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RESEARCH ARTICLE

Assessing the feasibility of adapting a nursing questionnaire for evaluating patient safety education in pharmacy

Angela Adams[1], Mary Bushell[1], Andrew Kelly[1], Irmina Nahon[1], Minh Chau[1], Phillip S Kavanagh[1], Faran Sabeti[1], Tanya Lawlis[1], Rachel Bacon[1], Kate Leary[1], Jane Frost[2]

[1.] Faculty of Health, University of Canberra, Bruce, Canberra, Australia
[2.] University of Western Sydney, Sydney, New South Wales, Australia

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Correspondence
Mary-A Bushell
Faculty of Health
University of Canberra
Bruce
Canberra
Australia
mary.bushell@canberra.edu.au

Abstract

Background: Understanding pharmacy students' views on patient safety learning during clinical placements is vital for addressing educational gaps and promoting safe practices. The Patient Safety in Nursing Education Questionnaire (PaSNEQ) assesses students' perceptions of patient safety education. **Objective:** To assess PaSNEQ for evaluating pharmacy students' perceptions of patient safety education during placements. **Methods:** In a mixed-methods approach, post-clinical placement students adapted PaSNEQ, measuring perceptions of patient safety learning. Focus groups of four participants explored their experiences. Data were analysed for reliability and consistency through thematic analysis. **Results:** The adapted PaSNEQ showed strong internal consistency and was feasible. Participants reported frequent discussions about patient safety with supervisors and a supportive safety environment. However, 55% lacked experience in reporting safety incidents. Focus group revealed perceived gaps in structured patient safety practices and inconsistencies in their inclusion across placements. Students emphasised the importance of hands-on experience and systematic patient safety learning. **Conclusion:** The adapted PaSNEQ is reliable for assessing pharmacy students' perceptions. Students recognised the importance of patient safety education and desire more structured, experiential learning, particularly in incident reporting. Integrating tools like the PaSNEQ into pharmacy education can help educators identify gaps, support curriculum development, and better prepare students for pharmacy practice.

Introduction

The World Health Organisation (WHO) reports that one in four patients experience harm during healthcare delivery, prompting the global prioritisation of patient safety across national health agendas (International Pharmaceutical Federation [FIP], 2020). Patient safety is defined as the reduction in harm to patients during the provision of healthcare, including the omission of preventable harm and accidental injuries (World Health Organisation (WHO), 2011). Coordinated and collaborative action from healthcare professionals is required to improve patient safety culture and outcomes (Bader *et al.*, 2019). Medication safety, a component of patient safety, involves the prevention and management of medication-related harm (FIP, 2020). Medication safety is critical, as medication use is associated with a greater incidence of errors and adverse events than any other healthcare intervention, with up to 50% of incidents preventable (Australian Commission on Safety and Quality in Health Care (ACSQHC), 2011). Medication-related errors and adverse events increase morbidity and mortality, with global estimated costs of USD 42 billion annually (WHO, 2011). Research is required to identify systematic, evidence-based approaches towards improving patient safety (WHO, 2011).

Pharmacists play a vital role in ensuring the safe and quality use of medicines throughout the prescribing, dispensing and administration stages (ACSQHC, 2011; WHO, 2011). To protect the public from harm, the Australian Commission on Safety and Quality in Healthcare developed the National Safety and Quality Health Service (NSQHS) standards, dictating the level of care consumers can expect in healthcare institutions (ACSQHC, 2011). Standard four is dedicated to the safe and quality use of medications (ACSQHC, 2011). In 2017, the WHO launched the third global patient safety challenge, "*Medication without harm*", which highlighted the role of pharmacists in enhancing patient safety (Donaldson *et al*., 2017). In response to this challenge, Australia committed to a 50% reduction in medication-related harm by 2025 (ACSQHC, 2020). Clear and systematic embedding of patient safety learning in the education of future health professionals is vital to achieve this outcome (Walpola *et al.,* 2015).

Pharmacy educators have a responsibility in promoting the aims of medication without harm by cultivating a strong patient safety culture and developing patient safety skills and knowledge in their graduates (WHO, 2011). The Institute of Medicine recommended reforming patient safety education, highlighting inadequacies in current curricula, and advocating for a collaborative, interprofessional approach (El-Awaisi *et al.,* 2022).

Various guidelines and frameworks have facilitated the incorporation of patient safety concepts into curricula, including the WHO multi-professional curriculum guideline, a competency-based approach to patient safety education focusing on patient safety culture, teamwork, and risk management (WHO, 2011; El-Awaisi *et al.,* 2022).

