Introduction

Errors cause suffering for patients, their families and significant others. They also impact upon health care organisations and their staff.

Patients and their families expect safe high quality healthcare. Patient safety is a significant challenge across the world. Patient safety can be compromised by any unintended incident which could (near miss) or does (adverse event) lead to harm. WHO (2014) suggests there are approximately 43 million patient safety events globally every year across the world, and around 1 in 10 patients suffers avoidable harm. Vlayen et al (2012) state the majority of adverse care episodes and near misses are preventable.

In a social context which is rapidly changing, with the development of enhanced and increasingly powerful technologies, shifting population demographics, and rising healthcare costs, healthcare and social care practice must develop and innovate (Keown et al 2014). Education, research and collaboration are crucial to developing health and social care practice and improving patient safety (Pearson, Steven et al 2009).

Research and education which draw on a range of situated perspectives, disciplines and theories can enrich practice innovation and add otherwise neglected dimensions. We teach students that practice should be evidence based where possible. However, while we seek to integrate empirical evidence with situated cultural and practitioner expertise and knowledge (Wieringa et al 2017), the perspectives of those learning to become health professionals are often overlooked. In addition there is a need to move education beyond a reliance on reflection on action to promote greater reflexivity or reflection in situ to enhance patent safety practice.

Therefore, in developing research and educational resources to enhance patient safety it is crucial that we build on existing bodies of work, while also engaging multiple perspectives and promoting greater reflexivity. These are further enhanced if different national and cultural viewpoints are brought to bear. Collaboration is fundamental to developing and undertaking such work.

This paper focuses on 'Sharing Learning from Practice for Patient Safety' (SLIPPS), a collaborative international patient safety project co-funded by Erasmus Plus programme of the European Union. SLIPPS draws on students' practice experiences and shares patient safety learning across professional and national boundaries.

Background

Healthcare work takes place in diverse healthcare systems. In the countries involved in the SLIPPS project, healthcare systems are mainly publicly financed with a smaller proportion of the population having private health insurance (Mossialos, Wentzl et. al, 2016). In large parts of Europe, healthcare is primarily financed by insurance and run by private enterprises/NGOs (Braut, Holmboe, 2015).

Patient safety has traditionally been viewed as a responsibility for individual professionals, expressed in codes of ethics, and concern for the authorisation of healthcare professionals. However, with growing recognition of unintended patient harm, more attention is being given to educational, psychological and organisational challenges in the healthcare environment. In 2000, the report *To Err Is Human: Building a Safer Health System* recommended that healthcare organisations should develop a culture of patient safety, and that this should be a leadership responsibility (Kohn, Corrigan, Donaldson 2000). In a literature review, Sammer and coworkers identified seven 'subcultures' of a patient safety culture, including leadership, teamwork, communication, learning, and patient-centredness. (Sammer et. al 2010), Individual responsibility is broadened to include participation in effective teamwork, demanding communication and information sharing between professions, and understanding and respect for each other's roles and perspectives. Psychological barriers, such as professional borders and hierarchies need to be addressed, as well as organisational challenges such as geographically distributed teams (Weller et.al, 2014).

As specification of goals for patient safety and implementation of routines becomes a responsibility for leaders, national and regional governments need to engage directly in developing a safety culture by formally enacted legislation. In models of health care based on public financing, such goals and routines should be part of ordinary activities. In a model with

private enterprise, it becomes a task for its leaders to demonstrate an organisational safety culture that meets the requirements of reliability.

The timing and development of patient safety policy and the underlying evidence base varies across the world and between our partner countries. In UK the Department of Health (2000) published a report which highlighted the failure of healthcare to learn from its mistakes, in stark contrast to industries such as aviation. In 2001, Vincent and colleagues (Vincent et al 2001) published a retrospective review of adverse events recorded in British Hospitals. In April 2001, the UK government outlined a programme of work to improve patient safety. This involved establishment of a National Patient Safety Agency to lead change and monitor outcomes, and the creation of improvement targets. At the same time, a national Patient Safety Research Programme was set up to promote the development of an evidence base for patient safety. Fifty-one studies were undertaken over the next decade. Only one of these (PS/030) related to education about patient safety. In 2012, the functions of the National Patient Safety Agency transferred to NHS England, as part of NHS Improvement. Reporting of patient safety incidents continues through the National Reporting and Learning System.

