

Original Article

Self-Assessment of Patient Safety Competence: A Questionnaire Survey of Final Year British and Finnish Pre-Registration Nursing Students

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Abstract

Background: The integration of patient safety into nursing curricula has been under the spotlight during recent years. Effective patient safety pedagogies and students' sensitivity to their own role in healthcare have important roles in ensuring safe clinical performances. The patient safety content of pre-registration nursing education has previously been studied, but there is sparse evidence about how nursing students assess their own patient safety competence.

Objective: To examine and compare the self-assessment of patient safety competence between British and Finnish nursing students.

Methods: The Patient Safety in Nursing Education Questionnaire (PaSNEQ), in the 4-point Likert scale format, was used. We distributed 502 surveys to the final year nursing students, prior to registration in two universities of applied sciences in Finland (n = 299) and two universities in the UK (n = 203) during 2012. Of which, a total of 353 (70%) nursing students in Finland (n=195) and the UK (n=158) responded to the survey. The data were analyzed with descriptive statistics and binary logistic regression.

Results: Majority of both British and Finnish participants reported that their curriculum did not include a separate module for patient safety. The overall patient safety competence of British and Finnish nursing students was high. However, the British nursing students evaluated their overall patient safety competence significantly higher than Finnish nursing students. Both groups of students ranked their competence to prevent patient safety incidents (attitude) the highest and their competence to act after errors (skill) relatively low. The predictors for having a high level of patient safety competence for nursing students were being British and detecting separate patient safety module in the curriculum.

Conclusions: Nurse educators should provide students with more effective practice environment that will prepare them with the patient safety skills needed to respond to errors at work safely.

Keywords: Competence, Education, Nursing curriculum, Nurse educator, Patient safety, Pre-registration nursing student

Introduction

Patient safety concerns have emerged on a global level due to the increasing number of injuries and fatalities in healthcare (Kohn, Corrigan & Donaldson, 2000; Baines et al., 2013). Patient safety refers to “freedom from accidental injury” (Kohn, Corrigan & Donaldson, 2000, p.58). Nurses comprise the major body of healthcare professionals and play a key role in enhancing the quality and safety of care (Ramanujam, Abrahamson & Anderson, 2008) through the prevention and reporting of adverse events or medical errors (Vaismoradi, Salsali & Marck, 2011). Therefore, international and national patient safety guidelines have emphasized the importance of integrating patient safety into nursing education (European Network for Patient Safety (EUNetPaS), 2010; World Health Organization (WHO), 2011).

Within undergraduate nursing education, patient safety competence includes the three aspects of knowledge, skills, and attitudes, which have been designed to prepare nursing students for healthcare environments that require high levels of quality and safety (Cronenwett et al., 2007). Competence is determined based on an individual's ability to perform a safe care in a given situation based on the standards of care (Safadi et al., 2010). In this study, patient safety competence encompasses three dimensions of building patient safety competence (knowledge), preventing patient safety incidents (attitude) and acting after an error (skill).

In Europe, education and training for patient safety is developing under the collaboration and recommendations of EUNetPaS (2010). The UK sparked the initiatives of patient safety in Europe but patient safety education has been promoting gradually in both Finland and the UK and included in the curricula of universities and professional healthcare organizations (Patient Safety and Quality of Care Working Group, 2014). However, only limited research exists about the transformation of classroom patient safety knowledge into safe clinical practice (Ironsides, McNelis & Ebright, 2014; Steven et al., 2014), and it is unknown how European students perceive their patient safety competence (Tella et al., 2014; Stevanin et al., 2015). Hence, nursing students' self-assessments of their patient safety competence are a robust way to improve

patient safety education (Morris & Hancock, 2013; Tella et al., 2014; Lee, Jang & Park, 2016).

Background

Registered nurses who have recently graduated make up more than 10% of a hospital's nursing staff; however, only 10% of nursing executives believe that the new nurses are well prepared to provide safe and appropriate care (Berkow et al., 2009). Newly graduate nurses should understand the importance of a systems-based approach to errors, patient-centered care, and learning from errors. In fact, healthcare quality is positively associated with nursing education (Dimitriadou et al., 2015), and the quality of education is a determinant factor that improves nurse competence in the clinical performance (Istomina et al., 2011).

