



Undergraduate Nursing Students' Perceived Knowledge and Competence of Patient Safety: Comparison between Clinical and Classroom Settings

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Abstract

Safety is one of the six competencies outlined by Quality and Safety Education for Nurses. The study aimed to compare whether there is a difference in self-reported perception of knowledge and competence on patient safety learned from classroom versus clinical setting among undergraduate nursing student. A descriptive and comparative study design was conducted. A convenience sample of 140 undergraduate nursing students in their final year at a Midwest university completed the Health Professional Education in Patient Safety Survey (H-PEPSS). The tool was to measure student's perceived safety and knowledge confidence in the classroom and clinical setting. Data analysis was conducted using the latest version of SPSS. The overall H-PEPSS score was high (Mean = 4.3, SD = 0.64). Graduating nursing students were most confident in learning patient safety in the classroom rather than clinical setting. They are also most confident in the domains of *Clinical Safety* and *Communicating Effectively*, and least confident in *Recognize, Respond to, and Disclose Adverse Events and Close Calls*. Statistically significant differences were noted between the classroom and clinical setting; however, the effect size is low. The study suggested that graduating nursing students have high levels of perceived knowledge and confidence on patient safety at the time of graduation.

Keywords

Patient safety, Knowledge and confidence, Nursing students

Introduction

Patient safety is a “fundamental principle of healthcare” [1]. The WHO defines patient safety as the “prevention of errors and adverse effects to patients associated with healthcare.” Adverse events can occur in any complex setting such as healthcare system, which can have significant impact to patient care. The cost of adverse patient safety events in the United States (U.S.) and European health system in 2016 exceeded \$317B [2]. In their *Patient Safety in Healthcare, Forecast to 2022*, Frost and Sullivan predicted that by 2022, the estimated cost of adverse patient safety events will be a staggering \$384B [3]. It is therefore of utmost significance to address patient safety in healthcare from the provider perspective. Nurses are the largest healthcare providers in the healthcare system who have a role in ensuring and improving patient safety. Nursing education is the driving force that ensures nurse graduates have the competence to provide safe patient care.

The Quality and Safety Education for Nurses (QSEN) Institute guides nursing programs in developing curriculum to prepare safe nurses by defining six competencies a student should achieve by graduation and continue to utilize

in their daily nursing practice after graduation. Safety is one six competencies in the QSEN document [4]. Student's knowledge and competence on patient safety begins from training in nursing school either by learning it in the classroom or in the clinical setting. Therefore, the purpose of this study was to determine undergraduate nursing student's self-reported perceived knowledge and confidence in learning about patient safety in the clinical versus classroom setting.

Review of the Literature

There were limited studies that evaluated the concept of patient safety among graduating students in health care professions, including nursing. Studies that examined

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perception of patient safety were among medical students [5,6], dental students [7], physical therapy student (pharmacy students [8], and physiotherapy students [9]. There were few studies on nursing student's perception of patient safety found in the literature; however, most of them were conducted outside the U.S., [10-15]. Other studies were on translating and validating patient safety instruments [16-18]. Levett-Jones, et al. [19] also developed Patient Safety Competency Framework for Nursing Students. This framework identified nine domains that nursing students must achieve to practice patient safety. The nine domains are patient-centered care, therapeutic communication, cultural competence, teamwork and collaborative practice, clinical reasoning, evidence-based practice, and preventing, minimizing and responding to adverse events [19].

Method

Design and sample

This is a descriptive and comparative study design. All undergraduate students in their last year of nursing program at a large university in Michigan were eligible to participate. Students were recruited through flyers posted throughout the university and by asking faculty members teaching undergraduate courses to distribute flyers in their classes. The study was conducted from fall 2017 to summer 2018. No grade or extra credit was assigned to students who participated in this research study.

Instrument

Perceived Patient Safety Knowledge and Competence: The Health Professional Education in Patient Safety Survey (H-PEPSS) was used to assess student's perception of nurses' own perceived patient safety knowledge and competence. The tool is designed to measure competence in the classroom and clinical setting separately. The H-PEPSS is a 20-item survey using a 5-point (disagree-agree) Likert scale that assesses knowledge, attitudes and skills required for health care professionals to be considered competent in patient safety. The seven dimension of patient safety measured include: 1) Clinical safety, 2) Contribute to a culture of patient safety, 3) Work in teams for patient safety, 4) Communicate effectively for patient safety, 5) Manage safety risks, 6) Optimize human and environmental factors and 7) Recognize, respond to and disclose adverse events and close calls [20]. The mean for each dimension is calculated to obtain a dimension score. A high mean signifies better patient safety competence The H-PEPSS is a valid and reliable tool, with Cronbach's alpha that ranges from 0.81-0.85 [20]. Permission to use the H-PEPSS was obtained from Dr. L. Ginsburg via email personal communication.

Data Analysis

Descriptive statistics was used to analyze the demographic and individual H-PEPSS scales. Paired t-test was used to compare the classroom and clinical results. Effect size between classroom and clinical settings was calculated using Cohen's d statistics.

Table 1: Student socio-demographics.

Characteristics	Frequency (n)
Age (Mean)	23.5 (SD = 5) (n = 139)
Gender	% (n)
Female	84% (117)
Males	16% (23)
Race	
Asian	5% (7)
Black/African Americans	9 (12)
Pacific Islander	1 (2)
White	84% (117)
Did not disclose	1% (2)
Ethnicity	
Hispanic	4.3 (6)
Marital Status	
Single	42.9% (60)
Married	10.7% (15)
Divorced/Separated	2.8% (4)
In a relationship	43.6% (61)
Nursing Program	
Accelerated	19% (27)
Traditional	54% (76)
2 + 2	26% (37)
Working in a healthcare facility	
Yes	52% (73)

Results

Student characteristics

One-hundred forty-seven nursing students participated in the study. Data from 140 students with completed survey were included in the analysis. Students had a mean age of 23.5 (SD = 5) years of age, 84% females, and 84% whites. Table 1 presents the student's socio-demographics.