The systematic implementation of patient safety has become widespread in nursing and medical schools, including the Quality and Safety Education for Nurses (QSEN) initiative in the United States (El-Awaisi *et al*., 2022; Lee *et al*., 2021). In contrast, the inclusion in allied health curricula is less comprehensive (Walpola *et al.,* 2015). A recent systematic review investigated the incorporation of patient safety learning into pharmacy education, focusing on perceptions, content, and methods of delivery (El-Awaisi *et al.,* 2022). Patient safety interventions included simulation, seminars, and dedicated patient safety courses (Frenzel *et al.,* 2018; Aubin & King, 2015; Bajis *et al*., 2019; Hollamby *et al.,* 2018; Iverson *et al*., 2018; Kearney *et al.,* 2010; Langlois, 2016; Schaffer & Munyer, 2015; Scalese *et al.,* 2015). Overall, student attitudes towards patient safety improved post-intervention, although a lack of standardisation in incorporating patient safety learning into pharmacy curricula was identified.

Research into patient safety education has usually focused on academic, rather than clinical settings (El-Awaisi *et al.,* 2022). A perceived gap in patient safety learning between academic and clinical settings has been identified in nursing students (Steven *et al*., 2014; Vaismoradi *et al.,* 2014). Students' perceptions indicate that practical skills, including identifying factors leading to patient safety incidents, have greater relevance in clinical settings (Ginsburg *et al.,* 2013; Tella *et al.,* 2015b). Although simulation-based learning in academic settings may narrow this perceived gap (Tella *et al.,* 2015b), systematically integrating patient safety competencies into clinical placements may enhance outcomes through the assimilation of theory and practice that occurs during clinical placements (Cooper *et al.,* 2020). Further research into learning effective measures of patient safety during clinical placements is required.

The Patient Safety in Nursing Education Questionnaire (PaSNEQ) is a self-report measure of nursing students' perceptions of patient safety learning (Tella *et al*., 2015a, 2015b). The PaSNEQ includes domains assessing learning across both academic and clinical settings (Tella *et al.,* 2015a), potentially providing educators with a tool to bridge the perceived gap between clinical and academic settings to facilitate an integrative learning experience. Three sum variables (factors) of patient safety skills, patient safety knowledge and affirmative patient safety attitudes have been identified in the PaSNEQ academic domain (Tella *et al.,* 2015b). Affirmative attitudes were rated the highest, with relatively low patient safety skills ratings in British and Finnish nursing students (Langari *et al*., 2017). Whilst other patient safety tools measure only attitudes, for example, the widely used Attitudes to Patient Safety questionnaire (Cervera-Gasch *et al.,* 2021), adequate knowledge and skills are vital in applying patient safety reasoning during professional activities (El-Awaisi *et al.,* 2022). The broader scope of the PaSNEQ may provide greater guidance to educators by identifying specific gaps in patient safety skills and knowledge.

The current study

Pharmacists play a vital role in promoting patient safety; therefore, understanding the current state of patient safety, learning from pharmacy students' perspectives is critical (Donaldson *et al*., 2017; FIP, 2020; ACSQHC, 2020). Systematically, developing patient safety education in curricula to build competence in future pharmacists may support the medication without harm initiative and promote the Australian target of a 50% reduction in medication-related harm (Donaldson *et al*., 2017) A pilot study was conducted to determine if an adapted PaSNEQ is a

feasible and valid tool to measure the perceptions of Australian pharmacy students' patient safety learning during clinical placements. The PaSNEQ was investigated for its ability to promote students' awareness of patient safety and provide an avenue for student-to-educator communication.

Methods

Design

The present pilot study employed a cross-sectional, mixed-methodology design. A self-report questionnaire (adapted Patient Safety in Nursing Education Questionnaire (PaSNEQ)) and a focus group were utilised to align with the recommendation to measure patient safety. Quantitative data were analysed using IBM SPSS Statistics (Version 28); given the small sample size, only descriptive statistics are reported as there was insufficient power to conduct any interferential statistics.

Participants and procedure

Following the completion of a clinical placement, participants gave informed consent and completed the adapted PaSNEQ online via Qualtrics. After the questionnaire, students were asked if they would like to participate in a focus group to discuss the value of the PaSNEQ from their perspective further. While seven students indicated interest, four students participated in the focus group facilitated by a pharmacy academic.

A total of 29 participants (pharmacy students who had just completed clinical placement) completed the adapted questionnaire. The inclusion criteria were enrolment in either an undergraduate or postgraduate pharmacy degree at the (deidentified for blind review), and students must have completed placement within two months prior. The participants comprised five male and 24 female students, enrolled in the second to fourth years of pharmacy study. Ethics approval was granted from the (deidentified for blind review) Human Research Ethics Committee (approval 0096).

Measures

Quantitative data were collected through an adaptation of the Patient Safety in Nursing Education Questionnaire (PaSNEQ) clinical domain, a 17-item self-report measure of nursing students' perceptions of patient safety learning in clinical settings, where each of the 17 items are responded to twice, once for level of agreement regarding inclusion in clinical setting and once for degree of importance (Tella *et al.,* 2015a). The original PaSNEQ was designed in Finnish, based on an integrative literature review and international patient safety guidelines, with subsequent translation into English (Tella *et al.,* 2015a). Principal component analysis of the original clinical domain PaSNEQ identified three factors: a supportive and systems-based approach to ensuring patient safety, gaining experience to ensure patient safety, and reporting patient safety incidents.