The WHO patient safety curriculum guide (2009) recommends that healthcare students understand both patient safety and the complexity of healthcare. There has been an emphasis on integrating the six core competencies of quality and safety education for nurses, which includes the three aspects of knowledge, skills, and attitudes, into nursing curricula to improve the clinical safety performance of recently graduated nurses (St Onge et al., 2013). The six core competencies of patient safety education include patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics (Cronenwett et al., 2007). However, according to Tella et al. (2014), the main patient safety content identified in the contemporary nursing education includes “learning from errors, responsible individual and inter-professional teamwork, anticipatory actions in complex environments, and patient safety-centered nursing” (p.10), and the extent to which each of these is covered differs across countries. Moreover, studies have emphasized that a nurse's education does not go into enough depth in terms of patient safety and is thus unable to bridge the gap between theory and practice (Attree, Cooke & Wakefield, 2008; Vaismoradi, Salsali & Marck, 2011; Cresswell et al., 2013; Steven et al., 2014; Tella et al., 2014; Colet et al., 2015). Therefore, educational enhancement in regard to patient safety content is essential by means of evaluating students' competencies (WHO, 2009).

The quality of patient safety education for nurses also influences a student's confidence in clinical and classroom settings, which will then affect the student's competence for providing safe care. It has been shown that students' patient safety confidence in the clinical setting decreases during the year prior to graduation (Lukewich et al., 2015). This is logical, as nursing students are mostly in the clinical setting during the last year of their studies, but their low level of confidence could also reflect inadequate or improper patient safety education. In self-reported competence, students evaluate their own knowledge and abilities to perform a task, and it has been shown that the resulting score does not deviate much from the competence assessment done by another person (Lauder et al., 2008). A growing body of literature suggests that student self-evaluations of patient safety competence and knowledge are essential for addressing the educational needs of healthcare professionals and preparing students to provide high-quality care (Ginsburg, Tregunno & Norton, 2013; Stevanin et al., 2015; Bressan et al., 2016).

This article aims to examine and compare the self-assessments of patient safety competence between pre-registration nursing students in two European countries, Finland and the UK.

The research question was:

How do British and Finnish pre-registration nursing students assess their patient safety competence, and is there a difference between the two groups of students?

Method

A questionnaire survey was implemented to 502 senior nursing students in Finland and the UK. Among collaborating universities in Europe, our international research group selected two British universities and two Finnish universities of applied sciences with the nursing program for this data collection. The research group members in Finland and the UK approached pre-registration nursing students in their classrooms. The paper questionnaires were distributed to 203 British participants between May and August 2012.

Afterward, data collection in Finland was conducted with 299 nursing students during November and December 2012. Participants were recruited using non-probability sampling.

The study population included final year undergraduate nursing students, prior to registration. The researchers did not collect the questionnaires to avoid the dual teacher-researcher role. Students were assured that study participation would have no effect on their final course evaluation and they had adequate time to complete the questionnaire. The action of filling out a questionnaire was assumed to reflect informed consent (Grove & Burns, 2012).

The instrument

A validated research instrument, the Patient Safety in Nursing Education Questionnaire (PaSNEQ) was used (Tella, 2015). The PaSNEQ consists of two main sections and was designed based on the recent patient safety literature and guidelines. The first section obtains demographic information (gender, age, education, work experience in healthcare, having separate modules for patient safety in nursing education), while the second section assesses nursing students' perceptions of patient safety based on three categories: patient safety in the academic setting (19 items), patient safety in the clinical setting (17 items), and patient safety competence (14 items). This paper presents the analysis results concerning the third category of the PaSNEQ: patient safety competence.

The questionnaire followed a 4-point Likert scale ("fully disagree", "disagree", "agree", "fully agree") and its validity and reliability was tested meticulously. The initial version of the questionnaire was in the Finnish language, then double-blind back-translated into English and Finnish by two different native, bilingual translators, resulting in two English versions and two Finnish versions.

Afterward, members of the British and Finnish patient safety research groups, as well as the translators, checked that both versions of the questionnaires (English and Finnish) were equivalent in terms of concepts and content.

