

Student nurses' experiences of engaging in quality improvement in practice: an ethnographic study.

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Declaration

I understand the nature of plagiarism and I am aware of the University's policy on this. I give consent to the use of plagiarism detection software. I certify that this research reports original work by me during my university project and artificial intelligence has not been used to inform any part of this thesis.

Signature *Mrs Lorraine Armstrong* **Date** March 2025

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Abstract

In the UK, the Nursing and Midwifery Council (NMC) stipulate that quality and safety proficiencies must be achieved to qualify as a registered nurse. The aim of this thesis was to explore the experiences of student nurses who were educated about quality improvement (QI) during their undergraduate degree and who undertook a QI project in the practice setting. The findings offer rich insights into the settings in which student nurses conducted QI projects by investigating what contextual factors influenced their QI experiences and whether QI engagement was sustained as registered nurses.

A qualitative ethnographic design was used across two phases. In Phase One, 34 hours of field observations were undertaken with adult student nurses (n=31) across nine settings within an acute hospital in central Scotland. Informal interviewing, document analysis, semi-structured in-depth interviews (n=8) and focus groups (n=5) were conducted. A qualitative interpretative approach was used to conduct within-case and cross-case analyses of the contextual factors that influenced student nurses' QI learning experiences. A conceptual model is presented to illustrate how the contextual factors inter-related and influenced students' engagement with QI called the QI Nursing Engagement in Practice Model (QiNEP). In Phase Two, semi-structured interviews were conducted with the participants as registered nurses (n=10). The aim of this phase was to determine if they had remained engaged with QI activity and to identify what contextual factors influenced their engagement. The qualitative data in this phase was analysed using the QiNEP Model.

The study revealed that student nurses in all settings were exposed to similar contextual factors. The interrelated and dynamic nature of how these factors were experienced by student nurses had an impact as a barrier or facilitator and consequently influenced the levels of engagement with students' QI projects, and QI activity as registered nurses. Collaboration between academic and practice partners will be essential to develop innovative curricula which fosters early and ongoing QI educational activities in the practice setting. Student nurses' QI behaviours will need to be a central focus of QI nurse education because they act as an indicator of long-term engagement as registered nurses. To equip the future nursing profession with adequate QI skills, knowledge and behaviours needed to initiate and lead improvements in the real world, faculties should look to expose student nurses to a range of practice contexts throughout their degree to undertake QI activities.

Ethical Approval

The University of Stirling Research Ethics Committee (SREC) approved this study on the 7th of December 2015 (Ref: SREC 15/16 Paper No. 40). The research study was underpinned by the principles of the Data Protection Act (1998) and conducted in accordance with the University of Stirling Code of Good Research Practice and NHS Code of Confidentiality (2010).

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Dissemination of Research

PUBLICATIONS

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Armstrong, L., Lauder, W. and Shepherd, A. (2015) An evaluation of methods used to teach quality improvement to undergraduate healthcare students to inform curriculum development within pre-registration nurse education: a protocol for systematic review and narrative synthesis. *Systematic Reviews*, 4, pp. 1-8.

CONFERENCES

Armstrong, L., Shepherd, A. and Harris, F. (2024). Adapting improvement education to context: small-scale projects or diverse and reflective portfolios? *International Forum on Quality and Safety in Healthcare*. ExCeL London, UK, 10th-12th April 2024.

Armstrong, L., Harris, F. and Shepherd, A. (2022) Understanding the influence of context on final year student nurses' experiences of improvement science education in practice. *8th International Nurse Education Conference.* Sitges, Spain, 19th-22nd October 2022.

Armstrong, L., Shepherd, A. and Harris, F. (2019) Putting QI education into context for pre-registration nurse education: an ethnographic multiple-case study. *International Forum on Quality and Safety in Healthcare*. Tuesday 26-29th March, The Scottish Exhibition Conference Centre, Glasgow: Poster Presentation.

Armstrong, L., Shepherd, A. and Harris, F. (2016) Improving the use of QI Education in Pre-registration Nursing Practice using Qualitative Data: Preliminary results and potential improvement interventions. *International Forum on Quality and Safety in Healthcare.* Tuesday 12-Friday 15 April 2016, The Swedish Exhibition and Congress Centre, Gothenburg: Poster Presentation.

1.0 INTRODUCTION

UK registered nurses are expected to make a key contribution to quality improvement (QI) to enhance health outcomes and people's experiences of care (NMC 2018). Pre-registration nurse education providers have integrated QI content into their curricula for decades and are adopting small-scale improvement projects to equip student nurses with the knowledge and skills to engage in real-time QI activities (Kyrkjebo 2006; Smith et al. 2014; Baillie et al. 2014; James et al. 2016). However, there continue to be calls from nurse academics to progress understanding of the different practice settings in which these QI projects occur and to better understand students' and registered nurses' QI engagement (Robinson and Gelling 2019; Craig and Machin 2020). This thesis is situated at the intersection of two core disciplines: healthcare improvement science and nurse education. It draws on the principles, methodologies, and pedagogical priorities of both fields to explore how student nurses engage with quality improvement (QI) in practice. Specifically, it examines student nurses' QI learning experiences and their engagement with QI as registered nurses and offers novel insights into QI education. The research questions are:

1) What contextual factors influence the QI learning experiences of third year student nurses in the practice setting?

2) How do these contextual factors interplay throughout the QI learning process and across different practice settings?

3) Do student nurses continue their QI engagement as registered nurses and what are the influencing contextual factors?

This chapter now introduces the background to the study and provides an overview of my motivations to explore QI education in nursing. The importance of the role of the nurse in healthcare improvement is emphasised and the problems that registered nurses face when engaging with QI are highlighted. Next, an overview of QI methodology is provided to prepare the reader to understand the QI projects that student nurses undertook during this study. The underpinning ideas that enabled the key gaps in knowledge to be identified are discussed. Next, an outline of how the findings address the research gap is stated and lastly, a chapter synopsis of the research is listed.

1.1 BACKGROUND TO THE STUDY

In 2010, I was introduced to healthcare improvement as an adult student nurse, when in Scotland the 'Healthcare Quality Strategy' was published and envisioned that all healthcare professionals would be equipped with the skills to make improvements to patients and healthcare services (Scottish Government 2010). The importance of the improvement agenda was introduced at that time by the Nursing and Midwifery Council (NMC) in the UK who stated that student nurses should 'act as change agents and provide leadership through quality improvement and service development to enhance people's wellbeing and experiences of healthcare' (NMC 2010). Through launching the new NMC (2018) standards, the evolution of this statement has led to specific quality and safety proficiencies being developed for student nurses to achieve before registration (see Box 1.1.).

At the start of this research, Batalden and Davidoff (2007) had not long defined QI as 'the combined and unceasing efforts of everyone; healthcare professionals, patients and their families, researchers, payers, planners and educators; to make the changes that lead to better patient outcomes (health), better system performance (care) and better professional development (learning).' In contrast Cepero (2011) has defined QI more concisely as 'a cyclical process designed to evaluate workflow and clinical indicators or outcomes.' These definitions sit at opposite sides of the spectrum with Batalden and Davidoff (2007) capturing a holistic vision of QI on one side and Cepero's (2011) simplified, individual and practical view of QI on the other. For this thesis, a middle ground has been chosen, and so QI is considered an umbrella term that encompasses multiple systematic change methods to support improvement or better outcomes for patients and healthcare services (Health Foundation 2021; Langley et al. 2009).

The key policy and professional drivers mentioned above had encouraged academics at the University of Stirling to develop QI content for their pre-registration nursing curriculum (Rooney and Beattie 2012; James et al. 2012). Within this context I developed my own QI proficiencies by undertaking the Institute for Healthcare Improvement's (IHI) e-learning modules and attended many QI lectures during my nursing degree. In 2013, an opportunity to participate in a trial teaching intervention called the 'QI Practicum' was offered to student nurses. This learning experience involved applying QI knowledge within student nurses' practice placements through undertaking a small-scale improvement project. Participation as a student nurse was timely for me and influenced by an awareness of a renowned patient safety scandal in the UK at that time.

Box 1.1. NMC Standards of Proficiency (2018) Platform 6

NMC Standards of proficiency – Platform 6 (NMC 2018)
Improving safety and quality of care 6.1 understand and apply the principles of health and safety legislation and regulations and maintain safe work and care environments. 6.2 understand the relationship between safe staffing levels, appropriate skills mix, safety, and quality of care, recognising risks to public protection and quality of care, escalating concerns appropriately. 6.3 comply with local and national frameworks, legislation, and regulations for assessing, managing, and reporting risks, ensuring the appropriate action is taken. 6.4 demonstrate an understanding of the principles of improvement methodologies, participate in all stages of audit activity and identify appropriate quality improvement strategies. 6.5 demonstrate the ability to accurately undertake risk assessments in a range of care settings, using a range of contemporary assessment and improvement tools. 6.6 identify the need to make improvements and proactively respond to potential hazards that may affect the safety of people. 6.7 understand how the quality and effectiveness of nursing care can be evaluated in practice and demonstrate how to use service delivery evaluation and audit findings to bring about continuous improvement. 6.8 demonstrate an understanding of how to identify, report and critically reflect on near misses, critical incidents, major incidents, and serious adverse events in order to learn from them and influence their future practice. 6.9 work with people, their families, carers, and colleagues to develop effective improvement strategies for quality and safety, sharing feedback and learning from positive outcomes and experiences, mistakes and adverse outcomes and experiences. 6.10 apply an understanding of the differences between risk aversion and risk management and how to avoid compromising quality of care and health outcomes. 6.11 acknowledge the need to accept and manage uncertainty and demonstrate an understanding of strategies that develop resilience in self and others. 6.12 understand the role of registered nurses and other health and care professionals at different levels of experience and seniority when managing and prioritising actions and care in the event of a major incident.

Patient safety underpinned my student practice during my nursing degree and was about reducing the risk of unnecessary patient harm to an acceptable minimum, to which one in ten people accessing hospital or primary care services are known to be exposed (Panagioti et al. 2019). The magnitude of this issue was illustrated by a patient safety scandal revealed in the 'Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry' (Francis 2013). This investigation found that patients and families failed to receive the basic standards of care which led to avoidable fatalities caused by workforce pressures such as poor teamwork, organisational culture, under staffing, inability to raise concerns, leadership and a lack of training. Knowledge of these failures motivated me to become involved with improving patient care and healthcare services. Therefore, taking part in the QI Practicum enabled me, as a student, to identify an area of basic care to improve. The project I chose aimed to improve patient satisfaction and reduce inadvertent peri-operative hypothermia in pre-operative patients by providing a thermal blanket on admission. Unbeknownst at the time, many of the workforce pressures highlighted by the Francis Report (2013) such as lack of training and supportive leadership (in QI) influenced my own QI experience which went on to inspire this study.

There had been different QI models identified in healthcare around this time by a systematic review which included total quality management or continuous quality improvement, business process reengineering, lean thinking, six sigma and the IHI's rapid cycle change; also known as PDSA cycles (Powell et al. 2009) (see Table 1.1). My own student training involved the latter model more commonly known as the Model for Improvement (MFI) which was the original framework developed by statisticians Langley and colleagues in 'The Improvement Guide' (Langley et al. 2009) and this is the term chosen throughout this thesis. While no QI model has been proven to be more efficacious than the other, improvement models tend to employ the same tools to achieve similar objectives such as cause-and-effect diagrams (also known as Ishikawa diagrams), driver diagrams and run charts (Health Foundation 2021; Ishikawa 1985). However, they differ in the pace at which they are completed, the organisational levels at which they target (micro, meso or macro) and their overall primary focus such as reducing waste or reducing harm (Powell et al. 2009). The MFI was a suitable model for student nurses to learn because it enables those at the frontline to initiate change, determine problems and test low-risk solutions that are context specific (Langley et al. 2009). Academics believed a strength of this model was that it required little time and financial resources for student nurses to apply their QI knowledge in the practice setting (James et al. 2012).

Table 1.1 Comparison of Quality Improvement Models

QI Model	Description	Key Principles
Plan-Do-Study-Act	A cyclical method for testing changes on a small-scale before implementing across the broader healthcare system.	Iterative approach using data-driven decisions and small-scale changes which are adaptable to context.
Lean Thinking	A waste reducing method for improving efficiency in healthcare processes such as lower costs and hospital length of stay.	Value-stream mapping or patient journey mapping, eliminating waste, continuous improvement.
Six Sigma	A data-driven methodology aimed at reducing variation and defects in organisational processes.	Define, Measure, Analyse, Improve, Control (DMAIC), focus on measurable outcomes.
Total Quality Management (TQM)	A customer-focused methodology aiming for long-term success through customer satisfaction and total employee commitment.	Organisation wide commitment, data-driven, teamwork, customer focus, integration of systems.
Model for Improvement	A combined model using PDSA and three questions: What are we trying to accomplish? How will we know a change is an improvement? What changes can we make?	Setting clear goals, identifying the problem, measuring outcomes, iterative testing, learn and improve.
Business Process Re-engineering	A workflow model which analyses internal and external processes influencing organisations to generate radical redesign.	Mapping processes, measures outcomes instead of processes, data collection at minimal points, centralising resources.

(NHS 2007; Reed et al. 2016; Musa and Othman 2016; Langley et al. 2009; Powell et al. 2009; Russ et al. 2023)

My experience of conducting a QI project using experiential learning was novel in the UK and considered to be an innovative approach to teaching QI at the University of Stirling. The educational theory of QI learning was considered compatible with philosophical assumptions of constructivism; the belief being that the engagement of students in active as opposed to passive learning would allow knowledge to be translated more effectively from theory to practice (Thomas 2007). This theory was reinforced by the Health Foundation in their evidence scan: 'Quality improvement training for healthcare professionals' (Health Foundation 2012). This review found little empirical research about training students in QI but did report that students gained most QI knowledge from being in actual practice. The review also highlighted that UK curriculums had been less explicit in their QI content, compared to Europe and the USA, and were not teaching a whole systems approach to improving patient and healthcare services.

My own lived experience of undertaking the QI Practicum presented several challenges in practice such as a lack of trained staff in QI to support the project and a lack of autonomy as a student nurse to enable change. However, other student nurses participating in the trial had contrasting experiences which reflected a supportive QI culture and clear guidance from leadership. This stark comparison of QI learning experiences across practice areas is what sparked my curiosity and influenced the aim of the thesis which was to determine what factors influenced students' capacity and capabilities to contribute to the future improvement and nursing agenda.

A key paper published in the Milbank Quarterly by Kaplan et al. (2010 p. 502) had identified that many 'contextual factors' were associated with undertaking QI. This systematic review defined contextual factors as 'anything not directly part of the technical QI process such as the QI methods themselves and the clinical intervention'. The contextual factors identified that led to the success of QI (or not) included the environment, the culture, support and capacity, leadership, motivation, teamwork, expertise and resources. Some of these factors such as the lack of support had been pre-empted by nurse academics who were developing QI education in the UK at the time. They concluded that it was impractical to teach QI to large cohorts of student nurses through QI projects due to the lack of resources in practice and therefore deemed it appropriate to keep QI education in the classroom (Jones et. al 2013).

However, despite these challenges the QI Practicum was deemed feasible at the University of Stirling and became a permanent assignment for student nurses in March 2014 (James et al. 2016). At this point I had commenced a five-year clinical academic fellowship in healthcare improvement within the health sciences faculty. As a newly qualified nurse the aim of this role was to develop subject knowledge and teaching expertise in QI, to support nurses' developing QI knowledge in the partnering healthcare organisation and to undertake a doctoral level study. This new role provided a timely opportunity to investigate student nurses' learning experiences of undertaking QI projects. The study in this thesis remains the first of its kind to focus its enquiry from within the practice setting and contributes significant insights for the academic and practice communities who continue to develop and evaluate QI nurse education. The first steps in the fellowship which are discussed next were to explore the importance of healthcare improvement in nursing and to identify what associated problems and research gaps existed.

1.2 NURSING AND HEALTHCARE IMPROVEMENT

Nurses represent one of the largest occupations in healthcare and account for 60% of health professionals worldwide and 43% of the healthcare workforce in Scotland (WHO 2020; Scottish Government 2017). As frontline practitioners, registered nurses are considered well placed to identify areas to improve and optimise the quality of care as they make up most of the contact between patients, families, carers and the multi-disciplinary team. The improvement to patient outcomes by nurses has been documented from as early as 1859 during the Crimean war during which Florence Nightingale, a nurse, cared for the British soldiers. During her practice a correlation was identified between a lack of clean air, poor hygiene, overcrowded beds and military casualties. By introducing handwashing practices, proper equipment sterilisation and renewing bed linen saw the mortality rates dropped from 42% to 2% (Schmalbach 2015).

These nursing practices continue to reduce hospital-acquired infections today among other evidence-based patient interventions such as ward safety briefings, accurate medicine administration, falls and pressure injury prevention and leadership walk rounds (Vincent and Amalberti 2016; Healthcare Improvement Scotland 2024). However, the demands of the global healthcare landscape have become more complex and multi-faceted which means there has never been a more pressing era than now for students and registered nurses to learn how to initiate and lead improvements. The role of the nurse over the past two decades has undergone transformation to support complex healthcare provision. As well as facing an aging patient demographic who are managing long-term chronic co-morbidities, registered nurses are expected to deliver care within unified systems supported by evolving digital technologies and artificial intelligence (NHS 2021). In the next decade, episodes of patient care are predicted to be managed exclusively by registered nurses whose oversight is expected to lead multi-agency teams within and across health, social and voluntary care sectors (Scottish Government 2017). Further, they play a vital role in answering the global call from the United Nations to improve good health and well-being and to deliver quality education as set out in the 2030 Agenda for Sustainable Development (Dossey et al. 2019). These rapid changes in healthcare have increased the responsibilities of registered nurses on the frontline and there is greater emphasis on the profession to innovate and work efficiently to improve patient outcomes and healthcare systems whilst reducing expenditure that is due to rise between three and four per cent in the next five years (Scottish Government 2017).

Despite the importance of a skilled nursing workforce who can lead healthcare improvement initiatives, many reasons exist as to why engagement with QI methodology in practice is problematic. At the start of this research, it was understood that as many as 46% of newly qualified nurses in the USA had never participated in any type of QI activity (Kovner et al. 2010). That is not to say that they did not better patient outcomes, as they are reported to have completed this through clinical audit, research, evidence-based practice, service evaluation and innovation (Borbasi et al. 2010; Hughes 2006; Williams 2001; LaSala et al. 2007). However, the term 'QI' was popularised by the Institute of Medicine's (IOM) 'Crossing the Quality Chasm', a white paper that outlined a strategy to reduce the healthcare quality gap in the USA (IOM 2001). This report followed an earlier paper 'To Err is Human' which exposed high levels of unsafe patient care arising from medical errors in the USA which led to patient harm (IOM 2000). The notion of 'harm' has evolved over the years, but it can emerge from within complex health systems known as a near miss, adverse event, patient safety incident or critical incident. These harms occur because of mistakes such as patient misidentification, wrong site surgery and/or failure to accurately diagnose. In the UK alone, such incidents lead to stifling budgets for negligence claims totalling £400 million a year (Vincent and Amalberti 2016).

However, the lack of nurse QI engagement in practice is ongoing and continues to present challenges. The rise in recent research in this area highlights that many barriers exist that face registered nurses today (Djukic et al. 2015; Robinson and Gelling 2019; Elizalde et al. 2024; Blok et al. 2022; Alexander et al. 2022a; Alexander et al. 2022b) (see Box 1.2). Despite the well documented benefits of QI which include improvements to patient outcomes, enhanced efficiency in processes and nurses' professional development, Blok et al. (2022) established that over 3,000 nurses identified time constraints (54.8%) and a high workload (53.1%) as primary obstacles to QI engagement. These findings are mirrored in earlier studies which suggest that without having protected time, QI is likely to remain an additional task, rather than to be an integrated component of nursing practice (Djukic et al. 2025). Another key barrier is the absence of a supportive organisational culture in which nurses report feeling discouraged by the hierarchical structures and lack of psychological safety that inhibit them initiating or participating in QI efforts (Alexander et al. 2022). And further, access to data and QI expertise remains a significant challenge meaning that nurses lack the skills to interpret and action data in a timely manner to measure outcomes and evaluate interventions (Blok et al. 2022). This suggests that there is a gap in role modelling and capacity building that could otherwise empower nurses to initiate and lead change initiatives.

Box 1.2 Barriers to Nurses' Engagement with QI

Barriers to nurses' engagement with QI	
○ Lack of time or too busy ○ Heavy workload ○ Lack of adequate resources ○ Lack of enthusiasm ○ Lack of education/training ○ Difficulty accessing data ○ Lack of institutional focus on QI ○ Siloed departments ○ Competing workloads	○ Lack of leadership support ○ Lack of organisational culture ○ Insufficient data expertise ○ Lack of nurses ○ Lack of QI expertise ○ Lack of financial support ○ Absence of a just culture ○ Resistance to change ○ Lack of accountability

These barriers are also compounded by the external pressures that face the nursing profession today such as an ageing workforce who are predicted to retire and leave a deficit of 4.7 million nurses by 2030 (Health Foundation 2017; WHO 2020). The impact of this workforce crisis means that insufficient staffing levels are likely to continue to cause registered nurses to be overburdened by demanding workloads which will reduce their capacity to participate or lead QI initiatives. Moreover, the aftermath of the Covid-19 pandemic has exacerbated these challenges as the psychological impact on the nursing workforce has increased rates of burnout, apathy and incidences of poor mental health which is known to worsen patient safety (Jun et al. 2021; Couper et al. 2022). Consequently, over one third of registered nurses in the UK are reported to be thinking of leaving the nursing profession in the next five years (NMC 2024).

Contrastingly, the Covid-19 pandemic has primed other opportunities to improve the rapidly changing healthcare system. A plethora of studies describing QI activity during the pandemic were published and demonstrate the value of QI's continued use, for example, see Foster and Stack (2020), Zarasvand et al. (2020), Sorensen et al. (2021) and Pesch et al. (2022). There are even attempts to reduce nurses' burnout levels and improve mental health using QI methodology by Money (2023), Walker et al. (2024) and Pagador et al. (2022). Ironically, there is evidence to show that where registered nurses participate in QI activity, they experience a reduction in burnout (Walker et al. 2024). Given the critical need to retain and replenish the nursing workforce and develop resilient staff who can lead QI initiatives, it is essential that student nurses enter the profession with adequate knowledge and skills in QI.

With that being said, the worth of QI in healthcare in general is also important to consider. Despite widespread advocacy, Dixon-Woods and Martin (2016) offer a critical perspective on the limitations of QI in healthcare. Their article challenges the assumption that QI in healthcare is inherently effective and highlights that inconsistency on outcomes as well as negative impacts on staff satisfaction and financial costs are reported. They emphasise that intended outcomes are frequently not delivered in instances where QI tools are adopted without understanding their underlying mechanisms. This point is supported by Reed and Card (2016) who examined a widely used QI tool, the PDSA cycle, in their systematic review. They found that oversimplification of the PDSA cycle leads to teams jumping too quickly from 'plan' to 'do' without investigation or adequate engagement with stakeholders, which leads to failed projects and wasted efforts. They caution that organisations struggle to adapt to complexity, context and the influence of theory in QI, instead opting for a 'one-size-fits-all' approach which pays little attention to organisational culture (Reed and Card 2016). An overreliance on these 'magic bullet' interventions, such as checklists and huddles, as universally effective solutions are reported to foster a culture of 'projectness' rather than continuous improvement (Dixon-Wood and Martin 2016). And lastly valuable insights from both successful and failed QI efforts are frequently limited due to poor reporting, lack of evaluation and inadequate dissemination of lessons learned (Wells et al. 2018).

