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Susanna Tella

Learning about Patient Safety in Pre-registration Nursing Education. Comparing Finnish and British Nursing Students' Evaluations

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SUSANNA TELLA

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ABSTRACT

The purpose of this study was to synthesise knowledge from learning about patient safety in pre-registration nursing education and to explore and compare Finnish and British pre-registration nursing students' evaluations on their learning about patient safety in academic and in clinical settings. The aims were to produce new knowledge on nursing student learning about patient safety in academic and clinical settings. This study was conducted in three sub-studies.

In the *sub-study I*, with an integrative literature review, knowledge was synthesised from teaching and learning contents and methods and, nursing students' learning about patient safety. The data (n=20) was collected with database and manual search from 2006-2013 and was analysed with constant comparative method. In the *sub-study II*, cross-sectional survey design was adopted to compare Finnish (n=195) and British (n=158) nursing students' learning about patient safety in academic and clinical settings. Data were collected with a purpose-designed, double-blind-back translated Patient Safety in Nursing Education Questionnaire (PaSNEQ) instrument in two Finnish and two British higher education institutes. The data were analysed with descriptive statistics, principal component analysis, cross-tabs and binomial logistic regression. In the *sub-study III*, qualitative study was conducted to describe Finnish (n=22) and British (n=32) nursing students' written important learning events about patient safety in clinical settings. The data were collected with critical incidents technique and analysed with inductive content analysis.

The themes that emerged in integrative literature review were: patient-safety-centred nursing, responsible working, anticipatory actions, interprofessional team-working and learning from errors. Multiple teaching and learning methods were used to achieve continuing learning about patient safety. Students' sensitivity to their own role and supportive learning environment were important for student learning. In survey, Finnish students were more critical on their learning about patient safety in academic and in clinical settings compared to British students. All students considered learning about patient safety to be more important for their own learning than what they evaluated their programme had included. Predictive factors for differences between the students were training patient safety skills in academic settings and supportive and systems-based approaches in clinical settings. Students' important learning events about patient safety in clinical settings were related to preventing patient safety incidents and acting safely after a patient safety incident. Notable was the lack of nursing students' reporting and analysing errors.

Patient safety education in nursing programmes should be developed in multidisciplinary collaboration with other health care faculties and with health care practice so that organisational structure and cultures enable systematic learning about patient safety. Benchmarking the education in international context can help in developing and harmonising patient safety education.

National Library of Medicine Classification: WY 18
Medical Subject Headings: Patient safety; Medical Errors; Education, Nursing, Baccalaureate; Students, Nursing; Learning; Perception; Benchmarking; Finland; England

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Potilasturvallisuuden oppiminen hoitotyön koulutuksessa – suomalaisten ja englantilaisten sairaanhoitajaopiskelijoiden arvioiden vertailua
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TIIVISTELMÄ

Tutkimuksen tarkoituksena oli syntetisoida tietoa potilasturvallisuuden oppimisesta sairaanhoitajakoulutuksessa ja tutkia ja vertailla suomalaisten ja englantilaisten sairaanhoitajaopiskelijoiden arvioita potilasturvallisuuden oppimisestaan akateemisessa ja kliinisessä ympäristössä. Tavoitteena oli tuottaa uutta tietoa sairaanhoitajaopiskelijoiden potilasturvallisuuden oppimisesta akateemisessa ja kliinisessä ympäristössä. Tutkimus koostui kolmesta eri osatutkimuksesta.

Osatutkimuksessa I integratiivisella kirjallisuuskatsauksella syntetisoitiin tietoa potilasturvallisuuden opetus- ja oppimissisällöistä ja -menetelmistä ja opiskelijoiden potilasturvallisuuden oppimisesta hoitotyön koulutuksessa. Aineisto (N=20) kerättiin tietokanta- ja manuaalisella haulla vuosilta 2006–2013 ja analysoitiin jatkuvan vertailun menetelmällä. *Osatutkimuksessa II* poikkileikkaustutkimuksella verrattiin suomalaisten (n=195) ja englantilaisten (n=158) sairaanhoitajaopiskelijoiden näkemyksiä heidän potilasturvallisuuden oppimisestaan akateemisessa ja kliinisessä ympäristössä. Aineisto kerättiin tutkimuksessa kehitetyllä, kaksoissokkokäännetyllä Patient Safety in Nursing Education Questionnaire (PaSNEQ)-mittarilla kahdessa suomalaisessa ja kahdessa englantilaisessa korkeakoulussa. Aineisto analysoitiin tilastollisilla tunnusluvuilla, pääkomponenttianalyysillä, ristiintaulukoinnilla ja regressioanalyysilla. *Osatutkimuksessa III* laadullisella tutkimuksella kuvailtiin suomalaisten (n=22) ja englantilaisten (n=32) sairaanhoitajaopiskelijoiden oppimiskokemuksia potilasturvallisuudesta kliinisessä ympäristössä merkityksellisten tapahtumien tekniikalla. Kirjoitetut oppimiskokemukset analysoitiin induktiivisella sisällön analyysilla.

Integratiivisella kirjallisuuskatsauksella tunnistettiin teemat: potilasturvallisuus-keskeinen hoitotyö, vastuullinen työskentely, ennaltaehkäisevät toimintatavat, moniammatillinen tiimityö ja virheistä oppiminen. Eri opetus- ja oppimismenetelmiä käytettiin jatkuvan potilasturvallisuudesta oppimisen saavuttamiseksi. Opiskelijan sensitiivisyys omaa roolia kohtaan ja kannustava oppimisympäristö olivat tärkeitä opiskelijan oppimiselle. Survey-tutkimuksessa suomalaiset opiskelijat olivat englantilaisia kriittisempiä koskien opiskelua akateemisessa ja kliinisessä ympäristössä. Molemmat opiskelijat pitivät potilasturvallisuuden oppimista tärkeämpänä omalle oppimiselleen kuin mitä arvioivat koulutuksen sisältäneen. Eroja ennakoivia tekijöitä opiskelijoiden välillä olivat potilasturvallisuustaitojen harjoittelu akateemisessa ympäristössä ja kannustavuus ja systeemilähtöisyys kliinisessä oppimisympäristössä. Opiskelijoiden merkitykselliset oppimiskokemukset potilasturvallisuudesta kliinisessä ympäristössä liittyivät virheiden ennaltaehkäisyyn ja toimintaan virheiden jälkeen. Huomioitavaa oli opiskelijoiden virheistä raportoinnin ja niiden analysoinnin puuttuminen.

Potilasturvallisuuden opetusta hoitotyön koulutuksessa tulisi kehittää monialaisessa yhteistyössä muiden terveydenhuollon koulutusalojen ja käytännön kanssa, jotta organisaatioiden rakenteet ja kulttuuri mahdollistaisivat potilasturvallisuuden systemaattisen oppimisen. Koulutuksen kansainvälinen vertailu voi auttaa kehittämään ja yhtenäistämään potilasturvallisuuden opetusta.

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Yleinen suomalainen asiasanasto: potilasturvallisuus; hoitovirheet; koulutus; hoitotyö; opiskelijat; oppiminen; reflektio; oppimisympäristö; työssäoppiminen; Suomi; Englanti

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In Ruokolahti, October 2015

Susanna Tella

List of the original publications

This dissertation is based on the following original publications:

I Tella S, Liukka M, Jamookeeah D, Smith N-J, Partanen P and Turunen H. What do nursing students learn about patient safety? An integrative literature review. *Journal of Nursing Education 53: 7-13, 2014.*

II Tella S, Smith N-J, Partanen P and Turunen H. Learning patient safety in academic settings: a comparative study of Finnish and British nursing students' perceptions. *Worldviews on Evidence-Based Nursing, 2015. DOI: 10.1111/wvn.12088.*

III Tella S, Smith N-J, Jamookeeah D, Partanen P, Lamidi M-L and Turunen H. Learning to ensure patient safety in clinical settings: Comparing Finnish and British nursing students' assessments. *Journal of Clinical Nursing, 2015. DOI: 10.1111/jocn.12914.*

IV Tella S, Smith N-J, Partanen P and Turunen H. Work placements as learning environments for patient safety: Finnish and British pre-registration nursing students' important learning events. *Journal of Vocational Education and Training, 2015 (In Press). DOI: 10.1080/13636820.2015.1104715.*

Contents

Abbreviations

ACA	Academic Settings (In this study)
BSc	Bachelor's Degree, Bachelor of Science
CEU	Council of the European Union
CI	Confidence Interval
CIT	Critical Incident Technique
CLIN	Clinical Settings (In this study)
CVI	Content Validity Index
DoH	Department of Health (In the UK)
EC	European Council
ECTS	European Credit Transfer and Accumulation System
EHEA	European Higher Education Area
EU	European Union
EUNetPaS	European Union Network for Patient Safety
FHEQ	Framework for Higher Education Qualifications in England, Wales and Northern Ireland
FQ-EHEA	Framework for Qualifications of the European Higher Education Area
HaiPro	Finnish safety incident reporting database
HEI	Higher Education Institute
ME	Ministry of Education (In Finland)
MEC	Ministry of Education and Culture (In Finland)
MeSH	Medical Subject Heading
MSAH	Ministry of Social Affairs and Health (In Finland)
NHS	National Health Service (In the UK)
NIHW	National Institute for Health and Welfare (In Finland)
NMC	Nursing and Midwifery Council (In the UK)
NPSA	National Patient Safety Agency (In the UK)
NQF	National Qualification Framework
OR	Odds Ratio
PS	Patient Safety
PaSNEQ	Patient Safety in Nursing Education Questionnaire
QSEN	Quality and Safety Education for Nurses (In the United States)
RCA	Root Cause Analysis
RN	Registered Nurse
SBAR	Situation, Background, Assessment, Recommendation
UAS	University of Applied Sciences
UK	United Kingdom
WHO	World Health Organization

1 Introduction

This study focuses on synthesising knowledge from patient safety in pre-registration nursing education. In addition, the study explores and compares learning about patient safety in Finnish and British pre-registration nursing education. Patient safety has been highlighted over recent decades at national and international levels in order to develop healthcare (Kohn et al. 2000, WHO 2005, MSAH 2009, Secretary of State for Health 2009, Francis 2011, IOM 2011). The role of healthcare education has been recognised as one of the key elements for developing safer healthcare systems (MSAH 2009, WHO 2009, EUNetPaS 2010, WHO 2011). Comparing nursing education between different countries can provide important information for creating patient safety centred nursing curricula which has potential to enhance safety and quality care (Sherwood & Shaffer 2014).

A survey among European citizens showed that half of the respondents felt they might be harmed during healthcare and a quarter claimed that they or a family member had experienced an adverse event during healthcare (Special Eurobarometer 2010, 2014). According to several studies (Vincent et al. 2001, Baker et al. 2004, de Vries et al. 2008, Soop et al. 2008, Vlayen et al. 2012), adverse events happen approximately for one in ten patients during healthcare treatment. These errors in healthcare delivery cause an enormous amount of human suffering and result in great financial loss for societies (Gray 2003, Järvelin et al 2010). Improving patient safety will not only benefit patients, but reduction in the number of adverse events will also benefit society. (Gray 2003, WHO 2005, Warburton 2009.) A significant factor is that many of the patient safety incidents could have been prevented. To develop patient safety in healthcare settings, lessons have been learned from other high-risk sectors like aviation (IOM 2000). The UK (DoH 2000) and the US (IOM 2000) have been among the pioneering countries, while some countries, for example Finland, have launched their patient safety initiatives years later (MSAH 2009).

In recent years, patient safety in healthcare education has received increasing attention. At international level, the World Health Organization (2011) and the European Network for Patient Safety (EUNetPaS 2010) have given their guidelines for embedding patient safety in undergraduate healthcare education. In these guidelines the focus has been in themes such as patient-centred care, multidisciplinary teamwork, understanding human factors, having systems approach, learning from errors and enhancing an affirmative safety culture. At national levels, for example in Finland, the Finnish Ministry of Social Affairs and Health (MSAH 2009) and in the UK, the Nursing and Midwifery Council (2010) have given their guidance for nursing education to develop patient safety education in the HEIs. However, these guidelines are not giving comprehensive and detailed instructions regarding patient safety education in pre-registration nursing programmes. In fact, the Patient Safety and Quality of Care Working Group (PSQCWG 2014) has carried on the work at EU level and found out that patient safety education has been the least implemented area of all areas of the European patient safety recommendations (CEU 2009).

In the European Union, comparable and harmonised patient safety education in healthcare programmes has been raised to a crucial position. Firstly, the Bologna Process (1999) highlights comparability of higher education degrees in order to promote the quality of education in different countries, including nursing education. The Bologna Process has adopted the Budapest-Vienna Declaration (2010) and launched officially the European Higher Education Area. Secondly, the Council of the European Union has given recommendations that patient safety needs to be embedded in healthcare education, including in undergraduate nursing education (CEU 2009). Thirdly, the EUNetPaS (2010) has given patient safety guidelines for European healthcare and thus, for nursing education. Fourthly, implementation of the EUNetPaS (2010) and the WHO (2011) are

strongly recommended by the Patient Safety and Quality of Care Working Group (2014). Therefore, European nursing education should contain and produce the same levels of nursing competence including core competencies related to patient safety.

Patient safety guidelines of the EUNetPaS (2010) highlight the importance of pre-registration nursing students having foundation competencies including knowledge, skills and behaviour/attitudes regarding patient safety. They should know how to assure patient safety and adopt systems-based working methods. According to these guidelines, graduating students should demonstrate the ability to promote quality and safety in health care delivery. Similar guidelines have been created in the United States, where patient safety has been evolved in nursing education by creating the Quality and Safety Education for Nurses (QSEN) initiative. This initiative recommends content for nursing curricula including safety. The goal of safety competence is to prepare nursing students to provide safe care, which requires specific knowledge, skills and attitudes in patient safety from nursing students. (Cronenwett et al. 2007, Brady 2011.)

In nursing students' perceptions, patient safety is of high priority (Sullivan et al. 2009, Pearson et al. 2010, Cooper 2013, Cresswell et al. 2013). Patient safety is taught in academic and clinical settings, but is often implicit, not embedded clearly and systematically in nursing curricula (Attree et al. 2008, Chenot & Daniel 2010, Howard 2010, Mansour 2012, Cresswell et al. 2013, Tregunno et al. 2014). Nursing students characterise teaching and learning about patient safety in academic settings to concentrate on idealistic issues, while learning in clinical settings focuses more on informal learning such as learning from role models, favourable and unfavourable (Cresswell et al. 2013, Steven et al. 2014). Hence, nursing students' patient safety education seems to be incoherent and incidental. For example, reporting errors is perceived as a crucial element for ensuring patient safety in healthcare systems by nursing students (Pearson et al. 2010) and healthcare professionals (Anderson et al. 2013). However, nursing students confront many difficulties in learning to report patient safety incidents (Jenkins et al. 2009, Koohestani & Baghchegi 2009, Henneman et al. 2010, Pearson et al. 2010, Cooper 2013, Espin & Meikle 2014). One vital barrier for nursing students learning is the culture of safety of healthcare organisations and units. In many studies, the culture is characterised as rather defensive and seeking blame, rather than being open and fair (Attree et al. 2008, Cooper 2013, Steven et al. 2014, Tregunno et al. 2014).

The purpose of this study was to synthesise knowledge from learning about patient safety in nursing education and to explore and compare Finnish and British final year pre-registration nursing students' experiences, perceptions and evaluations on their learning about patient safety in academic and in clinical settings. The target was in learning, in tearms of what, how, where and when nursing students learn about patient safety during their education. Research from patient safety in nursing education and pre-registration nursing student learning about patient safety has been explored and developed, especially in Northern America, but less in Europe. In Europe, the topic has been examined mostly in the UK, but for example in Finland, the topic is less examined. The importance to compare patient safety education in healthcare programmes has been identified (Sherwood & Shaffer 2014). However, there has been a lack of comparative studies in this field. According to the European Commission (2012) education and training regarding patient safety is least implemented in the member countries. The topic is justified with producing new knowledge on learning about patient safety in nursing education in academic settings and in clinical settings and, information for nursing and healthcare faculty and managers in healthcare organisations. The study consists of three sub-studies: an integrative literature review, a survey for Finnish and British nursing students and a qualitative study about Finnish and British nursing students' written important learning events. This study is a part of a larger project titled Patient Safety Culture carried out at the Department of Nursing Science, University of Eastern Finland (UEF).

2 Learning to ensure patient safety in nursing education

In this section, nursing students' learning about patient safety is introduced in means of defining the main concepts related to patient safety, learning and nursing education, and describing the relationships between the concepts. Finnish and British patient safety work and pre-registration nursing educations are compared. In addition, results of a literature review regarding nursing students' learning about patient safety in academic and clinical settings are presented. In the end of this section a theoretical framework for this study is provided.

2.1 DEFINITION OF THE MAIN CONCEPTS

2.1.1 Learning about patient safety

Patient safety is defined as a patient's freedom 'from accidental injury' (Kohn et al. 2000), or 'the reduction of risk of unnecessary harm or potential harm associated with healthcare to an acceptable minimum'. This refers to collective understanding of the current knowledge, resources and context while taking into account 'the risk of non-treatment or other treatment'. In other words; patient safety comprises minimising a patient's risk for near misses or hazards while being hospitalised (WHO 2009a, EUNetPaS 2010), or 'efforts to reduce risk, to address and reduce incidents and accidents that may negatively impact healthcare consumers' (Pubmed 2014b). Vincent (2010) adds avoidance and amelioration into the defining of patient safety. This refers to the hazardous nature of health care. In this definition, there exists a need to take care of harmed and injured patients and to support the 'second victims', the staff members involved in the incidents (Vincent 2010, Ullström et al. 2014). A wider aspect informs the US National Patient Safety Foundation in its research agenda. This definition concentrates on the interdependence of the healthcare components, actions and stakeholders highlighting systems-based approach to the prevention of errors. The focus should be on building barriers to the continuum of mistakes and deviations. Enhancing patient safety depends on systems-wide learning rather than on an individual's performance, a functionality of a device or operating of a health care unit. (NPSF 2003.) Another definition of patient safety is provided by Emanuel et al. (2008), 'A discipline in the health care sector that applies safety methods towards the goal of achieving a trustworthy system of health care delivery.' In this definition the patient is also accountable in health care systems, and the attention is in minimising harm and maximising recovery. When inspecting patient safety from a patient's point of view, it is important that a patient has the correct and required care, which will not cause harm, or as least possible harm for the patient. In Finnish patient safety strategy, patient safety is described to include the safety of care, safety of equipment and medication safety. (MSAH 2009.)

The WHO Conceptual Framework defines the key concepts related to patient safety (WHO 2009a). *An adverse event* is defined as 'an incident that resulted in harm to a patient'. The concept harmful incident is used as a synonym for an adverse event. *Harm* is conceptualised in health care related situations as 'impairment of structure or function of the body and/or any deleterious effect arising there from including disease, injury, suffering, disability and death'. *A near-miss* is 'an incident that did not reach the patient'. In this kind of situation, nothing happened to the patient, but the health care cannot be described as safe organisation. *A hazard* is determined as a circumstance, agent or action, which can potentially cause harm for the patient.

The determination of *patient safety incident* includes both concepts: a near-miss and a hazard. The actions, event or circumstances could have led, or did lead, to an unnecessary

harm for the patient. (WHO 2009a.) Common for these harmful events or incidents are that they did not assist the patient care process instead they bring additional harm. Reporting of these errors is one key element of safe health care organisation (NPSA 2004, MSAH 2009). There are various reporting systems in different countries. For example in Finland, a private corporation has provided a web-based tool HaiPro for the reporting of patient safety incidents. HaiPro is used in over 200 health and social care organisations. (HaiPro, Awanic 2014.) In the UK, National Reporting and Learning System (NRLS 2003) has been established to gain information about the patient safety incidents on a wider perspective and to use this information in developing patient safety tools and guidance at a local level.

Systems are sets that are interrelated and interdependent components. These components 'form an integrated whole' (Perez & Liberman 2011). Health care organisations can be seen as complex adaptive systems which are a formation of diverse individuals or factors whose actions are interconnected, but who have freedom to act in an unpredictable way (Holden 2005). Thus in health care, different individuals, medical units and specialties answer for a patient's wellbeing rather than just a single health care provider. System theories provide the means to understand how for example health care systems operate and how they operate more effectively and efficiently. (Perez & Liberman 2011.)

Understanding systems and adopting *a systems-based approach* are pivotal issues for organisational and patient safety. 'The basic premise in the system approach is that humans are fallible and errors are to be expected, even in the best organisations.' Thus, errors are not causes, but more like consequences. (Reason 2000.) Characteristics for organisations that have adopted complexity philosophy are such elements as acceptance of uncertainty, realistic assessment of risk, tolerance for errors in risk and engaging continuous learning and adaption. In addition, relationships are collaborative and synergistic and precious insights are obtained from multiple different viewpoints. (Perez & Liberman 2011.) To learn from errors in a wider sense and to improve organisational safety, adoption of a systems-based approach is vital. The focus should be on the functioning of the systems rather than on an individual-related issue. (Reason 2004, 2005, 2012.)

Patient safety and *quality of care* are closely related, safety being a subset of quality of care (NPSF 2003). Quality of care can be characterised as effective, improving health that is based on patients' needs, and efficient, maximising use of resources and avoiding waste. The care needs to be accessible for consumers and equitable for everyone depending not on patients' personal characteristics. The quality of care also includes aspects related to acceptability and patient-centred. This refers to taking into account patients' individual and cultural preferences and aspirations. And overall, safety is one important element of quality of care. (WHO 2006.)

To improve quality of care, including patient safety, it is important to identify the roles and responsibilities of different stakeholders. Firstly, developing policy and strategy for quality outcomes on a national level is the basis for the whole health system and requires application of the activity across the entire system. Secondly, health-care providers, whole organisations, teams and individuals, responsibilities are to be committed to the aims of the national level, and ensure that provided care meets highest standards and needs. Thirdly, communities and health-service users can be seen as co-producers of health. Their role is to be critical and responsible in taking care after their own health in collaboration with health service providers and in bringing forward their needs and preferences. These different stakeholders are interconnected in quality improvement. (WHO 2006.)

A safety culture within an organisation is defined as 'the product of individual and group values, attitudes, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's health and safety programmes (Vincent 2010). Patient safety culture can also be defined as 'a systematic way of working that promotes the safe care of patient, and leadership, values and attitudes underpinning it.' This definition includes assessing of risk, preventing and correcting measures, and developing activities continuously. (MSAH 2009.) Subcultures for patient safety culture

have been identified to be leadership, teamwork, evidence-based, communication, learning, just and patient-centredness (Sammer et al. 2009).

In a safety culture, health care staff has an active role. The staff members are expected to be constantly aware of potential risks for patient safety. (NPSA 2004.) A mutual trust between different stakeholders is important for securing patient safety. As well, open communication and fair actions are vital elements of safety culture. (Vincent 2010.) Without support from their managers, the staff members cannot feel safe to acknowledge mistakes (NPSA 2004). In a safety culture, safety is taken seriously in the organisation at every level (Vincent 2010). It depends on the organisational culture, whether learning from errors and changing practice safety according the lessons learned are possible. In a safety culture, a systems approach is implied to focus more on the functionality of the organisation than on an individual's actions. (NPSA 2004.) However, the Francis report (2013) revealed professional malpractice and negative culture in health care organisations in the UK. In Finland, the same kind of negative culture has been described among nurses (Laiho & Ruoholinna 2013). This is harmful to learning for each individual, including nursing students, but also for the whole organisation. The role models, good and bad, have an effect in a learner's identity as it shapes relating to the connections and actions between learner, culture and activities of the health care unit. (Ahlgren & Tett 2010.)

