the health care team | 75% | 25% | 4.33 |
| Q 13 | To establish and maintain accurate client records | 92% | 8% | 4.71 |
| Q 14 | To administer medications appropriately and on time | 64% | 37% | 3.79 |
| Q 15 | To utilise resources effectively eg. MIMS or BNF | 58% | 42% | 3.88 |
| Q 16 | To monitor patient's condition before, during & after medication | 71% | 29% | 4.04 |
| Q 17 | To assess effectiveness of medication in achieving outcomes | 62% | 38% | 4.00 |

Aggar and Dawson (2014)

Discussion

Following analysis of the data a number of key aspects emerged. They centred crucially on the areas of knowledge acquisition and knowledge application or clinical competence around the administration of oral medications. Indeed, these items achieved the lowest mean scores of all items on the scale. The overall scale score for this sample (63.3) suggests that this group of students generally perceived that they are not adequately prepared for their role in the administration of oral medication. This is borne out in the mean score achieved on this item (4.12) indicating that students only “somewhat agreed” that they were adequately prepared with knowledge for safe administration of medications. Closer scrutiny of individual scale items highlighted shortfalls around specific aspects of medication

management. They include drug calculations, supervision of student practice, and pharmacology knowledge translation. These proved more revealing not only from a student perspective but also in relation to the system that is supposed to prepare and support students for their role in oral medication administration. It is well recognised that drug calculations have presented a challenge for both student and registered nurses in healthcare systems worldwide for some time ^{26–35}. Despite numerous suggestions and strategies to address such challenges that have emerged from all of this literature over the years, drug calculations continue to pose a real difficulty for student nurses. The current study demonstrated that less than half of the participants (45%) are confident in relation to drug calculations. This is a very worrying finding given the justifiable focus on ensuring that patients are safely and competently cared for in healthcare settings ^{1,4,5,21–23} coupled with the fact that this sample of student nurses will soon be looking to register and practice as licensed nurses. This should compel nurse educators to throw a spotlight on their overall focus on drug calculation skills within nursing curricula in terms of the number of dedicated hours in addition to the timing of their delivery. From an Irish perspective, it was found that the average number of hours across the four years of undergraduate nursing programmes, dedicated to drug calculation skills is as little as 3.3 hours in total²⁶. The identified shortfall in knowledge and skills is unlikely to be comprehensively addressed or improved with so few hours dedicated at programme level overall.

In addition to the deficits reported in drug calculation skills, education provision, application of theory to practice, and opportunities to practice were found to be lacking. Seventy-six percent of the students in this study reported that their nursing programme to date had not adequately prepared them with medication education. Similar findings have been reported in the literature over the years ^{26,36–39} suggesting little progress evident in this area. This is arguably compounded by the absence of any national or international benchmark around pharmacology education provision on nursing programmes ²⁶. Indeed, findings yielded by the open-ended questions on the survey administered in this study indicated that students would welcome greater pharmacology content, distributed across the four years of the programme. From an educator's perspective, it is imperative that not only the pharmacology content but also its delivery and translation from the classroom to the bedside are considered. It is important that students not only acquire the knowledge and understand it but also can see its relevance to patient care and outcomes. More appropriate and sufficient opportunities to utilise this knowledge in practice would help to overcome this.

Pharmacology content and instruction alone, is not guaranteed to produce practitioners competent in medication administration at the bedside. Appropriate application of the attained knowledge in the clinical setting is integral to safe, effective practice. Healthcare environments with all their complexities can be daunting for the novice nurse and supporting them in practice is paramount, if competence and confidence are to flourish. Confidence in applying pharmacology knowledge to practice proved a big stumbling block

for the majority of students (76%) in this study, a finding mirrored elsewhere in 2006³¹, suggesting that little advancement may have been made in the intervening period around this aspect. Opportunities in the clinical practice setting to engage and participate in drug rounds and medication administration under appropriate supervision are key mechanisms to facilitate the application of pharmacology knowledge to practice and to foster confidence and competence. Lack of such opportunities does little to develop and nurture either confidence or competence among students, yet 55% of students in this study reported that they were inadequately supervised in medication administration. Indeed, delegation by more senior staff of more fundamental patient care needs to students in preference to being afforded the opportunity to engage in supervised drug rounds emerged from qualitative responses further compounding the situation. This is reflected in the survey findings. It is interesting to note that the items attracting the highest mean scores on the survey are those concerned with the ancillary activities around the task of oral medication administration, such as seeking clarification, communicating with members of the healthcare team, and documentation. However, students “somewhat disagree” that they have been adequately prepared to perform tasks directly associated with the actual administration of oral medications to patients, such as the supervision of patients taking meds, and the appropriate and timely administration of oral medications. Arguably it is appropriate to refocus energies on ensuring that the nature and type of learning opportunities necessary for students to develop both competence and confidence in this area in practice are presented to, and safeguarded for students.