The questionnaire was first piloted with 15 British 24 and Finnish pre-registration nursing students recruited by convenience sampling. Necessary revisions were made to the latest version of the questionnaire based on the pilot test results. All participants answered the questions in their native language (Finnish or English).

Statistical analysis

Statistical analyses were performed with SPSS software version 21.0 (IBM Corp., Armonk, NY, USA). Descriptive data are presented as frequencies, percentages, mean values and standard deviations of variables. An exploratory factor analysis of the instrument's variables identified three factors that underlie patient safety competence, as follows: building patient safety competence (knowledge); competence to act after an error (skill); and competence to prevent patient safety incidents (attitude). Cronbach's alpha co-efficient was calculated to evaluate the internal consistency of variables measuring patient safety competence. The total Cronbach's alpha for the patient safety competence items was 0.89, which demonstrates the good reliability (Table 1). The questionnaire data were on the ordinal scale and did not exhibit normal distribution; thus, both Mann-Whitney U and Pearson's chi-squared tests were performed. Chi-squared test was used if expected count was more than 1 or less than 5 in 20% of cells, unless Fisher Exact test was used. The statistical significance level was defined as $p < 0.05$. A binomial logistic regression model was used to examine whether background variables predict the patient safety competence levels. Dichotomous nominal independent variables were country, gender, level of education, and the inclusion of a patient safety module in nursing education. Other covariate categorical variables were age and work experience in healthcare. The dependent binary variable was patient safety competence level (high level = 1-1.34, Low level = 1.35-4).

Ethical considerations

The University Committee on Research Ethics granted permission for this study. Additionally, permissions for survey implementation were obtained from the British and Finnish target universities. All participants received a cover letter containing detailed information about the study, as well as names and contact information of the researchers involved. Participants were informed about their right to voluntary participation, anonymity, confidentiality and withdrawal at any point during the study. Collected data were saved securely and were only accessible to our research team.

Results

Demographics

The total response rate was 70%. From the British students, 158 participated in the study with a response rate of 78%, while 195 Finnish students returned the questionnaire with a response rate of 65%. The majority of participants (92%) were women in both Finland and the UK. The mean age of participants was 30 years. However, the Finnish pre-registered nursing students were, on average, younger than British students, as 73.6% of the Finnish students were 27 years old or younger, compared to 45.5% of the British students ($p < 0.05$). Nursing students with a bachelor's degree were seven times more common in the UK (14%) than in Finland (2%) ($p < 0.05$). Nearly all the Finnish pre-registration nursing students who participated in this study reported some work experience in healthcare (97.4%). Approximately 41% of the Finnish participants had worked in healthcare for less than one year, compared to only 14% of British participants. In contrast, the British group of nursing students had 3.5 times as many students with over six years of work experience in healthcare than the Finnish nursing students group (British, 22.3%; Finnish, 5.8%, $p < 0.05$). Most importantly, about 70% of nursing students from both countries did not detect separate patient safety modules in their current nursing education (Table 2).

Building patient safety competence (knowledge)

Regarding building patient safety competence (knowledge) in table 3, over 60% of both British ($n = 100$, 65.8%) and Finnish ($n = 124$, 63.9%) pre-registration nursing students highly agreed that their "*patient safety competence has continuously improved during their nursing education*". However, number of British students ($n = 80$, 52.6%) fully satisfied with their patient safety competence were higher comparing to only 28.4% ($n = 55$) of Finnish students ($p < 0.05$). Moreover, another observed statistical difference between two groups of students was related to *having good patient safety competence*. British students ($n = 79$, 52.3%) strongly believed that they had *good patient safety* two times more than Finnish students ($n = 48$, 24.7%) ($p < 0.05$).

Competence to act after errors (skill)

The British students were twice as confident as Finnish students to be *competent to immediately respond to an adverse event* (British, n = 98, 64.5%; Finnish, n = 44, 22.7%, p < 0.05). The British group was also more competent than Finnish group that they would *speak up about*

patient safety if a patient was at risk by another person in the healthcare environment (British, n = 65, 43.6%; Finnish, n = 62, 32%, p < 0.05). However, only 36.2% (n = 55) of the British and 8.2% (n = 16) of the Finnish students could successfully *analyze a patient safety report* (p < 0.05) (Table 3).

