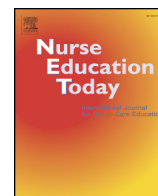


Contents lists available at [ScienceDirect](#)

Nurse Education Today

journal homepage: www.elsevier.com/nedt

Factor analysis of nursing students' perception of patient safety education

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ARTICLE INFO

Article history:
Accepted 24 April 2014
Available online xxxx

Keywords:
Nursing students
Awareness
Skills
Attitudes
Patient safety education

SUMMARY

Aim: The aim of this study is to investigate the factor structure of the Health Care Professionals Patient Safety Assessment Curriculum Survey (HPPSACS) when completed by a group of nursing students from one University in the UK.

Background: The quality, content and delivery of nursing education can have a significant impact on the future students' safety behaviours in clinical settings. The Health Care Professionals Patient Safety Assessment Curriculum Survey HPPSACS has been developed in the US to establish undergraduate nursing students' perceived awareness, skills, and attitudes toward patient safety education. The instrument has not been reported to be used elsewhere; therefore, some psychometric properties remain untested.

Design: Pre-registration nursing students ($n = 272$) from three campuses of a university in East of England completed the HPPSACS in 2012. Principal component analysis was conducted to explore the factors emerging from the students' responses.

Findings: 222 students (82%) returned the questionnaires. Constraining data to a 4-factor solution explained 52% of the variance. Factors identified were: "Willingness to disclose errors", "Recognition and management of medical errors", "The Perceived interprofessional context of patient safety" and "The perceived support and understanding for improving patient safety". The overall Cronbach's alpha was 0.64, indicating moderate internal consistency of the instrument.

Limitations: Some demographical and descriptive questions on the HPPSACS instrument were modified to accommodate the participants' educational context. However, all items in the HPPSACS which were included in the factor analysis remain identical to the original tool.

Conclusion: The study offers empirical findings of how patient safety education is contextualised in the undergraduate, pre-registration nursing curriculum. Further research is required to refine and improve the overall reliability of the Health Care Professionals Patient Safety Assessment Curriculum Survey (HPPSACS' instrument).

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Introduction

Health care systems are complex organisations, often with inherent unpredictable risks that impact on safe delivery of patient care. These systems must be managed by health care professionals who possess the knowledge and skills to safely provide health care to patients with increasingly complex needs (Carayon, 2006; Leape et al., 2009). It has been suggested that nurses are more likely than any other health care professionals to recognise, intercept, and correct errors that are often life threatening (Rothschild et al., 2006). Nursing Education providers are faced with the challenging task of equipping the nursing students with the necessary skills, knowledge and attitudes to manage such patient complex needs, and overall, improving patient safety. Schools of nursing and health education organisations are positioned in a strategic place to deliver the required patient safety education. This is

particularly so for the undergraduate nursing students, where the students' patient safety behaviours are not fully formed and have yet to be influenced by the clinical working culture (Flin and Patey, 2009; Andrew and Mansour, 2013).

Although a recent study suggested that there is a lack of significant relationship between nurse education, including BSN education, and patient outcome (Weinberg et al., 2012), there is a substantial body of literature which suggests otherwise. For example, a report published by the House of Commons Health Committee (2009) suggested that the quality, content and delivery of nursing education can have a significant impact on the future students' safety behaviour in clinical settings. Moreover, the Institute of Medicine found that nurses and other health care professionals in the US are not adequately prepared to provide the highest quality and safest patient care possible (Greiner and Knebel, 2003).

The role of patient safety education in a nursing and other healthcare disciplines has also been recognised internationally. The World Health Organisation has recently published the Patient Safety Curriculum

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Guide (WHO, 2011), which includes eleven patient safety themes that need to be integrated in all health care educational curricula, including nursing, in order to design “patient safety-friendly” curriculum. The Curriculum Guide has been launched in several countries globally, including a regional launch in Central American countries (Mexico), Eastern Mediterranean (Oman) and Western Pacific (Philippines). International work is under way to test the effectiveness of this Curriculum Guide.