In recent years, patient safety has been highlighted around the world (Appendix 1). In addition to international patient safety recommendations and guidelines (WHO 2005, 2009, 2011, EUNetPaS 2010), national guidelines have been given, such as 'Seven steps to patient safety' in the United Kingdom by the National Patient Safety Agency (2004) and 'Finnish Patient Safety Strategy for 2009–2013' in Finland by Ministry of Social Affairs and Health (MSAH 2009a). All these guidelines have declared that actions must be made in health care to ensure the safety of patient care. In Finland, the recent Health Care Act (1326/2010) enhances patient safety by obligating health care units to draw up a plan for the implementation of patient safety. In the UK, patient safety is not highly visible in the Health and Social Care Act (2012), where patient safety is only disclosed in one clause (281) referring to the abolition of the National Patient Safety Agency. However, the UK (DoH 2000) has been one of the pioneering countries in the field of developing national patient safety, while Finland has started patient safety work several years later (MSAH 2009) (Table 1, Appendix 1).

Nursing students are expected to learn evidence-based practice and for example learn the basic principles about patient safety. The term *learning* is determined by 'the activity of obtaining knowledge' or 'knowledge obtained by study' (Cambridge Dictionaries 2014), or 'the acquisition of knowledge or skills through study, experience, or being taught' (Oxford Dictionaries 2014). In Medical Subject Headings (Pubmed 2014a), 'learning' is described as 'relatively permanent behaviour that is the result of past experience or practice'. The concept includes the acquisition of knowledge. Recently, Jarvis (2013) defined learning as ´the process of individuals constructing and transforming experience into knowledge, skills, attitudes, values, beliefs, emotions and the senses'. Learning emphasises different learning elements. Cognitive learning includes gaining knowledge, psychomotor learning obtaining physical skills and affective learning relates to emotions and attitudes. Learning can also be seen as a process, such as 'I am learning about safe actions', and as an outcome, for example, 'I have learnt to use the reporting database'. (Merriam & Bierema 2013.) Gagne (1984) separates learning outcomes in different categories, which comprise procedural and declarative knowledge, cognitive strategies, motor skills and attitudes. In learning, it is a matter about transforming simple understanding into more holistic and precise comprehension (Pellegrino et al. 2001).

Learning outcomes have been depicted as competencies (Zabalegui et al. 2006). *Competence* can be defined as 'a concept that contains and balances different sides of an individual person's abilities and capabilities' including cognitive functions, skills and attitudes (Pikkarainen 2014) or as ´a dynamic combination of attributes, abilities and attitudes'

(Zabalegui et al. 2006). Winterton (2009) criticises the conceptual approaches to competence, which differs inside the European Union. Le-Deist and Winterton (2005) have suggested a holistic, multidimensional model for competence including four dimensions: cognitive, functional, social and meta-competence. Meta-competence refers to an individual's learning to learn. Thus, learning and competence are in close connection as concepts. In this study, concentration is more in nursing students' learning than in competence.

Table 1. Timeline of examples comparing appearances of patient safety efforts

UK	An organisation with a memory	National Patient Safety Agency est.	National Reporting and Learning System	Seven steps to patient safety	Safety first – A report for patients, clinicians and HC managers		The government response to the Health Select Committee report 'Patient safety'	
Years	2000	2001	2003	2004	2006	2007	2009	2010
Finland					Patient safety vocabulary	System for reporting and analysis of errors in hospital environment – HaiPro	Promoting patient safety together – Finnish patient safety strategy 2009–2013	Health Care Act (1326/2010) including patient safety

In nursing education, learning occurs in different environments and contexts, for example in academic and clinical environments, formal and informal ways in relation to other stakeholders and relating to individual factors (Edwards & Miller 2007, Spence 2012). Parallel findings have been found regarding the teacher's role in academic settings and the healthcare staff members' role in clinical settings to nursing students' learning. Mikkonen et al. (2014) have argued that teachers' empathy towards nursing students can enhance student learning and vice versa. Similarly healthcare staff members in clinical settings have been claimed to influence student learning (Cresswell et al. 2013). Social aspect has been shown to depict student learning starting from communicating about their understading on what they have read with someone else. Overall, construction of knowledge seems to occur best in groups having the possibility to discuss and share information. All that students are expected to learn, should be indicated in curriculum. However, there can be differences between the intended, written, implemented and hidden curricula. (Acedo & Hughes 2014.) Students' learning is based on the existence of these different curricula during their education. Learning is in the focus of curriculum (Acedo & Hughes 2014). It is important to understand how students learn the anticipated competencies, but also how they learn the unfavourable ways and habits.

Necessity of *work-based learning* (WBL) to learn about patient safety is indicated in several studies (e.g. Attree, Cooke & Wakefield 2008, Girdley, Johnsen & Kwekkeboom 2009, Lenburg et al. 2009). Healthcare students learn from mistakes, such as real-life examples, observing their peers or staff members, but also from their own mistakes (Smith et al. 2013;

Teigland et al. 2013; Steven et al. 2014). Learning occurs from genuine experience that students experience on any situation in health care units. The learning depends on concerns of the workplace. WBL can be often unplanned, informal, retrospective and serendipitous. (Tynjälä 2008, Lester & Costley 2010, Steven et al. 2014.) The experiential learning theory presents learning as a continuous and a holistic process. In this theory experience is transformed into knowledge in four stages: 1) concrete experience, 2) reflective observation, 3) abstract conceptualisation and 4) active experimentation. (Kolb 1984.) Theory is merged with practice and learning depends on the work itself, reflecting real-life experiences. (Dewar & Walker 1999, Williams 2010.) The focus may often be on completing single tasks related to patient care. Thus nursing students may miss learning of more complex aspects of nursing practice. (Ironside, McNelis & Ebright 2014.) Reflecting on clinical events and situations is important in helping nursing students to understand complex situations. Reflecting assists students to learn from complex real-life situations, as these situations seem to promote the reflection process. (Mann, Gordon & MacLeod 2009.) Reflecting critically on their own experiences, nursing students have the possibility to enhance their learning about patient safety.

Learning in clinical settings requires nursing students to take an active role in their learning and especially in communication. They are expected to ask questions to get information, be ready to receive feedback, but also provide feedback for those they are working with. (Eraut 2011.) This is not easy for nursing students, due to their junior and student status (Kennedy et al. 2009, Steven et al. 2014). However, sharing learning vertically and horizontally at the health care unit and organisation has an impact on collaborative learning (Bauer & Mulder 2007). Professional discussion is also important for nursing students learning to take responsibility as an individual care provider and a team member (Clouder 2009). Overall, open and clear communication is a pivotal issue for sharing information and learning and in this context, ensuring patient safety (Napgal et al. 2012).

It is crucial that nursing education ensures competent nurses enter to the health care field. In the EU, the Council of the European Union (CEU 2009) has given recommendation on patient safety in which the leaders of under and postgraduate healthcare education are directed to embed patient safety in the curricula and to promote learning of core competencies about patient safety. In addition, multidisciplinary patient safety education and training are among the issues to be contributed to and increased. As a continuation, the European Union Network for Patient Safety (EUNetPaS 2010) has given guidelines for nursing education to improve patient safety in European countries (Table 2). The guidelines emphasise such issues as having foundation competence about patient safety and promoting systems-based approach and positive culture related to patient safety (Table 2). On a national level, the Finnish Patient Safety Strategy for 2009–2013 (MSAH 2009a) highlighted that promoting patient safety should be taken into account in all health care education, including undergraduate nursing education. The national patient safety programme, based on the Finnish patient safety strategy (NIHW 2011), emphasises that an open, proactive and holistic approach to patient safety in Finnish under and postgraduate healthcare programmes is yet to develop. In the United Kingdom, the National Patient Safety Agency (2004) gives patient safety guidelines such as 'Seven Steps to Patient Safety' providingc guidance that emphasises learning and sharing in order to promote patient safety. Especially for nursing education, Nursing & Midwifery Council (2010) provides field-specific guidelines with patient safety issues embedded in the guidelines for nursing programmes. Although, these guidelines are not as specific in relation to patient safety as the EUNetPaS (2010) or WHO (2011) guidelines are. In both of these guidance, enhancing safety culture, supporting safety work with proactive management, reporting errors and learning from them, involving patients and learning about patient safety are recognised as key issues. There exist some differences between the guidance. In the Seven steps guidance, the public has been involved to discuss developing the safety of health care (NPSA 2004). In the Promoting patient safety strategy, the role of education and research is more

emphasised (MSAH 2009). Under the European Commission, the Patient Safety and Quality of Care Working Group (PSQCWG 2014) has published a report on the key findings and recommendations related to implementation and development of patient safety education in the EU countries. The key message was that patient safety education is the least implemented area of the Council Recommendations on patient safety (CEU 2009).

Table 2. Examples of objectives of patient safety curriculum guidelines

WHO's (2011) Patient safety in healthcare professionals curricula	EUNetPaS (2010) A general guide for education and training in patient safety	QSEN (2014) Pre-licensure knowledge, skills and attitudes
• Understanding patient safety • Applying human factors • Understanding systems and complexity of healthcare • Effective teamwork and clear communication • Learning from errors, preventing harm • Understanding and managing clinical risks • Improving quality of care • Patient-centred care, engaging with patients and carers • Infection prevention and control • Patient safety and invasive procedures • Improving medication safety	• Acquiring foundation knowledge, skills and attitudes/behaviours for patient safety • Assuring patient safety • Adopting systems-based working • Enabling patient safety culture • Setting direction for quality and safe healthcare • Patient-centred care	• Patient-centred care and respecting patient as full partner in providing compassionate and coordinated care • Effective interprofessional teamwork, communicating openly, respecting each one, sharing decision making • Integrating best available evidence • Improving quality of care • Minimising risk of harm to patients and providers through systems-based approach and individual performance • Using information and technology to communicate, manage knowledge, mitigate error and support decision making

In the United States, the Quality and Safety Education for Nurses (QSEN) initiative recommends contents for nursing curricula. The competency areas are patient-centred care, teamwork and collaboration, evidence based practice, quality improvement, safety, and informatics. The safety competence area includes the basics of safe care with specific knowledge, skills and attitudes in patient safety. (Cronenwett et al., 2007.) Brady (2011) describes five safety behaviours as hand washing, introduction of oneself to patient/family, patient-centred communication, double identifiers, and use of the SBAR (that is Situation, Background, Assessment and Recommendation) communication strategy.

2.1.2 Finnish and British pre-registration nursing education

In the dictionary, 'nursing' is defined as 'the profession or practice of providing care for the sick and infirm' (Oxford Dictionaries 2014). In recent decades, nursing has essentially evolved towards a more demanding profession with the trend being in community-based healthcare, more complex therapies, and continuously developing technology (2013/55/EU). 'Pre-registration nursing students' are 'students undertaking an educational programme in

a higher education institution leading to an academic award and registration as a nurse' (Quinn & Hughes 2007).

The Bologna Process has affected in Finnish and British pre-registration nursing students, education. The purpose of the Bologna Process was to create a coherent, harmonic, and attractive higher education area in Europe by 2010 (EHEA 1999), thus the comparability and compatibility of Finnish and British pre-registration nursing education were also subjects. In 2012, EHEA highlighted the results of the Bologna Process, for example that the higher education structures are more compatible and comparable. In recent years work has been undertaken in Finland and in the UK to develop pre-registration education to respond in European requirements. The Bologna Process with harmonising tools such as the European Credit Transfer and Accumulation System (ECTS) and the European Qualifications Framework (EQF) have facilitated the integration work. One ECTS credit corresponds to 25–30 hours of a student's work, while an academic year is about 1,500 to 1,800 hours (ECDG 2009). The EQF helps to compare between qualifications systems in European Union (EPC 2008). In pre-registration nursing education, learning outcomes meet the level 6 of the EQF. This means that qualifications, related to certain work or study, recognise 'advanced knowledge', concerning critical understanding of theories and principles, 'advanced skills' involving requirements to solve complex and unplanned situations, and managing of complex activities, and taking responsibility for decision-making and of professional development of individuals and groups (EC 2008). The EU-directive (2013/55/EU) steers the minimum competences that a general nurse (180 ECTS) has to acquire during the nursing education (Table 3). For example nursing students need to acquire competence to independently assure and evaluate the quality of nursing, to communicate and cooperate professionally with other healthcare professionals, and to analyse the quality of care to improve one's own professional performance.

Finnish pre-registration nursing students study in a nursing programme leading to a Bachelor's degree, which is a first-cycle degree (Polytechnics Act 351/2003), and equal to EQF level 6 in National Qualifications Framework (NQF_{FIN}) (ARENE 2010) (Table 3). The education is provided by HEIs, which are called either polytechnics (Polytechnics Act 351/2003) or universities of applied sciences (UAS) (ARENE 2007). The latter is used in this study. The UASs are either municipal or private institutions funded by the government and local authorities (MEC 2014). The programme comprises 210 ECTS, which takes three and half years to complete the studies. One ECTS is about 27 hours of a student's work. (ME 2006.) After the graduation, nurses can apply from the National Supervisory Authority for Welfare and Health as a national of a EU or EEA State a right to practice the profession of nurse as a licensed professional in Finland, and to become a registered nurse. An act about healthcare professionals (559/1994) regulates the Finnish healthcare field by ensuring that nurses, and other professionals, have had the required education and training to gain knowledge and skills necessary for safe practice of the profession. Finnish rectors conference of universities of applied sciences (UASs) has given recommendation on applying NQF and general competences of UASs in Finnish UASs. The competences are 1) learning competence, 2) ethical competence, 3) working community competence, 4) innovation competence, and 5) internationalisation competence. (ARENE 2010.) Subject specific competences for the degree programme in nursing are 1) competence in customerships in healthcare, 2) competence in health promotion, 3) clinical competence, 4) decision-making competence, and 5) counselling and mentoring competence (ARENE 2007).

British pre-registration nursing students have equally to Finnish peers their studies in nursing education programme that leads to bachelor's degree, and is a first-cycle degree (NMC 2010; QAA 2009) (Table 3). The nursing programme is 360 British credits (or 4,600 hours) and takes three years to complete the programme (NMC 2010). In England, UK there are three qualifications frameworks: the Qualifications and Credit Framework (QCF), the National Qualifications Framework (NQF_{UK}), and the Framework for Higher Education

Qualifications in England, Wales and Northern Ireland (FHEQ). In all of these frameworks, level 6 is equal to EQF level 6. (QCA 2010.) NMC (2010) has set standards for competence, knowledge, skills and attitudes that students must acquire before graduation. The competencies are 1) professional values, 2) communication and interpersonal skills, 3) nursing practice and decision making, and 4) leadership, management and team working. The competency requirements are separate for the four different fields that are adult nursing, mental health nursing, learning disabilities nursing or children's nursing. All pre-registration nursing students must perform safe nursing practice applying the best available evidence. (NMC 2010.)

Table 3. Pre-registration nursing education in Finland and in England, UK

COUNTRY	2013/55/EU	FINLAND	ENGLAND, UK
Education system	Universities, HEIs, vocational schools or training programmes	Polytechnics, (HEIs)	Universities, (HEIs)
Programme	Programmes in nursing	Degree Programme in Nursing	Degree Programme in Nursing
Exit qualification		Bachelor of Healthcare, first-cycle degree	Bachelor of Nursing, undergraduate degree (all programmes since 2013)
Programme content	Minimum competence requirements	Specific in each UASs reflecting the recommendations	Specific in each AEIs reflecting the standards
Duration	At least 3 years or 4 600 hours	3,5 years	3 years or 4,600 hours
ECTS	General nurse 180 ECTS	210 ECTS	360 British credits (180-240 ECTS)
Education in academic settings	At least third of the whole programme	135 ECTS	120 ECTS
Education in clinical settings (placement learning)	At least half of the whole programme	75 ECTS (36% from 210 ECTS) (42% from 180 ECTS)	90 ECTS (43% from 210 ECTS) (50% from 180 ECTS)
Payment	Not defined	Free of charge for students (funding by government and local authorities)	Mostly free of charge for students

2.1.3 Learning in academic and clinical settings

Finnish and British pre-registration nursing education takes place both in academic and clinical settings. 'Academic' relates to colleges, and universities, or is 'connected with studying and thinking, not with practical skills', whereas 'clinical' is understood as 'medical work or teaching that relates to the examination or treatment of ill people'

(Cambridge Dictionaries Online 2014). The term 'setting' refers to 'the time and the place in which the action of learning happens' (Cambridge Dictionaries Online 2014). European Union directive (2013/55/EU) divides nursing education into theoretical and clinical training. Theoretical training, referring to education provided in academic settings, is given in higher education institutions (HEIs), in Finland at polytechnics, and in the UK at universities.

Nursing students practice in workplace settings during particular placements, spending a certain amount of time in different workplace settings such as hospital wards and departments, community healthcare centres, nurseries, and residential homes. The students are not part of the nursing staff during their placements. (Quinn & Hughes 2007.) The directive (2013/55/EU) outlines nursing students clinical training as learning 'as part of a team and in direct contact with a healthy or sick individual and/or community, to organise, dispense and evaluate the required comprehensive nursing care, on the basis of the knowledge, skills and competences which they have acquired.' Thus the training can occur in clinical settings, but also in community settings. In this study, *clinical settings* are used to cover all pre-registration nursing students' placement environments outside of the *academic settings*.

In Finnish law about polytechnics (352/2003), it is enacted that nursing education must follow the directives of the European Union (Table 3). Thus, in Finland, nursing education encompasses learning in academic settings, covering in tearms of theoretical training, at least a third of the whole programme. Learning in clinical settings must comprise at least half of the whole programme. (2013/55/EU.) A half of the whole programme is 90 ECTS and it is counted from the requirements for general nurse education being 180 ECTS. However, in Finland actual learning in clinical settings are only 75 ECTS, but it is accompanied by a Bachelor's thesis 15 ECTS (ME 2006).

NMC (2013a, 2013b, 2013c) set expectations for British pre-registration nursing students' learning in academic and clinical settings. The main rationale for NMC standards is public protection, prioritisation of the safety and wellbeing of all service users. Approved education institutions (AEIs), meeting NMC requirements, provide nursing programmes in partnership with HEIs and clinical settings (NMC 2013b). Requirements for clinical learning environment include promotion of providing a safe and supportive learning environment for the students, and commitment of giving and supporting safe, effective and compassionate care for service users. Thus, students are expected to bring forward any concerns about safety, and clinical placement stakeholders are presupposed to have effective means to respond. Further, AEI and clinical placement partners are expected to answer in collaboration any concerns related to the safety of the clinical learning environment (NMC 2013c).

2.2 LITERATURE REVIEW: PATIENT SAFETY IN PRE-REGISTRATION NURSING EDUCATION

2.2.1 Literature search

In the original article I, the literature review was conducted for the period 2006-2012. In this section, the original literature review was supplemented between 2013-2014 and the results from both literature reviews are presented here to provide a coherent understanding of the phenomenon of patient safety in pre-registration nursing education. A summary of the key themes that emerged in the original article I, will be presented in the findings section.

In the supplemented literature review, keywords such as patient safety, healthcare errors, adverse events, nursing education, nursing students, learning, teaching, clinical and academic were used (Table 4). Inclusion criteria were as follows: focus on patient safety and pre-registration nursing education, empirical studies, systematic or integrative literature reviews and published in a peer-reviewed publication. Exclusion criteria were studies that

concentrated mainly on medication calculation or hand hygiene or falls and studies where focus was on first year nursing students. These criteria were selected to have more focus on patient safety and for example on reporting errors, learning from errors, communication, systems-based approach and culture. The search produced 135 research studies, which were selected according to exclusion and inclusion criteria first based on the title, then based on the abstract and finally based on the full text. From 2013-2014, research studies were included in this summary section. In summary, accounting for both literature searches a total of 42 studies were found. To analyse the data, a constant comparative method was used (Whittemore & Knafl 2005). A table was compiled to reduce and display the data (Appendix 2). The data were compared, conclusions drawn and verified with the primary sources.

Table 4. Literature search of the summary part

Search strategy	Database	Search results
Limitations in all databases: Years 2006-2014 Peer reviewed, abstract available, English language	CINAHL	1848
Different combinations of words: patient safety, healthcare errors, adverse events, nursing education, nursing students, learning, teaching, clinical and academic	PubMed	79
Included: patient safety and nursing or healthcare (nursing included) education, research articles	Scopus	545
		Accepted N = 42

2.2.2 Nursing students' learning about patient safety

Ensuring systematic and high quality patient safety education in nursing programmes is important for creating a safer healthcare system. Nursing educators are in the front line in developing nursing student possibilities to act as future patient safety guards and to adopt a desire to constantly learn about patient safety.

Nursing students have assessed patient safety as patients' comfort (Table 5). This includes physical and psychological safety in terms of preventing suffering and safeguarding patients from care related complications. In addition, respecting a patient's right to have privacy and continuously informing patients about their care and care related processes are pivotal elements in nursing students' perception. (Vaismoradi et al. 2011.) Patient safety is also described as complex and problematic when relating to interdependence and interactions between different stakeholders and directions by nursing students, their educators and clinical staff members (Steven et al. 2014). However, nursing students perceive that the patient is at the centre of patient safety (Attree et al. 2008).

Nursing students learn about patient safety in academic settings of HEIs and in clinical settings of healthcare organisations (Table 6). In many studies, patient safety has been shown to be implicit in the curricula (Attree et al. 2008, Cresswell et al. 2013, Steven et al. 2014). Nursing students' path should flow logically between and across these organisational contexts. Although, there are differences in the collaboration of these organizations, for example in such issues as different conceptualisations of patient safety, integrating nursing students in patient safety systems and ensuring a non-blame culture. (Steven et al. 2014.) Nursing students have perceived organisational culture related to patient safety rather as defensive and closed than open and fair (Attree et al. 2008, Cresswell et al. 2013, Steven et al. 2014). Healthcare organisations seem to be unprepared to include nursing students in organisational systems and procedures related to patient safety. Conversely, HEIs seem to be isolated from the real clinical conduct and culture. (Steven et al. 2014.) In some nursing programmes the challenge has been responded to with a

structured classroom and clinical environment education. When nursing students had these combined learning activities in both academic and clinical environment, nursing students' perceptions of their knowledge, skills and attitudes improved more. (Miller et al. 2009.)

Table 5. Perceptions on patient safety

Findings regarding patient safety in nursing education	Authors (year), country
Perceptions on patient safety	
• keeping patients safe and protected from harm, risk assessment and management, safe environment and communication, observation, safe medication, preventing falls, preventing infections	Attree et al. (2008) UK
• patients' physical and psychological comfort	Vaismoradi (2011) Iran
• gap between nursing students' perceptions and educators' conceptualisation	Mansour (2012) UK
• complicated problem	Steven et al. (2014) UK
• crucial for nursing students' success in clinical course	Tanicala et al. (2011) US, Cresswell et al. (2013) UK, Steven et al. (2014) UK

Several issues have been identified to contribute the way nursing students ensure patient safety and report or neglect reporting of errors (Table 6). Protecting patient safety, but also the willingness to compromise, has influence on nursing students' actions (Vaismoradi et al. 2011, Andrew & Mansour 2014, Steven et al. 2014). Nursing students have expressed that one way they safeguard patients is to follow the protocols and procedures of healthcare organisations. The excercising of good practices was an important topic in nursing students' opinion to ensure patient safety. Adhering to good practice was also perceived as a way to protect also oneself. (Andrew & Mansour 2014.) When nursing students had compromised patient safety, they could justify their actions with lack of knowledge and experience (Vaismoradi et al. 2011, Andrew & Mansour 2014). Other reasons for not following the protocol and procedures required for good practices were the ward culture (Andrew & Mansour 2014, Steven et al. 2014) and possible minor consequences for a patient. (Andrew & Mansour 2014). It was unlikely that nursing students would have challenged senior staff members because of their junior position as a student (Andrew & Mansour 2014, Steven et al. 2014). In addition, nursing students would not question staff members, if they trusted the person and believed that the care related actions were correct. (Andrew & Mansour 2014.)