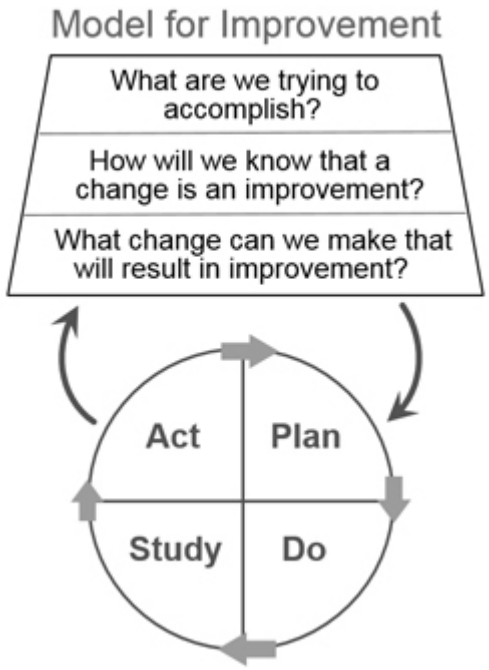
Before exploring the importance and value of teaching QI to student nurses, an overview of the QI methodology which they learned before undertaking the QI Practicum is highlighted alongside some key principles which underpin the study.

1.3 QUALITY IMPROVEMENT METHODOLOGY

QI methodology in healthcare sets out to improve one of six quality domains set out by the Institute of Medicine which include equity, timeliness, efficacy, safety, effectiveness and person-centredness (IOM 2001). As previously mentioned, the student nurses in this study used the MFI framework to guide their QI projects (see Figure 1.1). This framework originally drew upon the work of Edward Deming, an American statistician and lecturer who developed the Theory of Profound Knowledge. His theory combined an appreciation of the system, an understanding of variation, knowledge of psychology and the theory of knowledge (Deming 1986). In the 1950's, Deming taught his theory to Japan's business and industry leaders which was known to have revolutionised the industrial sector, giving rise to Japan's economic growth and global power. In 1980, interests were sparked in the U.S.A following a documentary '*If Japan Can, Why Can't we?'* and companies like Ford

Automobiles sought Deming's expertise which later led them to rank second worldwide (Deming 1986). In tandem, Deming championed the work of his colleague Walter Shewhart who developed the PDCA (plan-do-check-act) cycle. Originally coined The Shewhart Cycle, it was later changed to PDSA (plan-do-study-act) to exchange the notion of blameful scrutiny within *'check',* to a more reflective learning approach within *'study'* (Neuhauser 2006). PDSA cycles can offer a systematic process to facilitate iterative problem-solving, data collection and reflective analysis (Taylor et al. 2014). When combined with Deming's Theory of Profound Knowledge it offers a successful formula generated through the MFI to make improvements (Best and Neuhauser 2006; Provost and Murray 2022).

Figure 1.1 The Model for Improvement



(Langley et al. 2009 p:24)

The MFI consists of two parts; a thinking part which answers three fundamental questions that drives all improvements and a doing part which enacts several iterations of PDSA cycles that include collecting data for a range of measures (Langley et al. 2009). The model enables learners to develop the QI technical skills such as using QI tools to identify problems, explore solutions and test, evaluate and act upon ideas (Langley et al. 2009; Ishikawa 1985; Health Foundation 2014; Provost and Murray 2022) (see Box 1.3).

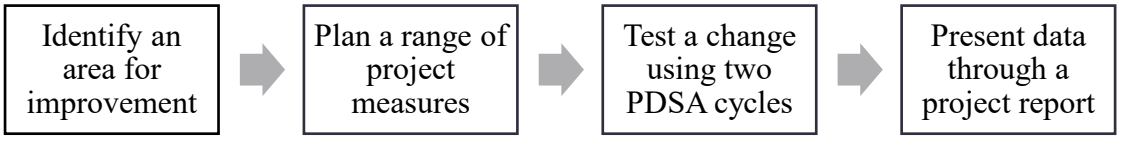
Box 1.3. QI Tools used in the Model for Improvement

QI tools used in the Model for Improvement	
○ Plan-do-study-act ○ Flowchart ○ Ishikawa diagram (cause/effect) ○ Pareto chart ○ Process mapping ○ Driver diagram ○ Five whys? ○ Root cause analysis ○ Run chart	○ Shewhart chart ○ Scatter plot ○ Gantt chart ○ Inter-relationship diagram ○ Operational definition ○ Linkage of processes ○ Radar chart ○ Frequency plot ○ Histogram

Alternative approaches to improvement or change have also been used by healthcare practitioners and include participatory action research which seeks to improve professional practice (Cornish et al. 2023). This approach shares similar processes to QI such as cyclical data collection, reflection and action at its core. This methodology focuses on generating solutions to practical problems within organisations or social groups who fundamentally become active participants in the research (Cohen et al. 2018). However, it has been argued that participatory action research might be less adaptable to changes in the environment making it less susceptible to sustainability. Thus, PDSA cycles have been suggested as an alternative approach to respond to system changes and solutions and is appropriate for students who are visiting practice areas for shorter periods of time (Eather et al. 2013).

In this study, student nurses used the MFI to guide the steps in their QI Practicum assessment outlined in Diagram 1.1. These steps were influenced by the Institute for Healthcare Improvement's Open School e-learning 'Quality Improvement Practicum' module which guides learners to undertake a small-scale QI project (IHI 2010). This format was adopted and adapted by the University of Stirling to suit the faculty's educational context. Student nurses who passed their assessment received an IHI QI Practicum Certificate.

Diagram 1.1 Process for the QI Practicum Assessment



To expand on QI methodology, it sits within the scope of improvement science which many have attempted to define in the research literature. A review undertaken by the Health Foundation analysed 17 studies that explored various definitions, terminologies and concepts associated with improvement science (Health Foundation 2011). No unified definition was identified but the review recognised that the ethos was to explore *'what works?'.* Marshall et al. (2013) claim that no singular operational definition of improvement science exists but do highlight some distinguishable features: 1) the scientific knowledge and theories underpinning the science are adopted from industries like aviation and manufacturing; 2) rigorous and credible assessment methods are adopted to produce high quality data and 3) the objective is to engage in real-time practical learning and application for local settings. Moreover, Hanchett (2012) characterises improvement science as the use of outcome measures (what is the system aiming to achieve), process measures (the actions or processes adopted to achieve the aim) and balancing measures (the unintended consequences emerging elsewhere in the system). These measures are used to improve efficiency, performance and effectiveness (or other quality indicators) through reliable data management and accurate reporting (Langley et al. 2009). Improvement science has been used interchangeably with the science of improvement, measurement for improvement, quality improvement methods, quality improvement science and the science of quality improvement (Health Foundation 2011; Hanchett 2012). It is also used interchangeably with the term implementation science where its meaning has different connotations.

Implementation science is known as translational research, translational science, evidence-based practice, knowledge translation and knowledge utilisation (Health Foundation 2011; Hanchett 2012; Sobo et al. 2008). Many authors discuss that there are shared concepts and overlap between implementation and improvement science which mostly relate to the contextual factors which influence the transition of evidence-based science into practice (Hanchett 2012; Peters et al. 2013; Sobo et al. 2008; Ogden and Fixsen 2014; Alexander and Hearld 2011). While improvement science draws upon disciplines such as aviation, engineering, management and manufacturing (Health Foundation 2011; Deming 1986; Flin and Yule 2004), implementation science draws upon disciplines such as behaviour change, psychology, sociology and education (Peters et al. 2013). Improvement science has traditionally paid closer attention to the measurable outcomes, defined processes and the linear and cyclical nature of collecting data for improvement (Marshall et al. 2013; Hanchett 2012), while implementation science generally focuses on researching the socio-cultural, organisational and individual aspects that prevent uptake of published evidence in practice

(Sobo et al. 2008). There is now a drive to understand how implementation science can influence improvement science activity and vice versa (Nilsen et al. 2022).

The study is firmly situated at the intersection of two core disciplinary domains: healthcare improvement science and nursing education. Student nurses were aligned to healthcare improvement science by using QI methodology to conduct their QI projects, yet the research focus is on the behavioural, social and organisational elements that influenced the student nurses' QI educational learning experiences and engagement in their learning environment. Two key concepts central to healthcare improvement and nursing education is that of context and complex systems which is important to understand.

Context

Context plays a critical role in healthcare improvement and determines whether a QI project or evidence-based initiative is tailored or adopted by practice or policymakers (Fulop and Robert 2015). The earlier work of McCormack and colleagues refer to context as 'the setting in which practice takes place' and is the meaning used to describe context in which student nurses enacted their QI projects in this study (McCormack 2002). Ignoring context is the antithesis of healthcare improvement principles because it is a pre-requisite for understanding why success ensues in one setting and not in another (Kaplan et al. 2010; Bate 2014; Fulop and Robert 2015). The context debate has evolved with many perspectives being developed to better understand the influence of different contexts on healthcare improvement outcomes (Coles et al. 2020). Context is related to the conditions which help or hinder improvement or educational initiatives, but researchers assert that it goes beyond simply identifying the barriers and facilitators of this (Ovretveit 2011). Dixon-Woods (2014) argues that explicit description of the conditions that lead to the success or failure of an improvement initiative should be at the centre of healthcare improvement but often omitted.

Several context frameworks or perspectives are discussed within the QI research literature. The Model for Understanding Success in Quality Improvement (MUSIQ) emphasises the conditions to be taken account of during improvement or educational initiatives. These relate to the micro-system such as the QI team, QI support and capacity, the organisation and the external environment (Kaplan et al. 2012). Other perspectives do instead consider context as the outer components (political, social and cultural) and the inner components (organisational structure, size and performance) (Bate 2014). Recently, Greenhalgh and Manzano (2021) identified context as the tangible, fixed, observable features that trigger

mechanisms or the relational and dynamic features that shape the mechanisms through which the intervention works. Similar findings identified across different context frameworks include leadership, organisational culture, individual capabilities, data, technical infrastructure, readiness for change, championship and relationships (Coles et al. 2020). To emphasise the importance of context in healthcare improvement, it is vital to highlight the role of complexity.

Complexity

Complex systems or complex adaptive systems provide a critical lens through which to understand how different healthcare improvement and educational outcomes are achieved (Campbell et al. 2007; Braithwaite et al. 2018; Long et al. 2018). The notion of complexity views healthcare systems as dynamic in which individual parts of the system interconnect in unpredictable and non-linear ways (Health Foundation 2010; Kannampallil et al. 2011; Greenhalgh and Papoutsi 2018). These relationships and interactions influence how the system functions and how individuals behave within them, making it difficult to replicate QI outcomes across different settings to spread improvements (Plesk and Greenhalgh 2001; Burton et al. 2018). This means that although MFI offers a systematic approach to small-scale change using qualitative and quantitative measures, learning from QI cannot be separated from its unique context which is made up of interconnected and complex parts. Thus, measuring healthcare improvement outcomes and/or educational programmes such as the QI Practicum requires a more holistic and flexible approach because determining relationships between cause and effect is difficult (Geary 2024; Dixon-woods 2004).

To produce novel insights into the real-world QI educational learning experiences of student nurses, it was important to capture the different contexts where QI projects were undertaken. Applying a complex systems mindset to the research enquiry was also essential to ensure the whole perspective of QI education as a phenomenon could be represented through a lens that was greater than the sum of its parts (Greenhalgh and Papoutsi 2018; Health Foundation 2010). In Chapter 2 there is an integrative review of the QI education literature in pre-registration health professions' education, but for now the research gaps that were identified in this context are discussed next.

1.4 STUDENT NURSE EDUCATION IN QUALITY IMPRPOVEMENT

To re-iterate, this study contributes to healthcare improvement science and nurse education by investigating how education interventions (nurse education) influences real-world improvement behaviours (healthcare improvement). Student nurses must demonstrate QI proficiencies before they enter the profession (NMC 2019). Thus, developing and evaluating QI education in pre-registration nursing for faculties has become an international pursuit (Armstrong et al. 2023). To equip student nurses with the skills and knowledge to evaluate and improve patient outcomes and care processes, a significant change to the pre-registration nursing curricula was endorsed at the start of the millennium by the 'Health Professions Education: A Bridge to Quality' report in the U.S.A (IOM 2003). There was evidence of the importance of integrating QI into nursing curricula earlier than this (Buerhaus and Norman 2001), however the plethora of published papers in the U.S.A emerged following the inclusion of QI as a core competency by the committee for Quality and Safety Education for Nurses (QSEN) (Cronenwett et al. 2007). Thereafter, the quest to develop effective theoretical and practical QI education became necessary for nursing faculties across the globe (Day and Smith 2007; Thornlow and McGuinn 2010; Fater and Ready 2011; O'Dell 2011; McKown et al. 2011; Didion et al. 2012; Flores et al. 2013; Disch et al. 2013; Koffell et al. 2017; Kirkby and Good 2020).

Internationally, a similar focus was mirrored by nursing academics who then and now continue to publish key papers on QI education in pre-registration nursing in Norway, Canada, New Zealand and Australia (Kyrkjebo et al. 2001; Kyrkjebo and Hage 2005; Kyrkjebo 2006; Flynn et al. 2017; Robb et al. 2016; Strand and Tveit 2020; Honeyfield et al. 2022; Mak et al. 2023; Mak et al. 2025). In the UK, emphasis on developing and evaluating QI curricula interventions has remained central to progressing nurse education, research and practice (Christiansen et al. 2010; Jones et al. 2013; Baillie et al. 2014; Machin and Jones 2014; Smith et. al 2014; Armstrong et al. 2017; James et al. 2016; Craig and Machin 2020; Armstrong et al. 2023). These studies are similar in that the majority recognise the importance of academic-practice partnerships to offer experiential learning activities to student nurses learning about QI within the context of an everyday real-world setting.

Experiential learning is an educational theory associated with David Kolb, and it focusses on an individuals' ability to improve their skills, knowledge and attitudes by learning from direct experience and reflection (Kolb 2015). This approach has been described in QI nursing education studies over the past 25 years (Kyrkjebo et al. 2001; Day and Smith 2007;

Christiansen et al. 2010; Fater and Ready 2011; McKown 2011; Baillie et al. 2014; Machin and Jones 2014; James et al. 2016; Craig and Machin 2020; Kirkby and Good 2020; Strand and Tveit 2020; Honeyfield et al. 2022; Mak et al. 2025). However, possessing the knowledge and skills in QI does not automatically transfer into behaviour change in QI which is essential for student nurses' if they are to initiate and lead on QI once qualified (Lucas and Nacer 2015). Bandura's Social Learning theory can help us to understand behaviour change in practice. The theory asserts that learning occurs in the social setting through continuous interactions with others through the process of observation called 'modelling' (Bandura 1977). Learning therefore occurs due to observing an individuals' or groups' good or bad behaviour. Developing positive QI behaviours needs time for student nurses to be exposed to the practice setting and can be indicative of how students engage with QI as registered nurses (Lucas and Nacer 2015). Therefore, understanding how student nurses behave during their QI projects will be essential to ensure that they can be nurtured or challenged for the future.

There is a lack of research that has explored student nurses' QI behaviours during their QI projects and whether these behaviours influence long-term engagement. Craig and Machin (2020) interviewed 25 third-year student nurses after completing a six-week theory module and having some participation in service improvement in practice. Seven positive adaptive QI behaviours were self-reported by students which included: valuing positive role models, developing reflective practice, becoming a lifelong learner, growing in self-confidence, playing the game to fit in, adapting to role transition and seeking ward manager feedback and support (Craig and Machin 2020). This research does not explore QI behaviours within the context of different practice settings, and so further research is needed to determine how various contextual factors across settings influence QI related behaviours.

The lack of research that effectively evaluates QI behaviours is recognised across all health professions in QI education studies. Several reviews that examine QI education in healthcare have been undertaken over the years in the medical profession, middle management or post-registration populations (Health Foundation 2012; Abbas et al. 2011; Nadeem et al. 2013; Schouten et al. 2008; Benn et al. 2009; Ahmed et al. 2013; Boonyasai et al. 2007; Okuyama et al. 2011; Gordon et al. 2012; Wong et al. 2010; Jones et al. 2015). Most of these reviews use one of the most well-known and widely used evaluation models for QI education called the Kirkpatrick Education Evaluation Model (Kirkpatrick 1967) (see Table 1.2). This model was introduced in the 1960's by Donald Kirkpatrick and has been adopted by many

organisations inside and outside of healthcare. It is used due to its conceptual simplicity and comprises four levels: reaction, learning, behaviour and impact or organisational performance. Although levels are positioned hierarchically, it is argued that one level does not assert a greater level of value than another and despite popular belief there is no causal link for one level to influence upon another (Reio et al. 2017).

Table 1.2 Kirkpatrick Education Evaluation Model (1967)

Level of Outcome	Type of Outcome	Description
One	Learner Reaction	Did the learners enjoy the training or education?
Two	Acquisition of Learning	Did knowledge transfer occur because of training or education?
Three	Behavioural Change	Did the learners' behaviours change because of training or education?
Four	Change to Practice	Did the training or education have a measurable impact on performance?

Across the reviews, a consistent finding to emerge has been that while QI education can determine improvements in QI knowledge, skills or attitudes (Boonyasai et al. 2007; Wong et al. 2010; Jones et al. 2015) and/or patient outcomes (Jones et al. 2015), there is inadequate evidence relating to a change in QI behaviours. These reviews allude to the methodological limitations that exist when evaluating QI education and report that most studies adopt quantitative pre/post survey designs that are not suited to capturing the complexity of the contexts in which QI activities and behaviours occur (Morrison and van der Werf 2016).

Until now no studies have explored student nurses' QI learning experiences within the natural contexts in which they undertake a QI project. As a result, it is difficult to ascertain how different practice settings influence student nurses' QI behaviours and/or their QI engagement once they become registered nurses. Indeed, QI projects offer both pedagogical and practical value, particularly where they are grounded in experiential learning to provide authentic opportunities for student nurses to engage with real world healthcare challenges (Armstrong et al. 2017). The approach is also positively received by students which suggests that QI projects can act as a necessary vehicle for embedding theory into practice. However, implementation and evaluation of QI projects continue to be limited which raises concerns about the long-term impact of QI projects in education on clinical practice and patient care. Taking account of the barriers students encounter such as lack of time, mentorship and

unclear expectations, students' success is contingent on the context in which QI is undertaken and is influenced by the readiness of the clinical area and their receptiveness to students' QI projects (Armstrong et al. 2017). In balance, as the next chapter will detail, QI projects are arguably worth being embedded into QI educational nursing programmes and they align to professional standards, however, their practical worth depends on thoughtful integration into curricula for which more research is needed.

1.5 ADDRESSING THE QUALITY IMPROVEMENT EDUCATION GAP

This study addresses this research gap by actively going into the different practice settings where student nurses undertake QI projects to observe their QI behaviours and to determine what factors influence their QI learning experiences. By investigating these experiences, a new perspective is developed into how student nurses engage with their QI projects during their degree and later as registered nurses.

The thesis addresses the gap through its positioning between healthcare improvement science and nursing education and draws upon literature from both field to explore how student nurses' engagement with QI in practice. The study is informed by the Model for Improvement (Langley et al. 2009), the contextual frameworks of Kaplan et al. (2010) and complex systems thinking (Greenhalgh and Papoutsi 2018) to understand how QI behaviours are shaped by dynamic and real word-settings. And, from the nurse education perspective, the work is grounded in experiential learning theory (Kolb 2015) and Bandura's social learning theory (1977) which both support the pedagogical rationale for embedding QI projects into clinical practice. The study is further situated within the regulatory educational framework of the NMC (2018) which stipulates that student must demonstrate QI competencies prior to registration. Together these disciplinary perspectives facilitates a deeper understanding of how QI educational interventions influence nurses' capacity to lead and sustain improvements in complex healthcare settings.

1.6 OUTLINE OF THE THESIS

Chapter 2: presents an integrative review of the types of approaches faculty adopt to teach QI to pre-registration healthcare students. The approaches are evaluated with the Kirkpatrick Education Evaluation Model (1967). The barriers and facilitators associated with teaching QI with gaps in knowledge are highlighted.

Chapter 3: outlines the aims of the study and it also clarifies my own philosophical position. An explanation of why ethnographic methodology was chosen is provided and the research methods used to conduct the study are discussed. A synopsis for the layout of the findings across Phase One and Two is provided.

Chapter 4: presents the first part of the research findings from Phase One. It presents four within-case analyses of the student nurses' QI learning experiences across the trajectory of their 8-week practice placement and captures the unique environments in which they were situated at the time of the research study.

Chapter 5: presents the second part of the research findings from Phase One. It presents a cross-case analysis of the contextual factors that emerged from the individual within-case analyses and reveals a third level of analysis that explains how contextual factors influenced student nurses' level of engagement with their QI projects.

Chapter 6: presents the research findings from Phase Two. It highlights the qualitative interviews with participants as registered nurses to determine whether they sustained their QI engagement in practice and what contextual factors influenced them.

Chapter 7: presents a discussion of the contextual factors that influenced student nurses' QI learning experiences in tandem with the wider literature and the (QiNEP) Model is presented to explain how the inter-related nature of contextual factors influenced students' level of QI engagement. The findings of registered nurses' engagement with QI are discussed.

Chapter 8: concludes the thesis by stating the unique contribution of the study to nurse education and practice. It discusses the strengths and limitations of the study and highlights the impact of the thesis. I reflect on the research journey and on the findings from the study.

1.7 SUMMARY

This chapter introduced the study and stated the research questions. It provided a background to my motivation to explore QI in pre-registration nurse education, and it set the context for the study within the current nursing professional landscape. The QI model that student nurses enacted in this study was explained and the underpinning ideas that influenced the study's approaches were highlighted: these were 1) context and 2) complexity. A brief account of QI nursing education was provided to highlight the research gap relating to the importance of

determining student nurses' QI behaviours in the settings in which their QI projects occur. Penultimately, the chapter stated how this study will address the research gap, and a chapter synopsis of the thesis was provided.

2.0 INTRODUCTION

This chapter presents an integrative review of the literature that was undertaken to refine the research questions answered within this thesis. The rationale for undertaking the integrative review is provided and the aims and objectives are stated. Justification for the review design and the approaches taken to conduct the review is discussed. The findings and a narrative synthesis are situated within the wider literature. An update of published evidence since undertaking the review is considered and the gaps and emerging research questions are clarified.

2.1 PROTOCOL AND PUBLICATIONS

The integrative review was published in the International Journal of Nursing Studies on 22nd May 2017 (see Appendix 1). Moher et al. (2015) recommend developing a study protocol before undertaking a review and so a study protocol was developed in 2014 and registered with Prospero (CRD42014013847). The purpose of a protocol is to facilitate a review and to explain the study's hypothesis, aims, methods and rationale for the approaches intended to be employed (Moher et al. 2015). This process was useful because it offered a structured framework from which to work, track and appraise each stage of the review and it stimulated a dialogue between me and the supervisory team. Searching Prospero was advantageous as it helped to identify if similar research was being undertaken, and in this respect, mitigate timewasting and duplication of effort (EPPI 2005). The protocol was published in the Systematic Reviews Journal on 14th January 2015 (see Appendix 2).