Adaptation of the PaSNEQ

For this study, the PaSNEQ was adapted by a panel of 3 pharmacists and pharmacy academics with expertise in patient safety, clinical pharmacy practice, and pharmacy education. The adaptation aimed to ensure contextual relevance for pharmacy students while maintaining content validity and comparability with the original tool.

Terminology adjustments were made to replace nursing-specific references (e.g., "*wards*" and "*nursing staff*") with pharmacy-relevant terminology, such as "*dispensary*" and "*pharmacy staff*," and pharmacy-specific resources including the Australian Pharmaceutical Formulary (APF), Australian Medicines Handbook (AMH), and AusDI. Content alignment involved the inclusion of additional examples relevant to pharmacy practice, such as the use of dispensing checklists and communication strategies specific to pharmacists (e.g. motivational interviewing and repeat-back techniques).

Importantly, the structure of the questionnaire was maintained, with no items removed or added, to support future comparative analyses and enable consistency with the validated factor structure. New item clarifications were incorporated to provide context-specific elaborations, such as emphasising learning from every patient safety incident and highlighting pharmacy-specific communication approaches.

The adapted items continued to address the three core factors identified in the original PaSNEQ: 1) a supportive and systems-based approach to ensuring patient safety, 2) gaining experience to ensure patient safety, and 3) reporting patient safety incidents. The adapted PaSNEQ can be found in the supplementary files. For the adapted PaSNEQ participants rated their levels of agreement about the extent to which the items (e.g., "*I became familiar with the patient safety materials*") were included in their clinical placement and importance of these experiences using four-point scales (1 = *fully disagree*; 4 = *fully agree*; 1 = *not important at all;* to 4 (*very important*). The ratings inclusion of experiences for the 17 items demonstrated

very good internal consistency (α = 0.83), with each of the factors demonstrating appropriate internal consistency (Supportive systems α = 0.78, gaining experience about patient safety α = 0.61, reporting patient safety incidents α = 0.61). Likewise, when the 17 items were rated for their degree of importance, they also demonstrated good internal consistency (α = 0.91), with each of the factors demonstrating appropriate to good internal consistency (Supportive systems: α = 0.87; gaining experience about patient safety: α = 0.83; reporting patient safety incidents: α = 0.61).

Table I: Participants' demographic and clinical placement characteristics

Variable	Response	N	%
Gender	Male	5	17
	Female	24	83
Year enrolled in degree	Second	2	7
	Third	11	38
	Fourth	16	55
Clinical placement setting	Hospital	16	55
	Community	13	45
Primary clinical supervisor	Early career pharmacist	6	21
	Greater than 5 years of experience	23	79

Results

Table I shows participant demographic and clinical placement characteristics.

Pharmacy students' perceptions about patient safety learning in clinical settings are presented as frequencies of responses to each item in Tables IIa, b, c, and d. These are presented and grouped according to the factors identified in the original PaSNEQ scale development by Tella and colleagues (2015a), to help facilitate direct comparisons.

Table IIa: All pharmacy students' perceptions about patient safety learning in clinical settings (n=29)

Scale item	Included %				Important %			
	1	2	3	4	1	2	3	4
Gaining experience about ensuring PS								
Discussed PS with supervisors	0	0	59	41	0	10	17	72
Familiarity with available PS materials	0	3	41	55	0	3	35	62
Acquisition of PS skills	0	3	52	45	0	0	24	76
Importance of PS competence emphasised	0	10	45	45	0	7	24	69
Recognition of factors leading to PS incidents	0	7	59	35	0	7	31	62
Reporting of PS incidents								
Practicing reporting of PS incidents	14	41	31	14	0	10	45	45
Reporting of adverse event (danger to patient)	7	14	52	28	0	3	24	72
Reporting of near miss events regarding PS	14	17	45	24	0	0	55	45
Supportive and systems-based approach to ensure PS								
Use of checklists to ensure PS	0	45	38	17	3	14	41	41
Learning systematically from PS errors	0	21	41	38	0	3	59	38
Interdependence between quality care and PS	0	14	55	31	0	3	41	55
Patient-centred care to promote PS	0	10	48	41	0	7	45	48
Responsibility of pharmacist in ensuring PS	0	3	35	62	0	0	24	76
Efficient teamwork ensuring PS	0	21	41	38	3	3	48	45
Clear communication ensuring PS	0	17	55	28	0	7	45	48
A systems-based approach to errors	0	24	45	31	0	7	48	45
Supportive environment for PS learning	0	3	45	52	0	0	24	76

Note. PS = Patient safety. Percentages expressed for the included sub-scale: 1 = Fully disagree, 2 = Disagree, 3 = Agree, 4 = Fully agree. Percentages expressed for the important sub-scale: 1 = Not important at all, 2 = Somewhat important, 3 = Important, 4 = Very important.