Nursing students have been found to feel responsible to their own role in ensuring patient safety (Chenot & Daniel 2010, Mossey et al. 2012) and consider about the possible consequences from their behaviour and actions (Andrew & Mansour 2010). This is not always the case, since nursing students may avoid their responsibilities, for example if they do not want to be involved in a challenging situation. They may drop out of the situation, if they perceive it is someone else's responsibility. In some cases, nursing students may even deny that an error could happen. (Andrew & Mansour 2014.) Nursing students can demonstrate variable responsibility and behaviour. In nursing students' perceptions, unsafe actions can result from dishonest behaviour, repeating errors, lack of partnership with educators, and being unprepared or unknowing, or consciously deviating from evidence-based practice (Mossey et al. 2012). Nursing students' age and gender may affect how they perceive patient safety issues. Yonger female students have been shown to be less comfortable with the issues than older male students (Chenot & Daniel 2010).

Table 6. The role of patient safety in nursing education

Findings regarding patient safety in nursing education	**Authors (year), country**
Nursing students value learning about patient safety	Sullivan et al. (2009) US, Pearson et al. (2010) UK, Cooper (2013) US, Cresswell et al. (2013) UK
Patient safety not embedded systematically in nursing curriculum	Smith et al. (2007) US, Attree et al. (2008) UK, Chenot & Daniel (2010) US, Howard (2010) US, Mansour (2012) UK, Cresswell et al. (2013) UK, Steven et al. (2014) UK, Tregunno et al. (2014) Canada
Perceived gap between patient safety education in academic and clinical settings	Attree et al. (2008) UK, Cresswell et al. (2013) UK, Duhn et al. (2012) Canada, Ginsburg et al. (2013) Canada, Mansour (2012) UK, Spence et al. (2012) Canada, Steven et al. (2014) UK, Tregunno et al. (2014) Canada
Lack of open and fair learning environment	Attree et al. (2008) UK, Chenot & Daniel (2010) US, Cooper (2013) US, Steven et al. (2014) UK, Tregunno et al. (2014) Canada, Monrouxe et al. (2014) UK
In clinical settings informal learning about patient safety and learning from various role models, favourable and unfavourable	Attree et al. (2008) UK, Cresswell et al. (2013) UK, Cooper (2013) US, Steven et al. (2014) UK
Reporting errors difficult for nursing students (e.g. unaware about systems, staff being busy or unclear, not being supported, not identifying incidents)	Henneman et al. (2010) US, Pearson et al. (2010) UK, Duhn et al. (2012) Canada, Cooper (2013) US, Espin & Meikle (2014) Canada, Mckay & Sanko (2014) US
Communication identified to play an important role in nursing students' learning about patient safety	Attree et al. (2008) UK, Abbott et al. (2012) US, DeBorough (2012) US, Duhn et al. (2012) Canada, Ginsburg et al. (2012) Canada, Spence et al. (2012) Canada, Cooper (2013) US, Cresswell et al. (2013) UK, Dolansky et al. (2013) US
Nursing students value shared learning in interprofessional groups	Abbott et al. (2012) US, Spence et al. (2012) Canada, Cresswell et al. (2013) UK
Combination of learning activities in academic and clinical settings increased nursing students' learning about patient safety	Miller et al. (2009) US, DeBorough (2012) US
Nursing students identified flaws in patient safety of their clinical units	Spence et al. (2012) Canada, Cooper (2013) US, Monrouxe et al. (2014) UK
Supported patient safety incident reporting promoting mindfulness and enhancing learning about patient safety	Mckay & Sanko (2014) US
Reflective assignments such as Root cause analysis (RCA) used to develop nursing students' learning about patient safety	Cresswell et al. (2013) UK, Dolansky et al. (2013) US, Seibert (2014) US
Simulation education increased learning about patient safety	Ironside et al. (2009) US, Mckay & Sanko (2014) US
Lack of learning about systems approach to patient safety	Attree et al. (2008) UK, Cooper (2013) US, Steven et al. (2014) UK, Tregunno et al. (2014) Canada

Reporting of patient safety incidents is a pivotal competence in healthcare. Nursing students have perceived that they adhere to the reporting of errors. The students have also expressed that they would tell the patient about the incident and inform the staff about the event. In case a peer would not report an error, nursing students would support the peer to complete the patient safety incident, in this study the issue being a medication error. (Andrew & Mansour 2014.)

2.2.3 Learning patient safety in academic settings

Learning patient safety in academic settings is important for nursing student learning of patient safety principals, methods and procedures. Nursing students should be prepared in academic settings to safely enter in clinical settings, but many studies have proved the opposite (Steven et al. 2014, Tregunno et al. 2014). Firstly, nursing educators' and programme leaders' competence to teach patient safety has been challenged. They do not necessarily have appropriate competence or interest to embed patient safety in nursing curricula. (Steven et al. 2014, Tregunno et al. 2014). Secondly, it has been displayed by nursing faculty that the reality of clinical settings cannot be properly simulated, since clinical settings are increasingly complex. Healthcare educators seem to teach what they know best and feel comfortable to teach. According to the previous research, healthcare educators do not necessarily have the required will and competence to change the curricula and to teach patient safety. (Tregunno et al. 2014.)

In nursing students' perceptions, patient safety issues should be connected to care throughout the nursing curricula, and the curricula should be structured to serve evidence-based patient safety education. (Vaismoradi et al. 2014.) However, it is proven that patient safety is not evident in formal curricula (Cresswell et al. 2013). Nursing students have described how patient safety was implicit, somewhat embedded throughout their nursing programme, but did not exist as a specific theme. The education in academic settings was also described as being focused in teaching idealistic skills and what should not be done. Training of patient safety skills was lacking. (Attree et al. 2008, Steven et al. 2014.) The education was viewed as unrealistic. In general, nursing students did not prefer a separate patient safety module. This is interesting since newly graduated nurses could not describe what their training of particularly patient safety had been. (Steven et al. 2014.) This is crucial since one would expect that new nurses recall what kind of basic principals, procedures, methods etc. related to patient safety they should handle. On the other hand, literature suggests that patient safety should be embedded in nursing curricula throughout the education to reinforce the vital elements of the subject (Deborough 2012).

In the United States, the spread of the Quality and Safety Education for Nurses project has produced good results. Nursing students and programme leaders have perceived patient safety issues to be present in their nursing curricula (Smith et al. 2007, Sullivan et al. 2009). Very few nursing programme leaders felt that more education was needed on safety, patient-centred care, teamwork and collaboration (Smith et al. 2007). However, in the UK some nursing students have perceived a gap between patient safety education in academic settings and reality in clinical settings (Attree et al. 2008, Steven et al. 2014). Literature has suggested solutions to fill the gap and create a fluent and coherent movement between and across the academic learning environment and clinical practice settings of healthcare organisations. Deborough (2012) reported about the development of an academic and service partnership model in which nursing students' self-confidence about their role in a patient's care and preparedness to start their clinical shifts increased. In this model healthcare faculty emphasised the process of communication and effective teamwork strategies. In addition, recognition of nursing students' previous clinical experience might be beneficial since those with previous experience have been found to perceive more preparedness related to patient safety (Sullivan etal. 2009). Although, it is not clear whether these students are found to be more competent in the area of patient safety.

Interprofessional education about patient safety is rather rare in nursing curricula (Cresswell et al. 2013). Interestingly, nursing students have been shown to assess that an interprofessional module had improved their interprofessional and development competence, but they were not necessarily able to describe the elements of interprofessional teamwork (Gjessing et al. 2014). In another study, nursing students have been shown to experience that teachers concentrated in teaching about diseases, treatments and other such matters. The students felt that there was not enough time for patient safety issues. (Vaismoradi et al. 2011.) Overall, patient safety is not necessarily visible in nursing curricula, but can be taught informally (Steven et al. 2014, Tregunno et al. 2014).

Communication failures are shown to be a crucial cause for errors, for example in medication errors. Nursing students have expressed confidence on learning about communication with patient and other healthcare providers, and on preventing adverse events by using verbal and non-verbal communication (Duhn et al. 2012). Clear communication has been practiced with standardised communication formats such as SBAR (situation, background, assessment, recommendation) (Jenkins et al. 2011).

All nursing students have been shown to make errors in complex patient care; in simulation scenarios none of the students were infallible. (Henneman et al. 2010.) Handling scenarios related to an error in an academic setting helps in nursing students' perceptions. (Henneman et al. 2010, Andrew & Mansour 2014.) This is important for nursing students' learning regarding identifying, but also interrupting and correcting an error. Nursing students have been shown to have problems in identifying errors. (Mckay & Sanko 2014.) Learning in a safe environment, before entering in real-life clinical settings, can be seen to enhance patient safety. In addition, patient safety incident reporting can be practiced in academic settings for example as part of simulation education. Thus, nursing students can learn about reporting errors in a safe environment. (Mckay & Sanko 2014.) To be able to report errors, nursing students seem to miss support. Nursing students have been described to perceive that they should learn and be supported how to challenge suspicious conduct (Steven et al. 2014). Medication errors have been proved to occur, since nursing students' delay in requesting help (Mckay & Sanko 2014). In helping nursing students to identify, interrupt, correct and report errors, nursing educators have a crucial role for their part in creating a safer healthcare system (Tregunno et al. 2014).

Understanding deeper reasons for errors seems to be lacking in nursing education especially in academic settings according to prevalent literature. Learning from errors in academic settings using the method of root cause analysis (RCA) is rare according to Cresswell et al. (2013).

Simulation education has been recognised as an evidence-based method to teach patient safety (Jansson et al. 2013, Berndt 2014), although somewhat underused. Nursing students have been shown to perceive teaching about patient safety more in classrooms than in skills labs and in simulation environment in academic settings (Sullivan et al. 2009). Interprofessional simulation education, as interprofessional education overall, is not common although perceived as important. It has been shown that nursing students are satisfied with interprofessional simulation exercises and would prefer more training in interprofessional teams (Mikkelsen Kyrkjebø et al. 2006, Cresswell et al. 2013). Learning especially about teamwork, personal reactions and lack of competences were preferred according to Mikkelsen Kyrkjebø et al. (2006). An integrative review indicates that nursing students' knowledge and attitudes regarding patient safety could improve in high-fidelity simulation. This was related to nursing students' educational level. Practicing clinical competences in simulation education and thus having clinical experience can lessen medication related patient safety incidents. (Shearer 2014.) Using simulation education in academic settings before nursing students enter in real-life healthcare environment has been argued to be a safe method to practice the competences needed. In simulation scenarios patient safety competences such as hand hygiene and patient identification have been taught and learned. (Gantt & Web-Corbett 2009, Jansson et al. 2013, Jenkins et al.

2011.) Simulations with other teaching and learning methods during one semester have been shown to decrease errors, but not improve totally the safety behaviours of the whole group related to these topics. (Gantt & Web-Corbett 2009.) Ironside and colleagues (2009) have claimed that multiple-patient simulation experiences improved significantly nursing students' patient safety competences. Although, in an integrative literature review, high-fidelity simulation did not prove to be superior to other means of teaching and learning about patient safety; although perceived as 'an enjoyable learning activity' according to Blum and Parcells (2012).

2.2.4 Learning patient safety in clinical settings

According to nursing students, they should be fully involved in patient care in clinical settings. Nursing students feel that there should be a reliable relationship between nursing education and practice. (Vaismoradi et al. 2014.) There is a danger that nursing students feel unprepared when entering a clinical practice environment. If the education in academic settings is too theoretical, nursing students may consider themselves as unsafe for patient care. (Vaismoradi et al. 2011, Steven et al. 2014.) In addition, nursing students have perceived that their mentors do not have time to teach patient safety or to assess them properly and faithfully (Attree et al. 2008). In several studies, nursing and healthcare students have been shown to perceive a gap between education in academic settings and practice in clinical settings (Vaismoradi et al. 2011, Steven et al. 2014). Nursing students need help in internalising patient safety related knowledge, skills and attitudes (Vaismoradi et al. 2011, Cresswell et al. 2013). The students feel also that they need reinforcement in questioning suspicious behaviour (Steven et al. 2014). Putting a patient in the centre of care and esteeming patients' rights are key elements that nursing students need to be supported in. (Vaismoradi et al. 2011). However, the students have described how senior staff members expect them to move forward quickly and the staff members can express dissatisfaction about nursing students' hesitation and will to double-check the task (Andrew & Mansour 2014).

It seems that in some nursing students perceptions, their mentors do not have enough time and understanding for them (Attree et al. 2008). This is a relevant issue since nursing students have perceived that working in a dedicated education unit having 'a smaller student-to-teacher ratio' effected positively in preventing possible errors and in gaining of knowledge related to medication (Mulready-Shick et al. 2009). The same kind of findings exists in Redi-Searl's et al. (2008, 2010) studies: when a medication error occurred, nursing students did not have proper level of supervision from their mentors. Overall, patient safety has been a key issue when deciding if nursing students' pass their clinical placements (Tanicala et al. 2011).

Effective teamwork is important to ensuring patient safety. In healthcare, patients are taking care of by interprofessional teams. To promote interprofessional caring, nursing students have suggested that interdependence should be increased between different healthcare providers. (Vaismoradi et al. 2014.) Nursing students are not necessarily confident on their learning regarding teamwork during their clinical placements (Duhn et al. 2012). Barriers for effective teamwork have been recognised to be poor and unprofessional communication, fragmentation of patient report, lack of training techniques in collaboration with other staff members and defects in nursing students' access to information assessed by nursing students (Seibert 2014). Learning in a dedicated education unit in clinical settings, have been felt to support taking of responsibility for coordinating patient care with the health care team by nursing students and enhancing of professional communication skills (Mulready-Shick et al. 2009).

It is important that nursing students practice reporting errors during their placements in clinical settings, but literature reveals shortage in this learning area of patient safety. Nursing students have described their possibilities to report errors as unusual, due in part

on their student status (Attree et al. 2008, Koohestani & Baghcheghi 2009, Pearson et al. 2010, Steven et al. 2014). A major problem seems to be lack of safety culture and undeveloped organisational structure of patient safety in clinical settings. Nursing students have expressed that there exists administrative barriers in reporting errors. In addition, they perceived the organisational culture as defensive, blaming and thus concealing. They have felt unprepared to handle patient safety incidents for the sake of the blame culture. (Attree et al. 2008, Koohestani & Baghcheghi 2009.) In addition, healthcare staff can provide varying role models for the students (Attree et al. 2008, Steven et al. 2014). It has been suggested that the good role models of patient safety are rare (Cresswell et al. 2013). Thus, challenging of actions and omissions is not easy for nursing students. (Attree et al. 2008, Steven et al. 2014.) Clinical leaders have viewed reporting of errors as problematic, since there were challenges with identifying and addressing mistakes and in creating an open culture to be able to report and eventually learn from errors (Steven et al. 2014). Moreover, nursing students have perceived lack of confidence in recognising, responding and disclosing hazards and near misses (Duhn et al. 2012). A good example for supporting nursing students to learn to report errors is a web-based curricula innovation project. Nursing students were asked to report errors in clinical settings with a web-enabled handheld device. The most common hazards were related to infection control and the most common near-misses were medication errors. (Currie et al. 2007.) In another study, medication administration was found to be the most common unsafe event (Gregory et al. 2009). A malign example of nursing students learning about reporting errors is not engaging nursing students systematically in reporting errors in health care organisations (Pearson et al. 2010).

Learning from errors is a vital phase to ensure patient safety. Learning from errors related to the actual reporting of errors and required consequential feedback to staff was perceived as challenging by clinical leaders (Steven et al. 2014). This sets an undesirable premise for nursing students learning from errors. Since nursing students, nursing educators and other key stakeholders have expressed that nursing students have involved and experienced patient safety incidents in clinical settings (Attree et al. 2008), it would be important that these incidents were properly dealt with. Unfortunately, there are negative experiences, where nursing students felt that there was no opportunity to discuss the errors and learn from the hazards and near misses (Attree et al. 2008). Nursing students have evinced their willingness to critically reflect their or other healthcare providers actions in a constructive way to learn about possible consequences of the actions (Vaismoradi et al. 2011). In some cases, mentors have been prepared to give honest feedback about nursing students' unsafe actions and to support the students to self-evaluation (Luhanga et al. 2008). Furthermore, there are examples from involving nursing students together with health care staff in learning from errors by means of root cause analysis. Deeper factors in addition to personal factors have been identified, such as environmental, communication and culture. To enhance patient safety, improvements have been developed. (Dolansky et al. 2013.)

Supportive environment is a crucial element for patient safety. A just culture is fair and individuals are supported to report errors. The just culture takes into account learning from errors and supporting individuals in case of human error, but in case of negligence there will be disciplinary actions. Thus, it is possible to blame individuals if they behave recklessly. (Barnsteiner & Disch 2012.) Unfortunately, several studies have reported that healthcare students' learning about patient safety is thwarted because of the poor safety culture in clinical settings (Attree et al. 2008, Steven et al. 2014, Tregunno et al. 2014). Nursing students have revealed how the culture can be blaming and defensive. The descriptions have included concerns about prioritising oneself over patients, because of the defensive and concealing culture. (Attree et al. 2008.) In previous research, clinical placements have been shown to be unsafe learning environments because of malign power relationships with lack of respect for learners (Steven et al. 2014, Tregunno et al. 2014).

Seibert (2014) provides a different example, where nursing students had meaningful assignments for their learning in clinical settings. These students felt that the climate for change was open and favourable. The students had previously studied concepts of change theory and were able to transfer it into actual practice. In addition, mentors have been shown to feel responsible for creating a supportive environment (Luhanga et al. 2008).

A systems-based approach is important for enhancing patient safety in healthcare organisations. Although the focus should be on assessing and developing the organisational systems, often it is merely on a nursing student's knowledge, skills and behaviour (Attree et al. 2008). Nursing educators can support their students to learn systems-based approach in clinical settings with insightful designing of the course. Seibert (2014) described a series of practice-based learning activities that stimulated nursing students to widen their thinking in system levels. Overall, third and fourth-year nursing students' confidence on their clinical learning about patient safety has been found to decrease compared to first-year and second-year nursing students (Duhn et al. 2012).

2.3 FRAMEWORK FOR NURSING STUDENT'S LEARNING ABOUT PATIENT SAFETY

The theoretical framework for this study has been formed according to Finnish and British national patient safety strategy, international patient safety education guidelines and the current literature about patient safety in nursing education. Notable is that there was a lack of Finnish research regarding learning about patient safety in nursing education. On the contrary, British research about the topic was established and results of the most significant studies are presented here. Research about Finnish patient safety culture was available and is presented here, as this is important to nursing students' learning experiences in clinical settings.

In this framework, nursing students' learning to become a constant, collaborative learner about patient safety is seen as an on-going individual process that goes ahead between and across academic and clinical settings (Figure 1). The HEIs and healthcare organisations are in important roles in teaching and learning about evidence-based patient safety, and it is important that nursing students are committed to learn. Globalisation of health and national and international healthcare and patient safety policies, guidance and trends give frames for healthcare organisations performance and HEIs to develop nursing/healthcare curricula. In an extensive qualitative study, Cresswell et al. (2013) showed that patient safety is not necessarily visible in British nursing curricula, but is more present in practical sessions and on clinical placements. Learning about patient safety attends to be implicit in curricula, but not a distinct learning area. However, patient safety is highly valued and the appreciation has increased in recent years (Pearson et al. 2010). In the British study, it was highlighted that teaching about patient safety is not just influential in knowledge and skills, but also in reflection and attitudes (Cresswell et al. 2013). It is not clear, what the situation is in Finnish nursing education regarding patient safety education.

Academic settings can be seen as implicit microsystems of healthcare organisations. Teaching in academic settings has an important role to prepare nursing students as fit for practice before they enter in healthcare organisations. In academic settings, nursing students are expected to learn about evidence-based patient safety knowledge like basic concepts, principals, methods, national policy and strategies. Patient safety skills should be trained before entering in real-professional context for example via simulation, also in interprofessional teams to gain an understanding of a student's own role in ensuring patient safety. Cresswell et al. (2103) indicated that British nursing students had only rare possibilities for interprofessional learning. It was argued that in academic settings, nursing students learn ideal practice (Cresswell et al. 2013), although it would be important that nursing students learn to act in complex situations, in situations when something goes

wrong and learn from the errors. Such methods as root cause and significant event analysis were rarely visible in British nursing curricula (Cresswell et al. 2013). In the literature, no research was found on Finnish nursing students' learning about patient safety in academic settings regarding described dimensions.

Clinical settings can be described as explicit microsystems of healthcare organisations. Nursing students learn about patient safety in direct contact with patients in interprofessional collaboration. In the British study (Cresswell. et al. 2013), learning has been described as more informal than formal. In both Finnish (Turunen et al. 2013) and British studies (Pearson et al. 2010), patient safety culture has been recognised to contain challenges especially related to communication and reporting of errors and thus, to systematically learning from errors. While nursing students' learning in clinical settings takes a large part of their programme, it is clear that the prevailing culture plays a prominent role in learning about patient safety.

Nursing students are expected learn about patient safety in terms to avoid, prevent and ameliorate harm. Nursing students' path between and across academic and clinical settings should be fluent and progressive in learning about patient safety. In current literature, no studies comparing learning about patient safety in nursing education in different countries were found.