In Finland moves towards an explicit Patient Safety Strategy began in 2006 with the establishment of a Steering Group for the Promotion of Patient Safety. The first Finnish *Patient Safety Strategy* was published in January 2009. It aimed to embed patient safety in all the structures and processes of the health system. It looked at incident reporting, risk management and patient involvement. One of the key objectives of the 2010 *Finnish Health Care Act* (1396/2010) was to improve the quality and patient safety of care. To implement this, healthcare units have to produce a plan for quality management and ensuring patient safety. Sahlström et al (2014) found that treatment, medication and device safety were mostly regarded as excellent or very good by Finnish hospital patients (N=175), although 20% of patients reported they had experienced errors at some time during their care and 29% didn't receive an updated medication list on discharge. The second Finnish strategy – the *Patient and Client Safety Strategy 2017–2021* - recognizes the risks of patient safety incidents, which cannot be totally

avoided even though health and social care staff are competent, committed and regulated. The strategy sets out an action plan focused on safety culture and resourcing.

The Spanish Ministry of Health, Social Services and Equality developed a Patient Safety Strategy from 2005 with the creation of a national network of patient safety stakeholders. This facilitated engagement across Regions, enabled professionals and their organisations to contribute, and ensured participation by patients´ associations. The objectives of the strategy included promoting patient safety culture, education about patient safety for professionals, the development of reporting systems, and patient and public involvement. The strategy was updated for 2015-2020, with an emphasis on decision making about patient safety across the Spanish system.

In Norway, a Patient Safety Programme called *In Safe Hands* was launched in 2011 by the Norwegian Ministry of Health and Care Services. This is now focused on measuring patient safety culture and developing a reporting system.

In Italy, work on regional and national patient safety strategies began around 2008 with an agreement between national government and regions to require patient safety reporting systems in each healthcare organisation, and the development of a repository of safe practice. Most recently a decree of the Italian Ministry of Health in February 2018 put in place the innovative *Law 24/2017* known colloquially as the Gelli Law which is focused on the safety of care and the occupational accountability of practitioners in health professions.

Whilst timelines differ, several common threads can be seen: attention to systematic reporting and the importance of a patient safety culture which is not focused on blame.

Underpinning education for patient safety must be a theoretical model of patient safety practice. One such model is that developed from Rasmussen's framework model of system migration (Rasmussen 1997) and extended by Amalberti into a theory of migration and transgression of

practices (Amalberti 2001). This model incorporates three phases: an initial safe space of action as defined by professional codes and standards; a borderline zone of tolerated conditions of use; a forbidden or deviant space, which may usually be inhabited by reckless or aberrant individuals, but may become normalised when a system is under extreme pressure. The UK study mentioned above (PS/030) funded by the Patient Safety Research Programme (Pearson et al 2009, Cresswell et al 2013, Steven et al 2014) investigated the formal and informal ways pre-registration students from four healthcare professions learnt about patient safety to become safe practitioners. The aim was to understand some of the issues which impact upon teaching, learning and practising patient safety in academic, organisational and practice 'knowledge' contexts, drawing on work by Eraut (1994) and Stewart (2006). Patient safety in the curriculum was largely implicit rather than explicit. All students very much valued the practice context for learning about patient safety. However, resource issues, peer pressure and client factors could influence safe practice. Variations existed in students' experience and the quality of the supervision available. The role model offered by the mentor or clinical educator and the relationship established affected how confident students felt to challenge unsafe practice in others. Clinicians were conscious of the tension between their responsibilities as clinicians (keeping patients safe), and as educators (allowing students to learn under supervision). Incident reporting was not incorporated to any great extent in undergraduate curricula. Newly qualified staff were aware of the need to practice in an evidence based way, and, for some, the need to modify 'the standard' way of doing things to do 'what's best for the patient'. This suggests that as they moved from an idealised or imagined way of working into practical experience, individuals tested the boundaries of the initial safe space and the transition into borderline tolerated conditions of use.