Table 1. Factor loadings for rotated exploratory factor analysis and Cronbach's alpha associated with three factors of the patient safety competence instrument.

	Variables	Factor	Factor	Factor	α
		1	2	3	
Building patient safety competence (knowledge)	Q1. My competence regarding patient safety is good	.848			0.78
	Q2. I am satisfied with my patient safety competence	.744			
	Q3. I understand the central concept related to patient safety, e.g. patient safety incident, near miss, adverse event and barriers	.779			
	Q4. My competence in patient safety has continuously improved during my nursing education	.369			
Competence to act after an error (skill)	Q5. If I notice a patient safety incident (an adverse event or a near miss event), I know how to make the patient safety report		.881		0.75
	Q6. After a report of patient safety incident is made, I know how the analysis should proceed		.779		
	Q7. If I notice an adverse event (patient suffer of harm), I respond immediately as the situation requires.		.541		
	Q8. If another health care professional behaves in a manner that puts the patient at risk, I intervene without delay		.548		
Competence to prevent patient safety incidents (attitude)	Q9. I plan to continue to develop my patient safety competency after graduation			.880	0.80
	Q10. I understand the role of effective teamwork to ensure patient safety			.791	
	Q11. I work systematically to ensure patient safety			.371	
	Q12. I can identify possible patient safety incidents			.355	
	Q13. I communicate clearly to ensure patient safety (using such as repeat back, ISBAR)			.301	
Q14. I can prevent possible patient safety incidents in nursing care			.114		
Total					0.89

Extraction Method: Principal component analysis Rotation Method: Promax with Kaiser Normalization
 ISBAR: (Introduction, Situation, Background, Assessment and Recommendation) a framework for standard communication α = Cronbach's alpha

Table 2. Background information of the British and Finnish pre-registered nursing students (N = 353).

Pre-registration nursing students				
	British % (N)	Finnish % (N)	Total % (N)	P-value
Gender	(N = 158)	(N = 195)	(N = 353)	
Female	94.9 (150)	89.7 (175)	92.1 (325)	.073
Male	5.1 (8)	10.3 (20)	7.9 (28)	
Age group	(N = 154)	(N = 193)	(N = 347)	
27 or younger	45.5 (70)	73.6 (142)	61.1 (212)	0.001*
28-33	26.6 (41)	16.1 (31)	20.7 (72)	
34 or older	27.9 (43)	10.4 (20)	18.2 (63)	
Education	(N = 155)	(N = 195)	(N = 350)	
6th form/A-level high school	63.9 (99)	73.8 (144)	69.4 (243)	.044*
Bachelor's degree	14.2 (22)	2.1 (4)	7.4 (26)	.000*
Master's degree	1.3 (2)	1.0 (2)	1.1 (4)	.817
Other degree	34.8 (54)	33.8 (66)	34.3 (120)	.846
Healthcare working experience (year)	(N = 150)	(N = 190)	(N = 340)	
0	22.7 (34)	2.6 (5)	11.5 (39)	0.000*
<1	14 (21)	41.1 (78)	29.1 (99)	
1-2	22 (33)	34.7 (66)	29.1 (99)	
3-5	20 (30)	15.8 (30)	17.6 (60)	
≥ 6	22.3 (32)	5.8 (11)	12.6 (43)	
Having separate module for patient safety in education	(N = 157)	(N = 194)	(N=351)	
Yes	33.8 (53)	28.9 (56)	31.1 (109)	.325
No	66.2 (104)	71.1 (138)	68.9 (242)	

Table 3. The patient safety competence of British and Finnish pre-registration nursing students in three areas of knowledge, skill and attitude (N = 353).