2.2 RATIONALE, AIMS AND OBJECTIVES

At the start of the research process, the Nursing and Midwifery Council (NMC) stated in their professional standards that student nurses were to 'act as change agents and provide leadership through quality improvement (QI) and service development to enhance people's wellbeing and experiences of healthcare' (NMC 2014). The QI Practicum was an innovative approach to teaching QI to enable student nurses to achieve these competencies. Therefore, determining how QI was taught to pre-registration students internationally was important to identify best practice and inform future iterations of the QI Practicum. Until the review, best practice was unknown with only opinion articles available to advocate for QI in pre-registration health professions education (Rooney and Beattie 2012; Jones et al. 2013). This

first step in the process intended to provide timely evidence to the University of Stirling to inform QI teaching in the BSc Nursing Programme. Further, this process enabled the gaps in the literature to be identified to narrow the focus of the thesis and its research questions. Since trial searches revealed only a small body of literature relevant solely to QI education in nursing, the search was broadened to include healthcare professionals in general. This enabled the search strategy to maximise relevant publications as well as to widen the potential for transferable learning across the professions.

The aim of this review was firstly to describe and analyse the educational approaches used to teach QI to pre-registration healthcare professionals. The objectives were to:

i. Identify and describe teaching approaches used to deliver QI education to pre-registration healthcare professionals.

ii. Determine the impact(s) of the teaching approaches, if any, using the four educational outcome levels of the Kirkpatrick Evaluation Model (1967).

iii. Establish the enabling or impeding factors associated with teaching QI education to pre-registration healthcare professionals.

2.3 DESIGN

An integrative review framework was adopted to undertake the literature search in this thesis (Whittemore and Knafl 2005). A systematic review is understood to be the '*gold standard*' approach at the top of the evidence hierarchy for examining the research literature (Gough et al. 2017). However, systematic reviews are designed to combine the results of several similar studies to provide reliable results such as a meta-analysis (quantitative) or meta-ethnography (qualitative) (Akers et al. 2009). At the point of undertaking this review, QI education in pre-registration nursing was at its infancy, which meant that a systematic review approach had potential to limit insights into this phenomenon. After deliberating, an integrative review was decided to be the most appropriate approach to answer the research questions. Using this method, inferences could be drawn from, and an objective critique conducted about, a new subject area while still performing systematic categorisation of the data and a thematic analysis (Christmals and Gross 2017). The rigour and transparency of the review was upheld using the Guidance on the Conduct of Narrative Synthesis in Systematic Reviews (Akers et al. 2009) and Moher et al.'s (2009) PRISMA Framework.

2.4 METHODS

Literature search strategy

The literature was searched in June 2014 and 2016. To enable replication of the search and demonstrate transparency and completeness, the primary search strategy (below) was developed in MEDLINE using MeSH terms (EPPI 2005). Subsequent searches were translated for CINAHL, PsycINFO, ERIC, ASSIA, SCOPUS and Google Scholar. For example, Medline indexes 'quality improvement' as 'continuous quality improvement', whereas Cinahl indexes it as 'quality management'. Date ranges, language, truncation, and wildcard symbols were applied. Several databases were searched to enhance the quantity and quality of sources obtained (Moher et al. 2015). Reference lists of retrieved articles were scanned to identify additional useful sources and duplicates were removed before the final papers were uploaded to RefWorks (Version 2).

Example of MEDLINE (OVID) search strategy

1. exp quality Improvement*/
2. (science of improvement or improvement science or continuous quality improvement or total quality management or quality standards or improvement models).tw.
3. 1 or 2
4. exp education*/
5. course$.tw.
6. train$.tw.
7. curricul$.tw.
8. teach$.tw.
9 learn$.tw.
10. 4 or 5 or 6 or 7 or 8 or 9
11. student.ab.
12 trainee.ab.
13. learner.ab.
14. (undergraduate).ab.
15. 11 or 12 or 13 or 14
16. exp programme evaluation/
17. evaluat$.ab.
18. 16 or 17
19. 3 and 10 and 15 and 18

Eligibility criteria

The review searched for studies that evidenced QI teaching to pre-registration healthcare students, as opposed to student nurses. The purpose of expanding the population was to maximise understanding of the phenomenon where the literature was already understood to be sparse. For the search, QI teaching had to describe a commonly used QI model in healthcare such as Total Quality Management, Continuous Quality Improvement, Business Process Reengineering, Model for Improvement (MFI)/Plan-Do-Study-Act, Lean Thinking and Six Sigma (Powell et al. 2009). To identify international best practice no geographical limitations were placed on primary peer reviewed studies. English studies that reported an evaluative outcome were included, if these were published at the entry point of QI in healthcare between the year 2000 until 2016 (Institute of Medicine 2001).

Screening and selection

Firstly, the articles were independently screened by me, and the eligibility criteria was applied to titles and abstracts. Ineligible articles were excluded but later retained, grouped, and coded. This process was recommended to offer transparency in the selection process and to be able to refer to potentially useful studies later to enhance contextual understanding and/or discussion (Gough et al. 2017). Secondly, full text articles and those without a determined eligibility from titles and abstracts were retrieved. All the articles were read in full by me before a decision was made to include or exclude them. A supervisory team member with in-depth subject knowledge cross checked a random sample of 20% of the articles. This process validated the selection process and provided an opportunity to resolve four discrepancies through re-reading articles and holding further discussions in the supervisory team until agreement was reached.

Data extraction and analysis

Data extraction was undertaken and 20% of the extraction forms were checked by a member of the supervisory team with expert QI knowledge. As no reporting standards for QI education existed at that time, a hybrid data extraction form was developed and influenced by several factors. Firstly, the SQUIRE (Standards for Quality Improvement Reporting Excellence) Guidelines developed by Davidoff et al. (2008) were drawn upon. These standards made no reference to educational interventions but did report on concepts relative to QI activities in practice (Ogrinc et al. 2016). Secondly, the Guidelines for the Reporting of primary empirical research Studies in Education (REPOSE) helped when extracting the straightforward information necessary for

understanding and synthesising individual education studies such as sample size, characteristics, location and duration (EPPI 2005). Thirdly, the outcomes of the Kirkpatrick Evaluation Model (1967) influenced data extraction due to the frequency of its use in health professions education and its application within QI education studies. While it should be acknowledged that this evaluation model only focuses on outcomes, and not the factors influencing these outcomes (Allen et al. 2021), it was important to use to make inferences about the findings in the review. The model includes Level (1) student reaction (what were students' perceptions about the teaching approaches used), Level (2) skills, knowledge and attitudes (what learning outcomes were measured and what were the relationships between the teaching approaches used), Level (3) behaviour (did students transfer new knowledge or skills to practice post intervention, and Level (4) patient/organisational outcomes (were there any improvements to patient care or processes). Lastly, enabling and impeding factors relating to teaching QI education were extracted (see Appendix 3).

To analyse the data, study characteristics and outcomes of interest were tabulated to simplify the data by grouping individual studies by their population (e.g., nursing, pharmacy and medicine) and identify patterns emerging within and across disciplines. Subsequently, the Kirkpatrick Model (1967) was used as a framework to conduct a subgroup analysis, at each outcome level and to explore relationships in the data. In tandem, a thematic approach was applied to enabling and facilitating factors; where a factor appeared more than once across studies a theme was developed. A summary of each theme is presented with a brief textual description. The findings of the review are presented as a textual narrative structured by the study's research aims and objectives.

Evaluation of methodological quality and relevance of studies

Evaluating methodological quality in educational interventions is known to be inconsistent (Reed et al. 2005). For this review, the priority was to choose a framework that could be applied to a variety of study methodologies and settings for multi-disciplinary populations. The Weight of Evidence Framework (WoE) was appropriate because it could account for the different healthcare disciplines encountered. Further, it favours the 'relevance' of research in terms of answering the review's objectives and then refrains from excluding studies that fall short of gold standard criteria. This flexibility was important as there was limited evidence anticipated (Gough 2007).

The WoE Framework uses a pre-determined formula to make judgements about the quality of studies across three categories (A, B and C) and their subcategories (Table 2.1). The scores in Categories A, B and C are combined to give an overall WoE (Gough et al. 2017). The TAPUPAS acronym included in Table 2.1. was recommended by Gough (2007) to help make judgements about each category. This process helped to minimise bias and streamline the secondary appraisal process within the supervisory team. In the review, a study had to achieve a 'high' score in no less than two sub-categories within WoE A to achieve a WoE of 'high', and studies had to be allocated a 'low' score in at least two sub-categories to be given a WoE of low. Studies achieving a 'medium' or 'high' score were included in the review. Ten percent of eligible articles were independently appraised by a second member of the supervisory team, and a third member appraised one paper as this had been co-authored by the other team members (James et al. 2016). All WoE scores were agreed upon.

2.5 RESULTS

Literature Search

After excluding six 'low' weight of evidence studies, the review included ten studies which are illustrated by the PRISMA Diagram (Figure 2.1) and summarised in Table 2.2.

Characteristics of studies

Study characteristics are shown in Table 2.3 and comprised four quantitative methodological approaches, four mixed method, one qualitative study and one cluster randomised trial. Drawing on these tables, five studies originated from the USA, two from Norway and three from the UK. Healthcare disciplines included nursing, pharmacy and medicine with students in first year through to third year. Most studies described Plan-Do-Study-Act cycles (or Plan-Do-Check-Act), three mentioned Continuous Quality Improvement, and one mentioned audit combined with the MFI. All studies reported a level on the Kirkpatrick Evaluation Model. Most measured Level 1 (student reaction), all but one measured Level 2 (skills, knowledge or attitudes), no studies measured Level 3 (behaviour) and one measured Level 4 (patient/organisational outcomes).

Intervention Descriptions and Educational Outcomes

The QI educational interventions and teaching approaches are presented in Table 2.4 and discussed throughout the narrative review. The Kirkpatrick Model educational outcomes are detailed further in Table 2.5.

Overview of methodological quality and relevance

The methodological approaches and quality scores are presented in Table 2.4 and the decisions made using the Weight of Evidence Framework are shown in Table 2.6 and which show that all studies achieved a medium weight of evidence. Of the four quantitative studies, three adopted a quasi-experimental design (Kyrkjebo et al. 2001; Gould et al. 2002; Gonsenhauser et al. 2012) and one used post intervention evaluation (Christiansen et al. 2010). Of the mixed method studies, one adopted a quasi-experimental design (Levitt et al. 2012) and three used post intervention evaluation (Baillie et al. 2014; Kyrkjebo 2006; Skledar and McKaveney 2009). The qualitative study used post-intervention evaluation (James et al. 2016).

Quantitative Studies

The student sample size in the quasi-experimental designs were (n=25) in Gonsenhauser et al. (2012), (n=52) in Kyrkjebo et al. (2001) and (n=77) in Gould et al. (2002). These studies used non-validated assessment tools pre or post intervention to measure knowledge, attitudes, or beliefs. Other limitations included non-submission of pre intervention answers to determine post intervention improvement (Kyrkjebo et al. 2001), a lack of reported data and uncertainty over participants consent (Gould et al. 2002) and lastly, potential recruitment bias through an Institute for Healthcare Improvement Open School Chapter (Gonsenhauser et al. 2012). In the post intervention evaluation, the sample size (n=134) was significantly greater. This study used a stakeholder informed questionnaire to measure knowledge and attitudes which strengthened the study's findings, but insufficient intervention description for study replication (Christiansen et al. 2010).

Mixed Method Studies

The mixed method quasi-experimental study recruited eight participants and adopted a validated 'Quality Improvement Proposal Assessment Tool (QIPAT-7)' to assess QI skills pre and post intervention. No validated tools were used to measure knowledge or attitudes, and the focus groups consisted only of one question. Recruitment and analysis were not reported (Levitt et al. 2012). The other post intervention study recruited 76 participants to measure their knowledge acquisition through grading of assignment presentations. However, authors of the paper also formed the marking panel which may have invited bias. Voluntary formative evaluation was also conducted by Skledar and McKaveney (2009) to assess satisfaction and attitudes of participants, but how analysis and interpretation were conducted is unclear. Lastly, one study used their own questionnaire with forty-four participants

alongside focus group interviews and grading of assignment reports to measure reaction, attitudes, and knowledge. The number of questionnaires completed by students was not reported and data reported was primarily from focus groups and student assignments; the methods of which are vague (Kyrkjebo 2006).

Qualitative Study

The qualitative study consisted of eighteen semi-structured interviews post intervention to determine student experiences of completing QI projects in practice. Analysis of reflections from fifty students' assignments were extracted by authors using a non-validated 'Quality Improvement Principles Tool (QIP)'. Assignment reflections were analysed thematically in tandem with verbatim interview transcriptions, but only the interview data is reported (James et al. 2016).

Cluster Randomised Trial Study

The cluster randomised trial measured knowledge of thirty-nine participants using a non-validated 'Quality Improvement Knowledge Application Tool (QIKAT)' pre and post intervention, and students' performance was measured during Observed Structured Clinical Examinations. The intended randomised cross-over trial with an early and late intervention group did not run due to time constraints. Student self-assessed proficiency and satisfaction were measured by authors using Likert scales and free text evaluation. Satisfaction of educational facilitators was also obtained from focus groups; however, the methods or questions are unreported (Ogrinc et al. 2007).

Before undertaking a narrative synthesis, the tables and figures that supported the search, analysis and findings are presented in the order they have appeared throughout the text.

Table 2.1 Weight of Evidence (WoE) Framework

	WoE A	WoE B	WoE C	Overall WoE
Weight of Evidence	Trustworthiness of results of study	Appropriateness of study design to review question	Relevance to answer review question	A, B, C Combined
	High: 1.Intervention clearly articulated (who, what when, where, why) to allow for reproducibility. 2.Ethical, explicit and detailed methods sections for recruitment, data collection & analysis. 3.Comprehensive reporting of data and accurate interpretation clearly warranted from findings. ***Medium***: 1.Intervention described but not with sufficient detail to replicate. 2.Satisfactory reporting of methods sections for ethics, recruitment, data collection & analysis - minor omissions evident. 3.Minor bias in reporting of data and interpretations partially warranted from findings. ***Low***: 1.Intervention not described. 2.Unsatisfactory methods sections for data collection and analysis with major omissions evident. 3.Unsatisfactory reporting of data and/or interpretations not warranted from findings.	***High***: Large-scale multi-method designs e.g. RCT, quasi-experimental using validated tools and/or interview, observational data with large sample size. ***Medium***: Medium-scale qualitative, quantitative or mixed method designs e.g. local pre-post, post survey/questionnaire using acceptable tools and/or interview, observational data with medium/small sample size. ***Low***: Study design unclear or inappropriate choice of tools used.	***High***: Provides useful and relevant answers closely relatable to review objectives. ***Medium***: Provides answers relatable to review objectives. ***Low***: Unable to provide answers relatable to the review objectives.	***High***: A must be accredited no less than a 'high' in two domains to achieve an overall WoE of High. ***Medium***: A must be accredited no less than a 'medium' in 2 domains to achieve an overall WoE of Medium. ***Low***: A must be accredited a 'low' in 2 domains to be excluded.

Figure 2.1 Flow Chart of Systematic Search

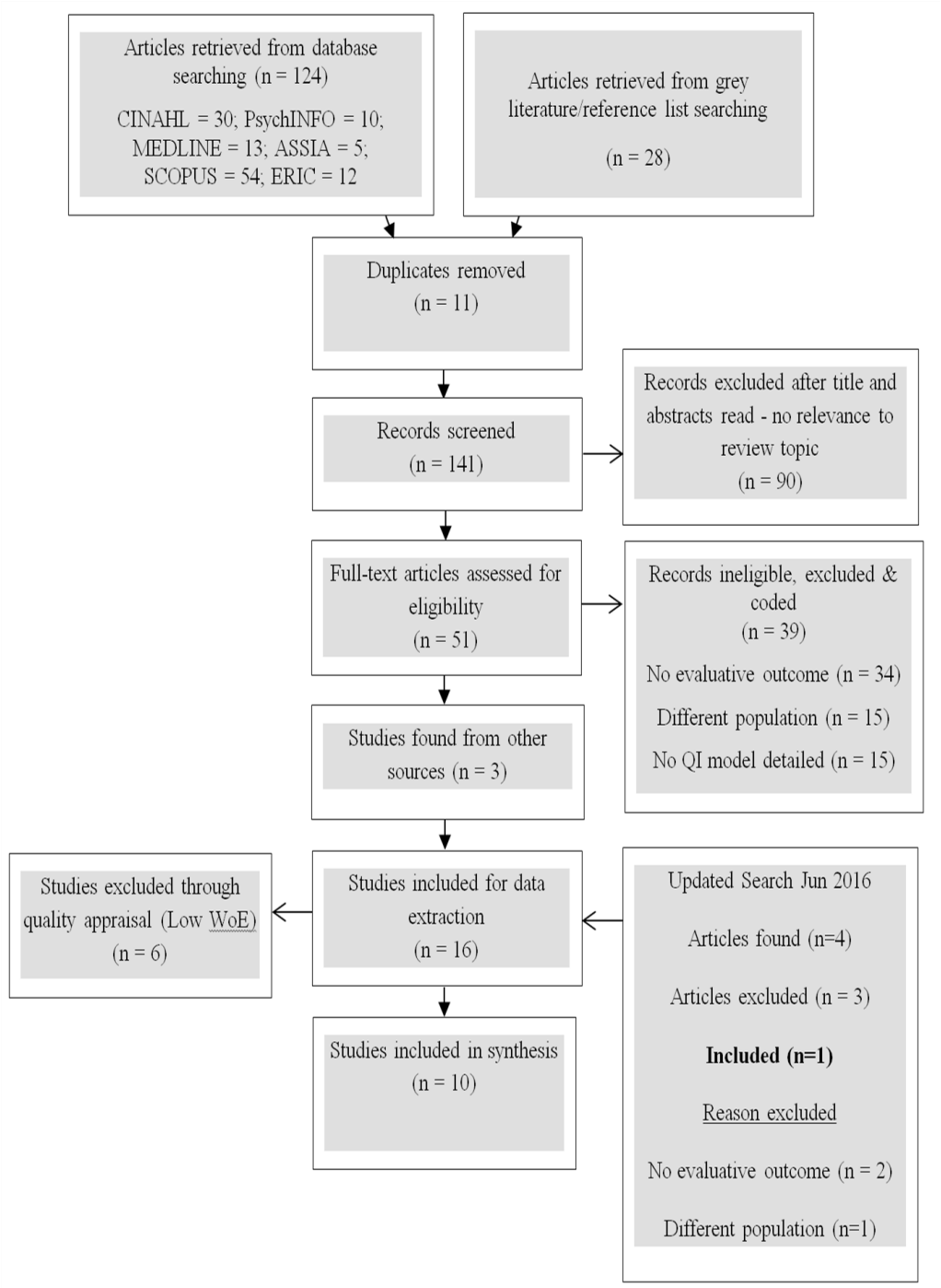


Table 2.2 Summary of included quality improvement education studies

Article	Discipline(s)	Teaching Approach	Outcome Measure(s)	Learners	Model
Baillie et al. (2014)	Nursing (UK)	Didactic/Experiential Learning	Student experience & perceptions. Academic experience	3rd Year Degree Students	PDSA
Christiansen et al. (2010)	Nursing (UK)	Didactic/Experiential Learning/Group Work	Knowledge & Attitude	3rd Year Nursing Students	PDSA
James et al. (2016)	Nursing (UK)	Didactic/Experiential Learning Self-directed Learning /Workshops	Student Experience	3rd Year Nursing Students	PDSA/MFI
Kyrkjebo (2006)	Nursing (Norway)	Seminar/Didactic Experiential Learning	Learning and implementation	1st Year Nursing Students	PDSA
Kyrkjebo et al. (2001)	Nursing (Norway)	Didactic/Experiential Learning/Group Work	Knowledge & Understanding	2nd Year Nursing Students	PDSA/CQI
Gonsenhauser et al. (2012)	Medicine (USA)	E-learning/Simulation/self-directed/experiential Learning	Knowledge & Perspectives	1st & 2nd Year Medical Students	Audit/Model for Improvement
Gould et al. (2002)	Medicine (USA)	Didactic/Seminar Experiential Learning	Knowledge, attitudes, beliefs & Quality indicators	2nd Year Medical Students	CQI
Levitt et. al (2012)	Medicine (USA)	Experiential Learning Self-directed	Satisfaction, knowledge, skills attitudes	3rd Year Medical medical students	CQI/PDSA
Ogrinc et al. (2007)	Medicine (USA)	Group Sessions/Seminar Experiential Learning	Satisfaction/Skills Knowledge/impact	1st Year Medical Students	Model for Improvement PDSA
Skledar & Mckaveney (2009)	Pharmacy (USA)	Didactic/Group Work Experiential Learning	Satisfaction Learning & attitudes	3rd Year Pharmacy students	CQI/FOCUS-PDSA

Table 2.3 Study Characteristics

Table 2.3 Study Characteristics	N =	(%)
Disciplines		
Medicine	4	(40)
Nursing	5	(50)
Pharmacy	1	(10)
Level of Training		
3rd Year	5	(50)
2nd Year	3	(30)
1st Year	3	(30)
Year Published		
2001	1	(10)
2002	1	(10)
2006	1	(10)
2007	1	(10)
2009	1	(10)
2010	1	(10)
2012	2	(20)
2014	1	(10)
2016	1	(10)
QI Models		
PDSA	8	(80)
CQI	3	(30)
FOCUS	1	(10)
MFI/AUDIT	1	(10)
Kirkpatrick Model		
Reaction	6	(60)
Learning	9	(90)
Behaviour	0	(0)
Impact	1	(10)
Demographics		
USA	5	(50)
Norway	2	(20)
UK	3	(30)
Teaching Methods		
Experiential Learning	10	(100)
Didactic	7	(70)
Group Work	4	(40)
Seminars/Workshop	4	(40)
Self-directed Learning	3	(30)
Simulation	1	(10)
Methodology		
Quantitative	4	(40)
Mixed Method	4	(40)
Qualitative	1	(10)
Randomised Cluster Trial	1	(10)

Table 2.4 Intervention description for quality improvement educational studies

General Information	Introduction	Methodology	Intervention/Teaching Approach	Kirkpatrick Level	
Ballie et al. (2014) Implementing service Improvement projects with Pre-registration nursing Education: a multi-method Case study evaluation	To evaluate the Implementation of service improvement projects with a pre-registration nursing curriculum.	Multi-method Case-study Questionnaire/focus groups with 'Degree' students and academics/observation of Action Learning Sets	Didactic/Experiential Learning Introductory sessions on patient focus, processing mapping and PDSA were given to nursing students. Degree students carried out service improvement projects over 9 weeks Action Learning Sets were held twice for support throughout which were held by mentors who were registered nurses. Link tutors were available to help prepare the practice areas	Knowledge Attitudes Perception Experience	(2)
Christiansen et al. (2010) Creating an improvement Culture for enhanced patient Safety: service improvement Learning in pre-registration Education	To evaluate student Nurses' experience of service improvement learning in the university and practice setting.	Post Cross-sectional survey 14 item questionnaire open/closed questions Likert scale 134 students completed	Didactic/Experiential Learning/Group work introductory sessions on inter-professional learning and working, leadership, management of change, clinical governance and patient safety. attendance at core learning day to hear experiences of service users and clinical experts Introduced to public/patient participation personal and organisational development, systems thinking and initiating/sustaining change Students then undertook work-based QI project and were supported by mentors and Action Learning Sets. Projects presented and graded.	Knowledge Attitudes	(2)
James et al. (2016) Time, fear and transformation: Student nurse's experience of *doing* a practicum (quality improvement project) in practice	To explore student nurse's experiences to provide evidence to inform the future design and delivery of a practicum within the undergraduate curricula.	Telephone and face to face Interviews (n=18) Thematic analysis of student practicum assignments (n=50)	Didactic/Experiential Learning Self-directed e-learning modules QI curriculum spanning 3 years. IHI e-learning modules each semester (9 in total). Supplementary didactic lectures, workshops, podcasts. Intro to QI, examples of QI initiatives, tools for QI, decision-making, intro to practicum, resilience Students assessed on QI periodically in MCQ exams. 11 week QI practicum undertaken in 3rd year within clinical practice where students 'test' small changes using PDSA/MFI and complete compulsory assessed assignment.	Experience	(1)