Tella's doctoral work (supervised by Turunen) developed aspects of this thinking further, in particular comparing Finnish and British students' experience. Tella (2015) explored and compared Finnish and British pre-registration nursing students' evaluations of their learning about patient safety in academic and clinical settings as part of a Finnish-British research group. Students identified important learning events about patient safety from their work placements

in healthcare organisations. The learning events related to the complex situations and mistakes that occurred in care processes. Reflecting enabled students' positive learning about patient safety by reinforcing the importance of the topic and learning from errors. Two key themes emerged: prevention of errors and safe actions after errors. In both groups, events included medication errors, but only British students described events related to falls risk assessments. Overall, students made important observations, which were underutilised. Reflection enabled students to critically appraise their positioning in relation to safe practice or, as they pursued enhanced performance, the borderline tolerated conditions of use. Such reflections facilitate discussion of the implications of progressive drift in practice. The links initiated and developed during this work became the foundation of the partnership which developed SLIPPS.

It has been suggested that we need universal patient safety programmes to identify the risk of adverse events for patients so that we can act to prevent or control risks (Johnstone & Kanitsaki, 2006). Runciman et al. (2009) indicate that a common international understanding of terms and concepts relevant to patient safety, may be important for the normalisation of patient safety in practice. Numerous international organisations have worked to standardise patient safety terminology and definitions (WHO, 2009; NQF, 2009; SP-SQS, 2005). Glossaries of patient safety terms have also been created (Battles & Lilford, 2003; SP-SQS, 2005). 'Patient safety' is a relatively recent entrant as a descriptor into Medical Subject Headings (MeSH) in 2011, defined as 'Efforts to reduce risk, to address and reduce incidents and accidents that may negatively impact healthcare consumers' (MeSH, 2018). Other related terms such as 'medical error' were added previously. Patient safety terminology is an important reference for healthcare professionals, students, and patients. The use of standardised terms empower best practice by healthcare professionals and enrich the patient safety educational programme for students and providers.

Related to language use are the perspectives which inform practitioner behaviour. Patient safety culture is developing as a new paradigm for healthcare. If the present approach to patient safety has been labelled as Safety-I, healthcare *should* focus on 'the concerted effort to enable things

to go right more often', Safety-II (Braithwaite et al., 2015). The SLIPPS project has adopted this idea and focuses on learning with students how to 'make things go right' with today's problems. One of the main objectives has been to develop a variety of learning resources which can assist students and healthcare organisations in learning about and from patient safety incidents and good practice, as well as developing individual and organisational resilience.

Among the key ways in which healthcare students learn safe and effective working is through exposure to practice, including the use of role play and simulation. Students and healthcare professionals may acquire clinical, communication and information technology skills to a specific level of competence before coming into direct contact with patients, or acquire and update new competencies during their professional life.

Simulation has been shown to improve students' critical thinking and clinical reasoning (Camp and Legge, 2018). This is important in today's complex healthcare environments and in managing patients with multimorbidity. Simulation is an effective support for the development of students' self-efficacy and confidence in clinical skills.

Technically advanced simulation environments offer healthcare students the opportunity to generate, develop and enhance their communication skills and confidence in their clinical ability without the risk of compromising patient safety (Bagnasco et al 2014). Simulation also gives students the opportunity to practice and correct mistakes in real time. It has also been shown to improve teamwork behaviour in a variety of clinical contexts, with improved team performance in critical situations (Oxelmark et al 2017).

Interprofessional cooperation is also essential for modern health care because the body of knowledge is growing rapidly and no single profession has a complete overview of the necessary knowledge and skills (Barr 2012). Interprofessional learning can be used to develop higher levels of patient safety, building from simulation lab sessions, through clinical training, to real clinical practice.

Project design

This project aims to use learning events experienced in practice placements to develop tools and resources which assist students in learning about types of patient safety incident and developing 'resilience'; greater understanding of how witnessing or involvement in incidents influences students' learning (and potentially future practice and culture); greater understanding of incident diversity and frequency across professions, nations and healthcare systems and to support high quality research into patient safety incidents, safety culture and professional working.