Perceived patient safety knowledge and competence

The patient safety knowledge and competence by students was high (Mean = 4.3, SD = 0.64) in all dimension of the H-PEPSS, both in the classroom and clinical setting. Although, the overall mean H-PEPSS scores between classroom (4.35, SD = 0.66) and clinical (4.2, SD = 0.68) were statistically significant (t(139) = 5.6, p = < 0.001), with students more confident with classroom than clinical setting; however, the effect size was small (0.1). Table 2 presents the comparison of the H-PEPSS scores between classroom and clinical settings. Graduating nursing students were most confident in the domains of *Clinical Safety* and *Communicating Effectively*; and least confident in the *Recognize, Respond to and Disclose Adverse Events and Close Calls*. There were statistically

Table 2: Comparison of the patient safety dimensions between classroom and clinical.

Patient Safety Dimension	Setting	n	Mean	SD	P value	Effect size
Clinical Safety	Classroom	140	4.7	0.68	< 0.001	0.3
	Clinical	140	4.5	0.70		
Culture of Safety	Classroom	140	4.4	0.76	< 0.001	0.3
	Clinical	140	4.2	0.77		
Working in Teams with Other Health Professionals	Classroom	140	4.2	0.84	0.004	0.2
	Clinical	140	4.0	0.91		
Communicating Effectively	Classroom	140	4.5	0.74	0.001	0.1
	Clinical	140	4.4	0.82		
Managing Safety Risks	Classroom	140	4.2	0.82	0.001	0.2
	Clinical	140	4.0	0.88		
Understanding Human and Environmental Factors	Classroom	140	4.3	0.90	0.022	0.1
	Clinical	140	4.2	0.89		
Recognize, Respond to and Disclose Adverse Events and Close Calls	Classroom	140	4.1	0.92	< 0.001	0.1
	Clinical	140	3.9	0.97		

significant differences in mean scores on all of the patient safety dimensions between the classroom and clinical setting noted in all dimension; however, the effect sizes were small and, therefore, may be of low clinical significance.

Discussion

Our study showed that graduating nursing students have high level of knowledge and confidence on patient safety at the time of graduate. Although, we did not have data comparing the patient safety knowledge and competence of students during the earlier years in the nursing program, the mean scores were consistent with higher level students from other studies [10,14]. This is not surprising as students are expected to gain more knowledge and skills as they progress in nursing school and towards graduation.

Graduating students were found to be most confident with patient safety learned in the classroom setting than clinical setting. This finding is similar with several studies from abroad [13,15,18,21]. There may be several explanations for our findings. Lack of preceptors is a major factor. Staff nurses precepting students are not educators and the unit may be too busy for them to teach nursing students; hence the quality of clinical preceptorship may hinder the learning in clinical setting. This finding further validates the theory-practice gap, in which there is a disconnect between what the students were learning in the classroom and the clinical setting. This result, however, is in contrast to a recent study by Rebesch [22] of baccalaureate nursing students in public university in Northeastern U.S., although their sample size was smaller.

The patient safety domains *Clinical Safety*, and *Communicating Effectively* were the two areas in which students were most confident. This result in Clinical Safety domain is consistent with several studies of trainees including medical and post-graduate students [23]. Similarly, the finding on Communicating Effectively was consistent with Levett-Jones, et al. [19] study of 1696 nursing students who were in their final years in Australia and New Zealand. However,

this finding was in conflict with Ginsburg, et al. [21]. WHO reported that nursing students have declining self-confidence in the later years of their study on teamwork, communicating effectively compared to physicians and pharmacists.

Lastly, the study found that graduating students were least confident with *Recognize, Respond to and Disclose Adverse Events and Close Calls* domain of patient safety. This may not be surprising as nursing students may not have developed the intuition and self-confidence to recognize and report adverse events to physicians or supervisors. Indeed, the hierarchical nature of healthcare system may prevent nursing students from reporting since they perceived themselves to be at the bottom of the hierarchy and may not be listened to or taken seriously by a health care provider. At the same time, nursing students may feel scared reporting safety issues because it may result in negative consequences, as a student and future nurses [13].

This study acknowledges several limitations. First, the study was self-report by the students and no objective evaluation was used to assess outcomes. Second, this is a cross-sectional study. Third, it a convenience sample of nursing students from one local university in Michigan, which limits generalizability. Lastly, we only evaluated the student's patient safety confidence during their last year in the program, hence we were not able to compare whether there was an improvement in the student's confidence in patient safety knowledge and confidence at the time of graduation. It is recommended that this study be repeated with larger sample size, compare confidence between students from one region of the U.S., and to compare confidence with other student variables, including the use of simulation. The evolving use of virtual reality simulation may be another variable to include besides classroom and clinical settings.

Conclusion

Our study highlighted that nursing students should possess high levels of confidence on patient safety at the

time of graduation. As the clinical environment continues to become more complex, it is vital that nursing students are able to perform effectively competencies that prepare them for the necessary knowledge and skills that they must perform to provide safe and effective care in the clinical environment. If students are confident and able to perform the necessary skills they will be able to promote client safety in the clinical environment.

Ethical Consideration

Institutional Review Board approval was obtained. All student participants signed the informed consent. None of the researchers was the instructor of the students at the time of data collection.

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