		Patient safety competence % (N)								P-value
		British nursing students				Finnish nursing students				
	Items	Fully agree	Agree	Disagree	Fully disagree	Fully agree	Agree	Disagree	Fully disagree	
Building patient safety competence (knowledge)	-My competence in patient safety has continuously improved during my nursing education	65.8 (100)	32.2 (49)	2.0 (3)	0	63.9 (124)	30.9 (60)	4.1 (8)	1.0 (2)	.526
	-I understand the central concepts related to patient safety (e.g. patient safety incidents, near miss adverse event and barriers)	55.9 (85)	42.1 (64)	2.0 (3)	0	48.5 (94)	47.9 (93)	3.6 (7)	0	0.310
	-I am satisfied with my patient safety competence	52.6 (80)	45.4 (69)	2.0 (3)	0	28.4 (55)	60.8 (118)	10.3 (20)	.5 (1)	0.000*
	-My competence regarding patient safety is good	52.3 (79)	47.0 (71)	.7 (1)	0	24.7 (48)	72.2 (140)	3.1 (6)	0	0.000*
Competence to act after an error (skill)	-If I notice an adverse event (patient suffer of harm), I respond immediately as the situation requires	64.5 (98)	34.9 (53)	.7 (1)	0	22.7 (44)	61.3 (119)	13.4 (26)	2.6 (5)	0.000*
	-If I notice a patient safety incident (an adverse event or near miss event), I know how to make the patient safety report	52.3 (79)	40.4 (61)	7.3 (11)	0	49.0 (95)	39.2 (76)	9.8 (19)	2.1 (4)	.310
	-If another health care professional behaves in a manner that puts the patient at risk, I intervene without delay	43.6 (65)	51.0 (76)	5.4 (8)	0	32.0 (62)	54.6 (106)	12.4 (24)	1.0 (2)	.019*
	-After a report of patient safety incident is made, I know how the analyses should proceed	36.2 (55)	42.1 (64)	20.4 (31)	1.3 (2)	8.2 (16)	49.0 (95)	35.6 (69)	7.2 (14)	0.000*
Competence to prevent patient safety incidents (attitude)	-I plan to continue to develop my patient safety competency after graduation	76.8 (116)	23.2 (35)	0	0	73.7 (143)	24.7 (48)	.5 (1)	1.0 (2)	.637
	-I understand the role of effective teamwork to ensure patient safety	75.0 (114)	25.0 (38)	0	0	66.0 (128)	32.5 (63)	1.0 (2)	.5 (1)	.118
	-I communicate clearly to ensure patient safety (using such as repeat back, ISBAR)	57.2 (87)	38.2 (58)	3.9 (6)	.7 (1)	29.0 (56)	50.3 (97)	17.1 (33)	3.6 (7)	0.000*
	-I work systematically to ensure patient safety	56.6 (86)	43.4 (66)	0	0	33.7 (65)	59.6 (115)	5.7 (11)	1.0 (2)	0.000*
	-I can identify possible patient safety incidents	55.3 (84)	44.1 (67)	.7 (1)	0	43.8 (85)	53.1 (103)	2.6 (5)	.5 (1)	.073
	-I can prevent possible patient safety incidents in nursing care situations	53.3 (81)	45.4 (69)	1.3 (2)	0	28.9 (56)	66.0 (128)	5.2 (10)	0	0.000*

4 = fully agree, 3 = agree, 2 = disagree, 1 = fully disagree SD: standard deviation Tests: Chi-squared test and Fisher Exact ISBAR: (Introduction, Situation, Background, Assessment and Recommendation) a framework for standard communication *Significant if P < 0.05

Table 4. Mean values and standard deviations of the patient safety competence sum variables of British Pre-registration nursing students

Sum variables	British		Finnish		Total		P-value
	Mean	SD	Mean	SD	Mea	SD	
Competence to prevent patient safety incidents (attitude)	3.61	.38	3.39	.39	3.48	.40	0.000*
Building patient safety competence (knowledge)	3.55	.43	3.36	.42	3.44	.44	0.000*
Competence to act after an error (skill)	3.40	.49	3.04	.51	3.20	.53	0.000*
Overall patient safety competence	3.53	.37	3.28	.36	3.39	.38	0.000*

and Finnish nursing students.

4 = fully agree, 3 = agree, 2 = disagree, 1 = fully disagree SD: standard deviation, Test: Mann-Whitney U

*Significant if $P < 0.05$

Table 5. Binary logistic regression model for predictor background variables of patient safety competence level.