The SLIPPS project builds on previous incrementally linked work of the UK and Finnish authors (Pearson, Steven et al 2009, 2010 a,b; Bradley, Steven et al 2011; Cresswell et al 2013, Turunen et al 2013, Steven et al 2014, Tella 2015 a-d,2016). Building on that and areas of expertise brought by the other partners (FM, RP, KM, LS, AB,JP), SLIPPS is underpinned by three main bodies of educational theory: Experiential and situated learning (Kolb 1984, Boud et al 1993, Eraut 1994, 2000,2007, Boud and Garrick 1999, Lave and Wenger 1991); the notion of learning across professional knowledge 'contexts' (Eraut 1994, 2000,2007, Stewart 2006, Steven 2002, 2009); and reflection and reflexivity (Schon 1987,1991, Boud and Walker 1998, Rolfe 2014).

Experiential and situated learning theories are part of the underpinning logic of SLIPPS which posits that students in health and social care professions learn much both formally and informally from their experiences in 'practice' or 'work' placements (Eraut 1994, 2000, Steven 2002, 2009, Pearson et al 2009, Tella 2015). Experience can be conceptualised as involving the 'whole person'(Rogers and Freiberg 1994, Jarvis 2006). The complex relationship between experience, knowledge construction and learning has been extensively explored and theorised (Dewey 1958, Kolb 1984, Schon 1987,1991, Boud et al 1993, Eraut 1994,2000,2007, Lave and Wenger 1991, Jarvis 2012, Bergsteiner and Avery 2014, Dyke 2017). Kolb's (1984) experiential learning cycle drew on earlier works by Dewey (1958), Lewin (1951) and others. Kolb (1984) emphasised that experience alone was not sufficient and required transformation into learning through reflection upon action, with 'reflection' referring to cognitive and affective processes of consideration (Ng et al 2015). However Jarvis (1987) criticises Kolb's 'cycle' as over-simplistic, proposing a more complex picture including 'reflection-in-action' (p18). Around the same time

Schon (1987, 1991) drew on the work of Dewey (1958) and others to conceptualise 'reflective practice' and critique technical rationality (Kinsella 2007).

Schon (1987, 1991) highlighted contrasting positions on practitioner knowledge, theorising that a technical rational approach privileged 'scientific' knowledge, while practitioner knowledge was grounded in action and complex day-to-day realities. These positions can be seen as linking different disciplinary or professional 'contexts' to views and values placed upon certain knowledge types (Steven 2002, 2009, Stewart 2006). The popular notion of the theory–practice gap common across nursing (Monaghan 2015) tends to heighten the dichotomy between these knowledge types and may function to maintain professional sub-group positions (Steven 2009). While a strict dichotomy between (scientific) technical rationality and (practitioner) experience may be overdrawn (Kinsella 2007) the notion of different 'knowledge contexts', not necessarily physical locations but ways of viewing the world, remains pertinent (Eraut 1994, 2000, Steven 2002, 2009, Stewart 2006). Such knowledge contexts may also have implications for patient safety (Pearson, Steven et al 2009, 2010 a,b; Bradley, Steven et al 2011; Cresswell et al 2013, Steven et al 2014). Indeed nursing students move between such contexts during their educational programmes while traversing academic, practice and organisational settings and often report and reflect on these differences (Pearson, Steven et al 2009, 2010 a,b, Steven et al 2014).

The concept of reflective practice, generally incorporating the use of reflection *on* action, has become key to nursing (Hayes et al 2017, Goulet et al 2016, Rolfe 2014). While there is broad consensus regarding the positive impact of reflection on personal and professional development and care (Goulet et al 2016) and links made to patient safety (Hayes et al 2017), there are calls for caution. Some highlight the over simplification of 'reflection' (Ng et al 2015) and warn against uncritical adoption (Rolfe 2014, Boud and Walker 1998, Usher et al 1997). The unreflexive nature of Schon's work and much of the ensuing reflective practice movement has been noted (Iedema 2011, Edwards and Nicholl 2006, Usher et al 1997). Unlike reflection, reflexivity is collaborative and the capacity to *'monitor and affect events, conducts and contexts in situ'* thus *'monitoring … the safety gradient of practice'* (Iedema 2011 pi84). Suggestions for moving beyond individual retrospective reflection and building reflexive capacity include sharing

patient stories (Iedema 2011). We suggest that the sharing of student accounts may also assist in this.