General Information	Introduction	Methodology	Intervention/Teaching Approach	Kirkpatrick Level	
Kyrkjebo et al. (2001) Introducing quality improvement to pre-qualification nursing students: evaluation of an experiential programme	To evaluate a programme Introducing QI in nursing education	Pre/post questionnaire Likert scale/student reports 52 students (38 out of 52 completed)	Didactic/Experiential Learning/Group Work 1 hour classroom-based introduction to to tasks to be undertaken in clinical practice which excluded any QI theory. 10 weeks in practice on surgical/medical wards. Students chose a patient to follow, documenting processes of care from patient perspective On return to theory students received 2 days Of QI learning then worked in groups to produce flow charts, cause/effect diagrams and define structure, process and result criteria relating to their clinical placement. A final report was submitted.	Reaction Understanding	(1) (2)
Kyrkjebo (2006) Teaching quality improvement in the classroom and clinic: getting it wrong and getting it right <u>Combined with:</u> ***Kyrkjebo and Hanestad (2003)*** Personal improvement project in nursing education: learning methods and tools for continuous quality improvement In nursing practice	To describe a CQI personal Improvement project and ascertain students experience of a CQI programme	Open ended Questionnaire/focus group interview 44 students 39 female/5 male All completed questionnaire	Seminar/Didactic/Experiential Learning Intervention over 3 semesters. 1st students' are introduced to improvement methods and tools and work on a project using PDSA, process mapping to make a personal improvement Student present projects to the class after 8 wks. (Further details in Kyrkjebo & Hanestand, 2003) In semester 2 students in care homes follow a patients' journey to get perspective of their experience and map the process. Data is collected and suggestions of improvements are made by students. Projects are presented to the class In semester 3 students observe 1 patient in a Medical/surgical ward and review processes again from the patients perspective. Using flowcharts and cause/effect diagrams they identify causes of the problems and created goals with structure, process and result criteria and produce a plan for improvement in a documented report.	Reaction Experience Knowledge & Attitudes	(1) (2)

General Information	Introduction	Methodology	Intervention/Teaching Approach	Kirkpatrick Level	
Gonsenhauser et al. (2012) Development and Assessment of quality improvement education for medical students at the Ohio state university medical centre	To evaluate a student driven educational QI programme integrated into the medical curriculum	pre/post assessment Likert-scale 60 student's (25 out of 60 completed)	E-learning/Simulation/Experiential Learning 2 hrs self-directed online IHI modules in QI/patient safety leadership/teamwork and Person-Centred Care 2.5hrs orientation of operating theatre and role play using surgical safety checklist, Observation of 3 operating room procedures with audit conducted	Knowledge Perspectives	(2)
Gould et al. (2002) Improving patient care outcomes by teaching quality improvements to medical students in community based practices	To examine impact of a CQI curriculum on educational outcomes of students and the impact on quality indicators in practice	pre/post open-ended questionnaire Likert-scale 53 out 77 completed	Didactic/Seminar Experiential learning Curriculum included clinical outcomes protocol development, chart abstraction & clinical process change through CQI Student undertook a 2.5-hour chart abstraction seminar that provided CQI theory and differences and similarities between CQI and clinical outcomes. In groups of 2-4 students at community based primary care practices collected baseline data, implemented a results specific intervention and re-assessed 6 months within later a diabetes clinic	Knowledge Attitudes Beliefs Quality Indicators	(2) (4)
Levitt et al. (2012) An innovative quality improvement curriculum for third-year medical students	To evaluate self-directed QI skills curriculum for medical students in a one year longitudinal third year clerkship	QIPAT pre/post survey Focus groups for facilitators (8 students; 2 groups of 4)	Experiential learning/self-directed One year longitudinal experiential self-directed QI curriculum. Students had to analyse a process of care to identify a quality gap, provide measurement and recommend changes to close the gap. Students were supported with personal and email 'check-ins' with programme director but had no formal didactics. One group explored pain management in palliative care and the other explored preventable causes of delirium.	Satisfaction Knowledge Skills Attitudes	(1) (2)

General Information	Introduction	Methodology	Intervention/Teaching Approach	Kirkpatrick Level	
Ogrinc et al. (2007)	To evaluate effects and assess impact of a PBLI module for 1st year medical students.	Randomised two group trial standard vs PBLI	Groups/seminars/experiential learning	Satisfaction Skills	(1) (2)
Integrating practice-based learning and improvement into medical student learning: evaluating complex curricular innovations.		83 students Pre/post Likert scale, free text evaluation, focus groups, QIKAT	During standard 20 minute seminars to review recording of patient information skills, intervention groups were given additional 10 minute overviews at 4 group sessions. Included were PDSA, data, system change and improvement. Students used this additional information to make a plan for Improving their OSCEs in groups of 8-10.	Knowledge	
Skledar and McKaveney (2009)	To describe/evaluate a Mandatory continuous	Assessment through project presentations and examinations	Didactic/group work/experiential learning	Satisfaction Knowledge Attitudes	(1) (2)
A method for teaching continuous quality improvement to student pharmacists through a practical application project.	quality improvement module.	Voluntary formative evaluation of student attitudes (76% response rate from Formative evaluation)	1st lecture included CQI theory, measures, differences between QI and research, FOCUS PDCA model (1 hour) 2ND lecture included presentations from exemplars Students in small groups selected an area to improve providing 2 citations to justify or propose a solution. Some chose a topic outside of pharmacy. Students applied CQI methods to develop an action plan and present 15 slides to a panel of QI experts.		

Table 2.5 Kirkpatrick Education Evaluation Outcomes

Study	Teaching Method	Level	Results	Duration	Quality
Baillie et al. (2014)	Didactic/Experiential Learning	2	62% felt they knew a fair amount after training. Most students rated service improvement (SI) as very important or important generally, in relation to patient safety and the individuals healthcare experience. Less than 30% were very keen to get involved in SI, with 59% being keen. Only 5% felt very confident to get involved in SI , 51% were confident and 32% were unsure. Most students felt SI was very important or important to professional development and 60% felt it would help enhance career opportunities whereas 26% were unsure.		Medium
Christiansen et al. (2010)	Didactic/Experiential Learning/Group Work	2	24% indicated they learned a lot, 68% learned a fair amount. Most indicated Service improvement (SI) was either very important or important. 85% rated it important for patient safety. 55% of mental health students were very keen to get involved in SI whereas less than a third felt this from the adult, learning disability and child branches. 53% of respondents were keen to get involved. 55% felt confident to get involved with SI work with 16% feeling very confident. 51% felt that it was very important for their professional development with 74% indicating it would enhance their employability. 85% felt that action learning sets enhanced their learning.		Medium
James et al. (2016)	Didactic/Experiential Learning/Self-directed e-learning modules.	1	3 themes emerged: **Time:** students highlighted time needed to prepare for the practicum, the need for a 'settling in period' on placement, challenges of choosing a topic within the given time and time to balance practice and theory. **Fear:** students feared measures and using QI tools, the QI terminology, making criticisms of practice and undertaking the task as a student. **Transformation:** students were helped through the process by a structured assignment, mock examples of QI projects and the clinical support from staff.		Medium

Study	Teaching Method	Level	Results	Duration	Quality
Kyrkjebo (2006)	Seminar/Experiential Learning/Didactic	1	All focus groups evaluated the lecture as informative All focus groups reported that the CQI programme was not well integrated into the programme. No time was given to work on project which represented an extra workload and therefore did not get priority.		Medium
		2	Several students thought the personal improvement project was useful in learning about improvement methods and tools Knowledge of patients' perspective increased students understanding of patient needs and provide holistic care		
Kyrkjebo et al. (2001)	Didactic/Experiential Learning/Group Work	1	Students reported that it was 'quite useful' to observe patient on one shift (mean 3.0) It was useful to a 'large extent' working in groups (mean 3.7). Student founds the introductory course 'useful' 'to a large extent' (mean 4.0)		Medium
		2	58% of students indicated that they knew the meaning of QI concepts following clinical practice and before introductory session. 46% were unaware of current QI projects ongoing in the ward environment. 27% didn't know. Authors claim that knowledge of QI pre/post improved significantly. Pre - SD value 2.0 (range 1-4) to post SD value 3.1 (range 2-4) Most students considered topic highly relevant for later career (mean 4.2) Students learned something new 'too some extent' (mean 2.8) Students considered it 'important' for nurses to have Knowledge about QI (mean 4.3)		

Study	Teaching Method	Level	Results	Duration	Quality
Gonsenhauser et al. (2012)	E-learning/Simulation Experiential Learning	2	Authors claim knowledge was significantly improved by 18%. 84% were more awareness of IHI and improved from pre: 2.4 +/- 0.98 to post: 4.2+/- 0.37. Student understanding of what constitutes a QI initiative improved from pre: 3.75 +/- 0.84 to post: 4.27 +/- 0.48. Increased preparedness to observe operating room activity and report error was increased from pre: 3.50 +/- 0.76 to post: 4.10 +/- 0.30. Students were significantly more prepared to effectively contribute to QI initiatives from pre: 3.47 +/- 0.76 to post: 4.04 +/- 0.45. There was a significant increase that student believed physicians were responsible for identifying health care improvement from pre: 3.80 +/- to 4.30 +/- 0.48.		Medium
Gould et al. (2002)	Didactic/Seminar/ Experiential Learning	1	85% of students were neutral or did not find the learning chart abstract experience valuable. 83% had sufficient time to complete project 62% reported tasks & expectations were clearly defined.		Medium
		2	Knowledge improved significantly of the nature, concepts, and principles of CQI after training in some elements. 64% believed the audit was not intrusive to patient confidentiality. 68% agreed or strongly agreed on making decisions by relying on data. 45% agreed or strongly agreed that the audit was beneficial to office practice. Only 18% found it beneficial to the patient with 30% not finding it beneficial to the patient. 48% reported that the audit did not benefit quality of patient care. 46% agreed or strong agreed that the experience improved documentation		
		4	the rate of foot and eye exams for patients increased by 51% to 70%		

Study	Teaching Method	Level	Results	Duration	Quality
Levit et. al (2012)	Experiential Learning	1	Students wanted the timeline shortened and more goals built in. They wanted more guidance and protected time to complete project.		Medium
		2	No significant improvement in knowledge identified with mean score out of 11 questions – pre 5.9 vs post 6.6 Shortcomings in QI skills identified in final projects such as defining measures and applying timely goals for their interventions. Attitudes in students confidence increased significantly Pre 13.4 vs post 16.1 Perception of the value of QI projects increased Significantly Pre 9.9 vs post 12.6 Students confidence in QI skills in confidence Increased significantly pre 13.4 vs post 16.1		
Ogrinc et al. (2007)	Group Sessions/seminar/ Experiential Learning	1	Students felt that the information could have been delivered in one session as opposed to 4 and they didn't feel it tied together very well. Students wanted more focus on practice.		Medium
		2	31% of students felt satisfied with identifying best practice from the literature. 44% felt satisfied with developing an aim and using small cycle change PBLI intervention group were better able to apply Improvement knowledge on a skills based exam than the control group No differences were found between scores in OSCE's		

Study	Teaching Method	Level	Results	Duration	Quality
Skledar and Mckaveney (2009)	Didactic/Group Work/Experiential Learning	1	Students thought that the timing of the practicum being before the holidays made it more difficult to form groups Student wanted more time for questions and groups work		Medium
		2	The mean score of practicum presentations for students learning was 93%. All students reported learning more through the practicum experience compared with the lecture . 80% of the students thought the lectures were informative or necessary. 85.7% students reported that they thought the practicum added value to the CQI learning 91% of students recognised the potential of CQI for fostering improvement and 97% were able to provide examples of applying CQI in their area of interest Following the lectures but before the practicum students' mean exam score on the 3 CQI questions was 83%. Following the practicum exercise the mean score for the 7 CQI questions improved to 97.4%		

Table 2.6 Weight of Evidence Quality Appraisal Results

Research Article				
Baillie et al. (2014)	1. Medium 2. Medium 3. Medium	Medium	High	**Medium**
Christiansen et al. (2010)	1. Medium 2. Medium 3. Medium	Medium	High	**Medium**
James et al. (2016)	1. High 2. High 3. Medium	Medium	Medium	**Medium**
Kyrkjebo (2006)	1. High 2. Medium 3. Medium	Medium	Medium	**Medium**
Kyrkjebo et al. (2001)	1. Medium 2. Medium 3. Low	Medium	Medium	**Medium**
Gould et al. (2002)	1. Medium 2. Low 3. Medium	Medium	High	**Medium**
Levitt et. al (2012)	1. Medium 2. Medium 3. Low	Medium	High	**Medium**
Skledar & McKaveney (2009)	1. High 2. Medium 3. Medium	Medium	High	**Medium**
Gonsenhauser et al. (2012)	1. Medium 2. Medium 3. Low	Medium	Medium	**Medium**
Ogrinc et al. (2007)	1. Medium 2. Medium 3. Medium	Medium	High	**Medium**
Excluded Articles				
Dysinger and Pappas (2011)	1. Medium 2. Low 3. Low	Low	Low	**Low**
Johson et al. (2010)	1. Low 2. Low 3. Low	Medium	Low	**Low**
Eramo (2012)	1. Medium 2. Low 3. Low	Low	Low	**Low**
Henley (2002)	1. Medium 2. Low 3. Low	Low	Medium	**Low**
Cox et al. (2009)	1. Medium 2. Low 3. Low	Low	Low	**Low**
Weeks et al. (2000)	1. Medium 2. Low 3. Low	Low	Medium	**Low**

2.6 NARRATIVE SYNTHESIS

TEACHING APPROACHES

The first objective of the integrative review was to identify and describe teaching approaches used to teach QI education to pre-registration healthcare professionals. Teaching approaches were combined with experiential learning on most occasions. Didactic sessions were reported in seven studies, group work in four and seminars in three. Other approaches included self-directed learning and simulation.

Experiential learning

Experiential learning outside of practice was used in medical education for students to apply improvement methods to enhance their individual patient history taking skills (Ogrinc et al. 2007). In nurse education, students undertook an 8-week 'personal' improvement project which aimed to facilitate the transfer of their QI knowledge from a personal to a professional setting (Kyrkjebo 2006). And, in pharmacy education students completed a hypothetical QI practicum, involving problem identification from the research evidence-base (or personal topic) as well as designing measures and a proposal for solutions (Skledar and McKaveney 2009).

QI experiential learning activities moved beyond the classroom and into practice. These activities involved student nurse observations in care homes, medical wards and surgical wards, where process maps to document patient journeys in the healthcare system were undertaken (Kyrkjebo et al. 2001; Kyrkjebo 2006). In the study by Christiansen et al. (2010), the student nurses collected patient stories to identify improvement opportunities. These narratives were later analysed using QI tools to facilitate problem-solving and they reflected on their experience afterwards, at Action Learning Sets with nurse mentors. Comprehensive QI learning activities were undertaken by student nurses who completed a small-scale improvement project as the basis for their dissertations and compulsory assignment. Students collected real time data and used QI tools to identify problems and conduct small tests of change using Plan-Do-Study-Act cycles. Project reports included reflective accounts which were submitted for their assignments (Baillie et al. 2014; James et al. 2016).

QI experiential learning opportunities in practice were available to medical students. In the study by Levitt et al. (2012) students were asked to identify a quality gap during a yearlong clinical rotation. This activity involved a literature review, development of

appropriate measures and a plan for collecting readily available data. Some students also collected real time data through clinical surgical safety audits in the operating room (Gonsenhauser et al. 2012). Others extracted data from patients' diabetes charts at primary care practices, implemented improvement interventions and then followed up on the results six months later (Gould et al. 2002).

Didactic learning

Didactic sessions varied in content and length with over half of the studies introducing QI to students in this way. Content of didactic sessions included person/patient-centred care, theories and concepts of improvement, quality indicator measures and differences between improvement and research (Gould et al. 2002; Gonsenhauser et al. 2012; Baillie et al. 2014; Kyrkjebo 2006; Skledar and McKaveney 2009; James et al. 2016). Some studies focused on improvement methodologies such as MFI, Plan-Do-Study-Act, root cause analysis, FOCUS/Plan-Do-Check-Act or process and systems thinking (Christiansen et al. 2010; Baillie et al. 2014; Skledar and McKaveney 2009; James et al. 2016), while others included specific QI tools such as process mapping, pareto charts, run charts, cause/effect diagrams and bar graphs (Baillie et al. 2014; Kyrkjebo 2006; James et al. 2016). Broader contextual topics included inter-professional learning and working, leadership and patient safety, personal and organisational development, clinical governance, management of change, evidence-based practice and resilience (Christiansen et al. 2010; Gould et al. 2002; Skledar and McKaveney 2009; James et al. 2016).

Didactic approaches were supplemented with workbooks, podcasts, question and answer sessions or resource lists signposting students to broader information such as quality indicator measures (Christiansen et al. 2010; Kyrkjebo 2006; Skledar and McKaveney 2009; James et al. 2016). Clinical expertise was called upon to introduce public and patient participation through Service User experience videos, exemplar accounts of national initiatives or from students who had previously undertaken QI education (Christiansen et al. 2010; James et al. 2016; Skledar and McKaveney 2009). The quantity and duration of didactics varied from one to three sessions, lasting one to two hours over a two-to-four-month period (Gould et al. 2002; Baillie et al. 2014; Skledar and McKaveney 2009). One study integrated more than ten didactic sessions over a three-year programme excluding workshops, e-learning and support sessions (James et al. 2016).

Seminar/Group Work/Workshops

Seminars, group work and workshops were approaches used to deliver QI education. Medical students undertook training to extract data from diabetic patients' charts and student nurses were to feedback on their experiences of a process mapping exercise in practice (Gould et al. 2002; Kyrkjebo 2006). Other studies used group work or workshops to deliver education, undertake clinical QI activities, answer questions about QI assignments, or as a way of offering mentor support (James et al. 2016; Ogrinc et al. 2007; Kyrkjebo et al. 2001; Skledar and McKaveney 2009).

Self-directed e-learning

Both medical and student nurses were introduced to the Institute for Healthcare Improvement e-learning modules (Gonsenhauser et al. 2012; James et al. 2016). Medical students completed two hours of self-paced study on topics such as QI, patient safety, leadership, teamwork and person-centred care. Further, student nurses completed 14 compulsory modules which were integrated throughout their three-year curriculum (Gonsenhauser et al. 2012; James et al. 2016).

Simulation

A 2.5-hour simulation session was adopted to orientate medical students to an operating room protocol and etiquette in preparation for their experiential learning. This activity involved role-play to familiarise students in the use of a surgical safety checklist audit tool (Gonsenhauser et al. 2012).

KIRKPATRICK EDUCATION EVALUATION MODEL OUTCOMES

The second objective of the review was to determine the impacts of the teaching approaches using the four levels of the Kirkpatrick Evaluation Model (1967). As Table 2.4 illustrates, most studies measured Level 1 (student reaction), all except one measured Level 2 (skills, knowledge or attitudes), no studies measured Level 3 (behaviour) and one measured Level 4 (patient/organisational outcomes).

Kirkpatrick Level 1 Reaction

The reactions of students were mixed yet most feedback related to 'timing'. Student nurses and student pharmacists felt their programme was not well integrated or delivered at an inappropriate time in the programme (Kyrkjebo 2006; Skledar and McKaveney 2009). Students in all disciplines expressed the need for more time to ask questions,

more time in practice, wishing they had attributed more time for preparation, wanted more protected time for projects, experienced challenges of time in selecting a topic and complaining of reduced time for didactic sessions and yearlong projects (Skledar and McKaveney 2009; James et al. 2016; Ogrinc et al. 2007; Kyrkjebo 2006; Levitt et al. 2012). Other student reactions related to the initial apprehension of using QI tools and terminology, the perceived lack of autonomy at pre-registration level to identify and initiate change, and a greater need for structured goal setting and guidance (James et al. 2016; Levitt et al. 2012). Students also felt taken advantage of, 'it's more important to involve students in the design and analysis than simply the data collection which is just labour' (Gould et al. 2002, p.1016).

However, positive student reactions emerged following QI educational activities in practice. Medical students were satisfied with their programme whereby 83% had time to complete projects and 62% felt that expectations of them were clear (Gould et al. 2002). Student nurses were positive and felt that observing patients was 'quite useful', working in groups to a 'large extent' was useful and QI introductory sessions were 'most useful' (Kyrkjebo et al. 2001). Student nurses appreciated having spare time during a holiday period to consider a QI topic and were grateful for the opportunity to do QI and enjoyed it more than expected. One positive student nurse believed that 'small changes can make a big difference, previous to starting this project I was unaware of how as a student I could help to achieve change' (James et al. 2016, p.75).

Kirkpatrick Level 2 Skills, knowledge, attitudes

In the intervention group with medical students, those who used QI methodology to enhance their practice, were best able to apply their knowledge of QI principles on a skills-based exam compared with the control group (Ogrinc et al. 2007). That said, less than half felt 'satisfied' in identifying best practice from the literature, developing aims or using small cycles of change, and over half failed to believe that there would be any benefits to patients. In the self-directed yearlong clinical rotation, medical students' knowledge demonstrated no significant improvement, and they were unable to define measures or apply timely goals (Levitt et al. 2012).

Contrastingly, knowledge increased significantly for other medical students after their QI training. Firstly, this was established where they were exposed to organised audits in the operating room and felt better prepared to report errors and contribute to

improvements post intervention (Gonsenhauser et al. 2012). Secondly, it was identified where students undertook data extraction from diabetic patients' charts, 'agreeing' or 'strongly agreeing' that decisions in practice should be based upon data (Gould et al. 2002).

Student nurses' knowledge of QI increased following an activity to map the patients' healthcare journey. Afterwards, 58% knew the meaning of QI concepts from being in practice alone despite having had no QI theory beforehand; however, 71% were 'unaware' or did not know of any QI activity going on in actual practice (Kyrkjebo et al. 2001). Other student nurses who conducted service improvement (SI) projects for their dissertation rated their own knowledge higher compared to the control group and demonstrated statistical significance (Baillie et al. 2014). Similarly, student nurses' knowledge of the healthcare system increased following exposure to an activity observing patients in practice (Kyrkjebo 2006).

Pharmacy students (87%) valued their practicum assignment more than lectures alone, and mean knowledge scores increased from 83% following didactic lectures, to 97.4% when reassessed after completing the hypothetical practicum (Skledar and McKaveney 2009). Most pharmacy students (97%) could provide examples of applying improvement in their area of interest and demonstrated positive attitudes towards QI, rating it 'important' to have knowledge of QI and regarding it 'highly relevant' for their later career.