It is imperative that factors contributing to this situation are addressed at both organisational and ward levels in order to prevent its perpetuation going forward. In the first instance, the findings of this pilot study have revealed that there may be a chasm between what the education planners believe need to be taught and what student nurses feel they need in order to participate in oral medication administration. In light of this, the findings of this pilot study have been disseminated at a number of fora within the department, across campus and with clinical colleagues and educators in other institutions. Translating pharmacology knowledge into practice and having the confidence to apply it at the bedside is clearly problematic for these students. In the authors’ institution, a dedicated focus has been placed on simulated learning within modules in an attempt to nurture competence and confidence in practical nursing skills including oral medication management. Of particular concern to the authors and their colleagues were revelations from students that they are not being facilitated with adequate opportunities in clinical practice to engage in oral medication administration. Clinicians and educators have come together in a more strategic manner to examine how this deficit can be tackled. Integral to this process is the inclusion of the students’ voice, as this pilot study has demonstrated and has been previously proffered by the authors¹⁸. A novel initiative that has been established in one of the clinical partner services is a student forum where students can raise any issues concerning their clinical practice experience during their placements, including oral

medication administration related issues. This enables a more timely and contextual resolution of any issues or deficits raised, than previously established feedback mechanisms which were usually retrospective in nature allowed.

The findings of this pilot study have been both revealing and helpful in terms of formally identifying and highlighting areas of concern that were previously suspected but largely anecdotal. They have provided a good direction of travel on how to help maximise student learning opportunities in this area and should be of particular interest to nurse educators and clinical preceptors responsible for preparing and supporting student nurses for senior internship placements, and nurse registration/licensure. While the findings of this pilot study are new and specific to our students, they do serve as a timely reminder of the enduring challenges around safe preparation of students for their role in medication management. To this end, embedding the knowledge and skills of medication management and pharmacology, with a key focus on numeracy and calculation skills, early and incrementally throughout the curriculum is integral¹⁸. Constructive alignment of such theoretical content to dovetail with level-specific clinical practice placements facilitates consolidation of learning and application to practice. Other recommendations previously cited in the literature, such as regular drug calculation testing^{17,28,29}, student-led dedicated tutorials¹⁸, a structured, collaborative, multi-disciplinary approach to supporting students in their role in medication management¹⁵ remain relevant and beneficial if implemented. A recently introduced initiative in one of the clinical partner services of the researchers' institution, is the establishment of a student forum, where final year students on clinical placement can raise any practice-related concerns or issues they encounter. The forum comprises a number of relevant stakeholders including the Director of Nursing and those directly responsible for coordinating nurse education in practice. This forum provides students with a mechanism that affords them scope to highlight any shortfalls they perceive in their clinical preparation for medication management. This enables immediate, context-specific responses or solutions to be effected by the appropriate people who are in a position to address the concerns raised. Anecdotal feedback to date from both the students and the clinical partner services on this initiative has been very positive and it appears to be very beneficial for all involved.

Further research in this area would be useful. It is important to acknowledge the limitations of this study in terms of generalisability. It was a pilot study involving a convenience sample of one student cohort in a single site. Stronger, more representative findings would be yielded by a randomised, multi-site study, involving larger student cohorts. This pilot study was a pre-test only design, with data collected at the end of year 4 students' final supernumerary practice placement and in advance of their 36 week internship placement. Post-test collection of data following completion of their internship placement would have enabled direct comparison of students' perceived level of preparation both before and after their internship placement and immediately prior to licensure as registered nurses.

Conclusion

Nurse education programmes provide the building blocks that contribute to a nursing profession that is safe, effective and patient-centred. As such, these programmes are understandably demanding, gruelling at times and tightly governed by the professional bodies that regulate them in an effort to uphold public safety. Demands on nursing students originate from a number of sources including academic and clinical personnel and organisations. Navigating their way through a four year fulltime (demanding) degree programme coupled with the practice-based requirements to attain a broad range of competencies in the clinical setting, requires an intricate balancing act on their part and brings with it many stressors and anxieties. Key stressors that can present for final year students include their perceived readiness to meet the responsibilities of their impending role as a senior intern in the first instance, followed by a licensed/registered nurse. A central concern repeatedly voiced by students is the area of medication administration and management and the current pilot study would support that this area continues to be a source of anxiety for students. The findings revealed that knowledge acquisition, knowledge application and clinical competence around the administration of oral medications are significant stumbling blocks for final year nursing students. It is imperative that appropriate measures are put in place to ensure that these stumbling blocks are minimised and where possible eliminated. This responsibility lies with both the academic and clinical organisations and the personnel working within them. In tandem with this is the need to consider aspects which students perceived as helpful to supporting them in the area of medication administration and management, building and strengthening confidence in these areas. This will afford a more holistic approach to ensuring they are truly supported in their preparation for practice as a licensed/registered nurse and feel truly confident in their ability to undertake this role.

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