According to EU directive (2013/55/EU) at least half of a nursing programme must be in clinical practice (90 ECTS). The design of this study therefore engaged partner universities offering nursing, allied health, and social care education, as well as some contacts with medicine, and for each, health and social care organisations. The group spans 5 countries (UK, Finland, Norway, Italy and Spain), and 7 universities. The five intellectual outputs described below were drawn into work packages, each led by one or two partners, and supported by representatives of all the others. UNN takes overall responsibility for project management with a transnational management group (TMG) that has members from each partner organization. This group meets monthly on a virtual basis by Skype and around 6 monthly face to face. The latter opportunities are important in building and sustaining rapport, and developing effective communication/collaboration mechanisms.

Project protocol

This section describes the five intellectual outputs which form the substance of the SLIPPS project, outlining our planned work packages. Fundamental to the whole programme is the development of SLIPPS Learning Event Recording Tools (SLERT) for students to record, reflect on and learn from important learning events about patient safety observed while in practice placements. This work draws on a review of relevant literature and the existing expertise of the team. The tools are for students to complete to describe a patient safety event (positive or negative) and write a reflective account. Guidance and illustrations are being developed to assist the students. Initially developed on paper, the SLERT will then be made available to students online for data collection. SLERT data will then be stored and made available nationally and internationally to underpin research and educational development.

The SLIPPS project provides two tools for the management of SLERTs; one for selected faculty and the second for international use. This division is based on the idea that selected faculty members monitor SLERs, potentially use them in educational activities and select the SLERs that

could be shared internationally. The faculty tool forms a local database for faculty members involved and allows them to analyse and anonymise students' learning events, if necessary, before submission to the international database. The SLIPPS international database offers a collection of anonymised learning events accessible all around the world. Access to these SLERs will be through a Virtual Learning Centre website. This database will offer various search options that will enable users to find SLERs suited to their interest.

Two further planned outcomes will be a series of simulation scenarios and the underpinning propositions of, and scenarios for, a patient safety game. The simulation and patient safety scenarios created in this project are based on the multinational experiences collected via the students' SLERTs about patient safety. Researchers and educators work with diverse stakeholders (students and practice colleagues) to analyse events and create simulations. Simulation scenarios can be presented to students in real or virtual seminars.

The conceptual framework adopted for the development of the SLIPPS scenarios is the Nursing Education Simulation Framework (NESF) (Jeffries 2005). This model can be applied to all kinds of scenarios, from those with low realism (low fidelity) to those with high realism (high fidelity). In the SLIPPS project, scenarios are drawn from real situations that students experienced during their clinical placements, using the SLERs.

Thematic analysis of early SLERs found three themes predominating: communication; infection control, and medication errors, across three main contexts: critical care (A&E and Operating Theatre); hospital wards (routine non-critical care); and the community (home-based care). The aim of this element of the SLIPPS project is to design a maximum of 9 scenarios, one for each developing theme, across the three contexts.

The final planned output will be a series of virtual open access seminars. From the analyses of the SLERs we will develop a virtual seminar on a specific topic. Each seminar will cover a topic developed from learning and insights gained from analysis of the SLERs, with implications and

suggestions for the future. Partners paired with healthcare organisation (HCO) associates will analyse learning event reports (SLERs) in line with their specific expertise and output aim. Where possible this analysis will involve students working under the supervision of partners thus facilitating learning about patient safety research for a further cohort of professionals. It is intended to develop four virtual seminars. Each will cover a topic developed from insights gained from analysis of the SLERs, reflection on their implications and suggestions for the future.

Discussion

At present this programme is developing towards the outcomes described above. In that process, we have identified a number of areas where we are learning about collaboration.

The first and perhaps the most obvious area for learning relates to collaboration across countries – in which we experience both cultural and contextual similarities and differences. Cross-cultural research is important in the health sciences. It enables researchers to test, modify and disseminate theories in an international context. We also need to recognise the emotional link that exists between culture, language and patient safety for health professionals and patients (Johnstone and Kanitsaki, 2006). Currently, patient safety is one of the most monitored parameters for healthcare professionals around the world (Ammouri et al, 2015). Previous studies using the Hospital Survey on Patient Safety Culture to assess the culture of patient safety have shown as common areas of strength 'Teamwork within units' and 'Organisational learning-continuous improvement'. Areas requiring improvement have been noted as 'Non-punitive response to error', 'Staffing', and 'Communication openness' for healthcare professionals (nurses and physicians, mainly) (Bagnasco et al. (2010); Wagner et al. (2013); Turunen et al., (2013); Kriestensen et al. (2015); Mir-Abellán et al., (2017)). These results demonstrate similarities and differences in patient safety culture in healthcare institutions across countries, and the importance of improving patient safety culture and education.