Attitudes were positive in all professions. In medicine, perceived confidence to be involved in QI, and a significant increase in its value, were stablished following medical students' clinical exposure, despite there being no improvement in knowledge (Levitt et al. 2012). Student nurses considered SI to be 'very important' or 'important' in relation to patient safety and the patients' healthcare experience, and 56% of those conducting SI felt 'very confident' or 'confident' to be involved (Christiansen et al. 2010; Baillie et al. 2014). Student nurses found it 'invaluable for current practice and (their) later professional career' and 'had a new motivation for quality improvement, something they would take seriously as a staff nurse and not shy away from again' (James et al. 2016, p.75).

Kirkpatrick Level 3 Behaviour

The review did not identify any study which focused on measuring QI behaviour change in the pre-registration population.

Kirkpatrick Level 4 Patient Care/Processes

One study measured patient outcomes, identifying an increase in foot and eye exams for patients with diabetes from 51% to 70% (Gould et al. 2002). Authors suggested that combining teaching approaches (didactic, seminar and experiential learning) gave medical students greater appreciation of the impact of improvement activities on patient outcomes.

ENABLING AND IMPEDING FACTORS

The third objective of the review was to establish what enabling or impeding factors existed in the delivery of QI education to pre-registration healthcare professionals. As illustrated in Table 2.4 five themes were identified which included: teaching approaches, clinical/faculty support, information provision, curriculum balance and QI data.

Teaching Approaches

Enabling: Students exposed to experiential learning considered QI within a real life setting and listened to patients/service users and carers. Different perspectives of quality care were gained from experiential learning which gave students an appreciation of how QI impacted the patient experience and assisted them to develop improvement ideas (Kyrkjebo et al. 2001; Baillie et al. 2014; Kyrkjebo 2006; Skledar and McKaveney 2009; James et al. 2016). Experiential learning reinforced the nature of using QI tools for problem solving, enhancing understanding of QI principles, emphasising the unpredictable nature of change and highlighting the necessity to obtain staff participation and feedback (Kyrkjebo 2006; Skledar and McKaveney 2009; James et al. 2016). Moreover, student nurses felt that the 'mandatory' nature of QI education was enabling and 85% of them felt that Action Learning Sets enhanced their learning (Baillie et al. 2014; Christiansen et al. 2010). Medical students in the U.S.A benefited from the Institute for Healthcare Improvement e-learning being free of charge (Gonsenhauser et al. 2012).

Impeding: Medical students felt the lack of practice-based experiential learning opportunities impacted their QI learning and they expressed a need to improve upon this

in the future (Ogrinc et al. 2007). Other medical students were concerned about receiving inadequate preparatory didactic lectures prior to practice and felt that working in pre-selected groups was difficult (Levitt et al. 2012). Likewise, student nurses' attitudes were affected as they failed to establish the point of identifying and analysing problems if there was no opportunity for learning to be transferred to practice (Kyrkjebo 2006).

Clinical and Faculty Support

Enabling: Almost half the student nurses rated support from personal lecturers, practice educators or link tutors most helpful with a few attributing successes of their practicums to keen placement mentors (Baillie et al. 2014; James et al. 2016). Similarly, mentor support in practice was the difference between a developed or underdeveloped project for medical students. In the former, students managed to seek an actively engaged mentor throughout the project whereby regular face-to-face meetings and emails were facilitated by their communication (Levitt et al. 2012).

Impeding: In contrast, some medical students became frustrated with the difficulty in finding a mentor to guide their projects. They felt support was variable depending on the clinical area visited and that a disorganised environment hindered their projects (Levitt et al. 2012). Clinical areas appeared reluctant to allow medical students to implement significant changes (Skledar and McKaveney 2009), and one medical student 'felt like (they) were invading without permission' (Gould et al. 2002, p.1016). Similarly, mentors of student nurses lacked awareness of the projects, instead perceiving students' QI activity as threatening asking 'is there something wrong here?' (Kyrkjebo 2006, p.114). Student nurses rated insufficient resources (staff and time) in practice to be the biggest barrier (Baillie et al. 2014).

Academic mentorship was unsupportive, and low priority was given to supporting student nurses during participatory QI counselling sessions. Faculty staff were reported to lack QI expertise and unable to guide students, 'ugh not this again' was a comment made which may have reduced students' own motivations for the programme (Kyrkjebo 2006). Other faculty challenges related to lack of understanding of training content or working out the logistics of fitting the module into the curriculum without it feeling like an add on (Baillie et al. 2014; Ogrinc et al. 2007).

Information Provision

Enabling: Supporting materials such as workbooks were useful for student nurses and a list of topics and references to refer to helped pharmacy students select project ideas (Kyrkjebo 2006; Skledar and McKaveney 2009). Student nurses' clarity was enhanced through structured guidelines which reduced confusion, 'it was hard to feel overwhelmed or lost in the process' (James et al. 2016, p.75). Students were provided with exemplar work conducted by previous students, listening to real life scenarios and having access to mock examples of projects were all considered beneficial, as were small counselling groups, support sessions and Action Learning Sets for information exchange (Baillie et al. 2014; Kyrkjebo et al. 2001; Kyrkjebo 2006; James et al. 2016).

Impeding: Medical students considered their materials irrelevant and more appropriated to third year students which made the module vague and confusing (Ogrinc et al. 2007). A lack of clear concepts during introductory sessions led to student nurses having poor understanding of the task undertaken in practice and made it difficult to inform staff of what they were meant to be doing. Therefore, a need for more project examples by students were expressed (Kyrkjebo 2006; James et al. 2016).

Curriculum Balance

Impeding: Balancing the QI workload within the medical curriculum presented challenges causing faculty to question the efficiency of time given competing educational demands, or where schedules were already full (Gould et al. 2002; Levitt et al. 2012). Students and course leaders agreed there 'was no need to dedicate the amount of time required (for QI) during already harried sessions' and instead viewed these additional topics as 'extraneous' (Ogrinc et al. 2007, p226). Similarly, student nurses who do improvement projects rated time as the most hindering factor (Baillie et al. 2014). Time was a reason in another study they were told to work on projects only when more important tasks were complete (Kyrkjebo 2006). Students were expected to pick project topics in the first two weeks in practice, yet they expressed a need during that time to familiarise themselves with the environment and potential learning opportunities at hand (James et al. 2016). Other student nurses did not prioritise their QI education over subjects relating to pathology, nursing and examinations, or in the case of medical students, aspects of their careers that were seen as more pressing (Kyrkjebo 2006; Gould et al. 2002). Other issues raised that related to the curriculum was the duration of QI education being too lengthy, elongated sessions that could have been condensed, and

the impact of the projects being interrupted by holiday periods making it difficult to form groups and collect data (Levitt et al. 2012; Ogrinc et al. 2007; Skledar and McKaveney 2009; Kyrkjebo 2006).

Data

Impeding: Students lacked information about where to collect data, some perceived data to be tedious, uninteresting, boring or non-educational and irrelevant (Gould et al. 2002; Skledar and McKaveney 2009).

2.7 DISCUSSION

This integrative review set out to identify, describe and analyse approaches used to teach QI to pre-registration healthcare students, and establish the associated enabling and impeding factors. Collectively, ten studies were eligible. The quality of these studies had limitations like those reported by Windish et al. (2009) who conducted a systematic review of methodological rigour in QI curricula. The limitations encountered were poor QI educational intervention reporting, a lack of validated data collection tools and the use of restrictive evaluation methodologies. Therefore, a summary of the best available evidence is presented and discussed to provide rationale for the research questions answered in this remaining thesis.

Teaching Approaches

The approaches used to teach QI in pre-registration healthcare education included experiential learning, didactics, seminars, group work, e-learning and simulation. As expected, Kolb's (2015) experiential learning was most prevalent and consistent with previous research; as was the variety in quantity and content of didactic lectures (Boonyasi et al. 2007; Jeffs et al. 2013; Cresswell et al. 2013). However, only two studies reported their teaching approaches sufficiently for replication (James et al. 2016; Kyrkjebo 2006). The limitation of these studies continues to strengthen the evidence base for the need to develop a reporting standard in QI educational research (Windish et al. 2009). As previously discussed, SQUIRE guidelines report QI work in practice and SQUIRE-EDU relates to educational improvement generally, but neither cater for reporting QI educational interventions (Ogrinc et al. 2016).

A reporting guideline that acknowledges the complex dynamic between QI and education would be a useful area for future research. For instance, QI education comprises multiple interacting components which make it complex (Medical Research Council 2008; Skivington et al. 2021). Its components comprise the faculty, the learner, the teaching approach, the practice setting, the inter-professional team, the patient and the QI endeavour itself. Each component contributes equally to the educational programme's outcomes which are themselves complex (Jones et al. 2015). For instance, learners may be affected by their own intrinsic or extrinsic motivations, sense of value, or perceived acceptance from peers (Bengtsson and Ohlsson 2010; Levet-Jones et al. 2009). The practice setting is complex and constructed by the physical space, the psychosocial and interaction factors as well as its organisational culture (Flott and Linden 2016). It is acknowledged that the search for causality in educational research is in fact a quest 'to search for the holy grail' (Morrison and van der Werf, 2016 p.1), and is potentially why attributing teaching approaches to educational, behavioural or organisational outcomes is particularly difficult. While the focus of the thesis could be to develop a reporting guideline, the interest lay in exploring student nurses' experiences of QI in practice. Thus, it was regarded a post-doctoral activity.

Kirkpatrick Evaluation Model Outcomes

The review framed the analysis using the Kirkpatrick Training Evaluation Model (1967) and most studies reported outcomes at Level 1 (reaction) and Level 2 (skills, knowledge or attitudes). A reason could be that these outcome levels are easier for a faculty to evaluate. One validated tool determined skill acquisition (QIPAT-7), and one developed for knowledge assessment (QIKAT) (Levitt et al. 2012; Ogrinc et al. 2007). Although there is now a QIKAT-R which supersedes the original QIKAT version and asserts stronger validity and reliability, use of this tool would need to be evaluated in a larger sample across multiple disciplines before recommending its uptake more generally (Singh et al. 2014). As a result of reliable and valid tools not being available to measure Level 1 and Level 2, and with researchers in the field already developing this area (Levitt et al. 2012; Ogrinc et al. 2007), measuring skills, knowledge and attitudes was not the focus of the thesis. However, it is positive to see development in this area in recent years. Brown et al. (2019) have applied a rigorous approach in developing the 'Beliefs, Attitudes, Skills, and Confidence in Quality Improvement (BASIC-QI) Scale' and would be useful for faculty to examine its impact for future QI curricula on learners.

There could be a valid reason that no studies measured Level 3 (behaviour). For instance, learners require sufficient opportunity in their practice placements to allow their knowledge and skills to become what Lucas describes as routine habits of action, otherwise known as 'behaviours' (Lucas and Nacer 2015). However, no students or their behaviours were observed or reported in practice during the interventions or as registered nurses. The focus of QI behaviours might have been catalysed earlier, if professional bodies had clarified what competences students were expected to achieve pre-qualification. For student nurses, this clarity came later in the Nursing and Midwifery's education standards (NMC 2018), in which Quality and Safety appeared as a stand-alone domain comprising twelve improvement related competences. These standards are welcomed as a step to regulate and develop QI education across nursing faculties (Cresswell et al. 2013). However, QI behaviours remain a widely recognised gap in pre-registration education and will form the focus of this thesis.

Level 4 outcomes to improve patient care or processes is challenging to measure because the multiple components of QI education are not evaluated using designs which are able to capture the complexities. This review identified one study which improved a patient process using a pre/post questionnaire (Gould et al. 2002). This method is the antithesis of QI because it assumes a causal linkage between educational intervention and outcome and fails to recognise the role of context in practice (Bate 2014). Understanding context in QI is defined as 'anything not directly part of the technical QI process that includes the QI methods themselves and the clinical intervention' (Kaplan et al. 2010, p.502), and is a pre-requisite for establishing why success ensues in one setting and not in another (Bate 2014). No studies in the review considered contextual factors in the interpretation of their findings. Establishing which factors are related to faculty and practice, and which are modifiable is important for planning QI educational activities (Van Hoof and Meehan 2011).

Enabling and impeding factors

The review identified several enabling and impeding factors relating to the delivery of QI education and were similar to previous research. These included the teaching approaches, clinical/faculty support, information provision, curriculum balance and data (Tella et al. 2014; Cresswell et al. 2013). Exploring contextual factors was not an objective of this review. To advance QI educational research and examine contextual factors influencing QI education, it would be useful to draw upon the knowledge from

improvement science literature, such as leadership, organisational culture, change management, human factors, clinical engagement and evaluation (Greenhalgh et al. 2004; Kaplan et al. 2010). This area of research is timely and important to support faculty who continue to develop and evaluate QI curricula and has influenced this study.

Limitations of the Study

There were limitations to the review that should be considered. Firstly, due to limited resources and time, only articles in English were retrieved excluding those, should there be any, in another language. The review included studies that reported upon the use of predetermined improvement models as reported by Powell et al. (2009) and may have excluded worthwhile studies using alternative improvement approaches. For example, where students undertook audit as part of a larger improvement project, yet the details of which were not reported in the paper. However, the screening process did not identify any studies which indicated this. Further, the review did not capture innovation and design thinking approaches which should be considered in future research as these improvement methods become more prevalent in nurse education (Roddy and Polfuss 2020). Despite limitations, bias was to the greatest extent mitigated through adhering to the study protocol which enhanced the rigour of the research process and of the quality and reliability of evidence found.

2.8 UPDATE OF PUBLISHED EVIDENCE

To ensure the most up to date evidence continued to inform the direction of the research and uphold the production of novel and contributory research, QI and health professions education journal alerts were subscribed to such as Nurse Education Today and BMJ Quality and Safety. By re-running the searches regularly, attending conferences and collaborating on QI education research opportunities both nationally and internationally, engagement with the literature was maintained to identify new or unpublished studies. After repeating the search in 2020 and 2023 many new articles emerged which have been useful for discussion throughout the thesis. However, two met the inclusion criteria for the review and are detailed in Table 2.7 (Burnett et al. 2018; Inayat et al. 2023). These studies did not change the direction of the research but their contribution towards the thesis' research questions is briefly discussed.

Table 2.7 Update of Published Evidence

Table 2.7 Update of Published Evidence

Article	Discipline(s)	Teaching Approach	Kirkpatrick Outcome (s)/Methods	Learners	Model
Burnett et al. (2018)	Medicine	Classroom/simulation	Experience & perceptions (1)	2nd/3rd/5th Year	MFI/PDSA
		Experiential learning/4-week	Impact on care processes (4)	Medical students	
	(UK)	QI project/IHI practicum	Student focus groups (n=14)		
			Clinical/academic mentor interviews (n=8)		
Inayat et al. (2023)	Medicine	Didactic lectures, small	Skills, knowledge (2) and attitudes (1)	2nd Year	PDSA
		Group learning, Panel discussions	Pre/post student survey (n=108)	Medical Students	
	(Canada)	Independent learning/group	Mentor semi-structured interviews (n=11)		
		Group projects – IHI e-learning			

Both international studies (UK/Canada) evaluated QI education which comprised project work through experiential learning in practice. Second year medical students were included in both studies but also 3rd and 5th year students in the study by Burnett et al. (2018). In comparison with the review findings, Inayat et al. (2023) measured Kirkpatrick evaluation outcome at level (1) and (2), suggesting that improvements were identified in students' teamwork, ability to self-lead and their knowledge and attitudes. Burnett et al. (2018) reported upon level (4) which involved the impact on care processes from students' projects such as improvements in the use of TED stockings at 48–72 hours post-surgery from 60% to 70%.

In line with previous findings, the barriers to QI education in practice related to insufficient time and the facilitators included students receiving scheduled mentorship support. A notable difference in the findings related to medical students' experiences of autonomy. Inayat et al. (2023) reported that providing students with autonomy through student-led QI projects contributed to the success of the intervention. Whereas Burnett et al. (2018) reported that students' perceived lack of autonomy as a detriment to their success. The findings raise an important issue when examining QI education which relates to relying upon self-reported data. Burnett et al. (2018) mitigated these reporting biases by gaining multiple perspectives from the students and academic and practice mentors which is a strength of this research. Thus, students' perceptions of autonomy were able to be challenged by mentors who could justify that the staffs' reactions to students' independence to enact change had been misconstrued. These findings strengthen the argument to adopt methodological approaches that can capture the complexities and multiple experiences of QI education in practice. Inayat et al. (2023) recommend undertaking longitudinal research to determine a better understanding of students' QI behaviours (level 3) and to ascertain whether students remain engaged in QI as registered practitioners.

2.9 EMERGENCE OF RESEARCH QUESTIONS

The findings from the integrative review have influenced the study's research questions. Experiential learning is a well-recognised QI teaching approach within pre-registration education. However, no studies have explored the practice settings are which students perform QI or the contextual factors which influence their QI learning experiences. Bandura's Social Learning Theory (1977) asserts that learners' experiences in social settings shape their attitudes and behaviours, meaning that exploring the practice

environment in which students engage with QI is fundamental to understanding how and why they experience QI education as they do. Further the review, and the wider literature continues to identify the need to establish whether students continue to engage with QI post-registration (Burnett et al. 2018; Robinson and Gelling 2019; Inayat et al. 2023).

To address the gap in knowledge and contribute new findings to the field of QI educational research and practice this thesis will answer the following questions:

1) What contextual factors influence the QI learning experiences of third year student nurses in the practice setting?

2) How do these contextual factors interplay throughout the QI learning process and across different practice settings?

3) Do student nurses continue their QI engagement as registered nurses and what are the influencing contextual factors?

2.10 SUMMARY

This chapter has presented the findings of an integrative review examining the research literature around the teaching methods used in QI education in the pre-registration population and the associated barriers and facilitators experienced by faculty, practice and QI learners. It highlights the gap in studying student nurses QI behaviours which has shaped the research questions of the thesis. The questions are contemplated in the next chapter to determine the most effective methodology to adopt to answer them.

Chapter 3 Study Design, Methodology and Research Methods

3.0 INTRODUCTION

This chapter explores why a qualitative research approach across two phases was best suited to answer the study's research questions, and it explains how methodological decisions were influenced by my own philosophical assumptions. It concludes that in Phase One, ethnography was the most appropriate methodology to generate new knowledge of student nurses' quality improvement (QI) learning experiences within and across practice settings, and in Phase Two, semi-structured interviews were appropriate to determine if they remained engaged in QI once qualified. The study context is described, and the methods employed during the study, as well as my positionality and conduct are narrated through a reflexive approach. The chapter closes with an outline of how the findings are presented in Chapter 4, 5 and 6. Firstly, and to reiterate, the study's research questions are:

1) What contextual factors influence the QI learning experiences of third year student nurses in the practice setting?

2) How do these contextual factors interplay throughout the QI learning process and across different practice settings?

3) Do student nurses continue their QI engagement as registered nurses and what are the influencing contextual factors?

3.1 RESEARCH APPROACH

Qualitative Research

A qualitative approach was chosen to answer the study's research questions. Research theory and practice is said to offer many interconnected 'tendencies, rather than definitive points of correspondence', meaning decision-making was not linear or easily determined (Bryman 2016, p.32). However, for simplicity they are discussed as such in this chapter.

Qualitative research is described as 'an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem' (Creswell and Creswell 2018, p.4). The approach is not prescriptive but is often discussed this way to classify social research methods and practice (Bryman 2016). Qualitative research is discussed

simultaneously (and in contrast) to quantitative research, described as 'an approach for testing objective theories by examining the relationship among variables' (Creswell and Creswell 2018, p.4). The discourse used in each, is characteristic of the approaches themselves, with 'quants' frequenting terms like statistics, hard data, prediction, formula, chart, number, independent variable and control, and 'quals' using terms like narrative, stories, context, interdependent, description, word, feeling and meaning (Patton 2015, p.87).

Through examination, a qualitative research approach was appropriate to answer the research questions. The study was to focus on exploring how contextual factors in the social setting influenced student nurses' QI learning experiences; it was not to test a theoretical notion or explore dependant variables, as in quantitative research (deductive). 'Quant' researchers explore variables by means of experimentation and use validated data collection instruments that result in quantities, frequencies, intensities, and amounts (Denzin and Lincoln 2017). Equally, Chapter 2 revealed that evaluation instruments have been unfit for purpose in QI education studies, meaning quantitative research was counter-intuitive and the purpose was to create new knowledge and value within the field (Armstrong et al. 2017). Consequently, qualitative research offered an opportunity for me to assert a greater degree of control when collecting data in person. Qualitative research was known to add value in answering the 'what' questions, synonymous to both 'quant' and 'qual' approaches but also the 'how' questions associated with qualitative research in which findings emerge from the data itself (inductively) (Denzin and Lincoln 2017).

Philosophical assumptions

Paley and Lilford (2011) argue that qualitative and quantitative approaches are merely a selection of tools by which research activity is undertaken. However, many authors acknowledge the need to delve deeper to identify the right tool to address a research problem or gap (Bryman 2016; Patton 2015; Denzin and Lincoln 2017; Corbin and Strauss 2015). Originally, it was understood that numbers and words were equally accepted forms of measurement resulting in 'outputs of a causal interaction between the world and an instrument, such as a thermometer measures temperature and an interview measures experience, attitudes, and beliefs' (Paley and Lilford 2011, p.957). But progressively, I acknowledged the deeper complexities that could influence each research decision. Patton (2015, p.87) refers to this insight as the 'radical middle', whereby oversimplified stereotypes are exceeded in favour of different researchers' values. He asserts that this understanding is

part of our ‘methodological heritage’, which should be embraced when exploring the different values that influence a study’s research methodology.

This section deliberately adopts the term ‘philosophical assumptions’ to encompass all the research ‘tendencies’ to be discussed (Bryman 2016, p.32). It is the theoretical positioning from which researchers make choices about the world and the nature of research. Terms to describe research beliefs in the literature comprise worldview, stance, perspective, and theory. Denzin and Lincoln (2017) use the term ‘paradigm’ and elaborate that it combines the concepts of epistemology, ontology, and methodology. Thomas Kuhn, a philosopher of science, in his seminal text ‘The Structure of Scientific Revolutions’ (Kuhn 2012), adopts this term to argue the differences between the natural and the social sciences. However, the term ‘paradigm’ has been criticised by qualitative experts who suggest it has become a victim of word inflation and lost its meaning (Holloway and Galvin 2016). Semantics aside, Denzin and Lincoln’s (2017) and Kuhn’s (2012) interpretation of ‘paradigm’, that being a theoretical position to make research decisions, aligned more to the research approach of this study. However, by considering Holloway and Galvin’s (2016) expert opinion, ‘philosophical assumptions’ was chosen to explore the different theoretical positions.

One theoretical position underpinning qualitative and quantitative approaches is the existence of the social and natural (or physical) sciences (Kuhn 2012; Bryman 2016; Creswell and Creswell 2018; Denzin and Lincoln 2017). In the former, qualitative research aims to *understand* individuals’ perspectives in the constraints of their everyday social world; it contrasts with the latter in which quantitative research in the natural (or physical) sciences abstract from the social world, to *explain* it (Denzin and Lincoln 2017). To that end, the research aligns to the social sciences because the enquiry focuses on understanding the student nurses’ perspectives of their QI learning experience in their everyday practice and social setting.