Table IIb: Second-year pharmacy students' perceptions about patient safety learning in clinical settings (n = 2)

Scale item	Included %				Important %			
	1	2	3	4	1	2	3	4
Gaining experience about ensuring PS								
Discussed PS with supervisors	0	0	0	100	0	0	100	0
Familiarity with available PS materials	0	0	0	100	0	0	50	50
Acquisition of PS skills	0	0	0	100	0	0	0	100
Importance of PS competence emphasised	0	0	50	50	0	0	50	50
Recognition of factors leading to PS incidents	0	0	50	50	0	0	50	50
Reporting of PS incidents								
Practicing reporting of PS incidents	0	0	0	100	0	0	100	0
Reporting of adverse event (danger to patient)	0	0	50	50	0	0	0	100
Reporting of near miss events regarding PS	50	0	0	50	0	0	0	100
Supportive and systems-based approach to ensure PS								
Use of checklists to ensure PS	0	50	50	0	0	50	0	50
Learning systematically from PS errors	0	50	50	0	0	0	100	0
Interdependence between quality care and PS	0	0	0	100	0	0	0	100
Patient-centred care to promote PS	0	0	100	0	0	0	100	0
Responsibility of pharmacist in ensuring PS	0	0	0	100	0	0	0	100
Efficient teamwork ensuring PS	0	0	50	50	0	0	50	50
Clear communication ensuring PS	0	0	100	0	0	0	100	0
A systems-based approach to errors	0	0	50	50	0	0	50	50
Supportive environment for PS learning	0	0	50	50	0	0	50	50

Note. PS = Patient safety. Percentages expressed for the included sub-scale: 1 = Fully disagree, 2 = Disagree, 3 = Agree, 4 = Fully agree. Percentages expressed for the important sub-scale: 1 = Not important at all, 2 = Somewhat important, 3 = Important, 4 = Very important

Table IIc: Third-year pharmacy students' perceptions about patient safety learning in clinical settings (n = 11)

Scale item	Included %				Important %			
	1	2	3	4	1	2	3	4
Gaining experience about ensuring PS								
Discussed PS with supervisors	0	0	0	100	0	0	100	0
Familiarity with available PS materials	0	0	0	100	0	0	50	50
Acquisition of PS skills	0	0	0	100	0	0	0	100
Importance of PS competence emphasised	0	0	50	50	0	0	50	50
Recognition of factors leading to PS incidents	0	0	50	50	0	0	50	50
Reporting of PS incidents								
Practicing reporting of PS incidents	0	0	0	100	0	0	100	0
Reporting of adverse event (danger to patient)	0	0	50	50	0	0	0	100
Reporting of near miss events regarding PS	50	0	0	50	0	0	0	100
Supportive and systems-based approach to ensure PS								
Use of checklists to ensure PS	0	50	50	0	0	50	0	50
Learning systematically from PS errors	0	50	50	0	0	0	100	0
Interdependence between quality care and PS	0	0	0	100	0	0	0	100
Patient-centred care to promote PS	0	0	100	0	0	0	100	0
Responsibility of pharmacist in ensuring PS	0	0	0	100	0	0	0	100
Efficient teamwork ensuring PS	0	0	50	50	0	0	50	50
Clear communication ensuring PS	0	0	100	0	0	0	100	0
A systems-based approach to errors	0	0	50	50	0	0	50	50
Supportive environment for PS learning	0	0	50	50	0	0	50	50

Note. PS = Patient safety. Percentages expressed for the included sub-scale: 1 = Fully disagree, 2 = Disagree, 3 = Agree, 4 = Fully agree. Percentages expressed for the important sub-scale: 1 = Not important at all, 2 = Somewhat important, 3 = Important, 4 = Very important.

Table IId: Fourth-year pharmacy students' perceptions about patient safety learning in clinical settings (n = 16)

Scale item	Included %				Important %			
	1	2	3	4	1	2	3	4
Gaining experience in ensuring PS								
Discussed PS with supervisors	0	0	62.5	37.5	0	12.5	12.5	75.0
Familiarity with available PS materials	0	6.3	31.3	62.5	0	6.3	31.3	62.5
Acquisition of PS skills	0	0	68.8	31.3	0	0	25.0	75.0
Importance of PS competence emphasised	0	12.5	50.0	37.5	0	6.3	25.0	68.8
Recognition of factors leading to PS incidents	0	6.3	62.5	31.3	0	6.3	37.5	56.3
Reporting of PS incidents								
Practising the reporting of PS incidents	12.5	56.3	31.3	0	0	12.5	50.0	37.5
Reporting of adverse event (danger to patient)	12.5	25.0	50.0	12.5	0	6.3	31.3	62.5
Reporting of near-miss events regarding PS	12.5	25.0	50.0	12.5	0	0	56.3	43.8
Supportive and systems-based approach to ensure PS								
Use of checklists to ensure PS	0	43.8	37.5	18.8	6.3	12.5	37.5	43.8
Learning systematically from PS errors	0	25.0	43.8	31.3	0	6.3	56.3	37.5
Interdependence between quality care and PS	0	12.5	62.5	25.0	0	6.3	37.5	56.3
Patient-centred care to promote PS	0	12.5	37.5	50.0	0	6.3	37.5	56.3
Responsibility of the pharmacist in ensuring PS	0	0	31.3	68.8	0	0	12.5	87.5
Efficient teamwork ensuring PS	0	18.8	37.5	43.8	0	6.3	37.5	56.3
Clear communication ensuring PS	0	25.0	50.0	25.0	0	12.5	31.3	56.3
A systems-based approach to errors	0	25.0	37.5	37.5	0	6.3	43.8	50.0
Supportive environment for PS learning	0	0	50.0	50.0	0	0	25.0	75.0