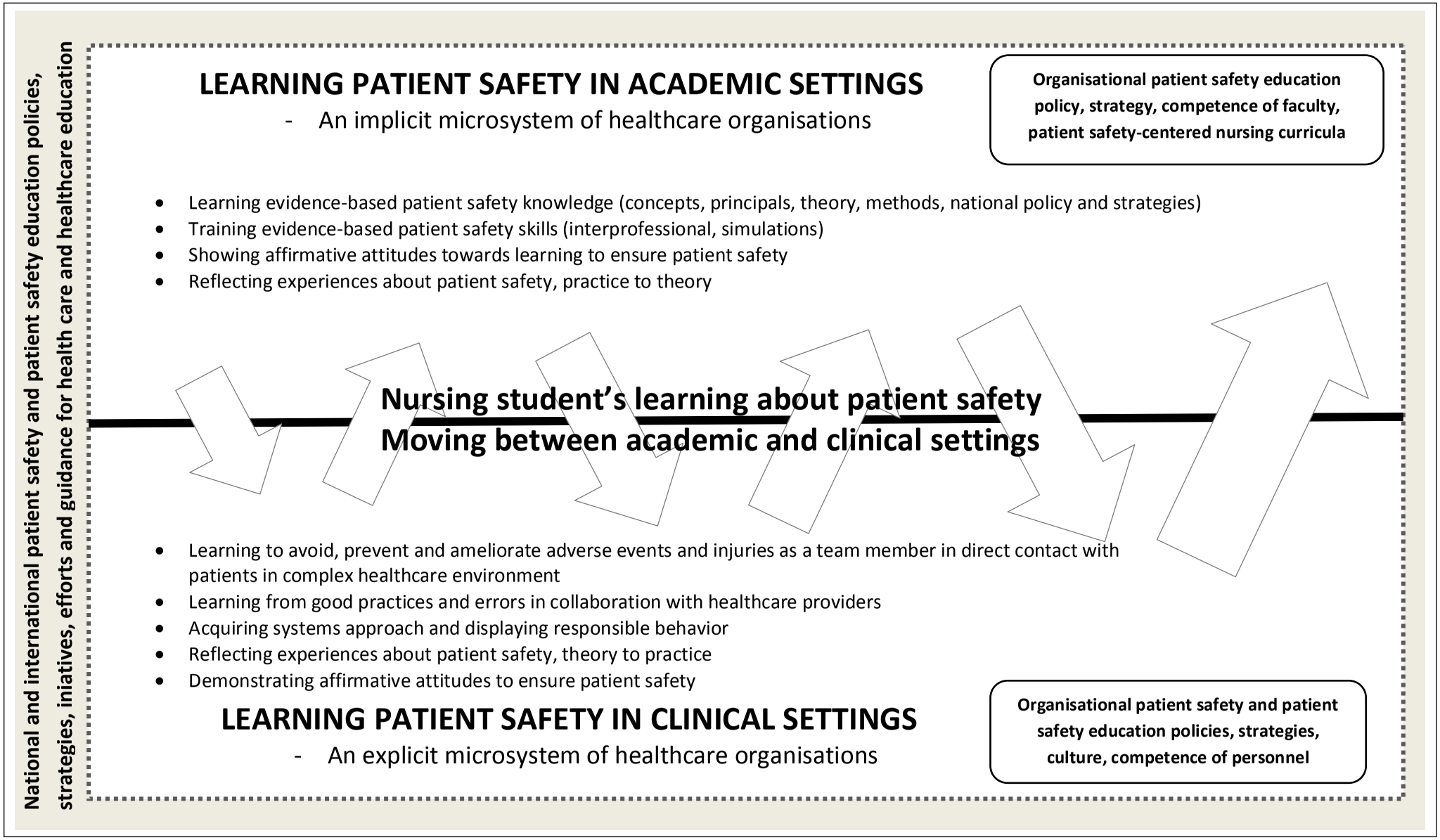

Figure 1. Framework for nursing students' learning about patient safety

3 *The purpose and research questions of the study*

The purpose of this study was to synthesise knowledge from learning about patient safety in pre-registration nursing education and to explore and compare Finnish and British pre-registration nursing students' evaluations on their learning about patient safety in academic and in clinical settings. The aims were to produce new knowledge on pre-registration nursing students' learning about patient safety in academic and clinical settings in order to provide information for nursing educators and health care leaders about designing of future education. The research questions are as follows:

1. What is the state of patient safety in pre-registration nursing education according to previous / existing nursing research literature in terms of teaching and learning contents and methods, and nursing students' learning? (Original publication I)

2. How do Finnish and British final year pre-registration nursing students evaluate their learning about patient safety in academic and in clinical settings? (Original publications II–III)

    - And what are the possible differences in evaluations?

3. How do Finnish and British final year pre-registration nursing students evaluate the importance of learning about patient safety in academic and in clinical settings? (Original publications II–III)

    - And what are the possible differences in evaluations?

4. What are the important learning events about patient safety in clinical settings described by Finnish and British final year pre-registration nursing students? (Original publication IV)

The results are important for the development of learning about patient safety in pre-registration nursing education in Finland and England, UK. Knowing what kind of patient safety competence do final year pre-registration nursing students achieve in their studies, gives understanding from the existing pre-registration nursing curricula, and helps to improve pre-registration nursing education. Furthermore, the results can be utilised to establish a path between the incidence of adverse events during clinical placements involving nursing students and the resultant reflection on curriculum development in nursing education.

4 Data and methods

4.1 DESIGN

The study was conducted in three sub-studies (Table 7). First, an integrative literature review was conducted on content, methods and learning about patient safety in nursing education. Second, in a survey-study, data was collected with a purpose-designed; double-blind-back translated Patient Safety in Nursing Education Questionnaire (PaSNEQ) in two Finnish Universities of Applied Sciences and in two English Universities. Third, a qualitative study with critical incident technique was used to gain an understanding of Finnish and British pre-registration nursing students' important learning events of patient safety during their clinical placements.

Table 7. Sub-studies of the research

Sub-studies / Aims / Articles	Design, sample and data	Methods
SUB-STUDY I (2011-2013) To examine patient safety in nursing education in literature Article I: What do nursing students learn about patient safety? An integrative review	Integrative review Research articles (n=20)	Integrative literature review Constant comparative method
SUB-STUDY II (2012-2014) To examine and compare Finnish and British pre-registration nursing students' perceptions on learning about patient safety Article II: Learning patient safety in academic settings: a comparative study of Finnish and British nursing students' perceptions Article III: Learning to ensure patient safety in clinical settings: Comparing Finnish and British nursing students' perceptions	Cross-sectional, comparative survey design Finnish (n=195) and British (n=158) pre- registration nursing students' perceptions collected with a purpose-designed, double-blind-back translated PaSNEQ questionnaire	Descriptive statistics, principal component analysis, Mann-Whitney U Test, logistic regression analysis
SUB-STUDY III (2012-2014) To investigate Finnish and British pre-registration nursing students' important learning events of learning about patient safety in clinical settings Article IV: Work placements as learning environments for patient safety: Finnish and British pre-registration nursing students' learning experiences	Qualitative design Finnish (n=about 22) and British (n=about 32) pre-registration nursing students written reflections using Critical incident technique (CIT)	Critical Incidents Technique (CIT) Inductive content analysis

4.2 SUB-STUDY I: AN INTEGRATIVE LITERATURE REVIEW (ARTICLE I)

4.2.1 Data collection

An integrative literature review was conducted to synthesise knowledge and to generate new knowledge from the research literature relating to the content of patient safety in nursing education, used learning and teaching methods and overall nursing students' learning about patient safety (Figure 1). The integrative review was carried out utilising Whittemore and Knafl's (2005) framework for data collection, analysis and synthesis. Planning and conducting of the literature search was supported by an information specialist. The search terms were identified from Medical Subject Headings, titles and abstracts of relevant studies and national and international patient safety policy publications. The terms and Boolean logic used in computerised search varied according the databases. Different combinations and variations were used to get best match from CINAHL, PubMed and EBSCOhost. In the manual search, scientific, peer-reviewed journals were browsed such as Journal of Nursing Education, Nurse Education Today, Nurse Education in Practice and Journal of Clinical Nursing. The search results were gathered and organised in RefWorks.

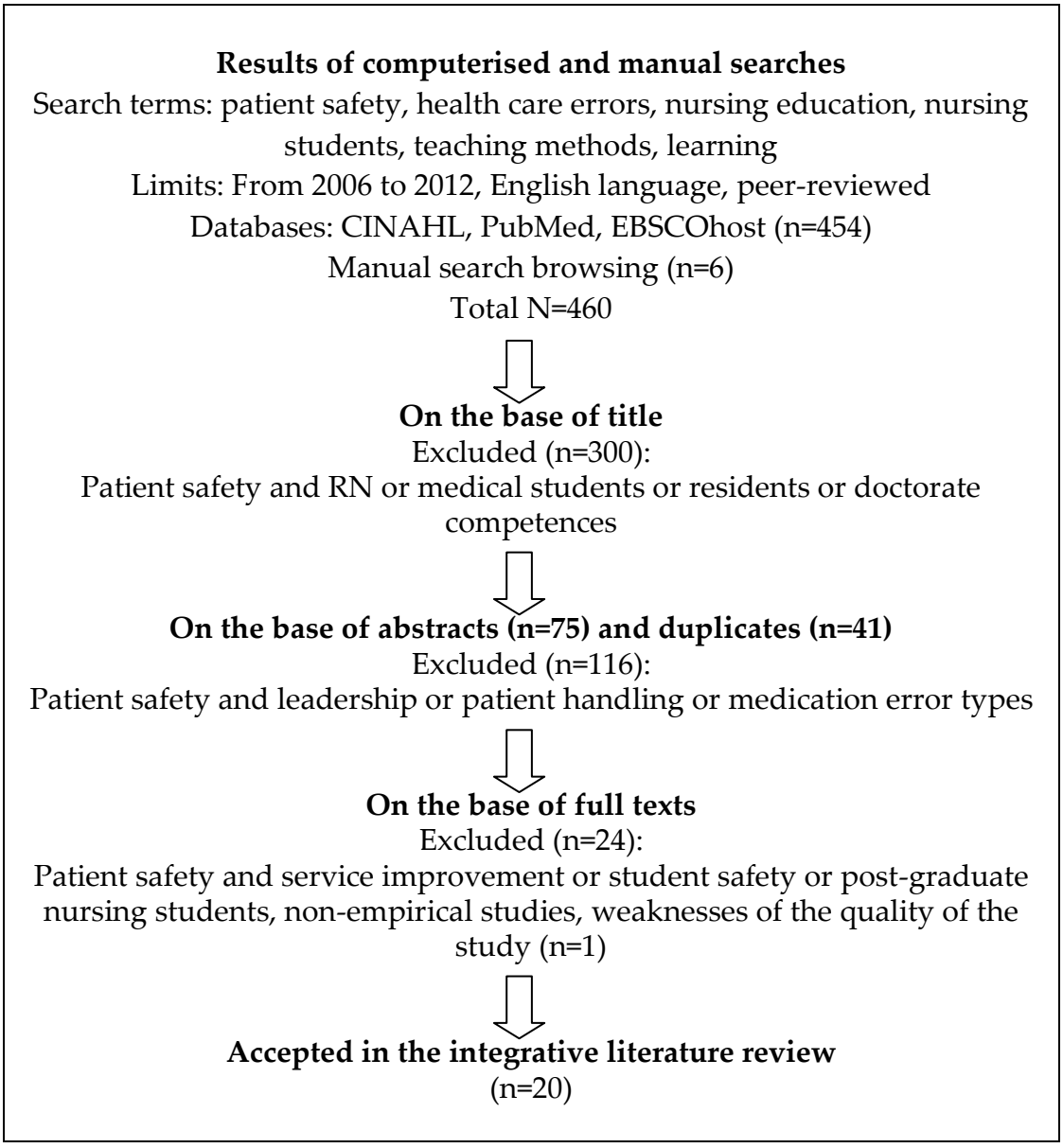

Figure 2. Literature search and study selection process of the integrative literature review.

Inclusion criteria were according to the title patient safety or errors or root cause analysis or unsafe and nursing education or nursing students or nursing curriculum. On the basis of abstract the inclusion criteria were patient safety contents and nursing education, patient safety and teaching methods or learning and nursing education and, patient safety competence and nursing education. In evaluating the full text, patient safety and prelicensure or pre-registration nursing education and empirical studies were included in the review.

4.2.2 Data evaluation and analysis

In data analyses, first the quality of the included empirical studies was evaluated (Whittemore & Knafl 2005). In this review, two scholars evaluated the quality of the studies. The second reviewer was a PhD student examining patient safety in health care and working as patient safety coordinator. The evaluation was conducted with a modification of Hawker's, et al. (2002) presented and also Jokelainen's et al. (2011) used form. The evaluation criteria were chosen because it was suitable for evaluating quantitative and qualitative studies. Jokelainen et al. (2011) used scores from 0 to 3, but in this study, scores were reduced to range from 0 to 2 to simplify the evaluation process. Background, purpose, data collection and analysis, ethical and reliability issues, and benefit of the study were assessed using a 0 to 2 range (0 = lack of information or irrelevant, 1 = inadequate, 2 = relevant information). The lowest points an empirical study could get, was 0 and the maximum score were 18. In this integrative review, the lowest were 8 points and maximum were 18, while the mean was 14.1. (mode 14). The lowest accepted points were 9. One study was excluded on the basis of data evaluation. The kappa test was used to evaluate the interrater agreement. The test showed good reliability (0.895). (Burns & Grove 2009.)

Second, a constant comparison method was used to synthesise the research literature related to patient safety education in nursing programmes. The method includes data reduction, in this context organising the data in to three sections (content, teaching and learning methods and nursing students' learning related to patient safety), data display (presenting the data in table, original publication I), data comparison (identifying themes), the drawing of conclusions and verification (generalising knowledge). (Whittemore & Knafl, 2005.)

4.3 SUB-STUDY II: A SURVEY FOR NURSING STUDENTS (ARTICLES II AND III)

4.3.1 Development of the PaSNEQ instrument

In the survey study, a purpose-designed Patient Safety in Nursing Education Questionnaire (PaSNEQ) was used in Finland and in the UK. The instrument was designed in a Finnish-British research group. The group members were the PhD student, a Finnish professor in nursing, a Finnish senior lecturer with PhD, an associate head of British nursing school with PhD and a director of clinical education of a British nursing school. The PhD student had the main responsibility in the development process, but all of the team members took part in development work.

The PASNEQ includes three domains: 'Academic settings' (ACA), 'Clinical settings' (CLIN) and 'Patient safety competence'. The 'Patient safety competence' domain was tested, analysed and reported separately in a Masters thesis (Nekouei 2014). There are altogether 57 variables: 7 background, 19 ACA and 16 CLIN variables. Two scales were used for ACA and INC domains: The first scale was to assess what kind of patient safety education was included in nursing education (INCa and INCc) and the second scale was about the importance of the patient safety education (IMPa and IMPc) perceived by

Finnish and British nursing students. A 4-point Likert scale (1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree) was used in both INC and IMP scales.

The Finnish and English versions of the PaSNEQ were developed in several phases at the same time ensuring the validity and reliability of the instrument and study. The PaSNEQ was initially formed in Finnish on the basis of an integrative literature review (Original article I) and international patient safety education guidelines (EUNetPaS 2010, WHO 2011). An expert panel evaluated the relevance of the questionnaire and based on the evaluations the content validity index (CVI) was calculated. The content of the initial version was discussed in the Finnish-British research group and the version to be translated was agreed. In the translation process, double-blind-back translation was used. The translators were either native Finnish or English speakers and had fluent skills in this other language. First, the Finnish version was translated into English (FTE1). Then a translator, who did not see the FTE1, translated it back to Finnish (BTF2). After that, the BTF2 was blind back translated to English (BTE2). These four different versions were ultimately compared and the conceptual equivalence of the translations evaluated (Sousa & Rojjanasrirat 2011). Consensus was sought in the Finnish-British research group and the Finnish and British pilot-test versions were formed. These versions were pilot-tested and according the test, minor changes were made to ensure unambiguousness (Burns & Grove 2009).

To examine interrelationships between the variables and to identify clusters of variables close together, INC sum variables were formed with principal component analysis (PCA). The Kaiser-Meyer-Olkin (KMO) was used as a criterion with threshold ≥ 0.6 to allocate suitability of PCA. Eigenvalue > 1 was used with Varimax rotation. Items that loaded above 0.4 were considered to be significant loadings. In ACA, three-factor solution explained 55.34 % of the variance and in CLIN, as well, three-factor solution explained 55.22 %. However, in CLIN, the largest factor was divided in two, producing a four-factor solution that better described different areas of nursing students' learning about patient safety. To be able to test the IMP in relation with INC, same kind of factor solutions were formed from IMP.

To study the relationships in the composed INC and IMP sum variables, Spearman's correlations that correlated over 0.3 were considered as acceptable. In this study, Spearman's correlations varied from 0.31 to 0.73. The sum variables were also examined with Cronbach's alfa. For a new instrument and since patient safety is a relatively new discipline, values over 0.7 were considered to be good. The Cronbach's alfa values of all sum variables were good ranged from 0.78 to 0.91, except 'Reporting patient safety incidents' INCc which was 0.43. Notable is that in 'Reporting patient safety incidents' there were only three variables.

4.3.2 Sample and data collection

The respondents were full time, final year pre-registration nursing students. They completed their bachelor's degree in three years in the UK (n=158) and in three and a half years in Finland (n=195). The response rates were 78% and 65%, respectively. The data were collected with a purpose-designed, double blind-back translated PaSNEQ instrument. Finnish students filled out the PaSNEQ in Finnish and British students in English. The respondents were given written instructions about filling out the PaSNEQ in a classroom setting. The data were collected in 2012.

4.3.3 Statistical analysis

Data were analysed with SPSS for Windows Version 19.0 (SPSS Inc., Chicago, IL, USA). Background variables of age, former education, previous work experience in healthcare and in other sectors were further categorised. Descriptive statistics, cross tabulations, Pearson Chi-Square tests, means and standard deviations (SD) were used to analyse and compare the Finnish and British data. The variables found were asymmetrical examined with the

Kolmogorov-Smirnov Test. Thus, Mann-Whitney U Test was used in comparing Finnish and British data. To examine possible predictive factors in Finnish and British nursing students' evaluations, binomial logistic regression analysis was used. Odds ratios (ORs) and 95 % confidence intervals (CIs) were calculated. A threshold of *P*-values ≤ 0.05 was considered as statistically significant (Burns & Grove 2009).

4.4 SUB-STUDY III: NURSING STUDENTS' WRITTEN CRITICAL INCIDENTS (ARTICLE IV)

4.4.1 Sample and data collection using the critical incident technique

The participants were Finnish and British final year pre-registration nursing students (Bachelor's degrees). The data was collected in one UAS in Finland and in one university in England, UK. The data collection was conducted in the international research team, but the researcher had the main responsibility in collecting the data. Finnish and British nursing students were recruited in classrooms. Data were collected in 2012 having participants from Finland (n=22) and from England UK (n=32), 44% and 64% volunteering, respectively.

Critical incidents technique (CIT) was used to increase understanding of Finnish and British nursing students' learning about patient safety during their clinical placements. CIT is a flexible method consisting of principals used for obtaining specific information about participants' experiences and views from certain events, meanings or procedures (Kemppainen 2000, Irvine et al. 2008, Hosie et al. 2014). With the method, valuable and generous information can be gained trough helping the participants to uncover their thoughts and actions related to the area of interest (Schluter et al. 2008). CIT was developed by an American psychologist Flanagan (1954) to help combat veterans with their problems related to human behaviour. CIT has been used in collecting research data, recognising of competences, experiences and practices, solving practical problems, and as a teaching and learning method in nursing education (Kemppainen 2000, Silén-Lipponen et al. 2004, Brunton and Jeffrey 2010, Hosie et al. 2014). In this study, to gain an understanding on Finnish and British nursing students learning experiences about patient safety, they were asked to describe the important events or situations related to especially their own learning about patient safety during their clinical placements. These important events could be either positive or negative by nature (Flanagan 1954, Irvine et al. 2008, Victoroff & Hogan 2006). Nursing students were asked to reflect these events to enhance their learning from experience at work placements. This can be seen as beneficial for the students, since reflecting the events improves assessing of complex situations (Smith 1998). The request was to describe one learning event by writing about what happened and when, the persons involved and why this event was important for the student's learning about patient safety. The description was requested to be about one page in length. Finnish participants wrote their critical incidents in Finnish and British participants in English.

4.4.2 Qualitative content analysis

Finnish and British nursing students' written reflections on their important learning events about patient safety during clinical placements were analysed using inductive content analysis (Graneheim & Lundmark 2004, Elo & Kyngäs 2008). The written data were recorded into Word-documents. Then, the text, altogether 25 pages, was carefully read through repeatedly to gain an understanding of the whole content of the data and was discussed in the research group. The content analysis was performed in the Finnish-British research team, but the researcher had the main responsibility in analysing the data. During the writing process, the manuscript was cross-referenced in the research team. In analysing process, the data were first categorised and abstracted, moving from detailed expressions to generalisation (Figure 3). Content-characteristic words, for example reporting the incident,

good aftercare of the incident or communication improved, were used to make observational notes and to divide those into *meaning units,* which were in this study, close to text. Further analysis included grouping the meaning units into *condensed meaning units,* in which, the underlying meaning was tried to reveal. From the condensed meaning units, eight *sub-themes* were formed. Finally, two *themes* were comprised. (Graneheim & Lundmark 2004, Elo & Kyngäs 2008.)

Finnish and British nursing students' written descriptions were also quantified to be able to better compare the important learning events. The descriptions were organised in a table into categories. The categories were as follows: the type of important learning event (hazard, near miss, good practices) positive or negative; whether it was a patient safety incident, was it reported; specific issue for example medication error; steps and factors associated; who were involved; type of the clinical unit; phase of nursing education; and overall what was learned.

Meaning units	Condensed meaning units	Sub-themes	Themes
'I mentioned this to my mentor who then realised that she was about to make an error.'	⇨ Identifying a possible error in a patient's care	⇨ Preventing of an error from proceeding	⇨ Safe actions after a patient safety incident

Figure 3. An example of the qualitative content analysis of the important learning events.

4.5 ETHICS OF THE STUDY

During this study, a good ethical practice was maintained (Finnish Advisory Board on Research Integrity 2013). Ethical concerns of the study were examined by the University of Eastern Finland Committee on Research Ethics. A favourable statement (7.2/2012) was granted for comparing patient safety in pre-registration nursing education in illustrated UASs in Finland and in Universities in England, UK. After that, the approvals were obtained from those universities of applied sciences in Finland and in the universities in England, UK that participated in the study. In general, ethical issues were considered respecting the international approach of the study. All persons involved were respected. Beneficence meaning maximising good and preventing harm, and justice, fair treatment of the participants, were confirmed. There was no harm caused for the participants, final year pre-registration nursing students, but concentrating on patient safety issues could have possible effects e.g. reflecting on patient safety can enhance learning about patient safety. In both countries, the participants were treated fairly and equally during the research process. Communities, meaning the HEIs and healthcare institutes involved were also respected. The benefits and risks were considered. Since the research was conducted in a Finnish-British research group, the contextual and cultural issues were considered from the beginning of the study giving the opportunity for researchers in both countries to impact in the conduct of the study. The knowledge that research focuses on, was designed to benefit nursing education in the institutes of both countries and wider. (Olsen et al. 2003, WMA 2008.) Overall, the research participants were protected. Nursing students were seen as vulnerable participants since their role as students and as education research participants (Loftin et al. 2011). Their right to voluntary participation and right to confidentiality and anonymity were respected throughout the study in the Finnish UASs and in the British universities. There was no risk that a single student would have been recognised by the researcher. A dual-role of teacher-researcher, was in one pilot-study, but the students were

informed about the voluntary nature of the study and that a single student could not be identified. In addition, the students were recruited in a group, left to answer without the teacher-researcher, while another teacher collected the data. (Loftin et al. 2011.) In other recruitments, there was no dual-role present.

In the sub-study I, the data was collected from primary studies and informed consent was not needed. The research process of the integrative literature review was planned, implemented and described carefully in the Finnish-British research group to conduct a good ethical practice (Finnish Advisory Board on Research Integrity 2013). *Sub-study II, ethics of comparison with the PaSNEQ.* Approvals for the study were obtained from the participating HEIs in Finland and in the UK. The possible respondents got the PaSNEQ with a cover letter. In the cover letter there were statements about the voluntary nature of the study and that the responses were anonymous. Additional information such as purpose of the study, data collection and analysis, names of researchers and contact information were also provided. A completed questionnaire acted as informed consent (Burns & Grove 2009). *Sub-study III, ethics of comparison of important learning events with critical incidents technique.* Participants of this study were recruited in classrooms in their HEIs in Finland and in England, UK. Collecting data in groups not individually, made it possible for nursing students to stay away from the study without feeling pressured (Loftin et al. 2011). An information letter was given for possible participants with details about the voluntary nature of participation and protection of each participant's anonymity through the research process. To safeguard anonymity and due to sensitivity of the topic, demographic data were not collected. In addition, information was provided about the study details, purpose, methods and publication plans. Researchers' contact details were given. (Burns & Grove 2009.) The written and electronic data were securely kept and only accessible to the research team.