Another theoretical position, stemming from an epistemological stance lies in how social scientists and the natural (physical) scientists accept the production of knowledge. Central to the debate is the applicability of positivism and interpretivism (Bryman 2016). Traditionally, positivists sit in the natural (physical) sciences, associate themselves with quantitative approaches, and assert an absolute truth of knowledge exists (Denzin and Lincoln 2017). One exception lies with the post-positivist researchers, who challenge the absolute truth theory in favour of realism. Both proclaim broadly similar *effect* and *outcome*

orientations, but post-positivists argue that only an approximation of truth exists and focus more on the mechanistic factors that determine outcomes, as opposed to the outcomes themselves (Creswell and Creswell 2018).

Interpretivism is related to people and institutions which align to the social sciences. The interpretivist view encompasses theological and sociological terms such as hermeneutics and verstehen which Bryman (2016) simplifies as the interpretation of human interaction and meaningful understanding. Patton (2015, p.136) specifies that it 'provides a theoretical framework for interpretive understanding, or meaning, with special attention to context'. This interpretivist position aligned to the study because student nurse interactions and interpretation of those interactions within their practice placements would require attention to their local environments. Patton (2015) links hermeneutics to the philosophical tradition of phenomenology, where it is believed that meaning arises from and within social reality by those living, being and acting within it. Until now, researchers have not studied what it means for student nurses to learn about QI from within their own social reality, and so through this lens its value was identified to 'gain access to peoples common sense thinking and interpret their actions and their social world from their point of view' (Bryman 2016, p.30).

Interpretivist epistemology is also associated with symbolic interactionism. This tradition stems from social psychology in which it is believed that 'people create shared meanings through their interactions, and those meanings become their reality' (Patton 2015, p.133). The term 'symbolic interactionism' was coined by a sociologist Herbert Blumer in 1969 who built upon the theories of his predecessor George Mead, arguing that meanings created within society are shaped by individuals' communications and interactions, and subsequently further by the interpretation of *those* communications and interactions (Blumer 2022). It was believed that symbolic interactionism could offer a useful theoretical 'tool' to guide, but not restrict, the line of analytical enquiry in this study and account for the multiple perspectives and realities that exist.

Accepting that multiple realities exist, which are created through the subjective perceptions and actions of individuals, is called one's ontological perspective. Ontology is the last theoretical position to be discussed and differentiates qualitative and quantitative approaches through understanding what determines a social entity (Bryman 2016). Epistemological beliefs question the nature of knowledge production, but ontological beliefs question 'what

things are' through a constructivist lens or an objectivist lens. Constructivists assert an interpretative stance as qualitative researchers who believe that social entities are a construction of individuals' interpretations and are subject to a state of flux. On the other hand, positivist quantitative researchers adopt an objectivist view, believing social entities have an objective reality external to individual influence (Bryman 2016). Given QI education is complex and socially constructed in which multiple components exist at many levels of the system, the objectivist view was contested in favour of constructivism for the purpose of this study (Greenhalgh et al. 2004).

To recap, epistemological beliefs question the nature of knowledge and ontological beliefs question what things are. Choosing qualitative research to understand the QI learning experiences of student nurses in practice, and as registered nurses, has been influenced by the different research positions. Through an interpretative epistemology, student nurses' experiences in this study were interpreted from their perspectives and interactions within their everyday social setting to explore the contextual factors influencing their QI learning and later engagement in QI activities. Using a constructivist ontological lens, the objective was to highlight the complexity and diversity associated with student nurses' QI learning experiences and determine how contextual factors interplay throughout the learning process, across different practice settings and in their future practice. To achieve this, Denzin and Lincoln's (2017) notion of the term 'paradigm' which comprises the methodological approach is discussed next.

3.2 METHODOLOGY

Methodology refers to 'how we know the world or gain knowledge from it' *(*Denzin and Lincoln 2017, p.22). These beliefs are moulded by the views that arise within and across different disciplines. Seale et al. (2007, p.8) offer a lay description of methodology, that being a 'framework that structures the research topic and guides researchers in concrete terms during the research process'. Creswell and Poth (2017) identify these frameworks as ethnography, narrative phenomenology, grounded theory, and case study. Seale et al. (2007, p.9) goes on to conclude that 'instead of forcibly applying abstract methodological rules to contingent situations, the research situation should be placed in a position of dialogue with methodological rules.' To embrace this dialogue, consideration was given to *how* the research questions would be answered, by taking account of the overlapping elements of

qualitative approaches. Common principles were identified and deemed valuable, but ethnography offered a framework to answer the questions, comprehensively.

Ethnography

> '… involves participating, overtly or covertly, in people's daily lives for an extended period of time, watching what happens, listening to what is said, asking questions – in fact, collecting whatever data are available to throw light on the issues that are the focus of the research…'
>
> (Hammersley and Atkinson 2019, p.1)

Ethnography was selected to explore the QI learning experiences of student nurses in the practice setting because its central claim is to know and understand human behaviour within the cultural context in which it occurs (Brewer 2000; Delamont 2016, Madden 2023). Although narrative research also focuses on context, it was not suited to this study since it focuses on individual stories and experiences rather than embracing the wider meso and macro level factors. While generalisation is not a priority in qualitative research, ethnography encompasses larger samples which were required to develop a broader description of how student nurses as a cultural group experience QI education in the practice setting and beyond.

Creswell and Poth (2017) explain that, like ethnography, phenomenology is associated with developing common lived experiences; only *its* objective is to produce the 'essence' of a concept; for example, leadership. Limitations to using this enquiry existed as the interest remained in exploring *several* contextual factors influencing student nurses' QI learning experiences. Like ethnographers who engage with a theoretical framework to guide (but not restrict) their enquiries; a grounded theory approach was neither appropriate. At *its* core there is a unified theoretical explanation developed and grounded from within the data itself. Facets of grounded theory were relatable; however, theory development was not the sole intent of the study (Glaser and Strauss 2017; Charmaz 2024). It was rather, to explore the cultural group and understand how the social system worked. To this end, Rober Stake's (2015) case study approach was useful, but only to determine the boundaries of '*what'* was to be studied. Overall, an ethnographic methodology approach aligned best to the research questions and philosophical beliefs underpinning the research.

Ethnography stems from 'naturalism' and is associated with verstehen. This term means interpreting and understanding human behaviour in the same manner as those being studied (Hammersley and Atkinson 2019). In the early 20th century, traditional ethnography was rooted in British anthropology. Researchers like Bronislaw Malinowski travelled afar to the 'exotic' Trobriand Islands in pursuit of capturing the 'strangeness' of primitive cultures enacting the Kula ring in his seminal text 'Argonauts of the Western Pacific' (Malinowski 2013). Ethnography has roots in sociology too, where researchers such as Nels Anderson from the Chicago School of Sociology studied the culture, language, and life experiences of the homeless - in his work of 'The Hobo' (Anderson 1925). Later, the methodology entered healthcare education inspired by sociologist, Howard Becker, who capitalised on its value to study the complexities of medical training in 'Boys in white: student culture in medical school' (Becker 1961).

Today, modern sociologists such as Dixon-Woods (2003) has catalysed ethnography in healthcare improvement research, arguing that it allows us to 'probe into areas where measurement is not easy'. However, there is a degree of critique in this argument. While some healthcare professionals agree that sociologists and healthcare improvement practitioners share the same interests in context, they argue that ethnography provides only a description and critique *of* healthcare contexts, as opposed to describing and feeding-back *for* healthcare contexts (Leslie et al. 2014). Some healthcare professionals advocate for timelier input from rapid data collection to progress healthcare improvement initiatives. However, it could be said that sociologists and healthcare professionals add equal value to the healthcare improvement agenda. The differences lie in the objectives of each discipline in that sociologists tend to conduct healthcare improvement research while healthcare professionals undertake healthcare improvement practice (Leslie et al. 2014).

This debate highlights the importance of considering the use of different approaches to ethnographic research in healthcare improvement. Traditional ethnography is rooted in anthropology and sociology and involves long-term immersion in the field to produce a 'thick description' and analysis of the culture (Geertz 1973; Hammersley and Atkinson 2019). However, ethnographic research has had to adapt significantly to reflect modern research contexts, particularly in education and healthcare improvement. Cupit et al. (2021) argue for the value of 'focused' ethnographies in healthcare settings which are more targeted in scope and duration. This approach is not to be confused with 'institutional' ethnography which is used to explicitly study system structures, organisational discourse and power

relations (Smith 2005). Instead, 'focused' ethnography has a clearly defined research question and retains the core principles of traditional ethnography such as its commitment to context, reflexivity and understanding the emic perspective. The adaptation lies in its flexibility to allow researchers to focus on a specific phenomenon within bounded contexts through intensive data collection over shorter periods (Black et al. 2021). Similarly, the need for timely, actionable insights in healthcare improvement identified by Leslie et al. (2014), has led to the emergence of 'rapid ethnographies' which too are conducted in shorter periods. This approach though condenses the traditional ethnographic process through quick iterative team-based data collection and constant feedback with stakeholders (Vindrola-Padros and Vindrola-Padros 2018).

My own study in this thesis leans towards a focused ethnographic approach which draws upon the principles articulated by Cupit et al. (2021) and Black et al. (2021) but maintains the interpretivist and constructivist underpinnings of traditional ethnography. This approach was appropriate for several reasons: firstly, the study sought to understand how student nurses experience and engage with QI in real-time practice settings. The QI Practicum occurred within a bounded timeframe of the academic calendar, and thus focused ethnography enabled a more concentrated period of data collection without sacrificing depth or reflexivity. Secondly, my prior experience as a student nurse in the same setting aligned to focused ethnography because I could bring a valuable emic perspective and enhance rapport and contextual understanding to the study which is a key feature of focused ethnography (Madden 2023). And lastly, my research questions were specific to student nurses and the influence of contextual factors in the QI learning experiences, which kept the scope of the study within narrower parameters than that of traditional ethnography (Hammersley and Atkinson 2019).

Ethnography employs data collection methods such as observations, document analysis and interviews (Hammersley and Atkinson 2019; Brewer 2000; Delamont 2016, Madden 2023). Its signature method is observation in which researchers are immersed in their participant's day-to-day lives to produce a 'thick description' of why and how social systems work as they do, and to represent the emic perspective of participants (insider's point of view) through the etic perspective of themselves (outsider's point of view) (Geertz 2017; Fetterman 2019; Agar 1980). This process is known as fieldwork and characterises ethnography. Researchers enter native environments, sometimes for several years, to understand people and behaviours in their real-world constraints and contexts (Fetterman

2019). Understanding context is fundamental to studying healthcare improvement and ethnography enables researchers to become embedded in the social setting. Regular presence assists in identifying contextual factors that otherwise might be missed (Bate 2014; Kaplan et al. 2010). Observational data collection has been reported in previous research of QI nurse education (Baillie et al. 2014); however, these observations are conducted away from the students' natural practice setting in which they undertook their QI project. Fetterman (2019, p.18) emphasises that to interpret a cultural group, 'the ability to describe what the researcher heard and seen within the framework of the social groups reality' is imperative. Therefore, observation was central to answer the research questions, and to achieve the ethnographic objective which is to 'disclose the social world as it truly is' (Brewer 2000, p.38).

Ethnographers disclose the social world and aim to describe the values, beliefs, language, motives, intentions, and behaviours of a cultural group (Hammersley and Atkinson 2019). Thus, ethnography was optimal to address the research gap around students' QI actions and capture the 'more predictable patterns of human thoughts and behaviours' (Fetterman 2019, p.1). Developing behaviours, or 'routine habits of action' as Bill Lucas calls them in his report 'Habits of an Improver' is fundamental for students' to translate QI knowledge to the practice context (Lucas and Nacer 2015). If attention, through observation is applied to the settings in which students undertake QI learning, then appropriate meanings can be attributed to their experiences and behaviours (Kaplan et al. 2010).

The remainder of this chapter will explain the conduct of the research process and the methods applied during the study. First, the quality of qualitative research is discussed.

3.3 QUALITY IN QUALITATIVE RESEARCH

Corbin and Strauss (2015, p.341) discuss that quality is difficult to define because 'little consensus about what constitutes an appropriate evaluation criterion for qualitative researchers' exists. Traditionally, positivists steered the debate, arguing their own measurable scientific criteria upon qualitative researchers, who refute the approach and defend that it contradicts interpretative views and the nature of qualitative research (Pope and Mays 2019). Quality criteria should be determined on each side of the division accordingly, as Seale (2007) suggests that research quality is a subjective interpretation of the audience's perceptions. This study in this thesis intends to appeal to both sociologists and practitioners with differing views, and so it was imperative that the concept of quality

was explored and aligned to the individuality of the study, rather than to select one of the (too) many prescriptive frameworks that exist (Dixon-woods et al. 2004).

Broadly, quality (or rigour) refers to the transparent process through which researchers abide, and in which the credibility of the study is determined through the validation of its findings (Seale 2007). To that end, what Dixon-Woods et al. (2004, p.224) refer to as 'universal features' was helpful, in that they combine concepts to offer researchers prompts to use during quality appraisal. The prompts are:

- Are the research questions clear, and suited to qualitative inquiry?
- Are the following clearly described, and appropriate to the research question?
    - Sampling
    - Data Collection
    - Analysis
- Are the claims made supported by sufficient evidence?
- Are the data, interpretations, and conclusions clearly integrated?
- Does the paper (research) make a useful contribution?

(Dixon-Woods et al. 2004)

These prompts were invaluable to facilitate a critical 'voice' during the research and writing process, and to express and produce a transparent and credible study. Guba and Lincoln (2017) state that to achieve this 'voice' in qualitative research, writing practices such as narrativity and reflexivity are essential and are discussed later. Firstly, the criteria underpinning the 'universal features' recommended by Dixon-wood et al. (2004) is discussed alongside the overlapping concepts which are clarified.

In qualitative research, trustworthiness and authenticity are favoured over objectivist measures such as validity and reliability (Creswell and Creswell 2018). The divide in this perspective is not easily discerned and some authors are attentive in drawing parallels between the terms to illustrate their shared meanings (Lecompte and Goetz 1982; Seale 2007; Creswell and Creswell 2018). There are some quantitative researchers who continue to defend a single shared meaning in quality appraisal (Majid and Vanstone 2018). These positivist researchers are guided by construct validity (does the measure reflect the concept

being measured), internal validity (does the independent variable truly cause the variation) and external validity (are the results generalisable beyond the study's context). Likewise, they consider internal reliability (is there confidence in whether a measure is stable without fluctuating, and do results remain consistent) and external reliability (the degree by which the study can be replicated) (Bryman et al. 2008).

An exception is identified by Creswell and Creswell (2018, p.201) who adopts the terms 'qualitative validity' and 'qualitative reliability' to discuss interpretative analysis which have different connotations. He suggests that validity in qualitative investigation refers to the procedures used to check the accuracy of findings, and reliability is the consistent approach applied by researchers within and across studies. To understand the shared meanings, LeCompte and Goetz's (1982) translation of validity and reliability was useful as they convert positivist definitions to relatable meaning for qualitative investigators. These translations offered a common language to use while identifying some of the key similarities between principles of trustworthiness, which in qualitative research include credibility, transferability, dependability, and confirmability (Bryman et al. 2008). These principles are elaborated on within Table 3.1 which includes LeCompte and Goetz's translations of the positivist concepts. Tabulating the overlaps in quality perspectives enabled transparency about the interpretations of quality, and as such, is displayed below.

In conclusion, a singular approach to appraising quality was not selected based on the knowledge that over 100 quality appraisal tools exist (Dixon-Woods et al. 2004). Rather note was taken from the experts, and their prompts were used as a quality framework to remain critical at each stage of the research process. The philosophical debate around quality continued to form interpretations during the study to ensure the research practice undertaken was upheld to the highest quality. Two key strategies used to promote quality across the research study included triangulation and reflexivity.

Table 3.1 Quality in Qualitative Research

LeCompte and Goetz's' (1982) Translation	The study's interpretation of quality	Trustworthiness principles
External Reliability The replication of a study is difficult in qualitative research but can be achieved through adopting similar social roles and settings as the original study.	To achieve quality this study upheld meticulous recording of the steps taken during the research process, and the setting and researcher's role is well described to enable others to make judgements and/or replicate the study.	Dependability The replication of a study requires that researchers detail the research process which is presented in an accessible format to allow for scrutiny and audit.
Internal Reliability Relates to the nature of what is being observed. For example, ensuring measures and agreement about what is seen and heard is reached.	To achieve quality, I adopted strategies and techniques to ensure personal experience and values did not influence the research conduct and remained clear about how potential bias was reduced.	Confirmability Researchers must have acted in good faith not to allow personal bias to influence the conduct of research, and is explicit in how they achieve objectivity per se.
Internal Validity The legitimacy of claims made from observations to theoretical notions, which is a key strength in qualitative research through prolonged time in social settings.	To achieve quality, I acted fairly and lawfully and used strategies and techniques to maximise understanding of the student nurses' experiences and became embedded within the social world at length.	Credibility The legitimacy of the findings through fair representation, and measures taken to confirm understanding of the social world.
External Validity The degree to which the findings from one social setting can be generalised to others is less a focus due to case studies and small samples.	To achieve quality, the depth of context within the study's findings was imperative to allow the audience to determine if they are applicable to and beyond the settings of the study.	Transferability Thick descriptions of the context and rich accounts allow the audience to judge how findings translate to another setting.

(LeCompte and Goetz 1982; Bryman et al. 2008)

Triangulation

To represent student nurses' experiences fairly and to uphold transparency and robustness, or credible or valid, a qualitative research design underpinned by triangulation was chosen. This strategy enhances rigour using multiple methods and/or sources of data at various points in the research process to study a social phenomenon (Flick 2018; Creswell and Creswell 2018). Originating from within land surveying, the quantitative term refers to measuring a location from two separate points to test measurement validity (Flick 2018; Patton 2015). In

social research, Fetterman (2019) claims that interpretivist philosophical assumptions contest that a single location (reality) exists and as such triangulation, as validation, is not possible in the event of multiple realities. In contrast though, he defends that the quality of data is always enhanced through 'testing one source of information against another to strip away alternative explanations' (Fetterman 2019, p.93).

Denzin and Lincoln (2012) offer four categories to which triangulation relates in qualitative research which include theory, investigator, methodological and data. These categories were useful to consider the triangulated approaches adopted in this study:

Theoretical	Multiple perspectives were taken from improvement science and pedagogical theories to construct research questions, and to interpret data during analysis.
Investigator	Analytical bias was reduced by selected transcripts being read by supervisors and coding/themes checked against their interpretations of the data.
Methodological	Ethnographic methodology used multiple methods: observations, interviews and document analysis to study a single problem.
Data	Various data sources used such as field notes, transcripts, emails, student assignments, newsletters, annual reports, websites, photographs and patient feedback.

Triangulation offers greater 'opportunities for deeper insight into the relation between the inquiry approach and the phenomena under study' (Patton 2015, p.316). To identify the benefits of triangulation within this study, and for its quality to be externally judged, Guba and Lincoln (2017) recommend incorporating reflexivity.

Reflexivity

Reflexivity has been adopted within sociological, anthropological and feminist traditions and is referred to as the 'ethnographic self' or 'ethnographic presence' (Marcus 1998; Coffey 1999; Fetterman 2019). Reflexivity is described as a reflection of the researcher's location in time and social space which necessitates sensitivity towards the cultural, political and social contexts (Bryman 2016). Here, 'in-depth experiential, interpersonal, interdependent and interacting' researcher's experiences are deliberated (Patton 2015, p.70). However, the

term ‘reflexivity’ has been overused in recent years which has prompted authors to re-iterate the implications of engaging with its process as a token measure (Pink 2007). For instance, the absence of reflexivity can act as a barrier to replicating the original context of a study. It can expose the intellectual rigour of the researcher, and thus the credibility of the study overall (Corti and Thompson 2004; Patton 2015).

Reflexivity was therefore an essential strategy to use to articulate learning and demonstrate research quality. That said, a fine line exists between how researchers achieve a reflexive narrative without being over dominant. Fetterman (2019, p.125) encourages reflexivity to be ‘artfully crafted’ to avoid narcissism. He suggests embedding ‘self-portraits’ explicitly and implicitly during the study to consider how roles, values, backgrounds, biases and experiences have shaped the enquiry and findings.

Therefore, I remained cognisant of how my own roles and experiences could contaminate the research from study conception to the final writing up stage of the thesis.

Role of the researcher

Acknowledging the researcher’s role is key in the reflective process of qualitative research. My roles included being a teaching assistant, a post-graduate researcher and Lecturer of Nursing. To mitigate bias, a process of introspection through ‘self-portraits’ is recommended by Fetterman (2019, p.125). Therefore, to demonstrate how my roles influenced the direction of the study is provided next.

At the start of this research, I engaged with study participants through an emic (insider) lens. I already held knowledge about some of the topics presented in this thesis and had personal experience of undertaking a QI project as a student nurse. This meant that I gained an early sense of belonging into the group I was studying which was essential to ethnographic research. To a degree, study participants probably felt at ease with me observing them in practice because they viewed me as a newly qualified nurse and a post-graduate research student. I believe my influence within these positions enabled the study participants to be more transparent about the different aspects of their QI learning experiences and enriched the study findings. Had students been interviewed by those holding more senior roles such as nursing lecturers or senior nurses, they may have been less willing to share their realties due to the power relations that can be perceived by participants during interviews and focus

groups. However, in hindsight, my initial position as a student nurse also carried with it a bias that QI education involved an 'us' (student) versus 'them' (healthcare staff) dichotomy.

As the research progressed, my position as a clinical academic quickly alerted me to my biases. My vantage points had become broader as I gained different perspectives of teaching QI through MSc programmes and continuous professional development courses (CPD). This new position informed me of the greater challenges that existed around QI education such as there was a drive to teach healthcare staff but also a lack of capacity and capability to support its implementation. Similarly, my philosophical beliefs were being shaped by my research training, and I began to develop my thinking. My naive and unconscious beliefs that a single truth existed (positivist) moved towards an understanding that multiple truths could be determined (interpretative), and I become more empathetic to other staff involved in QI education. This was a pivotal moment in my research journey, and I began to feel more confident to apply objectivity to my own experiences and thoughts. Looking back, my position as a clinical academic was beneficial as it allowed me to create just enough distance between me as the researcher and the participants to gain an equal etic (outsider) lens for the study. Further, my triangulated perspective guided my research questions which then encompassed a more holistic lens to ensure learning from the study would be useful for all involved. During data collection and analysis, interpretation of my thoughts and beliefs were critically challenged by my supervisors. One supervisor was not trained in QI or in nursing and the other was a QI nurse expert which was beneficial in prompting perspectives from both the inside and outside. To that end, I understand that the ethnographic account of student nurses QI learning experiences in this thesis is only one interpretation, and I acknowledge that alternative versions of this phenomenon will exist.

Phase One

3.4 ETHNOGRAPHIC LOCATION

This section describes the study site (the hospital) and settings chosen for the research. It recaps on the QI Practicum and explains the ethical process and gaining access to the site.

Context

At the start of the research process, three academic campuses belonged to the University alongside their partnering NHS health boards: one in central Scotland, one in the north of Scotland and one in the Outer Hebrides. In all locations, third year student nurses (n=230)

were exposed to the same QI curricula and would conduct a QI project at one of 200 practice placements across Scotland. Access to three sites offered an opportunity to undertake a multi-site ethnography, however, this approach would have needed a larger research team to travel between distant sites (Leslie et al. 2014). The excessive travelling for a sole researcher was not an efficient use of time and would be counterproductive to creating the 'thick description' of the settings in which students undertook their QI projects. Further, the institution was about to embark on organisational restructuring that would result in the two northern campuses merging with a new university. The primary setting for the research therefore remained the central campus and is the reason this location was selected to undertake the ethnographic study in Phase One.