Note. PS = Patient safety. Percentages expressed for the included sub-scale: 1 = Fully disagree, 2 = Disagree, 3 = Agree, 4 = Fully agree. Percentages expressed for the important sub-scale: 1 = Not important at all, 2 = Somewhat important, 3 = Important, 4 = Very important.

For the included subscale, all 29 participants agreed (i.e. responded with "*agree*" or "*fully agree*") that they had discussed patient safety issues with their supervisor. Ninety-seven per cent of the participants agreed that the placement provided a supportive patient safety environment. The pharmacists' responsibility in patient safety was highlighted, and they became familiar with patient safety materials and acquired patient safety skills. Items with the greatest percentage of participants in disagreement (i.e. responded with disagree or fully disagree) included practising the reporting of patient safety incidents (55%), the use of patient safety checklists (45%), and reporting of near misses (31%).

For the important subscale, items were predominantly rated (94% of responses) as "*important*" or "*very important*". Items the majority of participants rated as very important to patient safety learning included the acquisition of patient safety skills (76%), highlighting the pharmacist's responsibility in patient safety (76%), a supportive patient safety environment (76%), discussing patient safety issues with your supervisor (72%), the reporting of adverse events (72%), and the importance of patient safety competence was emphasised (69%). Items with the lowest percentage of agreement (i.e. responses of "*somewhat important*" or "*not important*") were the use of patient safety checklists (17%), reporting of patient safety incidents (10%) and discussing patient safety with supervisors (10%). Descriptive statistics for the sum variables are shown in Tables IIIa, b, c, and d.

Table IIIa: Descriptive statistics for all students' responses grouped by factors (n = 29)

Sum variables	M	SD
Gaining experience in ensuring PS		
Included	3.39	0.36
Important	3.63	0.46
Reporting of PS incidents		
Included	2.75	0.65
Important	3.49	0.43
Supportive and systems-based approach to ensure PS		
Included	3.20	0.41
Important	3.46	0.40

Table IIIb: Descriptive statistics for second year students' responses grouped by factors (n = 2)

Sum variables	M	SD
Gaining experience in ensuring PS		
Included	3.40	0.00
Important	3.50	0.14
Reporting of PS incidents		
Included	2.33	0.94
Important	3.67	0.00
Supportive and systems-based approach to ensure PS		
Included	3.28	0.79
Important	3.39	0.24

Table IIIc: Descriptive statistics for third-year students' responses grouped by factors (n = 11)

Sum variables	M	SD
Gaining experience in ensuring PS		
Included	3.45	0.42
Important	3.67	0.51
Reporting of PS incidents		
Included	3.21	0.54
Important	3.57	0.42
Supportive and systems-based approach to ensure PS		
Included	3.17	0.54
Important	3.42	0.43

Table IIId: Descriptive statistics for fourth-year students' responses grouped by factors (n = 16)

Sum variables	M	SD
Gaining experience in ensuring PS		
Included	3.35	0.35
Important	3.61	0.46
Reporting of PS incidents		
Included	2.47	0.52
Important	3.42	0.46
Supportive and systems-based approach to ensure PS		
Included	3.21	0.35
Important	3.49	0.42

Mean scores were consistently lower for the included, compared to the important sub-scale, with the included "*Reporting patient safety incidents*" items displaying the lowest mean scores. The important "*Gaining experience to ensure patient safety"* items recorded the highest mean scores.

Responses to the open-ended question "*What else would you like to say regarding your education in patient safety while on placement?*" generally related to either omission or inconsistent inclusion of patient safety learning. Responses included: there was a lack of systematic structure around the pharmacist's role in patient safety, there were large variances between staff, there were no specific patient safety practices shown, and there was a lack of explicit inclusion of patient safety learning on clinical placements.

Focus group results

The focus group findings suggest that students appreciate the importance of learning patient safety in clinical pharmacy settings.

"*The role of medication or patient safety for a pharmacist is like two domains, like practical and then theoretical stuff, and you gotta put them together*." - Student A

A deductive thematic analysis, utilising principal component analysis of the original PasNEQ tool, was used to determine usefulness for pharmacy students. A priori themes were identified as: 1) A supportive and system-based approach to ensuring patient safety; 2) Gaining experience to ensure patient safety; and 3) Reporting patient safety incidents.