4.6 VALIDITY, RELIABILITY AND LIMITATIONS OF THE STUDY

Validity and reliability of the study was confirmed in several ways. Triangulation was used to gain a holistic view of the studied phenomenon. Methodological triangulation increases validity of the study with combining strong external validity of quantitative method and strong internal validity of the qualitative method. Investigator triangulation, having the Finnish-British research group, enhances validity of the study. (Burns & Grove 2009.) While the research group consisted of investigators from both countries, it was possible to gain wider understanding on the effect of cultural diversity. Conducting the research in an international research group, having different cultures and language, may have also caused bias. Researchers tried to minimise the possible bias by having close collaboration in the research team and trying to communicate as clearly as possible. The role of the language has been especially acknowledged and the research documents have been checked by professional translators. In this section, validity and reliability and limitations of the findings of the sub-studies are considered.

Integrative literature review

The integrative review was carried out combining studies of different research methodologies (Hawker et al. 2002). In this sub-study, quantitative and qualitative research studies were reviewed and synthesised to determine current knowledge about patient safety in nursing education. To improve trustworthiness of this research, the integrative literature review was planned and evaluated in an international research group (Burns & Grove 2009, Bettany-Saltikov 2010a). Moreover, two independent scholars performed data selection and evaluation (Whittemore & Knafl 2005, Burns & Grove 2009, 621–622, Bettany-Saltikov 2010b). The primary studies were evaluated by examining the following areas of the studies: background, aims/research questions, sample, data collection, data analysis,

findings, ethical aspects, validity and reliability, and finally, how useful the results were (Hawker et al. 2002, Bettany-Saltikov 2010a, 2010b, Jokelainen et al. 2011). Each area was examined using a 2 point scale: 0 = lack of data or/and inconsistent in relation to aims, 1 = superficial or/and inaccurate, 2 = does meet the aim and systematic presentation. The highest scores that a single primary study could get, was 18 and the lowest 0. The evaluated studies (n = 20) got scores ranging from 8 to 18 points. The mean of the studies was 14.1 and the mode 14. In addition, an interrater agreement between two evaluators was 0.895 using the kappa test representing a good reliability (Burns & Grove 2009).

There are some *limitations* for this sub-study. The use of the subject headings can be considered as narrow. However, different subject headings were tested before choosing the actual ones. In addition, the chosen subject headings seemed to produce the best match for the study purpose. However, there is a possibility that some relevant studies have been missed. Further, the limits set for the search may have caused bias. The search was set to start from 2006 because the first alliance for patient safety was launched by the WHO (2004) in October 2004. Thus, nursing education and nursing education research was thought to include patient safety issues no earlier than 2006. English language was also set as the limit for the studies chosen in the literature review. This may cause bias leaving possibly relevant studies published in other languages outside the review. Furthermore, the inclusion and exclusion criteria may have been inaccurate. However, there were some studies that were considered to be on the border and thus, it is possible that some studies should have been included or excluded contrary to agreed decisions. In addition, coverage of the searching and browsing may have left some relevant studies unnoticed. However, the searches were conducted with the help of an information specialist.

The study quality of the primary studies included in the integrative literature review varied according to the evaluation. In some studies, it was possible that the same data was used causing bias for the results. In addition, the analysing may have been inaccurate since the studies included in the literature review also included nursing students from different phases and levels of their studies, but also mentors and leaders' views have been included. This may cause bias or otherwise be said, to increase reliability of the review. It is possible that there is more coherent understanding of the phenomenon when there is a broader view of the issue. Patient safety is a common concern and similar issues related to patient safety have been reported about healthcare professionals and students. Furthermore, the integrative literature review itself has limitations. The variability of research methods and sample sizes can cause bias and lead to inaccuracy (Whittemore & Knafl 2005).

The survey study using the PaSNEQ

While the discipline of patient safety, and especially in nursing education is fairly new, a purpose-designed instrument was justified. The validity and reliability of the new instrument, PaSNEQ, were ascertained in many phases (Burns & Grove 2009). *Content validity* of the questionnaire was supported with firstly undertaking the integrative literature review and exploring the international patient safety guidelines (EUNetPaS 2010, WHO 2011), which was the basis for developing of the PaSNEQ (DeVon et al. 2007). This provides common understanding of the phenomenon and related key concepts. Secondly, a panel of content experts (n=5) evaluated the relevance of the items and total questionnaire (Waltz & Bausell 1981, DeVon et al. 2007). Content validity index (CVI) with a 3 point rating scale was used in this evaluation (1 = not relevant, 2 = somewhat relevant, and 3 = relevant). If an item had 1 or 2 points, a consensus was searched for between the expert panel members. (DeVon et al. 2007.) After that, the instrument was revised and required changes were made. In addition to the evaluation of the expert panel, there were discussions with the British research group members throughout the development process. Thirdly, the questionnaire was double-blind-back translated in Finland and in England, UK to ensure the coherence and clarity of Finnish and English versions (Sousa & Rojjanasrirat 2011). Fourthly, the PaSNEQ was pilot-tested in both countries. The respondents had the

possibility to comment on those items that were not clear. After the pilot-test, required minor changes were undertaken. Overall, the strengths of this study are in the carefully designed instrument.

The analysis of the data included principal component analysis in order to analyse the relationships between the variables regarding Finnish and British nursing students' learning about patient safety to evaluate the *construct validity* of the PaSNEQ. Construct validity was supported with factor-loadings above 0.4. (DeVon et al. 2007.)

As a new instrument, the PaSNEQ showed a good internal consistency. Measured with Cronbach's alfa, the total instrument (86 items $\alpha = 0.97$), the academic settings domain (INCa $\alpha = 0.784–0.853$, IMPa $\alpha = 0.802–0.847$) and for the clinical settings domain (INCc $\alpha = 0.724–0.827$, IMPc $\alpha = 0.789–0.859$) indicated good reliability, with the exception of reporting of patient safety incidents, which was, unacceptably low (3 items, $\alpha = 0.428$). Therefore, the findings cannot be totally generalised.

This sub-study has limitations. The participants were not selected randomly and the data was collected in two UASs in Finland and in two universities in the UK. In addition, due to the poor inconsistency of 'reporting patient safety incidents', generalisation of the results needs to be carefully considered. The poor inconsistency may stem from the fact that the nursing students' possibility to report errors in healthcare environment varies a lot. There is as yet no coherent practice for example on how nursing students learn to report patient safety incidents in academic settings and what are their possibilities to report in a clinical setting.

The qualitative study

Trustworthiness of the study of describing Finnish and British nursing students' important learning events about patient safety was evaluated with credibility, dependability and transferability (Graneheim & Lundman 2004). Critical incidents technique was used in data collection and inductive content analysis in analysing the written important learning events.

Credibility concerns about the whole research process. For example, how the research is formed, what is the focus of the study, how the data is gathered, who are the participants and overall how the research meets the expectations (Graneheim & Lundman 2004). This research was formed around patient safety since the topicality and importance of the phenomenon (see MSAH 2009a, WHO 2011, Francis 2013). Nursing education has an important role in providing evidence-based education and ensuring that new nurses are fit for practice. Since the UK has been a pioneering country in the field of patient safety and Finland launched the patient safety initiatives several years later, it was a relevant premise for comparing nursing education in Finland and in the UK. Having participants with different experiences provides a richer picture of the phenomenon (Graneheim & Lundman 2004). The selection of data collection method, critical incident technique, was considered to enhance credibility of the study. With the technique it was possible to gain new knowledge about Finnish and British nursing students' important learning events about patient safety and whether the events were positive or negative in nature. In addition, crosschecking was used among the Finnish-British research group in ensuring credibility in the different phases of the study from designing to analysis and further (Burns & Grove 2009). Since the purpose was to gain an understanding of pre-registration nursing students' important learning experiences about patient safety during their clinical placements, final year students were selected as the participants. They have learning experiences from at least two years and they can compare different events, situations and meanings better than those having less academic years behind them. In addition, the analysis process, producing generalisation out of relevant specific data is an issue of credibility (Graneheim & Lundman 2004, Elo & Kyngäs 2008). Thus, representative citations were presented from the Finnish and British nursing students' authentical text. Finnish students' writings were shown as English translations.

Dependability deals with how the data changes over time (Graneheim & Lundman 2004). To ensure dependability, the data were collected in the same year in Finland and in England, UK from pre-registration nursing students at the same phase of their studies. Equality in data collection was considered carefully (Graneheim & Lundman 2004). The information letters for both Finnish and British nursing students were translated and compared with care. The data was collected in classrooms in both cases. Moreover, dependability focuses on the changes in the analysis process depending on the researcher's solutions and open dialogue within the research group (Graneheim & Lundman 2004). To avoid one-sided insights and decisions, the Finnish-British research group had open conversations throughout the research process. In addition, relevant literature was searched throughout the research process.

Transferability describes how the research can be generalised to other settings, circumstances or groups (Graneheim & Lundman 2004). Qualitative studies are described to have rather strong internal validity than external validity (Burns & Grove 2009). Thus, generalisation of the study findings needs to be considered carefully. Depicting the culture and context of the research helps to enhance transferability (Graneheim & Lundman 2004). In this study, Finnish and British patient safety policies, the state of development, and pre-registration nursing educations and the role of patient safety in the educations were described and compared to support the transferability of this study. Also rich and representative quotations of the original text were presented in the original publication (article IV).

Limitations for this study relate to the rather small number of the participants in Finland (n=22) and in the UK (n=32). Therefore, one needs to be careful with generalising the findings. Furthermore, the used method, CIT has been criticised because of some inaccuracies (Bradbury-Jones & Tranter 2008). In this study, the quality of nursing students' written important learning events about patient safety varied. All participants did not write a coherent description on their experiences and reflections. This may relate to the situation that students wrote about their events. The data was collected in Finland in December at the end of the semester and in the UK in May. Thus, Finnish students may have for example been busy with exams. Furthermore, the instructions for the students could have been more accurate. Possibly a structured reply form may have supported the students in writing their events. In addition, the data was rich and patient safety is a complex and broad issue requiring deep understanding of the issue. Hence, the analysis may not have reached all the important aspects that would be important in reporting nursing students' important learning events about patient safety.

Considering about the possible limitations of the study, one needs to take into account the role of the researcher. The researcher is a lecturer in a Finnish university of applied sciences and has been teaching patient safety for several years. Thus, Finnish nursing education is more familiar to the researcher than the British system although the nursing curricula in Finland are unique in each UAS. This may have caused bias in analysing the data and interpreting the results.

5 Findings

The findings of the study are reported in the following order: *First,* the integrative literature review on patient safety in nursing education; S*econd,* Finnish and British pre-registration nursing students' evaluations and perceptions on their learning about patient safety in academic and in clinical settings; *Third,* Finnish and British pre-registration nursing students' important learning events about patient safety during their clinical placements; and *fourth,* a summary of the study findings is presented. The findings of the original publications, articles (II–III) are presented together and are distinguished with ACA referring to article II, CLIN to article III. The integrative literature review and the important learning events are reported separately referring to articles I and IV, respectively.

5.1 CONTENTS, METHODS AND LEARNING OF PATIENT SAFETY IN NURSING EDUCATION (ARTICLE I)

The empirical studies (n=20) of the integrative literature review were published between 2006 and 2012, most of those being from the United States. The types of the studies were quantitative, qualitative and triangulations. In these studies, patient safety in nursing education was mainly examined from nursing students' point of view.

Patient safety content in nursing curricula. In this integrative literature review, patient safety was not logically and clearly visible in the nursing education. Themes identified were learning from errors, responsible individual and interprofessional teamwork, anticipatory actions in complex environments and patient-safety-centred nursing. Learning from errors included such issues as understanding human behaviour, identifying errors, stopping them to proceed and report errors. Analysing of errors and ultimately learning from them was less described. In this integrative literature review, nursing students were assisted to learn responsible and safe actions as a team member but also as individuals. Complex healthcare environment was recognised as a threat for patient safety and systematic actions were taught for example in the use of good practices (patient identification, hand hygiene, allergy verification etc.) and critical thinking skills. Patient safety education comprised of learning supportive elements related to ensure patient safety, but also from learning to behave in disruptive situations. Overall, in many studies patients and their safe care were seen to be in the centre of nursing.

Teaching and learning methods of patient safety. The teaching and learning methods included several different types of methods, such as traditional readings and lectures, modern simulations also in interprofessional student teams, innovations like web-based reporting of errors, and overall clinical practice, and different types of combinations for example class room discussions about a patient safety case and afterwards patient safety project in clinical settings. Nursing students were helped to proceed in their behaviour towards safe actions in real-life context. In this integrative literature review, most of the empirical studies dealt with nursing student learning about patient safety in clinical settings. Mentors' role was crucial for nursing students' safe actions. It was important that nursing students had appropriate level of supervision commensurate to their ability to learn and act in clinical settings. In addition, the mentors' role was essential in helping nursing students to internalise patient safety and in supporting the students to challenge questionable behaviour. Also collaboration of academic and clinical learning environments was seen to be important for nursing student learning opportunities about patient safety. There were some studies that evaluated usefulness of simulation education. Simulation

education was found to be relevant for learning about patient safety, but not eliminating errors. Simulations needed to be well prepared and realistic to serve the learning.

Nursing students' learning about patient safety. The themes formed were continuing improvement of patient safety competence, sensitivity to the students' own role and supportive learning environment. Nursing students' learning about patient safety was described as variable depending on the study, methods, context and learning area. The way nursing students perceived learning, varied in different contexts. Learning to report errors and learn from them was one important learning area. Nursing students' recognised patient safety incidents and reported them as follows: medication errors were the most common near misses, and poor infection control the most common hazards. Other common near misses were lack of patient identification and allergy verification. Reporting of errors required sensitivity to the students' own role. Since most nursing students were revealed to make an error, it was important that the learning environment was supportive and not punishing. On the basis of this integrative literature review, supportive learning environment to learn about patient safety is highlighted, but learning from errors remains some how weak. Analysing the errors is not clearly described and for example use of root cause analysis is lacking.

5.2 FINNISH AND BRITISH NURSING STUDENTS' EVALUATIONS ON THEIR LEARNING ABOUT PATIENT SAFETY IN ACADEMIC AND CLINICAL SETTINGS (ARTICLES II AND III)

The findings of the survey (ACA and CLIN) display that British nursing students were older ($P < 0.001$), had more work experience in healthcare settings (ns) and in other settings ($P = 0.03$) (Table 7). From Finnish nursing students 90 % were females and from British nursing students 95 (ns). Sixth form or A-levels were 74 % and 64 % ($P = 0.04$), bachelors degree 2 % and 14 % ($P < 0.001$) and masters degree 1% and 1 % (ns), respectively. A separate patient safety module was included in Finnish nursing students' programme 29 % and in British nursing students' programme 34 % (ns).

In academic settings. British nursing students evaluated overall more teaching and learning about patient safety compared to their peers in Finland (ACA). The widest differences in academic settings dealt with training of patient safety skills. Only about half of the Finnish nursing students evaluated that their programme had contained 'recognising situations that might lead to serious incidents' (Strongly agreed or agreed 51 %) while most of the British had an affirmative view (Strongly agreed or agreed 96%) ($P<0.001$). The Finnish nursing students also perceived quite contrary to their British peers the inclusion of education about reporting patient safety incidents (27% vs 80%, $P<0.001$). Similarly, most of the Finnish nursing students had negative evaluations on how the topic was included in their education while most of the British nursing students had affirmative views on inclusion of interprofessional simulation education (19% vs 67%, $P<0.001$) and simulation education (38% vs 77%, $P<0.001$), respectively. In Finnish nursing students' perceptions their education included only some teaching of clear communication (38% vs 86%, $P<0.001$) and systems-based approaches to errors (35% vs 77%, $P<0.001$), respectively.

There were significant differences between the Finnish and British nursing students' evaluations on their learning about patient safety in academic settings (ACA). Finnish nursing students' evaluated gaining less knowledge about patient safety (mean 2.62 ± SD 0.55) compared to British nursing students (3.15 ± 0.50) ($P<0.001$), training patient safety skills (2.24 ± 0.54 vs 3.11 ± 0.49, $P<0.001$) and highlighting affirmative attitudes and motivation to ensure patient safety (2.84 ± 0.57 vs 3.48 ± 0.38, $P<0.001$), respectively.

Table 8. Background variables of Finnish and British pre-registration nursing students (PaSNEQ)

Background measure	Finnish (n = 161–193)	British (n = 117–154)	*p*
Age (n = 347)			
Mean	26	29	<0.001*
Median	24	27	
Std. deviation	5,2	7,6	
Minimum	21	21	
Maximum	49	51	
Work experience in health care (n = 334)			
Mean	2,1	3,4	0.11*
Median	1,0	2,0	
Std. deviation	3,5	4,4	
Work experience in other sector (n = 278)			
Mean	3,6	5,8	0.03*
Median	2,5	4,0	
Std. deviation	3,6	5,9	

*Kolmogorov-Smirnov Test (p =0.00), Mann-Whitney U Test and Kruskall-Wallis Test

Predicting the differences in Finnish and British nursing students' evaluations were estimated with binomial logistic regression analysis (ACA). Two predictors for differences were training of patient skills in their education in academic settings (OR = 34.69, 95% CI 7.39–162.83, P <0.001), and had more work experience in the health care sector (OR = 3.02, 95% CI 1.39–6.58, P = 0.005).

In clinical settings. Finnish nursing students perceived less patient safety education during their clinical placements than their British peers did (CLIN). The differences between Finnish and British nursing students' perceptions are wide in 'Learning to use various types of checklists to ensure patient safety' (Strongly agree or agree 55 % vs 95 %, P < 0.001), 'learning systematically from errors' (68 % vs 90 %, P < 0.001), 'a systems-based approach' (46 % vs 84 %, P < 0.001), and 'supportive environment for learning about patient safety' (83 % vs 96 %, P < 0.001), respectively.

Finnish nursing students had significantly more critical views on how patient safety was included in their education in clinical settings than the British nursing students (CLIN). Differences were perceived in 'supportive and systems-based approach to ensure patient safety' (mean 2.82 ± SD 0.54 vs mean 3.40 ± SD 0.44, P < 0.001) in 'gaining experience about ensuring patient safety' (mean 3.24 ± SD 0.53 vs mean 3.51 ± SD 0.41, P < 0.001) and in 'reporting patient safety incidents' (mean 3.03 ± SD 1.09 vs mean 3.35 ± SD 0.65, P < 0.001), respectively.

One strong predictive factor was found for differences in Finnish and British nursing students' evaluations on teaching and learning about patient safety in clinical settings (CLIN). The predictor was perceived 'supportive and systems-based approach to ensure patient safety' (OR = 16.55, 95% CI 4.52–60.55, P < 0.001). This predictive factor consisted of nine items: interdependence of quality care and patient safety, patient-centred care,

responsibility of an individual care giver, efficient team work, clear communication, systems-based approach to errors, learning systematically from errors, learning to use checklists ensuring patient safety and supportive environment for learning about patient safety.

5.3 FINNISH AND BRITISH NURSING STUDENTS' PERCEIVED IMPORTANCE OF LEARNING ABOUT PATIENT SAFETY IN ACADEMIC AND CLINICAL SETTINGS (ARTICLES II AND III)

Learning about patient safety was perceived more important for the students' own learning about patient safety than what Finnish and British nursing students evaluated their education had contained in both settings, academic and clinical (ACA, CLIN).

In academic settings. Even that both Finnish and British nursing students reported patient safety education to be valuable for their own learning about patient safety, Finnish nursing students did not perceive as important as British students did (ACA). There were slight differences between Finnish and British nursing students' evaluations about the importance (Table 9): 'gaining knowledge about patient safety' (mean 3.38 ± SD 0.492 vs 3.63 ± 0.410, $P < 0.001$), 'training patient safety skills' (3.33 ± 0.484 vs 3.62 ± 0.393, $P < 0.001$) and 'highlighting affirmative attitudes and motivation to ensure patient safety (3.46 ± 0.455 vs 3.74 ± 0.331, $P < 0.001$), respectively.

Table 9. The possible predictors in Finnish and British students' perceptions. Findings of academic (ACA) and clinical (CLIN) settings analysed with logistic regression are combined.

Variables		95% CI		
	OR*	Lower	Upper	*P**
Gaining knowledge about PS				
• INCLUDED (ACA)	0.38	0.10	1.39	0.14
• IMPORTANT (ACA)	2.04	0.32	13.03	0.45
Training PS skills				
• INCLUDED (ACA)	34.69	7.39	162.83	<0.001
• IMPORTANT (ACA)	0.27	0.03	2.41	0.24
Highlighting affirmative attitudes and motivation				
• INCLUDED (ACA)	3.94	0.79	19.62	0.09
• IMPORTANT (ACA)	4.32	0.31	59.61	0.27
Supportive and systems-based approach				
• INCLUDED (CLIN)	16·55	4·52	60·55	<0·001
• IMPORTANT (CLIN)	2·62	0·0	·	0·996
Gaining experience about ensuring PS				
• INCLUDED (CLIN)	6·11	0·65	57·03	0·112
• IMPORTANT (CLIN)	0·00	0·00	·	0·995
Reporting of PS incidents				
• INCLUDED (CLIN)	2·08	0·83	5·22	0·119
• IMPORTANT (CLIN)	1·63	0·14	18·53	0·693

*OR = Odds ratios for differences between countries (British vs. Finnish) from logistic regression adjusted by age, gender, previous education, work experience, inclusion of patient safety module; CI = Confidence interval; PS = Patient safety, INCLUDED = Included in education in clinical settings, IMPORTANT = Important for student's own learning about patient safety.

In clinical settings. Minor differences were found between Finnish and British nursing students, British students perceiving patient safety education slightly more important for their own learning about patient safety (CLIN). Significant differences were found in perceived importance of 'supportive and systems-based approach to ensure patient safety' (mean 3.49 ± SD 0.46 vs mean 3.75 ± SD 0.35, $P < 0.001$) and in 'gaining experience about ensuring patient safety' (mean 3.67 ± SD 0.411 vs mean 3.78 ± SD 0.355, $P < 0.001$), respectively (Table 9). In 'reporting patient safety incidents', there were no significant differences found between Finnish and British nursing students' perceptions.

5.4 FINNISH AND BRITISH NURSING STUDENTS' IMPORTANT LEARNING EVENTS ABOUT PATIENT SAFETY DURING WORK PLACEMENTS (ARTICLE IV)

The findings revealed that Finnish and British nursing students learning experiences about patient safety during their clinical placements were more likely to relate to hazards or near misses rather than learning from good practices (Table 10). Two main themes and eight sub-themes emerged. Finnish and British nursing students learning experiences were related to 1) preventing patient safety incidents and 2) acting safely after a patient safety incident. The first theme was comprised of pre-emptive actions and elements such as clear communication, acknowledging their own responsibility, multi-professional care processes, learning from errors and having experience from good practices. Although the theme was preventive, Finnish and British nursing students' descriptions were related to errors and deficiencies in prevention. The second theme, highlighting actions after a patient safety incident, was formed from such elements and actions as prevention of an error from proceeding, transparent actions, taking care of the patient and recording the information related to the patient safety incident.