Responding to increasing calls for a restructuring of priorities in nursing education, and to address the need for safety and quality education in nursing curricula, Cronenwett et al. (2007) suggested a framework of six nurse competencies for Quality and Safety Education for Nurses (QSEN) to be included in all pre-licensure nursing programs. The six competency domains include: patient-centred care, evidence-based practice, quality improvement, informatics, patient safety, and teamwork and collaboration (Cronenwett et al., 2007). In each of these competency domains, there were proposed statements of the knowledge, skills, and attitudes (KSAs) for each competency that should be developed during pre-licensure nursing education, and more discussion on these statements can be found elsewhere.¹ Many schools of nursing have started to align their nursing curricula with the six-competency QSEN framework (DeBourgh, 2012). However, Chenot and Daniel (2010) have argued that there is a need to explore the current knowledge base for nursing competencies for the nurses to function as safe practitioners in the health care setting. Therefore, they have conducted an exploratory study to examine current patient safety education for nursing students. They carried out a survey to examine the perceived patient safety awareness, skills and awareness among pre-licensure nursing students. The researchers developed and validated the Health Care Professionals Patient Safety Assessment Curriculum Survey (HPPSACS). This survey helped to establish baseline information on the nursing students' perceived awareness, skills, and attitudes toward patient safety education in the context of the US. This is vital to measure the effectiveness of any proposed intervention to improve patient safety education in nursing. The Health Care Professionals Patient Safety Assessment Curriculum Survey (HPPSACS) has not been reported to be used and tested outside the US. This paper reports on the factor analysis of the Health Care Professionals Patient Safety Assessment Curriculum Survey (HPPSACS) in pre-registration nursing students, drawing on data gathered from its use in one university in England.

Methods

Design

A cross-sectional survey was used in this study. The Healthcare Professionals Patient Safety Assessment Curriculum Survey (HPPSACS) was administered to the final year students from a pre-registration nursing course in March 2012.

Participants and Setting Context

All final year pre-registration nursing students who were enrolled in a nursing training programme in one university in the East of England were eligible to participate in this study. The students were enrolled on a diploma or degree pathways from each of the following four nursing branches: Adult, Child, Mental Health and Learning Disability. The university has three campuses where pre-registration nursing training is delivered, and where the participants were recruited. Overall, the curriculum is designed to deliver 50% theory-based and 50% practice-based teaching to the students. To qualify as registered nurses, the students have to pass twelve modules, eleven of which have practice elements, where the students attend clinical placements in hospitals and skill

sessions at the university. Variety of teaching methods were used within the university setting, including lectures, group-work and practical skill sessions in the clinical skill laboratory. The students are also assessed by a variety of methods including written essays, unseen exams, presentations and personal reflections. The practice elements of the modules are assessed by allocated mentors in the clinical placements areas. Clinical mentors are registered nurses who are employed by the hospitals or primary care settings to work clinically, but who also have the additional responsibility of mentoring nursing students.

The Instruments

The Healthcare Professionals Patient Safety Assessment Curriculum Survey (HPPSACS) was adopted by Chenot and Daniel (2010) from the Patient Safety/Medical Fallibility Assessment Pre and Post Curriculum Survey (Madigosky, Headrick et al., 2006). The tool was originally developed for use with medical students, and has subsequently been used for other health care professionals, including nurses. It is a 34-item scale survey and subscale. A Likert-type scale (23 items) assesses attitudes and comfort with skills contributing to patient safety. Participants rate their level of agreement with each statement on a 5-point Likert scale (strongly agree = 1, strongly disagree = 5). The researcher carried out minor amendments to some questions related to the demographical attributes of the respondents. This is to satisfy the context and the structure of the respondents' nursing training and educational system. These amendments included adding more items on which university campus where the student is studying, reducing the number of pathways for nursing training from four to two (i.e. Diploma and BSc Degree), deleting the ethnicity item from the original tool as it contains ethnicities specific to American population, and adding an item on the branch of nursing that the student is studying.

The Procedures

The Healthcare Professionals Patient Safety Assessment Curriculum Survey (HPPSACS) was administered to the students, together with the participant information sheet, which informed the prospective participants that the participation was voluntary and anonymous. The survey was administered by the researcher and two other academic staff to a convenience sample of 272 pre-registration nursing students during their final farewell day in the university. The students had already obtained their results by that day, and had completed all the coursework required for their nursing training. Consent was implied by the completion and return of the survey. The students returned the survey at the end of the day, or sent it to a centrally-located box. No participant names or identifiable characteristics were collected on the survey. Ethical approval for this study was granted by the Faculty Research Ethics Panel at the university where the study took place. Permission to use the instrument was obtained from the original developers of the survey.

Data Analysis

The Statistical Package for Social Sciences (SPSS; Version 19.0) was used for data analysis. Exploratory factor analysis using Principal Component Analysis was used (Field, 2013). The initial screening of the correlation matrix revealed some correlations among several variables of more than 0.30. The Kaiser–Meyer–Olkin (KMO) index of sampling adequacy was employed. This determines if there is sufficient covariance in the scale items to warrant the use of factor analysis. The Bartlett Test of Sphericity was also used to detect if the correlation matrix was an identity matrix and hence its suitability for factor analysis. The KMO for the data set was 0.66 and the Bartlett's test was 1181 ($P < 0.0001$), indicating that the data was factorable. Varimax rotation with Kaiser Normalisation was used in this analysis. The Extraction of factors was based upon Kaiser's criterion for Eigenvalues

¹ More information on the six-competencies domain can be found from Cronenwett et al. (2007).

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