Variable	Beta coefficient	Standard error	Wald statistic	OR (95 % CI)	P-value
Country					
Finland				1.0 (reference)	
UK	.882	.335	6.923	2.41 (1.25 – 4.66)	0.000*
Gender					
Male				1.0 (reference)	
Female	.062	.544	.013	1.06 (.36 – 3.08)	.910
Age (years)					
≤27				1.0 (reference)	
28–33	-.026	.522	.002	.97 (.35 – 2.71)	.960
≥34	-.251	.477	.278	.77 (.30 – 1.98)	.598
Education					
6th form/A-level high school				1.0 (reference)	
Bachelor's degree	-.803	.528	2.318	.44(.15 – 1.26)	.128
Master's degree	-.630	1.427	.195	.53 (.03 – 8.73)	.659
Health care working experience (year)					
0				1.0 (reference)	
≤1	-.109	.506	.046	.89 (.33 – 2.41)	.829
1-2	.106	.488	.047	1.11 (.42 – 2.89)	.828
3-5	.207	.535	.150	1.23 (.43 – 3.51)	.698
≥6	1.077	.689	2.443	2.93 (.76- 11.31)	.118
Having separate patient safety module					
No				1.0 (reference)	
Yes	.618	.314	3.870	1.85 (1.00 – 3.43)	0.000*

OR: odds ratio, 95 % CI: 95 % confidence interval *Significant if $P < 0.05$

Competence to prevent patient safety incidents (attitude)

As demonstrated in table 3, most of nursing students in both groups (British, $n = 116$, 76.8%; Finnish, $n = 143$, 73.7%) recognized the importance of patient safety and *planned to continue to develop patient safety competency after graduation*. Meanwhile, the difference between groups was statistically significant where 57.2% ($n = 87$) of the British students highly agreed that they can *communication clearly to ensure patient safety*, compared to only 29% ($n = 56$) of the Finnish students ($p < 0.05$). Besides, more than half of the British students ($n = 86$, 56.6%) perceived that they *work systematically to ensure patient safety*, compared to one-third of the Finnish students ($n = 65$, 33.7%, $p < 0.05$). Unexpectedly, only 28.9% ($n = 56$) of the Finnish nursing students answered that they were *ready to prevent possible patient safety incidents*, whereas 53.3% ($n = 81$) of British students highly agreed on the same question ($p < 0.05$).

Overall patient safety competence

All nursing students in this study evaluated themselves high in terms of competence to prevent patient safety incidence (attitude) (mean = 3.48, SD = .40), building patient safety competence (knowledge) (mean = 3.44, SD = .44), and competence to act after an error (skill) (mean = 3.20, SD = .53) respectively. However, British students assessed their overall patient safety confidence significantly higher than Finnish students' (British mean = 3.53, SD = .37; Finnish mean = 3.28, SD = .36, $p < 0.05$) (Table 4).

A binary logistic regression determined certain background variables that were associated with a high level of patient safety competence. Students who were in the British group (OR 2.41, CI 95% 1.52 – 4.66, $p < 0.05$) and perceived a separate patient safety module in their education (OR 1.85, CI 95% 1 – 3.43, $p < 0.05$) were more likely to have a high level of patient safety competence (Table 5).

Discussion

One of the significant result of our study was related to the large proportion of nursing students reported high patient safety competence, which is in agreement with results from other

contemporary studies reporting students' self-assessment of patient safety competence (Ginsburg, Tregunno & Norton, 2013; Stevanin et al., 2015). However, this result was in contrast with some studies that nursing students had low clinical patient safety competence (Colet et al., 2015), as well as low knowledge and skills regarding patient safety (Vaismoradi, Salsali & Marck, 2011). These conflicting findings may be explained by cultural and contextual differences in patient safety education around the world.

In our study, British students perceived themselves to be more competent than Finnish students in all three aspects of patient safety competence (knowledge, skill and attitude). This positive result can be explained by the fact that the UK has initiated patient safety activities and education in Europe. Thus, the results presented in this paper could be related to the earlier integration of patient safety into the British nursing curricula.

The majority of British and Finnish nursing students (69%) in this study, did not detect a separate patient safety module in their nursing curricula. This result is in accordance with previous studies, which have also reported that nursing students did not notice patient safety as an explicit theme throughout their education (Attree, Cooke & Wakefield, 2008; Chenot & Daniel, 2010; Steven et al., 2014; Tella et al., 2014). This negative approach of the student toward integration of patient safety in their curricula is a matter of concern when studies show both faculty members at nursing programs and nursing educators believe that patient safety core competencies are addressed in the curriculum. Therefore, earlier research has been pivotal in revealing the contrasting perceptions of patient safety content and satisfaction levels between teachers and students (Attree, Cooke & Wakefield, 2008; Mansour, 2012). We suggest a qualitative investigation in the future to explore the perspectives of both nursing students and faculty members regarding patient safety content and needs in nursing curricula.