A supportive and system-based approach to ensuring patient safety

A supportive and system-based approach to ensuring patient safety was described by one pharmacy student who saw their role in safety as *"How to find the least risk adverse solution for them?"* - Student B.

A student discussed how they felt they were part of the system*: "I make it a habit. In my practice using, utilising all of the tools that will possibly make my practice safer. But when I'm taking medications off the shelf to give them to somebody, they're in a bag with their name on it. And I always open it up, you know? And I check that."*

Additionally, students mentioned that their role was to "*To regulate the prescription for, and make sure that the patient has the safe and appropriate medication*," and "*I feel like that's a huge role that I play. It's trying to meet the GPs, the goal of the GP with their medication management and how the patients take their medicines, the real-world logistics of taking medicine*," Student B.

Gaining experience to ensure patient safety

In terms of gaining experience, students explained the broader role of pharmacists in safeguarding patient outcomes:

"*if there was any ambiguity in your label at all, you kind of felt like you were failing the person you had to be incredibly explicit with your label instructions*." (Student A), and "*I felt as though in that situation I probably could have contributed, you know, and helped that patient understand a little bit more what the differences were, but I didn't feel like it was appropriate for me. Because I thought I would kind of be undermining her (pharmacist) knowledge*" - Student B

Another student recognised that the real-world practice was sometimes different from what is taught in class; "*In the ideal world, I think the role is to make sure you know that everything's appropriate. But I do understand that there are pressures there, so sometimes I do see a risk-based approach, for example, based on certain medications. Is this one likely to cause harm*?" - Student C

Reporting patient safety incidents

"*I've actually caught two really serious medication errors where it was completely the wrong drug in the box, and the patient was like Ohh, that's usually a different box and I was like, Why is it a different box?"*- Student D. "*And so, while we do have all the technology and all bits and pieces, having manual checking processes to make sure that things are good, are still important*." Student D.

From the focus group interaction, it may be suggested that the PaSNEQ may enable the understanding of the students' experiences during their placements, to ensure the greatest gain from the opportunity to assimilate theory and practice during clinical placements. The focus group findings suggest students believed the PaSNEQ had face validity and adequately covered the topic. *"This (PaSNEQ) covered most of the things that I would expect when being asked about patient safety."* - Pharmacy Student C. However, one student also reported that they *"actually had to really think about what the reality of my experience was, as opposed to what I wanted it to be."* Student D.

Discussion

The present pilot study investigated whether an adapted PaSNEQ, contextualised for pharmacy, is a feasible and valid measure of pharmacy students' perceptions of patient safety learning during clinical placements. The study findings suggest that students highly value gaining experience in patient safety and perceive discussions with supervisors and acquisition of patient safety skills as integral components of their placement learning. However, notable gaps remain regarding the practical experience of reporting patient safety incidents. These findings align with previous studies, which highlight the unpreparedness of pharmacy students for real-world patient safety challenges, despite strong theoretical training (Frenzel *et al.,* 2018; El-Awaisi *et al*., 2022). Research suggests that experiential learning opportunities, including active error reporting and systems-based safety practices, are essential for bridging the gap between classroom knowledge and practical application (Ginsburg *et al*., 2013; Tella *et al*., 2015b).

The study further echoes international pharmacy education literature, which identifies variability and lack of standardisation in patient safety education across programs (El-Awaisi *et al*., 2022). Recent studies emphasise that integrating systematic patient safety training into pharmacy curricula, globally, is critical in preparing graduates for evolving professional roles (Coombes *et al*., 2015; Ernawati *et al.,* 2022). In particular, embedding safety concepts throughout experiential placements enhances student confidence, encourages reflective practice, and strengthens their readiness to contribute to safer pharmacy practice upon graduation (El-Awaisi *et al*., 2022).

Moreover, the WHO's "*Medication Without Harm*" initiative and Australia's commitment to a 50% reduction in medication-related harm underscore the urgency of equipping pharmacy graduates with practical patient safety competencies (Donaldson *et al*., 2017; ACSQHC, 2020). Pharmacy educators must not only incorporate theoretical safety principles but also explicitly design opportunities for students to practise error reporting and engage with real-world safety systems.

In this study, the students' perceived lack of incident reporting experience may reflect either the limited availability of such opportunities during placements or discomfort and uncertainty around reporting processes. This suggests an urgent need for clear guidance and structured learning objectives in this domain. Strengthening partnerships with placement sites and educating preceptors on the importance of involving students in safety activities could be key strategies to address this gap.

The high internal consistency of the adapted PaSNEQ indicates its effectiveness as an evaluation tool for systematically capturing students' experiences and informing curriculum development. Future research with larger, more diverse samples and longitudinal tracking can further validate the tool and assess the impact of targeted curricular interventions on student preparedness for safe practice.