Table 10. Types of nursing students' important learning events during clinical placements

	Finnish pre-registration nursing students		**British pre-registration nursing students**	
	(N=22)	**%**	**(N=32)**	**%**
Hazard	(14)	64	(21)	66
Near miss	(3)	14	(9)	28
Good practices	(3)	14	(2)	6
Others	(2)	8	(0)	0

The nursing students made important observations about patient safety in clinical settings, since most of their learning experience were related to hazards (Table 9). However, none of the students described that they would have reported the patient safety incident. If reporting was conducted, it was someone from the staff members that reported the errors. The types of clinical placements where these learning events occurred were likely to be medication or surgical wards especially for British nursing students and paediatric wards for Finnish nursing students (Table 11).

Table 11. The types of nursing students' clinical placements where they experienced their important learning events related to patient safety

	Finnish pre-registration nursing students		British pre-registration nursing students	
	(N=22)	**%**	**(N=32)**	**%**
Paediatric ward	(6)	27%	(0)	0
Medical ward	(3)	14%	(10)	31
Elderly care unit	(3)	14%	(1)	3
Surgical ward	(2)	9%	(9)	28
Others	(0)	0%	(3)	9
Not informed	(8)	36%	(9)	29

The types of important learning events varied between Finnish and British nursing students. It was common that British nursing students reflected events related to a patient's falling or medication errors where as Finnish had medication errors strongly in their mind (Table 12). Medication errors were the second most common type of important learning events for British students, while falling was the most typical. Unlike British nursing students, Finnish nursing students did not describe such issues as conducting of or lack of falls risk assessments.

Table 12. The main types of nursing students' important learning events related to patient safety during their clinical placements

	Finnish pre-registration nursing students		British pre-registration nursing students	
	(N=22)	**%**	**(N=32)**	**%**
Medication error	(14)	63	(10)	31
Falling	(1)	5	(12)	38
Team work	(1)	5	(2)	6
Surgical checking	(0)	0	(2)	6
Alone in charge	(0)	0	(2)	6
Others	(6)	27	(4)	13

5.4 SUMMARY OF THE FINDINGS

The findings of the study comprise results of an integrative literature review, a survey comparing Finnish and British nursing students' evaluations on their learning about patient safety in clinical and in academic settings and inductive content analysis of Finnish and

British nursing students' important learning events about patient safety during their clinical placements. Literature shows there is a gap between patient safety education in academic and clinical settings. Idealistic care is taught in academic settings, while in clinical settings patient safety appears to be compromised in many cases. Although patient safety is taught in both settings, patient safety education can be characterised often as fragmented. In recent years, efforts to improve patient safety education in nursing programmes have been undertaken. Both Finnish and British nursing students' valuated patient safety education more than what they perceived to have experienced during their education in academic and clinical settings. The overall trend was that British nursing students' evaluated more patient safety education in their programme compared to Finnish nursing students. The predictive factors for differences were training of patient safety skills in academic settings and supportive and systems-based approach to ensure patient safety in clinical settings. In clinical settings, nursing students' important learning events about patient safety were related to preventing patient safety incidents and acting safely after patient safety incidents.

6 Discussion

In this study, Finnish and British pre-registration nursing students' evaluations on their learning about patient safety was examined and compared. While previous literature comparing this dimension between pre-registration nursing education in different countries was not found, this is among the first studies to highlight the similarities and differences between the nursing students' learning about patient safety. In this section, the results of this study are first discussed and considered in relation to previous literature and the differing policy context. Then, similarities and differencies in the students' learning are discussed in relation to former literature.

Findings from this comparative study emphasise nursing students desire to learn about safe practice. This was evident among both Finnish and British pre-registration nursing students. They both esteemed learning about patient safety. This was in line with previous studies, indicating that healthcare students valued patient safety highly and expected patient safety education of good quality (Pearson et al. 2010, Cresswell et al. 2013). Dixon-Woods et al. (2013) reported about the 'almost universal' will to provide best possible care to patients. Finnish and British nursing students desire to learn about patient safety was stronger than what they perceived to have experienced during their education. This was the trend in both academic and clinical settings. Although both Finnish and British nursing students valued learning highly, British students had even more affirmative perceptions on the importance of patient safety education to their own learning.

In the different policy context, it is obvious that Finnish and British nursing students learning about the vital knowledge, skills and attitude differ. The findings demonstrate that the state of national patient safety policy and nursing students' evaluations on their learning go hand in hand. The UK has pioneered in the patient safety field and Finland has started similar work many years later. British nursing students evaluated more learning about patient safety than their Finnish peers. This was the case in both academic and clinical settings. These findings are among the first to highlight the importance of 'evidence based policy'.

In the PaSNEQ survey, British respondents were significantly older and had significantly more work experience. It is thus notable that the age gap may relate how the students have considered their learning opportunities and their own role in the context. Previously, older nursing students have been shown to be more confident with their learning compared to younger ones (Bjørk et al. 2014) and nurses with less nursing experience to have greater learning needs compared to more experienced peers (Valaitis et al. 2014).

The framework of this study (Figure 1.) can be further developed according the key findings. First of all, the state of national patient safety policy can be seen in a more powerful role in relation to both academic and clinical settings. And since nursing students seem to have a strong will to became fit for safe practice, their will and motivation needs more supporting and needs to be fed with systematic learning opportunities. In addition, given greater attention to nursing students' personal characteristics could benefit both academic and clinical settings in their mission.

6.1 DIFFERENCES AND SIMILARITIES IN LEARNING ABOUT PATIENT SAFETY IN FINNISH AND BRITISH ACADEMIC SETTINGS

In academic settings, training patient safety skills such as having simulation education and reporting errors were key subjects for differences between the students. Esteeming learning about safe practice was most alike among the students in the two countries.

Finnish nursing students evaluated less patient safety education in academic settings. Finnish nursing students were significantly more critical on their learning about patient safety in academic settings than the British nursing students. More differences were found in Finnish and British students' views on how patient safety had been taught in academic settings than on how important nursing students perceived teaching of the topic to be for their own learning of patient safety. Even though, both Finnish and British students felt it important to gain knowledge about patient safety, rehearse the skills, and experience highlighting of affirmative attitudes and motivation towards patient safety in academic settings, British students valued patient safety education more. Previously, healthcare students have been shown to appreciate patient safety highly and presume that patient safety education is included in their programme (Pearson et al. 2010, Sullivan et al. 2009, Cresswell et al. 2013). The significant difference that British nursing students evaluated having more patient safety education in academic settings than their Finnish peers may reflect the state of national healthcare policy regarding patient safety. Patient safety, in terms of malpractice in some healthcare organisations, has been publicly discussed, openly analysed, shortcomings reported and improvement strategies developed. (e.g. Francis 2013, NPSA 2014, NIWH 2014.) In the UK, national guidelines to integrate patient safety in nursing curricula have also been introduced unlike in Finland (NMC 2010). These can affect Finnish and British students' perceptions on teaching and learning about patient safety in academic settings.

The strongest predictive factor for differences between Finnish and British students' evaluations was training patient safety skills in the academic settings. Even that Finnish nursing students perceived more lack of training skills than British nursing students, British nursing students had also quite critical views on rehearsing the vital skills in academic settings. Similar findings have been reported in previous studies (Attree et al. 2008, Steven et al. 2014). For example, nursing students viewed that they were taught idealistic skills in academic settings with the focus being on knowing what is forbidden to do. Unlike these recent studies, most of the British students reported that they have learned what to do for example about safe communication such as use of repeat-back or SBAR (S = Situation, B = Background, A = Assessment, R = Recommendation) and they have also rehearsed reporting of patient safety incidents.

Simulation education was part of the strongest predictive factor for differences between Finnish and British nursing students' evaluations. In this study, simulation education was assessed to be underutilised in training of patient safety skills, similar with Sullivan and colleagues (2009). Here also the trend was that Finnish students perceived more underuse of simulation compared to the British nursing students. Simulation education has been proven to have positive impact on nursing students' patient safety knowledge, skills and attitudes (Lewis et al. 2012, Berndt 2014). Simulation in interprofessional teams has been shown to be effective for healthcare students' learning about patient safety and interprofessional teamwork (King et al. 2013, Palaganas et al. 2014). Overall, healthcare students have been revealed to have their patient safety education in isolation. There is a lack of common patient safety education for different healthcare students. (Cresswell et al. 2013.) In this study, nursing students experienced that simulation was underutilised, but even more underused was simulation in interprofessional teams.

Finnish nursing students perceived more lack of practicing reporting patient safety skills in academic settings than their British peers. This topic related to the strongest predictive factor, reporting patient safety incidents. If nursing students do not learn reporting of errors already in academic settings prior to entry in clinical settings, important learning opportunities are lost. Nursing students need to learn and have support to report errors. Previously, nursing students have been shown to need to learn recognition of a patient safety incident, hazards and near misses, and how to do the report and when to do the report. If the students are not taught reporting, they may not recognise the errors and thus, incidents would be under-reported (Henneman et al. 2010, Espin & Meikle 2014). In addition, Finnish, more so than British nursing students, felt that their education did not

include learning about a systems-based approach. In academic settings, there was more concentration on an individual's errors than to system failures experienced especially by Finnish nursing students, described also by (Attree et al. 2008, Steven et al. 2014). This is unfortunate since nursing students need to learn this basis for open and fair behaviour.

The learning environment in academic settings was perceived as quite supportive for learning about patient safety. About two thirds of the Finnish and most of the British nursing students perceived the environment to be fairly supportive. In previous studies, nursing students have experienced learning about patient safety in academic settings to be safer and more supportive than learning in clinical settings. It was felt that they are more confident to learn about topics such as effective communication and interprofessional collaboration. In addition, nursing students have felt that it is easier to have conversations about errors and to understand the system-based approach, in academic settings. (Ginsburg et al. 2013.) Nursing educators have an important role in educating patient safety and hence, effecting to the safety of healthcare system (Tregunno et al. 2014). Thus, nursing educators have a good opportunity to teach and learn about patient safety with their students.

6.2 DIFFERENCES AND SIMILARITIES IN LEARNING ABOUT PATIENT SAFETY IN FINNISH AND BRITISH CLINICAL SETTINGS

In clinical settings, supportive and systems-based approach such as speaking about occurred errors were vital elements highlighting differences between the students. However, patient safety incidents were important for learning about patient safety.

Finnish nursing students evaluated having significantly less patient safety education in clinical settings compared to their British peers. In Finnish and British pre-registration nursing students' evaluations, learning about patient safety in clinical placements varied. There were significant differences between Finnish and British nursing students' views of their learning to ensure patient safety in clinical settings. British nursing students were overall more affirmative than Finnish nursing students who perceived less teaching and learning about supportive and systems-based approaches to ensure patient safety, gaining experience on ensuring patient safety, and affirmative attitudes and valuation of patient safety. The findings on Finnish students' perceptions support previous studies (Attree et al. 2008, Pearson et al. 2010, Steven et al. 2014) that emphasise nursing students' unfavourable learning experiences about patient safety in clinical settings. However, the findings of British students' favourable perceptions on gaining knowledge and experience about patient safety in clinical settings are in line with earlier studies (Attree et al. 2008, Sullivan et al. 2009), in which nursing students have felt that they are more likely to gain knowledge about patient safety in a healthcare environment. On the other hand, gaining knowledge in clinical placements was assessed to be similar with gaining knowledge in classroom education (Sullivan et al. 2009). The respondents of this study were near their graduation. In Duhn's et al. (2012) study, final year nursing students seem to lose their confidence related to their own patient safety capability. Thus, Finnish students' critical views can be in connection with previous findings that reveal decreasing levels of confidence among final year nursing students.

The differences between Finnish and British nursing students' evaluations may relate to the state of national patient safety policy and progress in Finland and in the UK. Finland is several years behind the UK in conducting national patient safety efforts (National Institute for Health and Welfare [NIWH] 2014, National Patient Safety Agency [NPSA] 2014). It is likely that this has some affect on organisational patient safety policy, culture, practices and education. In fact, Emanuel et al. (2008) wrote about healthcare organisations being open systems, in which regulators, policymakers, technology suppliers etc. have influence. Hence, British nursing students could have had their clinical placements in quite different

environments and perceive learning about patient safety differently. Equally, it has been shown that good clinical support and management are key elements for patient safety, but these vital factors can vary a lot inside national healthcare systems (Dixon-Woods et al. 2013). Thus, even inside the country, the clinical placement circumstances can vary. An important difference was found between the type of Finnish and British nursing students' important learning events. Many British nursing students described situations that related to preventing a patient from falling. In many cases, a falls risk assessment was in the focus of the event. These kinds of events were not typical in Finnish nursing students' learning events. In the UK, use of a falls risk assessment has been part of national guidance for several years unlike in Finland (NICE 2004, Secretary of State for Health 2009, NIWH 2013). This may increase British nursing students' awareness about patients' risk to fall and thus, a need to highlight faults in patient safety. Interestingly, in Aiken's et al. (2013) study, nurses evaluated that more adverse events regarding falls occurred to British than to Finnish patients in hospital settings. These findings are in line with the current study. This may reflect that in the UK, nurses and nursing students are more aware of patients' risk to fall and means to prevent falling. Overall, Emanuel's et al. (2008) notice to healthcare organisations being open systems can explain some of this result. Conversely, the role of nursing education is interesting and crucial. Nursing education should be evidence-based and thus, be up-to-date.

Supportive and systems-based approach to ensure patient safety was found as the strongest predictor for differences in Finnish and British nursing students' evaluations on learning about patient safety in clinical settings. British nursing students felt that in their clinical learning environment the focus had been in such patient safety issues as systems-based approaches to prevent errors, learning to ensure patient safety with checklists, systematically learning from errors and overall, the environment had been supportive for learning about patient safety, unlike Finnish nursing students who were clearly more critical. However, it was important for Finnish and British nursing students to learn about these patient safety issues in clinical settings, as reported in previous studies (Pearson et al. 2010, Cresswell et al. 2013). Patient safety culture of the clinical unit has been shown to cause challenges for healthcare students' learning about patient safety (Pearson et al. 2010, Cresswell et al. 2013, Steven et al. 2014, Tregunno et al. 2014). Healthcare students are often slightly outsiders in their learning environment. They are not necessarily integrated in the organisational operating culture and systems. In addition, healthcare staff members are often busy and they can cause confusion for the students by acting unprofessionally. (Pearson et al. 2010, Cresswell et al. 2013, Steven et al. 2014.) Equally, poor organisational culture and information systems can result in the staff being left to strive by themselves to deliver efficient care in pursuance of feeling disempowered (Dixon-Woods et al. 2013). When nurses' perceptions were compared in Finland and in England, about third of Finnish and less than a quarter of British nurses were dissatisfied with the actions of management (Aiken et al. 2013). The nurses were not sure that patient safety was a priority. These findings may reflect the results of the current study, Finnish nursing students giving less affirmative evaluations on their learning about patient safety in clinical settings. The situation is even more complicated since nursing students have been shown to feel a need to fit in the clinical team (Steven et al. 2014). Drach-Zahavy and Pud (2010) have stressed that it is important for forming of effective learning mechanisms that all nurses are engaged in the process of learning from errors. Nursing students make no exception since they are learning to be a solid part of the health care team and therefore need to be integrated in their clinical placements' processes of learning from errors.

In Finnish nursing students' evaluations, it was not safe to speak up about their own errors. There was a clear difference when compared to British nursing students' evaluations. In the survey, over half of the students reported that the focus was not on the functionality of the system instead it was more likely that reasons were sought from an individual's errors. Blaming a single person has been proven to be devastating for the safety of healthcare

systems (Emanuel et al. 2008). Finnish nursing students' feelings are in line with recent findings where nursing students have expressed that it is not very safe to speak up and not very easy to deal with the systems-based approaches in clinical settings (Koohestani & Baghchegi 2009, Ginsburg et al. 2013, Steven et al. 2014). This is a paradox in nursing students' education. Nursing students are expecting and expected to learn to safeguard patients, but the system does not support their honest behaviour. They learn to fall silent. In the survey, about half of the Finnish nursing students did not practice reporting of errors during their clinical placements, and in CIT study, there were no descriptions about Finnish or British students reporting of the errors. This is sensible since there exists difficulties in the patient safety incident reporting process in healthcare organisations (Anderson et al. 2013). However, nursing students have been shown to report errors either formally or informally (Espin & Meikle 2014). If nursing students are not bringing out their observations and notes about unsafe care and ultimately report the errors, healthcare organisations will fail to become safer systems. Thus it is important to understand how nursing students can be supported to speak up. They need to know what will happen if they make an error. 'Institutional logic' has been investigated by Dodds and Kodate (2011). They wanted to comprehend the relationship between 'organisational learning' and 'accountability', in relation to risk regulation. In the 'organisational learning' the focus is on reporting of errors. Thus, a blame-free culture is needed to be able to examine and learn from latent errors. According to this approach, these elements are needed to achieve deeper learning from errors and healthcare systems can build an on-going safety learning system. Based on 'accountability', attention is on an individual's responsibility for the actions. Thus it is notable whether the errors are intentional or not. 'Accountability' can be out of tune with 'organisational learning'. These approaches may be confusing for healthcare professionals not to mention the students. Thus, it should be clear for all healthcare providers, also for healthcare students, if an error will happen. Students need support and guidance to become 'a systems-based approach player'. Clearly both approaches 'organisational learning' and 'personal accountability' are needed with interaction between caregivers and those who have suffered.

Patient safety incidents stimulated learning about patient safety. Finnish and British nursing students learning about patient safety was stimulated by complex situations where errors happened to some of the healthcare providers in healthcare organisations. Work based learning seemed to relate often to unexpected and confusing situations. Previously, complex situations have been found to enhance reflection (Mann et al. 2009). Nursing students learned to prevent patient safety incidents, but also to act after an error had occurred. In previous studies, the focus has been more on recognising, stopping and correcting an error (Ironside et al. 2009, Henneman et al. 2010). Learning was in some cases shared in clinical unit, but deeper analysis of errors was lacking in Finnish and British nursing students' important learning events about patient safety. Learning to prevent patient safety incidents was related to elements like unclear communication, reported also by Napgal et al. (2012), identifying possible errors, examined in previous studies (Henneman et al. 2010) and social learning from errors, described by Eraut (2011). Characteristic for nursing students' learning about errors was that it was often connected to actions after an error. Preventing an error from proceeding and correcting the situation has also been examined by Hennemen et al. (2010). Recording information about the patient safety incident, meaning documenting the event in a patient's files and reporting the error through organisational reporting system, has previously been reported by Currie et al. (2007), but more in terms of reporting patient safety incidents. Holistic, systematic and transparent acting after an error and taking care of a patient's wellbeing are less described in patient safety in nursing education literature.

6.3 PATIENT SAFETY EDUCATION HIGH VALUED PATIENT SAFETY BY FINNISH AND BRITISH NURSING STUDENTS

Both Finnish and British nursing students expressed a gap between their expectations and the existing reality of education. The students viewed learning about patient safety as more important than what the clinical settings had provided. Even that both Finnish and British nursing students perceived learning about patient safety as important for their own learning, British students valued learning significantly more. The crucial gap between expectations and real-professional context may reflect the state of patient safety in healthcare organisations. For example, reporting patient safety incidents is valuated by healthcare professionals, but utilising of the incident reports is difficult (Anderson et al. 2013). Furthermore, there are a lack of studies examining healthcare professionals' patient safety knowledge and skills (Brasaite et al. 2015). Nursing students may have ideal expectations from healthcare professionals' work and on the other hand, they may have experienced malpractice in clinical units (Koohestani & Baghchegi 2009, Spence et al. 2012, Steven et al. 2014, Tregunno et al. 2014). The inevitable is that nursing students' learning about patient safety and developing of safer healthcare systems are bound together. As nursing students learn in the microsystems of healthcare organisations, which are in relation with the entire healthcare system (Emanuel et al. 2008), their learning to become constant patient safety learners depends on the efforts of nationwide improvements. Development of a healthcare system needs to focus on healthcare organisations and HEIs providing healthcare education. This is important for patients, the nations economic situation, efficiency of the healthcare and healthcare education, and the students themselves.

Understanding the whole picture of creating a safer healthcare system is important in securing nursing students' consistent learning about patient safety. Nursing education among other healthcare education is an integral part of a wider healthcare system. When developing nursing education to repond to national and international standards, developing of both healthcare education in HEIs and healthcare organisations together is imperative. Thus nursing students can have prerequisite to fulfil their professional promises about working in effective interprofessional collaboration to safeguard health and wellbeing of their patients and clients in the future as registered nurses (NMC 2008, 2012).

7 Conclusions

The findings of the study demonstrate the following conclusions on the basis of Finnish and British nursing students' evaluations:

1. Finnish pre-registration nursing education is behind compared to British nursing education in embedding patient safety in nursing curricula.

2. Training of patient safety skills such as the process of reporting and learning from patient safety incidents and practicing skills in interdisciplinary/professional groups in simulation environment are not yet common in a Finnish nursing education in academic settings.

3. An open and fair multiprofessional learning environment with systems approach in healthcare organisations is not yet reality in Finnish context. The culture of safety needs to be critically examined and systematic actions undertaken to influence attitudes and behaviour of healthcare providers. For example, nursing students need safe and supportive learning environment to feel safe to speak up from their concerns related to patient safety.

4. Nursing students are not yet systematically engaged in preventing patient safety incidents. Nursing students make important observations related to securing of patient safety in clinical settings in healthcare organisations. The important observations about patient safety incidents should be adequately utilised in healthcare organisations.

5. Finnish nursing students are not yet learning about evidence-based practice to prevent patient falls. Falls risks assessments and patient observations are essential for ensuring patient safety.

6. Nursing students' learning about safe and systematic actions after an error seems to be occasional. A clear standard is needed for teaching and learning the actions after an error has occurred. This would enhance nursing students' learning about minimising harm to a patient and supporting persons involved in these situations.

7. Nursing students seem to expect more learning about patient safety in academic settings and in clinical settings than the current education provides. Both learning organisations should develop their patient safety policy and strategy together so that new nurses would have better possibilities to learn about patient safety. This would be eventually for the benefit of patients and societies. A joint patient safety education strategy is needed in academic and clinical settings of nursing education.

8. The PaSNEQ instrument has proved to be a valid instrument for comparing Finnish and British nursing students' evaluations about patient safety education. Although, more testing is needed regarding the factor related to reporting patient safety incidents.

8 Recommendations

For nursing educators

1. Patient safety needs to be integrated systematically throughout nursing curricula using WHO's (2011) multiprofessional patient safety education guidelines and guidelines of EUNetPaS (2011).
2. Nursing students seem to expect more learning about patient safety than the reality currently provided in academic and clinical settings. Reflecting on nursing students' perceptions on their learning about patient safety and constantly developing curricula may help to provide evidence-based and student-centred patient safety education.
3. Nursing students need to learn to prevent patient safety incidents and act safely after a patient safety incident has occurred. The required patient safety knowledge, skills and attitudes need to be taken into account in developing nursing education in academic and in clinical settings.
4. Learning systematically to report patient safety incidents should be embedded in nursing curricula. Nursing students need to learn to report patient safety incidents in academic settings and have the possibilities and be supported to report these in clinical settings. Overall, nursing educators, students and their supervisors could benefit from interactive education, and detailed guidelines on how to act and give support after an error, and learn from them. A teacher's manual might help educators to encourage students and their supervisors to act openly after a mistake. A supervisor's manual might assist in standardised supervision and providing emotional support for nursing students. Nursing educators and managers need to pay attention to nursing students' possibilities to report errors and systematically learn from errors with healthcare staff, e.g. by using RCA.
5. Nursing students need to have possibilities to rehearse their patient safety skills, such as communicating clearly in interprofessional teams, reporting errors, understanding systems-based approaches and learning from errors, and testing these skills in simulation environments.
6. Nursing students need to learn to conduct a falls risk assessment in academic settings and practice using it in clinical settings.
7. Having international collaboration among nursing and healthcare teaching faculty may assist in integrating evidence-based patient safety education in nursing curricula and may assist in responding to the challenges caused by the globalisation of nursing and healthcare in general, and the complexity of healthcare systems.