Study site

The research study was undertaken in central Scotland between February and April 2016. The ethnographic site was an acute hospital hosting a variety of acute practice settings (n=25). Funding was provided by the University of Stirling for the study and supported by their partnering NHS health board serving a population of around 300,000. I had trained to be an NMC registered adult nurse at this site and was 'native' to the culture (Fetterman 2019). Being in a familiar location when undertaking observations was understood to help mitigate the need for a longer period of preliminary socialisation during ethnographic research and was advantageous given the time limitations for data collection (Murchison 2010). The hospital site acted as an appropriate hub in which the different settings that students enacted QI within could be accessed in proximity. Further, my 'insider' status enabled cultural experiences to be drawn upon from my own time there as a student. For example, knowing where student nurses congregated during breaks influenced and maximised data collection opportunities. This emic perspective allowed me to engage in casual conversations immediately and enable the early thoughts and feelings of students to be captured about their QI learning experiences (Fetterman 2019, Madden 2023).

The Quality Improvement Practicum

As discussed in Chapter 1, the QI Practicum was the academic assignment that third-year student nurses completed during their penultimate practice placement. The assignment required a small-scale QI project to be undertaken during a period of eight weeks and its purpose was for students to apply their QI knowledge in practice and learn the practicalities of doing QI, rather than to demonstrate measurable or sustainable improvements. The assignment format was based on the Institute for Healthcare Improvement's (IHI) Practicum. Faculty had developed their own version by adapting and aligning its contents most

appropriately to the faculty's processes and placement structures. The development process engaged stakeholders such as academics, clinicians, health board leaders and student volunteers who trialled elements of the QI assignment over a 20-month period. The implementation process is detailed elsewhere in a feasibility study (James et al. 2016).

Student nurses developed their QI knowledge during their degree by undertaking e-learning modules developed by the IHI, and this learning was supplemented with didactic lectures and group workshops. Prior to students' penultimate placement in third year, five-weeks of QI theory, engagement with podcasts and lecturer support was provided. The full QI curriculum is detailed in Table 3.2. Preceding students' placements, newsletters were emailed to teachers, clinicians and nurse leaders to raise awareness of student nurses undertaking a practice-based QI assignment. A support guide was created for all nursing mentors which students were to provide them with on the first day of placement. The assignment was structured into four stages and students were to develop a 4,500-word project report which was subsequently submitted for a summative assessment:

1. Identification of a project and seeking agreement to it
2. Preparing a plan for the project (including a measurement plan)
3. Testing an aspect of the project with at least two PDSA cycles; and
4. Writing a project summary report, including evaluation and reflection

Table 3.2 The QI Practicum Intervention

Semester	IHI open school courses	Teaching
1.		Person/Patient Centred Care Introduction to the concept of quality in healthcare Example of quality initiatives in action – Scottish Patient Safety Programme
2.	QI101 Fundamentals of Improvement PS100 Introduction to Patient Safety PS101 Fundamentals of Patient Safety	QI Questions in MCQ Exam Evidence-based learning
3.	PS102 Human Factors and Safety PS103 Teamwork and Communication QI102 The Model for Improvement: Your Engine for Change	Evidence informed practice Quality Improvement Model
4.	QI103 Measuring for Improvement QI104 Putting it All Together: How QI Works in Real Health Care Settings QI105 The Human Side of QI	Improvement and Safety QI Questions in MCQ Exam Practice-based Assignment – Care Partnerships Care Study
5.	QI106 Level 100 Tools	Tools for Quality Improvement
6.	PS104 Root Cause and System Analysis PS105 Communicating with Patients after Adverse Event	Decision-making Evidence for Practice Resources for Practicum online
7.	PS106 Introduction to the Culture of Safety L101 So You Want to Be a Leader in Health Care	Podcasts × 2 Introduction to Practicum Practicum: Essential Skills Workshop Preparing to work at SCQF level 10 Practicum Assignment Q&A Resilience Workshop
8.		Collaborative Improvement Project (Practicum) Practice events Online/email/telephone/interview/workshop support Reading week

(James et al. 2016)

Ethical approval

From the start of the ethics enquiry to gaining access to the study setting, it took approximately one year (2nd February 2015 to 27th January 2016). The University of Stirling's Research Ethics Committee (SREC) approved the study on the 7th of December 2015 (see Appendix 4). The research study was underpinned by principles from the Data Protection Act (1998) and conducted in accordance with the Central Scotland's Code of Good Research Practice and NHS Code of Confidentiality (2010). It was agreed that identifiable data obtained from the practice settings, staff and students would be protected using pseudonyms, not be excessive, be processed fairly and lawfully, obtained only for the purposes of answering the research questions, not be divulged with any unauthorised persons (outside of the supervisory team), and stored securely in a locked filing cabinet and office. A Letter of Access was granted on the 27th of January by the health board's research and development department; one week prior to students arriving at placement on the 8th of February 2016 (see Appendix 5, 6 and 7).

Negotiating site access

Negotiating access to the ethnographic site was an ongoing process prior to starting recruitment. To engage potential study participants multiple strategies were agreed:

1. Relationships built with four Senior Charge Nurses (SCNs) during my time as a student nurse was advantageous and I emailed them to seek expressions of interest, all of which indicated an interest pending ethical approval.

2. Placement faculty co-ordinators were contacted by me to identify settings hosting a high capacity of students so that interactions could be maximised in one setting at a time. From six SCNs phoned at their wards, three indicated an interest.

3. Face-to-face conversations with the QI Manager in the health board yielded contact details of two SCNs who held opposing views about students being involved in QI. Both SCNs were emailed a study outline but neither responded.

4. Permission to attend the SCNs monthly meeting to discuss the study was requested but declined. The chairperson assured the study outline would be shared on the 2nd of September 2015, but no expressions of interest were received after this meeting.

5. A SCN email distribution list was requested from the practice education facilitators (PEFs) and received in tandem with ethical approval on the 7th of December 2015.

3.5 RECRUITMENT PROCESS

A stipulation of the SREC approval on the 7th of December 2015 was that practice settings (wards) had to be recruited prior to student nurses being approached. The purpose being to prevent disappointment for students who would initially consent but later experience their practice setting as one that did not participate. The definition of a setting for the purpose of this chapter is the students practice placement environment in which phenomena could be studied from any number of angles', rather than calling it a case, 'which oversees the phenomena from one particular angle' (Hammersley and Atkinson 2019, p.41).

Recruitment of practice settings

On the 7th of December 2015, SCNs (n=20) were emailed to inform them of the study and to request access to their wards (see Appendix 8). Following a reminder email on the 6th of January, SCNs (n=9) responded and granted access to undertake data collection in their wards. The pseudonyms used to protect the identity of placements, and a description of each ward can be found in Table 3.3. Each practice setting was emailed a participant information sheet for it to be disseminated to all staff (see Appendix 9).

Consent from Senior Charge Nurses was accepted by email for the practice area and staff working within it and in line with the Data Protection Act (1998), the Central Scotland University's Code of Good Research Practice and the NHS Code of Confidentiality (2010), it was agreed with the QI manager that consent should be obtained on an ongoing basis. Therefore, consent was negotiated from the nurse in charge at each visit and before observational data collection could begin. All staff were reminded regularly of my presence and purpose of the research study.

Table 3.3 Recruited Practice Settings

Pseudonym for practice setting	Description of recruited practice setting	Number of students
Ward One	Surgical and medical in-patient and out-patient service dealing with a wide variety of patients living with heart disease.	(n=1)
Ward Two	Medical in-patient service treating patients with ischaemic stroke who require rehabilitation and discharge to the community/home.	(n=3)
Ward Three	Surgical orthopaedic in-patient service dealing with a variety of trauma and elective surgical procedures.	(n=4)
Ward Four	Medical and ambulatory receiving unit admitted through the emergency department or referred to via General Practitioner/Out of Hours.	(n=5)
Ward Five	Surgical in-patient service dealing with patients receiving care for urology, ophthalmology, ENT maxilla-facial and vascular conditions.	(n=3)
Ward Six	Medical in-patient service treating patients with complex respiratory conditions such as COPD, cancer, asthma, emphysema.	(n=2)
Ward Seven	Emergency medical admissions treating adults and children with a broad range of conditions who attend in person or by ambulance.	(n=7)
Ward Eight	Critical care receiving patients from any specialty who require enhanced monitoring and intervention for a range of conditions.	(n=3)
Ward Nine	General surgical in-patient service looking after acute and elective admissions for a range of surgical procedures.	(n=3)

Recruitment of student nurses

Student recruitment commenced on 11th of January 2016. A convenience sample of third year student nurses (n=37) participated because their practice placements had agreed to me accessing their ward. The study was advertised through posters placed on student information boards in the faculty (see Appendix 10). An announcement was uploaded to the virtual learning environment inviting potential students to receive further information by email or to attend a face-to-face information session on the 21st of January where there was an opportunity for students to ask questions. Students expressing an interest were issued with a participant information sheet (see Appendix 11).

Firstly, student nurse consent was obtained to observe them in practice and to ask permission to approach them at a later point to participate in an in-depth interview, focus group and view their QI Practicum reports (see Appendix 12). A total of (n=31) student nurses consented to being observed and consent forms were returned to the research office and stored in a locked

filing cabinet. The mean age of the participants was 23 (range 29-47). During the information session, I had explained how I was involved with the QI Practicum pilot study as a student nurse. This information potentially influenced the higher number of consenting participants who may have identified the benefits of my knowledge as a source of support during the QI Practicum. Having identified this correlation, my position was re-iterated to students to confirm that teacher support would not be provided in practice to maintain fairness and equity of learning for other students.

Consent was sought once more towards the last two weeks of the observational period. Participant information sheets about next steps of the research, which included interviews and analysis of QI Practicum reports, were personally handed to the students in the practice settings during observational visits (see Appendix 13 and 14). Students not encountered on practice placement due to being on different shifts were sent a participant information sheet by email to their university accounts. Students were offered an opportunity to ask questions in the hospital setting and reminded of being able to withdraw at any time. Due to me frequently moving from one setting to the next which made collecting forms difficult, it was agreed that consent forms could be signed before interviews on the day. All student nurses agreed to participate and have their assignments analysed (n=31).

From this sample, participants who had acted as key informants throughout the observations were identified and allocated to a semi-structured in-depth interview (n=8). Some of these students had been encountered more frequently or had stood out because they were identified as what ethnographers note as being a rebel or the person willing to reveal information (Hammersley and Atkinson 2019). These key informants were important to enable me to glean a deeper level of information and develop a thick description of the students QI settings and experiences (Murchison 2010). The remaining students (n=23) were allocated to participate in one of the focus groups (n=5). Opportunities to ask further questions were provided prior to the interviews and focus groups on the day. Consent forms were collected before the interviews and later stored in a locked filing cabinet (see Appendix 15 and 16). The final student participants' characteristics are listed in Table 3.4.

Table 3.4 Characteristics of Participants (Phase One)

Participant	Gender	Age	Practicum Setting	Lenth of time Observed	In-depth interview	Focus Group
A	Female	38	Ward Seven	2 weeks	Yes	
B	Female	21	Ward One	8 weeks	Yes	
C	Male	24	Ward Nine	2 weeks	Yes	
D	Female	28	Ward Nine	2 weeks	Yes	
E	Female	38	Ward Two	8 weeks		Yes
F	Female	23	Ward Five	2 weeks		Yes
G	Female	21	Ward Seven	2 weeks		Yes
H	Male	25	Ward Eight	2 weeks		Yes
I	Female	23	Ward Four	8 weeks		Yes
J	Female	26	Ward Four	8 weeks		Yes
K	Female	21	Ward Three	8 weeks		Yes
L	Female	24	Ward Five	2 weeks		Yes
M	Female	23	Ward Nine	2 weeks		Yes
N	Female	22	Ward Seven	2 weeks		Yes
O	Female	24	Ward Seven	2 weeks		Yes
P	Female	23	Ward Four	8 weeks		Yes
Q	Female	21	Ward Three	8 weeks		Yes
R	Female	21	Ward Eight	2 weeks		Yes
S	Female	20	Ward Seven	2 weeks		Yes
T	Female	21	Ward Six	2 weeks		Yes
U	Female	22	Ward Four	8 weeks		Yes
V	Female	29	Ward Three	8 weeks		Yes
W	Female	20	Ward Four	8 weeks	Yes	

X	Female	21	Ward Seven	2 weeks		Yes
Y	Female	22	Ward Two	8 weeks	Yes	
Z	Male	28	Ward Six	2 weeks	Yes	
A1	Female	20	Ward Eight	2 weeks		Yes
B1	Female	26	Ward Five	2 weeks		Yes
C1	Female	20	Ward Seven	2 weeks		Yes
D1	Female	22	Ward Three	8 weeks	Yes	
E1	Female	23	Ward Two	8 weeks		Yes

3.6 SAMPLING SETTINGS

Sampling of practice settings

Fieldwork commenced on the 8th of February 2016 which involved meeting the SCNs of the recruited practice settings in the first fortnight. The choice to sample the practice settings was influenced by initial observations and by gathering data to then narrow wards down. This stage was useful to determine how many practice settings could realistically be observed. The ethnographic researcher requires enough cases from which variation of the phenomenon can be observed in a reliable way (Perakyla 2004; Madden 2023), but not so many that something more general might be missed from studying a smaller number of individual cases and their relationship to what is being studied (O'Reilly 2012).

In this study, nine practice settings consented to participate (n=9). However, there were practical challenges in the first fortnight that influenced the decision to reduce observational settings to four (n=4). For instance, the first visit to each practice setting was intended for determining rules and boundaries with the SCNs. However, some were unavailable on arrival or on annual leave which delayed my data collection opportunities. In other practice settings, students' rotas were incomplete or changed, meaning a suitable time to return for observations could not be arranged. In one setting, the SCN or the student nurses were not encountered throughout the initial first fortnight.

It was apparent quickly that nine practice settings would risk achieving quality observational data. Hammersley and Atkinson (2019) cautions that ample time to record observations is as important as the observations themselves to attain depth rather than breadth of investigation.

Consequently, practice settings were not revisited beyond the first fortnight where SCNs or student nurses were not encountered or where students' rotas were inaccurate (n=2). Other practice settings were eliminated due to the challenges that arose observing students (n=2). For instance, if patient care was delivered mostly behind curtains or within side rooms, it was difficult to ascertain what students were on shift or conduct meaningful observations.

To select the final sample of practice settings to observe beyond the first fortnight, a pragmatic approach was taken during discussions at a meeting with the supervisory team. O'Reilly (2012) suggests that ethnographic cases should be chosen based upon their intrinsic interest. Therefore, observational data collected in the first two weeks from the remaining practice settings was reviewed to identify those that would represent a diverse sample. This exercise helped to identify settings that represented foreshadowed problems, complex issues and the settings' potential to answer the study's research questions. While these strategies, recommended by Hammersley and Atkinson (2019) laid the foundations for choosing the final sample, my own experience of undertaking the QI Practicum and knowledge of the research gap influenced the final sample. The decisions were presented to and discussed with the supervisory team and rationale for including each setting was provided. This opportunity allowed for selection bias to be identified and mitigated, if necessary. The final sample of study settings (n=4) and a description of each is detailed in Table 3.5.

Table 3.5 Sample of Included Practice Settings

Pseudonym for Practice Setting	Practice Setting Description	Number of Participants and Pseudonyms
Ward One	Small practice learning environment with single unit geographical layout. Hosting a low capacity of ten patients and led by one SCN. Small teams of nurses worked regular shifts, and the students experienced a consistent nursing routine, remained supernumerary, and were always mentored by one of two mentors.	(n =1) Katie
Ward Two	Medium practice learning environment with a single unit geographical layout. Hosting a medium capacity of thirty-two patients and led by one SCN. Medium team of nurses worked dayshift or nightshift. Students' workload was consistent and mostly worked with their mentors. Senior leadership changes were happening during the QI Practicum.	(n = 3) Lianne Lesley Karen

Ward Three	Medium practice learning environment with a two-unit geographical layout. Hosting a medium capacity of thirty-two patients with different care needs. Students worked in both areas, not always with a mentor, and worked a variety of long shifts. The workforce comprised newly qualified nurses during the QI Practicum.	(n = 4) Leeann Amy Kelly Nicole
Ward Four	Large practice learning environment with a four-unit geographical layout. Hosting approximately seventy patients across multiple locations. The department was managed by three SCNs and regular QI activity was evident. Students worked a variety of shifts with at least one member of nursing staff they encountered.	(n = 5) Janet Bhavna Clare Mandy Eleanor

The other practice settings

Some of the practice settings continued to hold valuable insights into student nurses' QI learning experiences. Therefore, the observational data gathered from the other practice settings in the first two weeks, as well as those students, remained part of the final analysis. For example, student nurses continued to be encountered in the staff rooms or canteen rooms during tea breaks throughout the 8-week practice placement. Sometimes, these interactions led to random visits. For instance, if students were keen to show me aspects of their projects, visits to wards would be made and rich data gleaned about their QI learning experiences. As such, these students remained engaged in the research process despite their wards not being observed for the duration of the QI Practicum. These students were equally invited to participate in the interviews and focus groups undertaken after the observational period.

3.7 DATA COLLECTION

Observations

Drawing upon the work of Delamont (2016), who asserts that it is vital to be methodical during ethnographic observations by focussing upon different participants at different times of the day, 24 observational visits were made to the ethnographic site in three-to-four-hour periods at different times. In total, 34 hours of observations were undertaken during the ethnographic phase, with 20 hours undertaken directly within the sampled ward settings. The visits included day and night shifts, and weekends. Ethnographers have highlighted the importance of observing a variety of scenes to capture the true reality of a phenomenon (Brewer 2000; Madden 2023). Therefore, observations occurred in wards, locker rooms, meeting rooms, the hospital canteen and foyer and waiting rooms.

To observe student nurses, the range of observational roles that are known to exist in ethnography were considered and range from 'complete participant' to 'complete observer' (Conroy 2017). 'Observer as participant' was situated between this range and suited my professional capacity at that time as a teaching assistant, however, as I was not a practicing nurse at that time non-participant observations occurred.

In this position, patient care was not delivered by me (this would be 'participant as observer'), but instead it allowed for interactions with student nurses and others to occur naturally during the research process (Conroy 2017). Previous researchers recommended that observations in practice should be guided, but not restricted, by a predetermined observation sheet (Silverman 2019; Spradley 2016). To preserve the sense of context for ethnographic research, Spradley (2016) suggests detailing: space, actors, activities, objects, acts, events, time, goals and feelings. Therefore, the following observations informed fieldwork:

1. Spatial mapping of the practice setting, service provision and the physical things related to QI such as run charts, project posters, policies and protocols.

2. Practice processes such as shift handovers, shift times, ward meetings and safety briefs. Relationships, conversations, actions and emotions related to QI.

3. Student nurses' actions and interactions with mentors, their beliefs and attitudes and behaviours related to the QI learning experience.
4. Staff attitudes and engagement with students to determine how their working role influenced students' QI projects.

To enrich observations any events, actions or interactions deemed to be interesting, deviant or intriguing were included in field notes (Emerson et al. 2011; Elliott and Wolf-Meyer 2024). Exploring such deviant cases has been known to help develop a more rich and in-depth understanding and, in this case, of the students' QI learning experiences (Silverman 2019). Observations were clarified regularly through member-checking with students in practice to gain validity of information recorded and to offer a true interpretation of the participants' realities which guided future observations (Silverman 2019). During field visits informal interviewing was adopted to speak with students and staff daily. Patton (2015) regards this style of interviewing as an 'engaged conversation' during which the flow should

be natural yet spontaneous and opportunistic. This method was important to capture the thoughts and feeling of students and staff as they occurred naturally and to add richness and depth to the data (Delamont 2016).

Ethnographers warn not to stay too long within the ethnographic setting as there is a risk of inaccurate recall of important observations (Hammersley and Atkinson 2019). To enhance the quality of data collection, observations were recorded in my field notes using bullet points, scribbles and what Emerson et al. (2011) refer to as ethnographic jottings. Later, after leaving the setting and finding a private space, notes were expanded upon immediately or recorded on a dictaphone and uploaded to a password protected computer via the Central Scotland University. In advance of the next visit, which on occasions could be as little as within 12 hours, detailed accounts of field notes were typed manually into a Microsoft Word document. Figure 3.1 illustrates an example of an original field note. Reflective journaling was used to log insights, reflections and analytical hunches as they developed (Elliott and Wolf-Meyer 2024). Observations that followed a pattern were pursued in other ward settings until key concepts became saturated, meaning no new information arose about that concept. To substitute observations, emails during field work were sent to student nurses to ask them to provide summaries of their experiences, only where they had not been encountered across the ethnographic site. This helped to validate my observations and provide leads for future field work visits.

Document Analysis

Documentary analysis within ethnographic research provides richness and methodological triangulation during data collection and analysis, which can represent historical and contextual information about a culture or individual (Brewer 2000; Chesnay 2015; Silverman 2019). I collected a variety of documentary evidence including safety brief agendas, newsletters, QI policy guidelines, patient opinion feedback, student emails, annual reports, meeting books, run charts, department statistics and social media posts. This evidence provided additional context and depth to the research setting and complemented data analysis. Student's assignments contained reflective summaries about their QI learning experiences which were collected after the marking process. These retrospective etic perspectives of how student nurses experienced their QI learning was considered valuable to triangulate the data and validate observations. During fieldwork, each practice setting permitted taking photographs if they did not disclose the identities of patients or staff. Pink (2007) states that there is no one criteria that determines an ethnographic photo, and that the

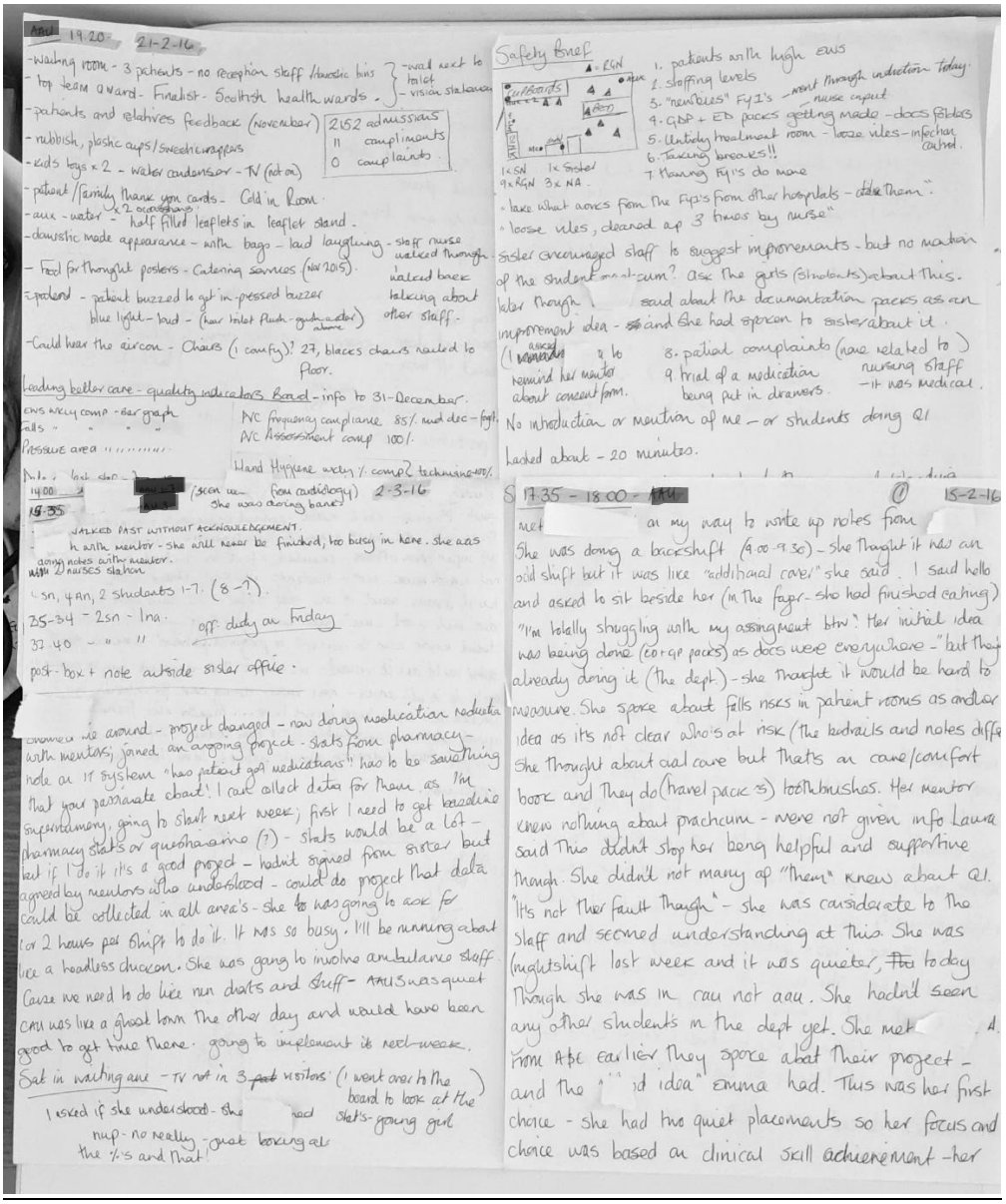
purpose of capturing images depends on the research project. Photographs taken within this study aimed to capture information that contributed to providing insights into the QI culture of the setting, such as performance measures and evidence of ongoing improvement activity. This evidence was used during focus group and in-depth interviews to stimulate conversation and interactions between the student nurses. Figure 3.2 provides examples of the types of documents and photographs collected within the study settings.