Limitations

This pilot study has several limitations. First, the small sample size (n = 29), particularly the limited number of second-year students (n = 2), restricts the generalisability of the findings. As such, the results should be interpreted cautiously and considered exploratory. Larger studies are needed to confirm the reliability and validity of the adapted PaSNEQ in diverse cohorts of pharmacy students. Second, the study employed a cross-sectional design, capturing perceptions at a single point in time following clinical placements. This limits the ability to assess changes in patient safety learning perceptions over time or in response to specific curricular interventions. Third, participation in the focus group was voluntary, and only a subset of students who expressed initial interest took part. This self-selection may have introduced response bias, as students who felt more strongly about patient safety may have been more motivated to participate. Additionally, the use of self-report measures, including the adapted PaSNEQ, may be subject to social desirability bias, potentially leading students to overreport positive experiences or underreport negative aspects of their placements. Finally, the study did not systematically evaluate the placement settings or supervisors' approaches to patient safety education. As such, it is unclear whether reported gaps reflect actual deficiencies in practice or students' lack of awareness or engagement with existing patient safety initiatives.

Future research should address these limitations by involving larger and more diverse samples, using longitudinal designs, and incorporating objective measures or supervisor assessments to triangulate student-reported data.

Conclusion

This pilot study demonstrates that the adapted PaSNEQ is a feasible and reliable tool to assess pharmacy students' perceptions of patient safety learning during clinical placements. The findings highlight a clear recognition among students of the importance of patient safety, particularly in gaining practical skills and fostering a supportive, systems-based approach. However, significant gaps were identified in students' experiences with reporting patient safety incidents, underscoring a critical area for curricular improvement.

By providing a structured and validated measure, the adapted PaSNEQ enables pharmacy educators to systematically evaluate and enhance patient safety education, bridging the gap between academic preparation and clinical practice. Incorporating this tool into routine program evaluation can guide targeted improvements, strengthen patient safety competencies. Embedding explicit, experiential patient safety learning, including active reporting of incidents, will be crucial to prepare future pharmacists as confident and competent contributors to safer pharmacy practice.

References

Aubin, D., & King, S. (2015). Developing a culture of safety: Exploring students' perceptions of errors in an interprofessional setting. *Journal of Interprofessional Care*, **29**(6), 646–648. https://doi.org/10.3109/13561820.2015.1045060

Australian Commission on Safety and Quality in Health Care (2011). *National safety and quality health service standards. Sydney: Australian Commission on Safety and Quality in Health Care*. http://www.safetyandquality.gov.au/wp-content/uploads/2011/09/NSQHS-Standards-Sept-2012.pdf

Bader, L., Kusynová, Z., & Duggan, C. (2019). FIP perspectives: Realising global patient safety goals requires an integrated approach with pharmacy at the core. *Research in Social and Administrative Pharmacy*, **15**(7), 815–817. https://doi.org/10.1016/j.sapharm.2019.02.012

Bajis, D., Chaar, B., Basheti, I. A., & Moles, R. (2019). Pharmacy students' medication history taking competency: Simulation and feedback learning intervention. *Currents in Pharmacy Teaching and Learning*, **11**(10), 1002–1015. https://doi.org/10.1016/j.cptl.2019.06.007

Cervera-Gasch, Á., González-Chordá, V. M., Manrique-Abril, F. G., Andreu-Pejo, L., Valero-Chillerón, M. J., & Mena-Tudela, D. (2021). Validation of the attitudes to patient safety questionnaire for nursing students in the Spanish context. *BMC Nursing*, **20**, 101. https://doi.org/10.1186/s12912-021-00634-y

Coombes, I., Wheeler, A., & Hale, A. (2015). Evaluation of effectiveness and relevance of safe medication practice tutorials as a course for pharmacist prescribers in New Zealand. *Pharmacy Education*, **11**(1), 95–98. https://pharmacyeducation.fip.org/pharmacyeducation/article/view/332

Cooper, S., Can't, R., Waters, D., Luders, E., Henderson, A., Willetts, G., Tower, M., Reid-Searl, K., Ryan, C., & Hood, K. (2020). Measuring the quality of nursing clinical placements and the development of the Placement Evaluation Tool (PET) in a mixed-methods co-design project. *BMC Nursing*, **19**(1). https://doi.org/10.1186/s12912-020-00491-1

Donaldson, L. J., Kelley, E. T., Dhingra-Kumar, N., Kieny, M.-P., & Sheikh, A. (2017). Medication without harm: WHO's third global patient safety challenge. *The Lancet (British Edition)*, **389**(10080), 1680–1681. https://doi.org/10.1016/S0140-6736(17)31047-4

El-Awaisi, A., Koummich, S., Koraysh, S., & El Hajj, M. S. (2022). Patient safety education in entry to practice

pharmacy programs: A systematic review. *Journal of Patient Safety*, **18**(2), e373-e386. https://doi.org10.1097/PTS.0000000000000818

Ernawati, D. K., Astuti, I. W., Susilawati, L. K. P. A., & Sumardika, I. W. (2022). The development of a medication safety module for healthcare professionals: Results of a Delphi technique. *Pharmacy Education*, **22**(2), 70–73. https://doi.org/10.46542/pe.2022.222.7073