For healthcare managers and mentors

1. Nursing students should be fully integrated in organisational learning systems about patient safety. The focus of nursing students' learning in clinical settings should be on the quality of a wider learning environment.
2. Educators and leaders should collaborate and continuously collect and utilise information about nursing students' perceptions of their clinical learning experiences about patient safety.
3. A need for qualified patient safety personnel in clinical units and healthcare organisations in which safe preparation of nursing students is standardised. Systematic learning about patient safety by nursing students is necessary for the

creation of safer healthcare systems and their future preparation as patient safety champions.
4. Nursing students should be taught about systematic actions to prevent errors, but also systematic actions on how to act after an error has occurred. For example, stopping an error from proceeding, open communication, apologising to a patient, taking physical and emotional care of a patient, giving and receiving feedback, documenting an error, reporting an error, learning from an error and developing improvement strategies in collaboration with staff members.
5. Continuous benchmarking of standards and practices in partnership with international peers may enhance patient safety at local and global levels.

For policy makers

1. Providing a national guidance on how to embed patient safety in nursing and healthcare curricula could help nursing educators to embed patient safety systematically in nursing curricula. Nursing educators need to comprehensively address and be supported with this issue by providing a high-quality national guidance for the revision of nursing curricula.
2. Giving national guidelines for nursing education on how to teach preventing patient safety incidents.
3. Giving national guidelines for nursing education about safe actions after an error has occurred during clinical placements in terms of preventing an error from proceeding, transparent actions, taking care of a patient's wellbeing, supporting those involved, documenting patient safety incident in a patient's files, reporting the error, analysing the error, learning from the error and development of education and practice.
4. Giving national level guidelines for nursing education on teaching about falls risks assessments and the actions after a patient has fallen.

For further research

1. To study the impact of national patient safety policy in nursing students' learning requires further research. For example, examining reporting patient safety incidents and learning from errors with the PaSNEQ before and after a patient safety education development initiative.
2. Analysing and comparing nursing curricula in a wider international context may provide important information for developing and harmonisation of patient safety education in nursing programmes.
3. It would be important to compare education and practices regarding patient safety on a wider scale and from different perspectives; comparing national status and healthcare organisations status of development in patient safety, and key stakeholders' assessments.
4. Examining actions after errors in healthcare organisations and the related guidelines in national, organisational and unit levels, and the education provided for healthcare students in HEIs.
5. To compare Finnish and British healthcare education in terms of education related to falls risks assessments.

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Appendix 1. Table representing patient safety work in the UK and in Finland supplemented with other remarkable examples

Year	UK	Finland	Other examples
2000	An organisation with a memory (DoH, Sir Liam Donaldson)		To err is human (IOM, Kohn et al.)
2001	National Patient Safety Agency established Learning from Bristol – the report about children's heart surgery (DoH)		
2002			
2003	National Reporting and Learning System (NRLS)		
2004	Seven steps to patient safety (NPSA) Falls. The assessment and prevention of falls in older people (NICE)		World alliance for patient safety (WHO)
2005			Quality and Safety Education for Nurses (QSEN) project began
2006	Safety first – A report for patients, clinicians and healthcare managers (DoH)	Patient safety vocabulary /STAKES, National Agency for medicines, ROHTO Safe pharmacotherapy. National guide for pharmacotherapy in social and health care (MSAH) (In English 2009b)	
2007		System for reporting and analysis of errors in hospital environment – HaiPro (VTT, NAM)	
2008			
2009	The government response to the Health Select Committee report 'Patient safety' (Secretary of State for Health)	Promoting patient safety together – Finnish patient safety strategy 2009–2013 (MSAH)	Recommendation on patient safety (CEU) Conceptual framework (WHO) WHO patient safety research (WHO) WHO surgical safety checklist (WHO)

Year	UK	Finland	Other examples
2010		Health Care Act (1326/2010) includes patient safety	A general guide for education and training in patient safety (EUNetPaS)
2011		Health Care Act: Plans for quality management and patient safety (341/2011) National patient safety programme based on the Finnish strategy (NIHW) Potilasturvallisuusopas (Patient safety guide) – potilasturvallisuuslain-säädännön ja -strategian tueksi (NIHW) (In Finnish)	Multi-professional patient safety curriculum guide (WHO)
2012	Health and Social Care Act 2012 (c. 7) (DoH): NPSA abolished The never events policy framework (DoH)	Adaptive patient safety management (VTT Technical Research Centre of Finland)	
2013	A promise to learn – a commitment to act (Berwick report) The Mid Staffordshire NHS Foundation Trust public inquiry (Francis report)		
2014			Key findings and recommendations on education and training in patient safety across Europe (PSQCWG) Patient safety and healthcare-associated infections – Report from the Commission to the Council (EC) Special Eurobarometer 411: Patient safety and quality of care report (EC)

Appendix 2. Studies examining the role of patient safety in nursing education

Author(s) (Year), country	Purpose and aims of the study	Design, method, sample	Results
Abbott et al. (2012), US	To examine nursing students' attitudes about the value of an interprofessional patient safety education to their professional growth and the role of the education in healthcare professionals' curricula	Exploratory, mixed methods study design Interprofessional patient safety course: nursing (n=8), pharmacy (n=19) and law (n=1) students Qualitative data: collected using critical case sampling interviews, participants nursing students (n=6), themes emerged and triangulated with quantitative data: collected from formative course performance measures and course evaluations (13-item standard course evaluation questionnaire with 5-point Likert scale) forming framework for qualitative themes	Themes emerged: **Awareness:** learning about the magnitude and severity of the possible problems, basic knowledge about patient safety and their own role as healthcare professionals related to patient safety **Ownership:** Identifying the roles of an individual and others regarding patient safety **Action:** Discussions with others about patient safety, advocating for patients and ensuring patient safety Students **highly valuated** the interprofessional patient safety course and perceived that they can apply basic principles of and identify tools of and value patient safety The findings provided a basis for integrating the course into nursing curricula and meeting national patient safety goals for nursing profession
Attree et al. (2008), UK	To explore the perceptions of nursing students, educators and key stakeholders about patient safety in an English pre-registration curriculum	Content analysis of curriculum Focus group interviews and semi-structured individual interviews Thematic analysis One pre-registration nursing degree curriculum Pre-registration nursing students (n=15) Educators (n=10) Key education stakeholders (n=6) A case study	**No explicit patient safety learning content and objectives** found in curriculum; No patient safety module exists; Included theory and ideals, but **no practice** Patient safety integrated into lectures; Theory and principles in lecturers' problem-based scenarios; **Individual rather than systematic approach** to learning both in university and practical settings; Defensive, blame culture in both education and clinical practice, especially in practice; Lack of opportunity to discuss and learn from patient safety incidents Nursing students gained **most knowledge and experience from clinical practice**; Nursing students' perceptions of patient safety and risk: keeping patients safe and protected from harm; safe medication and environment, falls, infection, communication, observation, risk assessment and management; Gap between what is taught and practice; **Nursing students perceive learning defensive practice.**

Author(s) (Year), country	Purpose and aims of the study	Design, method, sample	Results
Chenot & Daniel (2010), US	To gain a better understanding of the current status of patient safety awareness among prelicensure nursing students	*Phases I and II:* A survey research, the HPPSACS, a 34 item instrument, exploratory factor analysis and alpha reliability *Phase III:* A content analysis *Phase I:* academic professional nurses (n=150), *Phase II:* associate degree and baccalaureate nursing students (n=318) *Phase III:* Nursing programme and curricula from academic institutions (n=7) Questionnaire, *Phase I:* alpha near 0.70 or above, *Phase II:* alpha 0.64-0.82 Statistical significance used (p=0.05)	At least three of the six **QSEN competencies: patient-centred care, teamwork and collaboration, evidence-based practice, quality improvement, safety and informatics** included in nursing curricula of participating academic institutions Current patient safety curriculum (QSEN) Nursing students' learning about patient safety: **sensitivity** to their own role, **responsibility** for patient safety Themes identified: **comfort, error reporting, denial and culture** Evidence was found of characteristics related to demographic variables: race and ethnicity Younger female students were not as comfortable with patient safety issues.
Cooper (2013), US	To describe nursing students' use of safety tools and their perceptions of patient safety issues in clinical settings	An exploratory survey design Patient safety incident reporting tool was developed 5-point Likert scale Undergraduate nursing students (n=145)	In nursing students' perceptions it was **difficult to report all near misses and hazards** The majority of all students reported that they had **not experienced an error** **Reasons for not reporting** patient safety incidents were such as problem of someone else, being too busy, forgot, unaware, not knowing how to report, not enforced by agency, RN saying the error was no problem, not big enough issue, afraid it would affect grade Nursing students perceived **patient safety as primary concern** Nursing students discussed safety issues with RNs, but less about how to prevent errors with assigned nurses. Students perceived that students and RNs feel **speaking about mistakes could turn against** them 43% **identified patient safety problems** on the unit About 60% was at least sometimes **afraid to ask questions** on a case of something does not seem right 83% felt **supported by their instructors if an error** occurred
Cresswell et al. (2013), UK	To examine the formal and informal ways preregistration nursing, medicine, pharmacy and the allied healthcare professions students learn about patient safety	Using Eraut's framework Comparative qualitative case studies of university courses (n=8), focus groups (n=38), participants (n=162), observations of practice in clinical settings/learning activities (n=82), semi structured interviews (n=33), analysing of relevant documents (n=44)	Patient safety **implicit in curricula and explicit in a limited number** of disconnected topics; Learning about **ideal practice in academic settings;** Learning **in clinical settings** was likely to be **informal;** Patient safety learned **isolated from other healthcare students**, having only limited possibilities to interprofessional learning Students learned about patient safety from opportunities to train their skills and to understand; Patient safety was a **priority in students' learning**. Students **valuated learning** about patient safety, especially **from good role models**. The number of these models were **limited**

Author(s) (Year), Country	Purpose and aims of the study	Design, method, sample	Results
Currie et al. (2007), US	To describe a curricular innovation project: Promoting mindfulness of patient safety with web-based reporting system	Descriptive statistics, frequency and percentage distributions Baccalaureate nursing students (n=156) 2 to 5 weeks clinical practice during 10 weeks, 1487 reports submitted	Promoting mindfulness and enhancing patient safety; **Observing and reporting hazards and near-misses** during clinical practice **Web-based hazards and near-misses reporting system and documentation;** Students having wireless handheld device to submit a report every day **Reports:** Dangerous situations (n=933), Near-misses (n=554); **Poor infection control** practice was the most frequently reported dangerous situation and **medication errors** most often reported as a near-miss; **Insufficient patient identification and documentation** relating to hazards
DeBorough (2012), US	To describe nursing students' safety and quality knowledge and the students' perceptions of team behaviours and communication effectiveness	A descriptive pilot study in 2 phases I Phase: students' knowledge about safety and quality matters II Phase: students' perceptions of team communication Prelicensure nursing students (n=24), third semester Effect sizes calculated (Cohen's d) small 0.0-0.2; moderate 0.3-0.5; large when greater than 0,8	Clinical nursing course **The Synergy Partnership Model** aligning agency safety and quality initiatives with school's student outcome competencies; Students' safety and quality knowledge and perceptions of team behaviours and communication effectiveness Students' awareness of safety goals increased (effect size = 0.94 and 2.11); Knowledge gain for concept of **nursing care-sensitive** increased (0.67 and 0.95); **Being better prepared** to begin each shift increasing was (0.85); Availability of **communication opportunities** increasing was (0.66); Student having impact on **patient care outcomes** increasing was (0.70)
Dolansky et al. (2013), US	To describe a case study that focuses on nursing students' medication errors and application of root cause analysis (RCA)	The QSEN competences and use of RCA implemented in nursing programme RCA included critical evaluation of the patient safety incident and a literature review Undergraduate nursing students	Factors identified: environmental, personal, education and unit communication and culture **Use of RCA**: Developed students' and staff members' **identification of problems** and **improvement strategies to prevent** patient safety incidents **Promotes just and fair culture** and a **systems approach**
Duhn et al. (2012), Canada	To examine how nursing students' evaluate the rate of patient safety education in their programmes in classroom and clinical settings, and nursing students' perceptions regarding their confidence on their learning about patient safety	Cross-sectional survey study The Health Professional Education in Patient Safety Survey (H-PEPSS) was used Statistical analysis such as means and standard deviations, analysis of variance, Pearson correlation, Chi-square test and summary scores 5-point Likert scale Undergraduate, Bachelor level nursing students (N=238) in one Canadian university, Students in all 4-years	In students' evaluations their learning about patient safety consisted of: **Clinical safety issues** in academic (mean 4.5, SD 0.5) and clinical (mean 4.4, SD 0.6) settings ($P < 0.01$), **Human and environmental issues** in academic (mean 3.7, SD 0.8) and clinical (mean 3.8, SD 0.7) settings ($P < 0.01$), **Communication issues** in academic (mean 4.3, SD 0.6) and clinical (mean 4.2, SD 0.7) settings ($P < 0.01$) **Managing risks issues** in academic (mean 3.7, SD 0.8) and clinical (mean 3.8, SD 0.8) settings ($P < 0.01$), **Adverse events issues** in academic (mean 3.6, SD 0.8) and clinical (mean 3.7, SD 0.7) settings ($P < 0.01$), **Working in teams issues** in academic (mean 3.7, SD 0.7) and clinical (mean 3.5, SD 0.8) settings ($P < 0.01$), **Culture of safety issues** in academic (mean 4.0, SD 0.7) and clinical (mean 3.8, SD 0.8) settings ($P < 0.01$), Nursing students' perceptions regarding their confidence on their **learning about patient safety decreased from second to last year** ($P < 0.01$)

Author(s) (Year), Country	Purpose and aims of the study	Design, method, sample	Results
Gantt & Webb-Corbett (2010), US	To describe integration of patient safety instruction into simulation experiences for undergraduate nursing students	Descriptive statistics, frequency and percentage distributions Undergraduate nursing students Evaluative nursing clinical simulations using SimMan Pre-test (n=84) Post-test (n=110)	**Checklists;** **Patient safety practices** including hand washing, patient identification and patient allergy verification; **Critical thinking abilities** including students reactions, problem solving and reasoning skills; 30-minute **clinical scenarios evaluating students' use of competency checklist and care delivery critical thinking checklist;** Completed checklists were used to debrief students about their strengths and errors **Inadequate hand washing** in pre-test 61% and in post-test 38%; **Inadequate patient identification** in pre-test 61% and in post-test 22%
Ginsburg et al. (2012), Canada	To test the Health Professional Education in Patient Safety Survey instrument designed to measure a patient safety competency framework and HPs perceptions on their learning about patient safety in classroom and clinical settings	Cross-sectional survey design Using confirmatory factor analysis (CFA) to test H-PEPSS 5-point Likert scale, two scales: Learning in classrooms and clinical settings 15 nursing, 6 medical schools and 2 training programmes for pharmacists New graduates (N=1247) Response rates: nursing 28%, medical 26%, pharmacy 29%	Tests supported using of exiguous 6-factor model (16-items) of the H-PEPSS instrument **6 socio-cultural aspects** of patient safety were reflected: **'Working in teams with other HPs', Communicating effectively', 'Managing safety risks', 'Understanding human and environmental factors', 'Recognising and responding to adverse events' and 'Culture of safety'**
Ginsburg et al. (2013), Canada	To explore educational experience regarding patient safety among newly graduated nurses and other HPs	Cross-sectional survey design; Using the 16-item H-PEPSS instrument reflecting 6 patient safety dimensions; 'Working in teams with other HPs', Communicating effectively', 'Managing safety risks', 'Understanding human and environmental factors', 'Recognising and responding to adverse events' and 'Culture of safety'	Nurses' confidence on their learning about following patient safety issues differed **significantly:** - **less** confidence in 'Working in teams…' **in clinical settings** than medical participants and **greater** confidence **in classrooms** than the HPs - **greater** confidence in 'Communicating…' **in classrooms** than the HPs - **greater** confidence in 'Managing safety risks', 'Understanding human and environmental factors', 'Recognise and respond to remove immediate risks of harm' and 'Culture of safety' **in clinical settings** than medical participants and **in classrooms** greater than the HPs
Gjessing et al. (2014), Sweden	To explore new interprofessional learning module of Improvement of Quality and safety	A mixed-method design Using 19-item questionnaire 6-point Likert scale including 3 open questions, Nursing and medical students (n=222), Qualitative content analysis Quantitative responds dichotomised	Most of the students perceived the **new interprofessional patient safety and quality improvement module positively**, Nursing students were more positive towards the learning module than medical students

Author(s) (Year), Country	Purpose and aims of the study	Design, method, sample	Results
Gregory et al. (2009), Canada	To explore unsafe patient care events recorded in clinical learning contracts	Qualitative content analysis Descriptive statistical analysis Archived individual nursing students files from 1999 to 2005 (n=60) The authors categorized data together	Concerns about **unsafe patient care** In **nursing students files**, 154 unsafe patient care events documented **37 students of 60 concerned about unsafe patient care**; Errors 12.34%, near-misses 30.52%, potential adverse events 54.55% and adverse events 2.60%
Henneman et al. (2010), US	To describe the types and frequency of errors that happened to nursing students during human patient simulation exercises and describe types of errors identified, stopped and corrected	Retrospective study Senior nursing students (n=50) participating in a simulation exercise which was videotaped Two independent researchers reviewed videotapes Statistical analysis	**Error identification**, **stoppage and correction**; Rule-based error categories: skill-based, rule-based and knowledge-based; Rule-based category subdivided: coordination, verification, monitoring and intervention; Independent assessing and managing of an acutely ill patient; **Scenarios**: congestive heart failure (CHF) and a motor vehicle accident (MVA) Two **simulation exercises** lasting 15 and 30 minutes mimicking a real-life patient care situation; Prior to this simulation education**, theoretical lectures about managing patients using the medical diagnoses**; nursing students had two prior experiences of simulation **Error frequencies** in scenarios CHF 60% and MVA 51% (p=0.07); **Errors:** Patient identification 84%/88%, allergy verification 76%/68%, physician interactions 80%/ 56%, coordinating information with the patient and family 28%/8%, respectively; **Identifying of embedded medication errors** 14%, in CHF more often than MVA (p <.001); **All nursing students made errors**
Howard (2010), US	To examine the status of presence or absence of patient safety education, in terms of dedicated patient safety component (DPSC) from top-ranked US nursing school curricula	Reviewing 10 top-ranked US nursing school curriculum Curricula and programme materials obtained from the schools' websites Criteria: Terms 'patient safety', 'quality', 'care', 'error', 'human factors' were searched Scored scale from 0 to 1	**Embedding patient safety in nursing curricula**: Mean scores of all reviewed school curricula was 0.004 Highest score was 0.045 6 out of 10 schools did not meet DPSC criteria and had 0 as an overall score The top ranked school had only 2 nursing specialty curriculum catalogues, while 174 course descriptions missed the words 'safety', 'quality' and 'error'

Author(s) (Year), Country	Purpose and aims of the study	Design, method, sample	Results
Ironside et al. (2009), US	To explore the extent to which student experiences with multiple-patient simulation improved students' patient safety competencies and the student factors that were related to the outcome	Descriptive statistics Instrument MSTAT-I and Patient safety competency scale Multiple-patient simulation One-way analysis of variance, Fisher's exact tests Baccalaureate and associate degree nursing students (n=67) Instruments: Cronbach's alfa = 0.86-0.89	Nursing students' **patient safety competencies in scenarios** closely mimicking the complexity of patient care in acute care settings; Scenarios included minor and major disruptions 20 minutes **debriefing after scenario:** what went nicely and what did not, what was learned; Self-reported grade point average (GPA) **Learning about safety improved from first to second simulation** ($p<0.0002$); No significant correlations were found between achievement of patient safety competencies and students factors (tolerance of ambiguity, age and GPA)
Jenkins et al. (2011), US	To study nursing students' ability to detect errors and the consequences of the errors and their consequential awareness to patient safety standards	Using new skills, simulation and critique laboratories to teach patient safety principles; Student-peers observed real time patient safety violations and submitted critique form; Nursing faculty guided and observed students; Nursing students (n=81) participated in 2 scenarios; Outcomes reported in relation to the aims	Students did **not identify all patient safety violations** that their peers made during human patient simulations. Patient identification was the least recognised safety issue (55% recognised) Students **discussed about the possible consequences** of patient safety violations in debriefing sessions Faculty reported that national patient safety goals were met in some level: use of SBAR facilitated interdisciplinary communication, physicians orders were verified, hands were cleaned before and between patient contacts and at least 2 identifiers were used prior to a patient's care
Koohestani & Baghcheghi (2009), Iran	To describe barriers that nursing students perceived to exist to report medication administration error (MAE)	A cross-sectional, descriptive study MAEs 6-point Likert scale Descriptive and correlation analysis Nursing students (n=240) Instrument: MAEs	Nursing students perceived **barriers to medication error reporting** in clinical practice from **all medication errors 80% reported** to their instructors in clinical practice; 30% of nursing students reported making at least one error during clinical practices; **Administrative barriers** (including no positive feedback, focus on individual factors) and **fear** (recognized as incompetent, reprimands of doctor, instructor and nursing staff) were the major barriers to reporting medication errors
Luhanga et al. (2008), Canada	To describe strategies used by preceptors to teach students who act unsafely	Grounded theory, semi-structured interviews Passing / failing clinical practice: Unsafe action in clinical practice Constant comparative analysis Preceptors (n=22) Female (n=20) Male (n=2)	**Teaching and learning strategies used by preceptors** to teach nursing students prevention of unsafe practice: Communication with learner and faculty instructor, developing a plan of action, constant observation and gradual clinical independence, stopping mistakes and explaining correct way, encouraging student to practice skills, questioning and giving reading assignments, creating a supportive environment, giving positive and honest feedback in private, students self-evaluation, retaining high standard of practice, seek external help and after remedial interventions make decisions to prevent failure of clinical practice