Participants in the SLIPPS Project are healthcare students involved in clinical practice in five European countries. In this international context, for the SLIPPS team, students' experiences

during practice training and their reflections about adverse events, near misses, or good practice during care episodes are crucial to a better understanding and improvement of patient safety culture. We hope that we can learn from students' experiences and design patient safety courses and learning resources according to relevant cross-cultural similarities or differences.

A second area in which we are modelling collaboration in this work is in collaboration between technical and service users. Service users within the project currently include academic staff, healthcare practitioners and students. The technical team have taken time to participate in discussions from the beginning, and to understand the purposes of each element of the work, to inform development and design. The development of both 'Faculty' tools as well as the virtual learning centre has been done in close collaboration with the people who will use them. The DECSV faculty tool has been linked with multiple survey engines that are used by project partners. Tests of these revealed that the SLER data, although using the same frame, is presented in different formats. This needed to be taken into account in development. Linkage between the faculty tool and the international database was simpler as the faculty tool creates the same format for all SLERs. The virtual learning centre then offers an interface for users to access the international database. As soon as there are enough data in the database we hope that a wider group will be able to start using it.

In the SLIPPS project we aim to strengthen collaboration between higher education and healthcare organisations in designing, implementing and evaluating healthcare students' patient safety education. Clinical placements are important patient safety learning environments for healthcare students (Steven et al. 2014, Vaismoradi et al. 2014, Tella et al. 2015) and one of the 'knowledge contexts' which students must learn to work across (Steven 2009). Indeed students often report and reflect on the differences they encounter between academic, practice and organisational contexts (Pearson, Steven et al 2009, 2010 a,b, Steven et al 2014). A high level of patient safety culture in the learning environment supports students' learning of patient safety competence (Nekouei et al. 2017), whereas low patient safety culture may lead to unsafe practice (Liukka et al 2017). One of the key elements facilitating effective collaboration in this

project is the presence around our tables (real and virtual) of colleagues from healthcare organisations with a patient safety remit alongside academics. As we work through the steps for each outcome they keep our thinking grounded and assist in helping us understand the respective knowledge contexts students encounter.

It was envisaged that SLIPPS might also generate opportunities for the engagement of students at all levels in service innovation, teaching quality, and research. This has already begun, with positive engagement by computing students from Lappeenranta University of Technology, Finland, in the design and development of the DECSV teacher tool, and students from all countries participating in our Quality Assurance Group. We hope also to realise the potential of this programme for complementary research studentships and projects which draw on the data we gather, or examine the processes involved and build capacity within the workforce.

Conclusion

At present SLIPPS work continues. The programme has already increased dialogue between HEIs and HCOs, building on our international collaboration. The initial learning events collected have provided examples which have been the starting point of some fruitful discussions and plans for improvement. We believe that key to the ongoing success of the project are strong relationships, and a reciprocal openness to view things from diverse perspectives and cultures.

Key points

- Patient safety innovation and research in education and healthcare practice must build on existing work, and engage multiple perspectives.
- Students' experiences during clinical training and their reflections about learning events are crucial to understanding and improving patient safety culture.
- Sharing patient stories about care helps participants to move beyond individual reflection and builds reflexive capacity.

- When developing learning technologies, technical and healthcare staff should participate in discussions from the beginning, and understand the purposes of each element of the work.
- Dialogue between staff from academic and practice environments facilitates creativity grounded in experience.

Ethical Permissions

Ethical approval for this study was granted on 9 March 2017 by Dr Peter McMeekin on behalf of the Northumbria University Faculty of Health and Life Sciences Research Ethics Review Panel. The study was also assessed by the UK Health Research Authority (IRAS 223950) and deemed as not requiring HRA Approval. Approval was also obtained in each partner institution.

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