Frenzel, J. E., Skoy, E. T., & Eukel, H. N. (2018). Use of simulations to improve pharmacy students' knowledge, skills, and attitudes about medication errors and patient safety. *American Journal of Pharmaceutical* Education, **82**(8), 6644–6644. https://doi.org/10.5688/AJPE6644

Ginsburg, L. R., Tregunno, D., & Norton, P. G. (2013). Self-reported patient safety competence among new graduates in medicine, nursing and pharmacy. *BMJ Quality & Safety*, **22**(2), 147–154. https://doi.org/10.1136/bmjqs-2012-001308

Hollamby, J., Taylor, I., Berragan, E., Taylor, D., & Morgan, J. (2018). Preparing students for safe practice using an interprofessional ward simulation. *Journal of Interprofessional Education & Practice*, **12**, 78–82. https://doi.org/10.1016/j.xjep.2018.06.002

International Pharmaceutical Federation (2020). Patient safety: Pharmacists' role in "*Medication without harm*". https://www.fip.org/file/4757

Iverson, L., Bredenkamp, N., Carrico, C., Connelly, S., Hawkins, K., Monaghan, M. S., & Malesker, M. (2018). Development and assessment of an interprofessional education simulation to promote collaborative learning and practice. *The Journal of Nursing Education*, **57**(7), 426–429. https://doi.org/10.3928/01484834-20180618-08

Kearney, A., Adey, T., Bursey, M., Cooze, L., Dillon, C., Barrett, J., ... & McCarthy, P. (2010). Enhancing patient safety through undergraduate inter-professional health education. *Healthcare Quarterly*, **13**, 88–93. https://doi.org/10.12927/hcq.2010.21972

Langari, M. N. M., Tella, S., Smith, N. J., & Turunen, H. (2017). Self-assessment of patient safety competence: A questionnaire survey of final year British and Finnish pre-registration nursing students. *International Journal of Caring Sciences*, **10**(3), 1212–1223. http://search.proquest.com.acs.hcn.com.au/scholarly-journals/self-assessment-patient-safety-competence/docview/1988004119/se-2

Langlois, S. (2016). Developing an appreciation of patient safety: Analysis of interprofessional student experiences with health mentors. *Perspectives on Medical Education*, **5**(2), 88–94. https://doi.org/10.1007/s40037-016-0258-4

Lee, S. E., Morse, B. L., & Kim, N. W. (2021). Patient safety educational interventions: A systematic review with recommendations for nurse educators. *Nursing Open*, **9**(4), 1967–1979. https://doi.org/10.1002/nop2.955

Schaffer, S. D., & Munyer, T. O. (2015). Online learning: Integrating interprofessional and patient safety competencies into Doctor of Nursing practice and Doctor of Pharmacy curricula. *Journal for Nurse Practitioners*, **11**(2), e11–e15. https://doi.org/10.1016/j.nurpra.2014.11.007

Scalese, M. J., Kristeller, J., Hoot, E., & Kong, F. (2015). A case-based approach for teaching medication safety to pharmacy students. *Currents in Pharmacy Teaching and Learning*, **7**(4), 458–464. https://doi.org/10.1016/j.cptl.2015.04.011

Steven, A., Magnusson, C., Smith, P., & Pearson, P. H. (2014). Patient safety in nursing education: Contexts, tensions and feeling safe to learn. *Nurse Education Today*, **34**(2), 277–284. https://doi.org/10.1016/j.nedt.2013.04.025

Tella, S., Smith, N. J., Partanen, P., Jamookeeah, D., Lamidi, M., & Turunen, H. (2015a). Learning to ensure patient safety in clinical settings: comparing Finnish and British nursing students' perceptions. *Journal of Clinical Nursing.* **24**(19-20), 2954–2964. https://doi.org/10.1111/jocn.12914

Tella, S., Smith, N. J., Partanen, P., & Turunen, H. (2015b). Learning patient safety in academic settings: A comparative study of Finnish and British nursing students' perceptions. *Worldviews on Evidence-Based Nursing*, **12**(3), 154–164. https://doi.org/10.1111/wvn.12088

Vaismoradi, M., Bondas, T., Jasper, M., & Turunen, H. (2014). Nursing students' perspectives and suggestions on patient safety—Implications for developing the nursing education curriculum in Iran. *Nurse Education Today*, **34**(2), 265–270. https://doi.org/10.1016/j.nedt.2012.10.002

Walpola, R. L., Fois, R. A., McLachlan, A. J., & Chen, T. F. (2015). Evaluating the effectiveness of a peer-led education intervention to improve the patient safety attitudes of junior pharmacy students: A cross-sectional study using a latent growth curve modelling approach. *BMJ Open,* **5**(12). https://doi.org/10.1136/bmjopen-2015-010045

World Health Organisation. (2011). *Patient safety curriculum guide: Multi-professional edition.* https://www.who.int/publications/i/item/9789241501958