Author(s) (Year), Country	Purpose and aims of the study	Design, method, sample	Results
Mansour (2015), UK	To examine the factor structure of the Health Care Professionals Patient safety Curriculum Survey (HPPSACS) in a group of one University nursing students in the UK	Data collected with the HPPSACS and analysed with principal component analysis Pre-registration nursing students (n=222)	**A four-factor solution** explained 52% of the variation Factors were: **'Willingness to disclose errors', 'Recognition and management of medical errors', 'The perceived professional context of patient safety' and 'The perceived support and understanding for improving patient safety'** The overall Cronbach's alpha was 0.64, 'Willingness to disclose an error' had highest internal consistency (α=0.82), the rest had a moderate to weak internal consistency (α=0.62–0.55)
Mansour (2012), UK	To investigate current evidence on nursing students' and nursing faculty members' perceptions on the integration of patient safety education in nursing programme	Literature review Articles (n=15) empirical studies, literature reviews and discussion papers (years 2000 to 2011) Analysis process included culling by asking questions for the citations	Continuing lack of patient safety education research regarding preregistration (undergraduate) nursing education was recognized Competency-based approach to develop nursing curricula was recognized in most studies **Gap between students' perceptions and educators' conceptualization** of patient safety **Gap between patient safety education in academic and clinical settings** Lack of **teaching non-technical skills**
Mckay & Sanko (2014), US	To examine viability, practicality and sustainability of incorporating a patient safety incidents reporting system into an established simulation programme	A prospective longitudinal design 2-stages: 1) a literature review, creating an electric form, beta testing the form, 2) testing the reporting system in simulation Frequencies and percentiles calculated Nursing and nurse anaesthesia students (N=171) first and second semester	Students, simulation staff and faculty accepted the reporting system well **Reporting became an integral part of simulation** Students had some **problems in making the report** (how and what to report, where to access) which were corrected with additional information Reporting has not taken time from other educational issues and has increased awareness about reporting Short-term sustainability: the number of reported events increased
Mikkelsen Kyrkjebø et al. (2006), Norway	To test a simulation training program (BEST-principles) in inter-professional student teams, to evaluate the structure and design and to investigate the students' experiences going through the program	Focus group method A structured interview Health professional students (n=12): Nursing students (NS) (n=4) Postgraduate intensive nursing students (PINS) (n=4) Medical students (MS) (n=4) The moderator and co-moderator checked the categorizations	**Interprofessional education** with **BEST-principles (Better & Systematic Trauma Care)** from patient care scenarios related to adverse events experienced by students: Blood transfusion, basic resuscitation skills, administration of drugs and management of central venous catheters **Interprofessional simulation scenarios** having one MS, one NS and one PINS in each team: Introduction to **crew resource management (CRM)** and having discussions, simulation scenario 1, reflection 1, simulation scenario 2 and reflection 2 Students views: generally **satisfied with interprofessional education and wanted more team training**; Learning about own team performance, personal reactions and lack of competencies; Simulation scenarios ought to be realistic

Author(s) (Year), Country	Purpose and aims of the study	Design, method, sample	Results
Miller et al. (2009), US	To test the effects of structured classroom and clinical content related to safety and quality of health care systems on a group of senior-level nursing students	A mixed-method quasi-experimental study Repeated-measures analysis of variance (ANOVA) Content analysis from qualitative data Senior-level baccalaureate nursing students (N=65) Intervention group 1 (n=24) and Intervention group 2 (n=8) Instrument: The Student Perceptions of Safety and Quality Knowledge, Skills and Attitudes Questionnaire	**QSEN competencies**: Patient-centred care, teamwork and collaboration, quality improvement, safety **A combination of classroom and clinical learning activities**; First, classroom lectures: A case study, research and discuss; Second, (intervention group): **Discussions and structured clinical projects (related to quality and safety in health care systems) related to clinical experiences** Having classroom and clinical learning activities improved nursing students' knowledge, skills and attitudes about quality and safety; Intervention group: **Greater increase in perceptions reflected to teamwork and collaboration, safety and medication errors;** Similar perceptions in intervention and control groups related to **patient-centred care** Cronbach's alfa Pre-test = 0.398, Post-test = 0.596
Monrouxe et al. (2014), UK	To examine nursing and other healthcare students' narratives of professionalism dilemmas	A qualitative cross-sectional study design; Narrative interviews Healthcare students (N=69), nursing students (n=13) Framework analysis, linguistic inquiry and narrative analysis	**Professional dilemmas theme** comprised **5 sub-themes**: **Student abuse**, **patient safety and dignity breaches** by healthcare professionals, patient safety and dignity breaches by students, **whistleblowing and challenging**, and **consent;** Overall, students were more anger when healthcare professionals indulged in dignity breaches than when students Blaming had emotional implications
Montgomery et al. (2014), Canada	To describe third year nursing students' viewpoints of the circumstances which threaten safety in clinical settings	Q methodology design Factor analysis with Varimax rotation Baccalaureate nursing students (N=34)	In nursing students' perceptions **risk for safety occurred** when there existed **lack of readiness, misdirected practices, and negation of professional boundaries** Most unsafe was a **novice failed to connect cognitive, behavioural and ethical identity**
Mossey et al. (2012), Canada	To extend nursing knowledge of safety from perspective of students	Q-methodology, specified five types of contexts and students at risk for unsafe clinical practices; Baccalaureate nursing students (n=59), final year	Five perspectives identified about **nursing students' unsafe practice:** displaced, vulnerable, unprepared, unknowing, distanced
Mulready-Shick et al. (2009), US	To assess whether the DEU clinical education model facilitates students' learning of six QSEN competencies and to investigate additional outcome measures	Focus groups interviews Summary analysis report Nursing students (n=18) Staff nurses (n=9), The QSEN competencies: patient-centred care, teamwork and collaboration, evidence based practice, quality improvement, safety and informatics	**Clinical practice placement in Dedicated education unit (DEU)** Students concentrated on medication safety; **Practicing with smaller student-to-teacher ratio;** the potential for errors and increased medication knowledge decreased, **e**ducation and practice collaboration improved Improved nursing students learning about quality and safety Students found it easy to learn hospital systems; Supported quality improvements in nursing care delivery

Author(s) (Year), Country	Purpose and aims of the study	Design, method, sample	Results
Pearson et al. (2010), UK	To examine the formal and informal ways pre-registration nursing, medicine, physio-therapy and pharmacy students learn about patient safety in relation to organizational context and culture	Phased design with multiple qualitative methods Phase I: 13 pre-registration courses, curriculum documents, course director interviews; Phase II: 8 case studies, 2 for each disciplinary group On-going iterative analysis using frameworks agreed in conjunction with the researches	In students' perceptions: • **the value of patient safety** had increased in recent years • in organisations, **reporting errors was in a vital role** of patient safety agenda • **staff members were not clear enough** or they did **not have time** to report errors • students were **unaware** about reporting systems • students were **not integrated in learning and acting process** of reporting errors • students had only **incidental access to training sessions** of reporting errors
Reid-Searl et al. (2010), Australia	To investigate the factors influencing the practice of medication administration for nursing students in clinical settings	Grounded theory Demographic questionnaire In depth semi-structured interviews Bachelor of nursing students (n=28) Female (n=24); Male (n=4), Systematic approach described	**Medication administration** in clinical practice placement, **grade of direct supervision** **A third of participants reported making a medication error or a near-miss**; There was a **lack of direct supervision** when errors occurred
Reid-Searl et al. (2008), Australia	To explore the process of medication administration for nursing students when in clinical practice	A grounded theory In-depth interviews Constant comparative data analysis Undergraduate nursing students (n=28) Female (n=24) Male (n=4) Systematic approach described	**Safe administration of medication** in clinical practice placement **Four categories of supervision: Being with:** nurse conducting the necessary checks, positive, emphatic and caring supervision, **Being over:** nurse in close contact but considered non-supportive and rushed approach, **Being near:** nurse in visual range but not beside student, usually when student had already been in placement some time, **Being absent:** nurse provides no supervision, usually at the end of students placement Learning safe administration of medication in clinical practice; **Nursing students did not necessarily receive the appropriate level of supervision**
Seibert (2014), US	To describe construction of meaningful, practice-based learning activities focusing on safety beyond bedside care	Focus on safety assignments that emphasized systems level thinking, process evaluation, team communication, improvement campaigns in a clinical placement unit, Baccalaureate nursing students, final year (n=9) having management course	**Reflective assignments** engaged nursing students in critical evaluation of their comfort level about launching changes, and skills related to communicating and delegating The assignments **facilitated students to integrate the ideas** about change theory, systems theory, quality improvement and process evaluation and to achieve selected QSEN competencies
Smith et al. (2007), US	To evaluate current levels of integration of quality and safety content in prelicensure curricula	Descriptive study Online survey instrument Nursing programme leaders (n=195) from 629 schools	Safety spread throughout several courses (89%); **Dedicated safety-course (3%)**; Would like more of safety content in curricula (11%) and no safety in curricula (1%) Pedagogical strategies of safety (79%-89%): readings, lecture, clinical practices, simulation and return demonstrations, **Satisfaction of students beginning safety competencies (4.3-4.7)** on Likert 5-point scale

Author(s) (Year), Country	Purpose and aims of the study	Design, method, sample	Results
Spence et al. (2012), Canada	To examine nursing and medical students' organized contextual learning experience regarding patient safety in operating room (OR)	Interdisciplinary learning experience in OR Students' observations, discussions in focus groups Themes formed from discussion topics Third year nursing (n=120) and first and second year medical (n=175) students 65 randomly selected pairs completed observation	Nursing and medical students' perceived **interprofessional education** to be valuable when experiences were **shared** Students perceived **clinical learning as more meaningful** compared to learning in academic settings Students evaluated **OR processes to be surprisingly informal** and was characterized as having **lack of communication** Students perceived that incorporation of formal introductions would increase to develop respect and trust
Steven et al. (2014), UK	To examine the formal and informal ways pre-registration nursing, medical, pharmacy and physiotherapy students learn about patient safety	Case-study Focus groups (24 students, 12 qualified nurses, 6 service users) and interviews (4 health service managers) analysed with thematic approach Observations (4 episodes) of practice in clinical placements, Content analysed curriculum documents Research team developed analytic framework and coding	**Patient safety not visible in academic context**, in students' perceptions, ideal practice was taught **Limited number of organisational systems** for students to learn about the systems and procedures; **Learning through observing healthcare staff**, having variable role models; **Tensions** between challenging practice, nursing students' need of belonging in the unit and mentors role as deciding about students' passing their placements; **Patient safety was understood as complicated problem** in 10rganisational context. Creating an open, non-blaming culture was tensed in relation to performance management; **Tensions between and across academic, healthcare organisation and clinical contexts** relating to students **formal and informal learning** about patient safety; The tensions had **negative impact on students' emotional safety** in learning
Sullivan et al. (2009), US	To assess nursing students' perspectives of quality and safety content in their nursing programmes with self-reported levels of preparedness and perceived importance of the QSEN competencies	Descriptive study The QSEN Student Evaluation Survey (SES) consists of 3 different scales: Knowledge, skills and attitudes The six **QSEN competencies**: patient-centred care, teamwork and collaboration, evidence based practice, quality improvement, safety and informatics, 4-point Likert scales Prelicensure nursing students (n=575) from 1665	Learning of the QSEN competencies **Knowledge objectives**: mostly in classroom **Skills objectives**: concerned with hazard and errors mostly in care environments **Attitudes objectives**: safety viewed as second most important competency **Students' self-reported levels of preparedness including:** Communicate observations and concerns about hazards or errors in the care environment Demonstrate awareness of own strengths and limitations as a care team member
Tanicala et al. (2011), US	To identify faculty perspectives regarding nursing student behaviour's resulting in failure of a clinical practice	Qualitative data analysis, four focus groups Nurse educators from public and private schools of nursing, varied clinical specialties and degrees Systematic approach described	**Patient safety was considered a prominent issue** when assessing whether nursing students pass or fail the clinical course **Errors and near misses contributing to failure of the clinical course** depended on the **level of nursing students' studies and the type of errors** that occurred

Author(s) (Year), Country	Purpose and aims of the study	Design, method, sample	Results
Tregunno et al. (2014), Canada	To study nursing, medical and pharmacy teaching faculty views about factors influencing on integration of patient safety to the curricula and preparation of safe practitioners	Qualitative methods Thematic analysis Faculty members from universities (N=20) Nursing (n=8), medical (n=6), pharmacy (n=6)	**Healthcare faculty perspectives vary on embedding patient safety in curricula** **The culture of safety restraining** students' learning about patient safety **Formal and informal teaching** about patient safety identified **Faculty preparation** to teach patient safety requiring development **Authenticity** of education in academic settings was questioned **A gap between education in academic and clinical settings**
Vaismoradi et al. (2011), Iran	To study Iranian nursing students' perspectives and the role of nursing education regarding patient safety	Qualitative, semi-structured interviews, content analysis Junior and senior nursing students (n=17) Peer-reviewing; independent, compared and discussions, final consensus between all co-authors	Nursing **curriculum having insufficient nursing care and patient safety issues** compared to medical section **No separate section** for patient safety issues Nursing students expect **to be helped to internalize** the principles and values of patient safety Nursing students view **patient safety as patients' physical and psychological comfort** Nursing students find they are not knowledgeable or experienced enough **Gap between education in academic and clinical settings**
Vaismoradi et al. (2014), Iran	To examine nursing students' perspectives and suggestions on developing nursing curriculum with patient safety aspect in Iranian context	A qualitative methodology Three focus groups Nursing students (n=18) from a large Iranian nursing school Semi-structured interviews Content analysis	Two themes and four subthemes emerged: 1) **'Involving students fully in patient care'** divided to two subthemes 'Building a trusting relationship between education and practice' and 'Promoting interdependence between healthcare providers' 2) **'Structuring patient safety education'** divided in two subthemes 'Transforming nursing routines to evidence-based care' and 'Connecting care to patient safety issues'

Appendix 3. Information letter of sub-study II for Finnish nursing students

POTILASTURVALLISUUS HOITOTYÖN KOULUTUKSESSA

TIEDOTE TUTKIMUKSEEN OSALLISTUJILLE

HYVÄ HOITOTYÖN OPISKELIJA,

Pyydän Sinua osallistumaan potilasturvallisuutta hoitotyön koulutuksessa koskevaan tutkimukseen. Tutkimuksessa vertaillaan suomalaista ja englantilaista potilasturvallisuusopetusta hoitotyön koulutuksessa sekä kuvataan ja vertaillaan suomalaisten ja englantilaisten hoitotyön opiskelijoiden potilasturvallisuusosaamista ja heidän kokemuksiaan potilasturvallisuuden opetuksesta.

Merkityksellisiä oppimiskokemuksia voidaan kuvata tärkeinä tapahtumina oppijan elämässä. Pyydän Sinua palauttamaan mieleen hoitotyön harjoittelujen jaksoilta ne oppimistapahtumat, jotka koet erityisen tärkeiksi potilasturvallisuuden oppimisen kannalta. Oppimistapahtuma voi olla positiivinen tai negatiivinen oppimistapahtuma, jonka koet merkitykselliseksi potilasturvallisuuden oppimistapahtumaksi. *Kirjoita noin 1-sivun mittainen kuvaus yhdestä positiivisesta tai negatiivisesta merkityksellisestä oppimistapahtumasta.* Kuvaile, miksi kyseinen tilanne oli merkityksellinen oppimistapahtuma Sinulle. Tuo esille, mitä tapahtui (esim. haittatapahtuma tai läheltä piti tilanne), milloin (esim. millä lukukaudella, missä työvuorossa) ja missä (esim. minkä tyyppinen yksikkö, missä tilassa) se tapahtui. Lisäksi kirjoita, ketä oli tapahtumassa osallisina, millaisia rooleja, työtehtäviä tai ammattinimikkeitä heillä oli. (Älä kuitenkaan käytä ihmisten tai organisaatioiden nimiä.) Kirjoita merkitykselliset oppimiskokemuksesi mukana olevalle konseptille.

Antamiasi tietoja käsitellään ehdottoman luottamuksellisesti koko tutkimusprosessin ajan eikä yksittäistä vastaajaa tai ammattikorkeakoulua voi tunnistaa tutkimusraportista. Tutkimukseen osallistuminen on vapaaehtoista. Henkilötietoja ei kerätä ja siksi vastaukset ovat luottamuksellisia. Annan mielelläni tarvittaessa lisätietoja tutkimuksesta (yhteystietoni alla).

Tutkimus liittyy Terveystieteiden tohtoriopintoihini ja tulokset tullaan raportoimaan kansainvälisissä hoitotieteellisissä julkaisuissa sekä väitöskirjana. Ohjaajinani toimivat professori, TtT Hannele Turunen (Itä-Suomen yliopisto, UEF) ja lehtori, TtT Pirjo Partanen (UEF). Tutkimus kuuluu professori Hannele Turusen johtamaan Potilasturvallisuuskulttuuri tutkimushankkeeseen ja se on osa laajempaa Vetovoimainen ja turvallinen sairaala tutkimushanketta, jota johtaa professori, TtT Katri Vehviläinen-Julkunen (UEF) (http://www.uef.fi/hoitot/tutkimusohjelma).

Tämän tutkimuksen eettisestä ennakkoarvioinnista on saatu puoltava lausunto Itä-Suomen yliopiston tutkimuseettiseltä toimikunnalta ja tutkimuslupa ammattikorkeakoulustasi.

Yhteistyöstä kiittäen,
Susanna Tella

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Itä-Suomen yliopisto
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Appendix 4. Information letter of sub-study II for British nursing students

LEARNING OF PATIENT SAFETY FROM CRITICAL LEARNING INCIDENTS

INFORMATION FOR NURSING STUDENTS

DEAR PRE-REGISTRATION NURSING STUDENT,

I am asking you to participate **in a study that investigates patient safety in nursing education.** The purpose of the study is to analyze and compare patient safety education in Finnish and British pre-registration nursing education and furthermore, study and compare Finnish and British final year pre-registration nursing students' learning of patient safety.

Critical leaning incidents can be described as significant events in learners' life. Please, recall the learning events that you feel related especially to your own learning of patient safety in your clinical practice placements. The learning event can be positive, satisfactory or negative, unsatisfactory learning experience that you feel as significant learning event concerning patient safety. **Please, write a description of one critical learning incident, positive or negative** (about one page long). Describe why that event was critical learning incident of patient safety for you. Bring out in your writing what happened (e.g. hazard or near-miss), when (e.g. in which semester, shift: day time or night time) and where (e.g. what type of unit, which room) it happened. In addition, write who were involved, what kind of roles, actions and job titles those involved had (do not use any names of peoples or health care organizations).

Please, write your critical incidents in attached sheets. You can be sure that participants remain anonymous throughout the research process. Personal information will not be collected and thus the responses are anonymous and confidential. Participation in the study is voluntary nature, will not affect the assessment or conduct of your nurse education. If you need any further information, I am happy to give it.

The study is part of my dissertation and the results will be published in Doctoral Thesis and in an international journal of nursing sciences. My supervisors are Professor Hannele Turunen, PhD (University of Eastern Finland, UEF) and Senior Lecturer Pirjo Partanen, PhD (UEF). The study belongs to the Finnish research project titled Patient Safety Culture (lead by Prof. Hannele Turunen PhD, UEF) that is a sub-project in a broader Attractive and Safe Hospital Study (lead by Prof. Katri Vehviläinen-Julkunen, PhD) of the UEF (http://www.uef.fi/hoitot/tutkimusohjelma). Approval for the study has been obtained from your University. University of Eastern Finland Committee on Research Ethics has given a favorable statement on the ethical acceptability of the study.

Sincerely,
Susanna Tella

RN, MNSc, PhD Student
University of Eastern Finland
Department of Nursing Science
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FI-70211
Kuopio
Finland

E-mail: xxxx.xxxxx@xxxxx.xx
Tel. +xxx xxxxxxxx

Appendix 5. Information letter of sub-study III for Finnish nursing students

POTILASTURVALLISUUS HOITOTYÖN KOULUTUKSESSA

TIEDOTE TUTKIMUKSEEN OSALLISTUJILLE

HYVÄ HOITOTYÖN OPISKELIJA,

Pyydän Sinua osallistumaan potilasturvallisuutta hoitotyön koulutuksessa koskevaan tutkimukseen. Tutkimuksessa vertaillaan suomalaista ja englantilaista potilasturvallisuusopetusta hoitotyön koulutuksessa sekä kuvataan ja vertaillaan suomalaisten ja englantilaisten hoitotyön opiskelijoiden potilasturvallisuusosaamista ja heidän kokemuksiaan potilasturvallisuuden opetuksesta.

Tutkimusaineisto kootaan kyselylomakkeella, joka sisältää 57 kysymystä potilasturvallisuudesta ja sen opetuksesta hoitotyön koulutuksessa. Vastaaminen vie aikaa noin 15 minuuttia. Aineisto analysoidaan tilastollisesti. Tutkimukseen osallistuminen on vapaaehtoista eikä sillä ole vaikutusta opiskelijan opintojen arviointiin tai suorittamiseen. Henkilötietoja ei kerätä ja vastaukset ovat luottamuksellisia. Yksittäistä vastaajaa tai ammattikorkeakoulua ei voi tunnistaa tutkimusraportista. Annan mielelläni tarvittaessa lisätietoja tutkimuksesta (yhteystietoni alla).

Tutkimus liittyy Terveystieteiden tohtoriopintoihini ja tulokset tullaan raportoimaan kansainvälisissä hoitotieteellisissä julkaisuissa sekä väitöskirjana. Ohjaajinani toimivat professori, TtT Hannele Turunen (Itä-Suomen yliopisto, UEF) ja lehtori, TtT Pirjo Partanen (UEF). Tutkimus kuuluu professori Hannele Turusen johtamaan Potilasturvallisuuskulttuuri tutkimushankkeeseen ja se on osa laajempaa Vetovoimainen ja turvallinen sairaala tutkimushanketta, jota johtaa professori, TtT Katri Vehviläinen-Julkunen (UEF) (http://www.uef.fi/hoitot/tutkimusohjelma).

Tämän tutkimuksen eettisestä ennakkoarvioinnista on saatu puoltava lausunto Itä-Suomen yliopiston tutkimuseettiseltä toimikunnalta ja tutkimuslupa ammattikorkeakoulustasi.

Yhteistyöstä kiittäen,

Susanna Tella

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Appendix 6. Information letter of sub-study III for British nursing students

PATIENT SAFETY IN NURSING EDUCATION –QUESTIONNAIRE

INFORMATION FOR NURSING STUDENTS

DEAR PRE-REGISTRATION NURSING STUDENT,

I am asking you to participate in a study that investigates patient safety in nursing education. The purpose of the study is to analyze and compare patient safety education in Finnish and British pre-registration nursing education and furthermore, to study and compare Finnish and British final year pre-registration nursing students' patient safety competencies.

The research data is collected via a questionnaire containing 57 questions from patient safety education and patient safety competence. Answering takes about 15 minutes. The data will be analysed by statistical methods. Personal information will not be collected and thus the responses are anonymous and confidential. Participation in the study is voluntary nature, will not affect the assessment or conduct of your nurse education. If you need any further information, I am happy to give it.

The study is part of my dissertation and the results will be published in Doctoral Thesis and in an international journal of nursing sciences. My supervisors are Professor Hannele Turunen, PhD (University of Eastern Finland, UEF) and Senior Lecturer Pirjo Partanen, PhD (UEF). The study belongs to the Finnish research project titled Patient Safety Culture (lead by Prof. Hannele Turunen PhD, UEF) that is a sub-project in a broader Attractive and Safe Hospital Study (lead by Prof. Katri Vehviläinen-Julkunen, PhD) of the UEF (http://www.uef.fi/hoitot/tutkimusohjelma).

Approval for the study has been obtained from your University. University of Eastern Finland Committee on Research Ethics has given a favorable statement on the ethical acceptability of the study.

Sincerely

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Susanna Tella

Learning about Patient Safety in Pre-registration Nursing Education. Comparing Finnish and British Nursing Students' Evaluations

This study compared Finnish and British pre-registration nursing students' evaluations on their learning about patient safety in academic and in clinical settings. Both Finnish and British students considered learning about safe care to be important for their own learning. Differences were found in students' evaluations on patient safety education. British students perceived more systematic learning about the topic. Students' important learning events were related to preventing errors and acting safely after errors.

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