In comparison of three dimensions of patient safety competence, both British and Finnish nursing students in our study, perceived their competence to prevent patient safety incidents (attitude) the highest which is in line with other study (Lee, Jang & Park, 2016). While our study

participants were least confident to act after errors (skill). Similarly, in the study of Lukewich et al. (2015), final year students reported low confidence to manage, and respond to errors. These results are concerning since a lack of patient safety skills among final year nursing students could reflect challenges in the clinical setting, which could decrease the quality and safety of future care. In fact, the prevention of patient safety incidents and acting after errors are important experiences for students to have during their education, as they can learn from events in which patient safety is jeopardized. However, it has been reported that students act in an incidental, rather than systematic, manner after errors (Tella et al., 2016). It should be further noted that both the British and Finnish healthcare systems currently use a national patient safety reporting system, which healthcare professionals are required to use independently.

Moreover, low confident to act after error (skill) reflects low self-confidence, which may have been caused by a negative practice environment. Nursing students require practicing in a safe environment that has a blame-free culture. There is evidence from multiple studies that most students continue to have the low confidence to speak up or intervene when faced by unsafe healthcare (Doyle et al., 2015; Lukewich et al., 2015). Accordingly, the lack of supportive student mentors, a culture of blame, and an unsafe practice atmosphere all negatively impact the skills students attain during nursing education (Attree, Cooke & Wakefield, 2008; Steven et al., 2014; Stevanin et al., 2015). Hence nurse mentors should help the students learn how to report, analyze and prevent hazardous events without punishing mistakes or cultivating a fear of failure (Bianchi et al., 2016).

Finally, it should be noted that patient safety education still needs to be developed through various pedagogical methods (Chenot & Daniel, 2010; Bianchi et al., 2016) and curriculum revisions (Sherwood & Drenkard, 2007; Attree, Cooke & Wakefield, 2008; Pauly-O'Neill, Prion & Nguyen, 2013; Colet et al., 2015).

This study has some limitations. First, we included only final year nursing students. While, study results differ based on the chosen time-point and student's patient safety competence rises during the years of education (Doyle et al.,

2015). Therefore, a longitudinal research design is recommended for tracking the progress of students' patient safety competence over time. Second, the external validity of this study is limited by using non-probability sampling method, which results in a non-random study population that may not represent the real situation. Third, the self-reporting of patient safety competence introduces the risk of recall bias, as well as potential overestimation or underestimation of actual patient safety competence (Ginsburg, Tregunno & Norton, 2013). This risk was mitigated by asking the patient safety course leaders to provide students with adequate information about patient safety competence and the current research. Additionally, general definitions for patient safety and patient safety competence were given in the questionnaire.

Conclusions

The assessment of patient safety competence of students is an important part of improving patient safety education since it highlights parts of a curriculum that students feel need development.

This international research, which had a rather high response rate and applied a validated scale, showed that final year nursing students in both Finland and the UK had a high level of patient safety competence. However, the British students reported a higher patient safety competence than their Finnish peers. Building patient safety competence (knowledge) was ranked the highest and the ability to act after an error (skill) was identified as the weakest component of patient safety competence for all students. To maintain high levels of quality and safety in healthcare, we would like to recommend that all schools of nursing and faculties revise their curricula so that more of the patient safety theory is explained in practice and students practice in a safe environment.

Additionally, more collaboration between European schools of nursing which using the same patient safety guideline could work to unify patient safety content, as well as the pedagogies and methods used to teach and measure patient safety competence of nursing students. Consequently, recently graduated nurses are equally prepared to work with confidence in any healthcare settings.

Funding:

This research received a grant from the Department of Nursing Science, University of Eastern Finland.

Acknowledgement:

The authors would like to thank all research group members in Finland and the UK. We would also like to give special thanks to the University of Eastern Finland statistician, M.Sc. Marja-Leena Lamidi, for her support.

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