Focus Groups

Following observations in the practice settings, five focus groups were conducted with student nurses in the ethnographic site within a hospital meeting room during week seven (n=23). The purpose of the focus groups was to gain a wider conceptual overview of the student nurses QI learning experiences from their own perspective. The focus groups lasted between 1.5 to 2 hours, consisting of between 4 and 5 male and female students from mixed practice settings (including those settings not revisited beyond week two). Focus group interviews were recorded by a dictaphone which were later transcribed by an external transcriber and filed in a locked cabinet in the research office. To maintain objectivity and reduce researcher bias, two additional moderators; a supervisory team member and another research active member of staff joined the first three focus groups. A semi-structured approach using a predetermined interview guide was used and based upon the observations made in the practice setting and the research questions of the thesis (see Appendix 17).

The focus group interview guide offered an opportunity for my interpretations of field work data to be validated, and it allowed for exploring new and identified concepts (Bryman 2016). Sustaining flexibility was key during the focus groups to gain the perspectives of students QI learning experiences and allow emerging themes to arise outside of my preconceived assumptions. Murchison (2010, p107) advises that ethnographic researchers should work 'loosely' with their interview guide to maintain a natural flow. Thus, open ended questions, or 'non-directive' questions as Hammersley and Atkinson (2019) refer to them, were used to encourage the group responses to be explorative. The interactions between students during focus groups were in themselves advantageous for understanding the complexities of their QI learning experiences. Bryman (2016) highlights that the interactions between different participants can either be complementary to each other, or argumentative. Both interactions were witnessed during focus group discussions.

Figure 3.1 Example of Raw Fieldnotes



The former helped to validate my interpretations whereas the latter was useful for exploring the nuances of the events and students' perspectives in practice. In this instance, probing questions were used to gain deeper insights into the multiple realities that were experienced during the QI Practicum. Interactions between participants at times resulted in 'rambling' which was encouraged to identify what was important to them, however, where lengthy or irrelevant chat was identified, I referred to the interview guide to regain control of the discussion (Bryman 2016). The interview guide was reviewed after each session with the moderators to identify where questions had led to duplication of answers or needed re-ordering to enhance the natural flow of future conversations. The details of the focus groups can be found below in Table 3.6.

Table 3.6 Focus Group Interviews

No.	Date	Recording Name	Duration	Interviewer(s)	Number/Gender of Participants
1	22/03/2016	Focus Group 1	1.22:40	Researcher and supervisor	female (n=4)
2	22/03/2016	Focus Group 2	1.01:37	Researcher and staff member	female (n=5)
3	24/03/2016	Focus Group 3	1.13:42	Researcher and supervisor	female (n=5)
4	28/03/2016	Focus Group 4	1.22:59	Researcher	females (n=3) male (n=1)
5	28/03/2016	Focus Group 5	1.27:44	Researcher	female (n=5)

Semi-structured in-depth interviews

In ethnographic research, interviews usually supplement field work observations and involve an unstructured, informal or semi-structured format (Bryman 2016; Creswell and Creswell 2018; Patton 2015). Semi-structured interviews were undertaken following the focus groups to allow for a deeper exploration of key incidents observed during their placements to be undertaken. The order was important because it allowed in-depth recurring concepts from the focus groups to be explored and findings to be triangulated to validate my interpretations (Madden 2023; Hammersley and Atkinson 2019; Murchison 2010; Kumar 2019).

Interviews were critical to capture the students' etic perspectives and to obtain personalised and situated descriptions of the students QI learning settings that would otherwise be difficult to generate without. Bryman (2016) states that combining data sets in ethnography is advantageous for one to illuminate the other. The semi-structured interviews were undertaken during week eight of the placement with student nurses (n=8) in a meeting room within the hospital. The mean age of participants was 25 (range 20-38). The duration of the interviews lasted between 30 and 60 minutes and were recorded by a dictaphone and later transcribed by an external transcriber and filed in a locked cabinet in the research office.

Figure 3.2 Example of Documentary Evidence



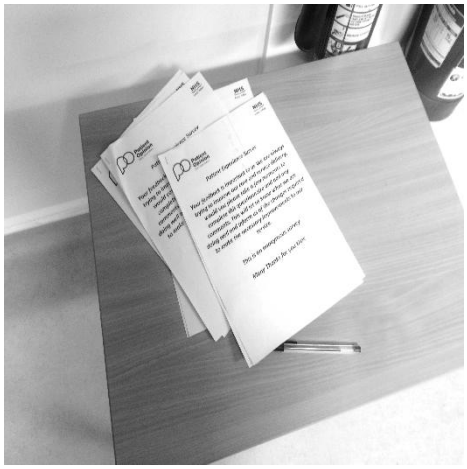
(i) Twitter Post



(iii) QI Annual Report



(ii) Quality Indicator Board



(iv) Patient Opinion Questionnaires

An interview schedule was prepared and used to guide the process to produce data sets that were comparable during analysis. It also proved to be useful during instances where students were slower to speak at length (see Appendix 17). The process of interviewing is a social interaction and one that should be structured by the researcher and the participant (Hammersley and Atkinson 2019). Therefore, to ensure participants felt comfortable and to maximise the information offered, the power dynamics between me and students were carefully considered. The power relationships in this study related to professional status, that of being a teacher and that of being a student. To neutralise this relationship with the student nurses, I dressed casually and welcomed them with open questions unrelated to the QI Practicum. A common ground was established first by offering some general memories that I had of being a student nurse working in the hospital. The intent of creating this balance in power dynamics is said to be the difference between a good and a bad interview (Davies 2012). During interviews, I put participants at ease by carefully referring to my own participation in the QI Practicum pilot but without influencing the responses of the students' QI learning experiences. Details of the interviews and participants are detailed in Table 3.7.

Table 3.7 Semi-Structured In-depth Interviews

No.	Date	Recording Name	Duration	Age	Gender	Ward Setting
1	28/03/2016	Interview 1	57.01	38	Female	Ward Seven
2	29/03/2016	Interview 2	35.19	21	Female	Ward One
3	30/03/2016	Interview 3	48.25	22	Female	Ward Four
4	30/03/2016	Interview 4	34.17	20	Female	Ward Four
5	30/03/2016	Interview 5	27.5	24	Male	Ward Nine
6	31/03/2016	Interview 6	59.06	28	Female	Ward Nine
7	31/03/2016	Interview 7	47.19	28	Male	Ward Six
8	31/03/2016	Interview 8	56.48	22	Female	Ward Three

Ethical Reflections

The Nursing and Midwifery Council (2018) emphasises that nurses undertaking research must uphold transparency, respect for autonomy, and safeguard participants from harm which were the principles I embedded during my study. The research presented a range of

ethical challenges, particularly due to my dual role at the University of Stirling as a former student nurse, teaching assistant, and nurse educator.

Firstly, my awareness of the potential to influence student participant's responses was heightened during my early visits which raised concerns over the perceived coercion that could be placed upon them. My reflective journal offered me the necessary pauses to critically examine my positionality regularly here and the consent process was treated as an ongoing activity and re-established at multiple stages. Further, I had no teaching contact with the student cohort during the study which did help to preserve my autonomy and build trust with the students. As previously referred to, I managed power dynamics to equalise relationships, including casual dress, rapport-building through shared experiences, and reassurance that students' participation would not affect their academic outcomes.

Secondly, a key ethical challenge experienced during my field work related to the concerns from senior charge nurses and staff about the potential exposure of their own identities and negative practice which was seen to deter them from authorising students' projects. This perception required me to take additional time with them to explain the study again, framing it as educational research rather than audit activity. Further, I re-iterated that anonymisation of staff and clinical settings would be rigorously applied and showed them examples of my field notes that had been constructed to avoid identifiable details. In line with Jones and Smith (2017) who emphasise that ethnographic research must balance rich contextual data with the ethical imperative of protecting professional identities, I reassured the SCNs that the study aimed to understand contextual factors influencing student learning, and that my intentions were not to critique the wards or individual's clinical performance. Mitigating their anxieties in this way was successful in most clinical settings, however, I respectfully acknowledged in one setting that the continued anxiety affected the location of where I was given permission to observe which often did not include students. As a result, I conducted no further observations during the research. However, to ensure inclusivity to the students who consented to participate and to offer an equal voice in the research, critical for balanced interpretation, students continued to be invited for the later interviews and focus groups.

Finally, I observed the treatment of student nurses being used as supplementary staff rather than supernumerary learners which raised ethical concerns. This practice not only breached the NMC (2018) educational policy which stipulates that students must be supported to meet their learning outcomes without being exploited or placed at risk, but it also compromised

students' ability to engage meaningfully with their QI projects. The students reported being delegated routine clinical tasks without mentorship, which limited their capacity to collect data or test change ideas. While I documented these occurrences in my field notes and encouraged students to reflect on them during interviews and focus groups, I re-iterated the University procedure of raising concerns and providing feedback during their placements. Their anonymised feedback was presented as part of the study's findings to advocate for change and contributes to a wider issue about the need for protected learning time and clearer boundaries between practice and QI educational engagement in clinical practice.

3.8 ANALYSIS

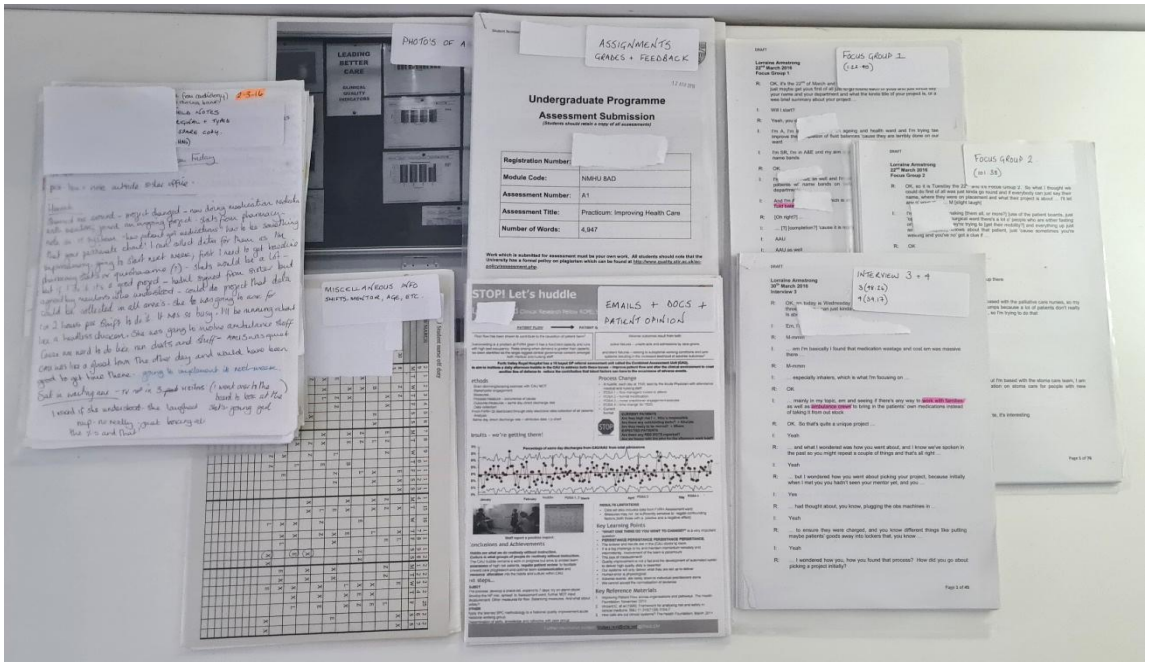
Ethnographic research generates an immense volume of unstructured data which is intrinsic to the methodology (Davies 2012). The analysis process is intertwined with all stages of the research journey that it is often difficult to discern where exactly it begins and then ends. An iterative-inductive approach is used in ethnography to bring together the disparate yet inextricably linked sources of abstract data to begin theorising and asking, 'what does this mean?' or 'what does this tell us about the nature of the phenomenon of interest?' (Patton 2015). The analysis in this research began with the accumulation of data during field work, where unsystematic 'flashes of insight come out of the interplay between a receptive and curious mind in a world explored over time' (O'Reilly 2012, p.184). During field work, recursive reflection and review of analytic memos was paired with my scrupulous attention to my own biases and preconceptions. This internal dialogue is what Davies (2012) refers to as the essence of reflexive ethnography. However, there comes a point at which the ethnographic site must be departed to undertake formal analysis and acquire some knowledge not previously known, so that it can allow people to see events in new ways (Agar 1980; Hammersley 2006). Central to the reflexive process in ethnography is recording, storing and retrieving a colossal amount of disparate raw data (Hammersley and Atkinson 2019). The first step is to reduce the data to develop an ethnographic story which can then be interpreted to inform the readers of what the story meant (Lecompte and Schensul 2010).

Ethnographic analysis involves some kind of sorting or tidying up of the raw data. O'Reilly (2012) asserts that no one formula exists in ethnographic analysis and suggests that 'something implicit' is shared about how data gets from 'writing down to writing up'. As the focus of this research was to examine the practice settings and the factors within them that influenced student nurses' QI learning experiences, the sorting phase involved collating

evidence into categories associated with each practice setting. These included the original and typed field notes, interview transcriptions, documents, photographs and emails (see Figure 3.3). To help manage this process, QSR NVivo 14 software was used to store the data. This was advantageous because all evidence could be scanned and uploaded to one location, meaning subsequent analysis was quicker. However, to avoid the criticisms of data analysis software, which is said to distance the researcher from the authenticity of the participants experiences, it was important to remain linked closely to the data at every step in the process.

To become familiar with the data, field notes were read and re-read first to become immersed in the real-life experiences of the participants and the events that occurred. Documents, photographs and emails were amalgamated at this stage to help produce chronological accounts and thick descriptions of the practice settings. These descriptive accounts were more than background data and began to form the basis for later interpretation which would contribute to answering the research questions the thesis started with (O'Reilly 2012). The thick descriptions of practice settings were reorganised and sculptured until I was confident that it 'looked and felt right' (Corbin and Strauss 2015, p. 58).

Figure 3.3 Categories of Evidence



While implicit ideas emerged through writing descriptive accounts, furthering the analysis beyond the low-level concepts that were established during field work and from the literature was seen as a challenge because field notes represented only one data set. Hammersley and

Atkinson (2019, p.209) reassures that often researchers at the early stages of analysis will 'not be sure *why* what is happening is happening and sometimes may not even understand *what* is going on'. This was true for me who had attempted to elicit a sense of what was going on through coloured codes and memos of startling facts, interesting events or inconsistencies, in the margins. The supervisory team reviewed twenty per cent of the fieldnotes and the memos from a QI and non-QI perspective, asking me probing questions to seek justification as to how their meanings arose (see Figure 3.4). While similar concepts emerged across the different settings, the meaning of the data at this stage remained unexplained. Therefore, a new dimension to the analysis was gleaned through coding the focus groups and semi-structured interviews in QSR NVivo 14 (see Appendix 21). This step was fundamental to generate connections between the different student nurses' QI learning experiences and the events identified within the practice settings and the codes related to the potential contextual factors that influenced students' experiences. However, the 'messiness' of ethnographic analysis came to light during this phase as I attempted to piece together the multiple data sets to produce a coherent with-in case analysis of practice settings (Murchison 2010).

In doing so, a new category of data had to be generated. For instance, to establish the relationships and/or contradictions between contextual factors that influence students' QI learning experiences in the same setting was not easy to identify from focus group data, and not all student nurses had been interviewed individually. A time-consuming process of creating individual cases for each observed student (n=13) was therefore undertaken to enable comparisons of their experiences to be made within the context of the same setting (see Figure 3.5). This process allowed inconsistencies and similarities to come to the forefront of the data. Thereafter, hunches, patterns, events and behaviours that occurred regularly were explored to make sense of the data and explain it (Hammersley and Atkinson 2019). The practice settings that had once remained descriptive now had a deeper dimensional layer that could be expanded upon to add richness to the within-case analyses.

The next step involved undertaking a cross-case analysis of the settings using the coding framework developed within QSR NVivo 14. Developing the explanations and interpretations of the students' actions and behaviours was achieved through constantly comparing contextual factors across the different locations and moving back and forth between the data.

Figure 3.4 Typed Field Notes and Memos

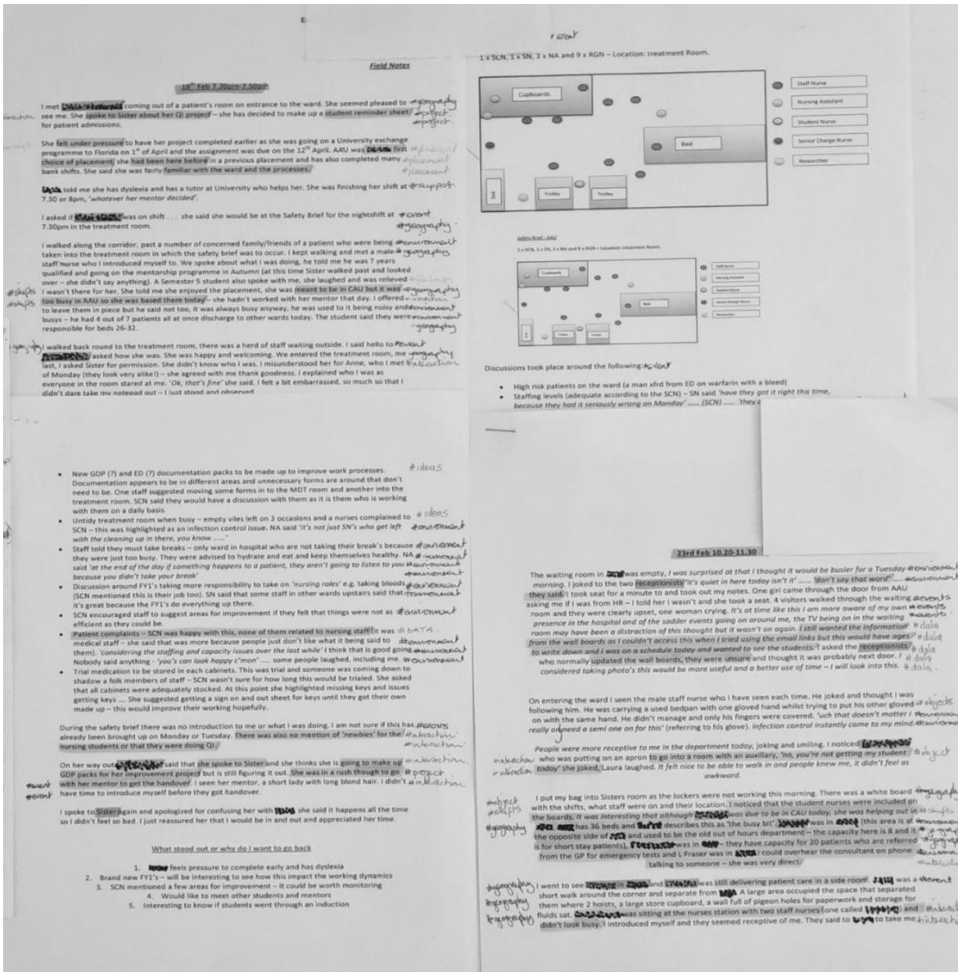
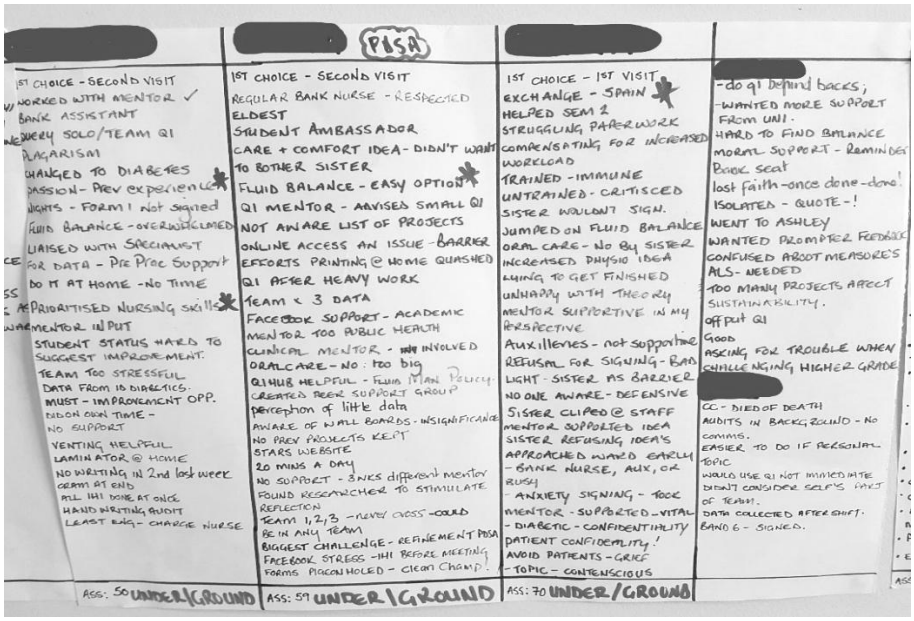


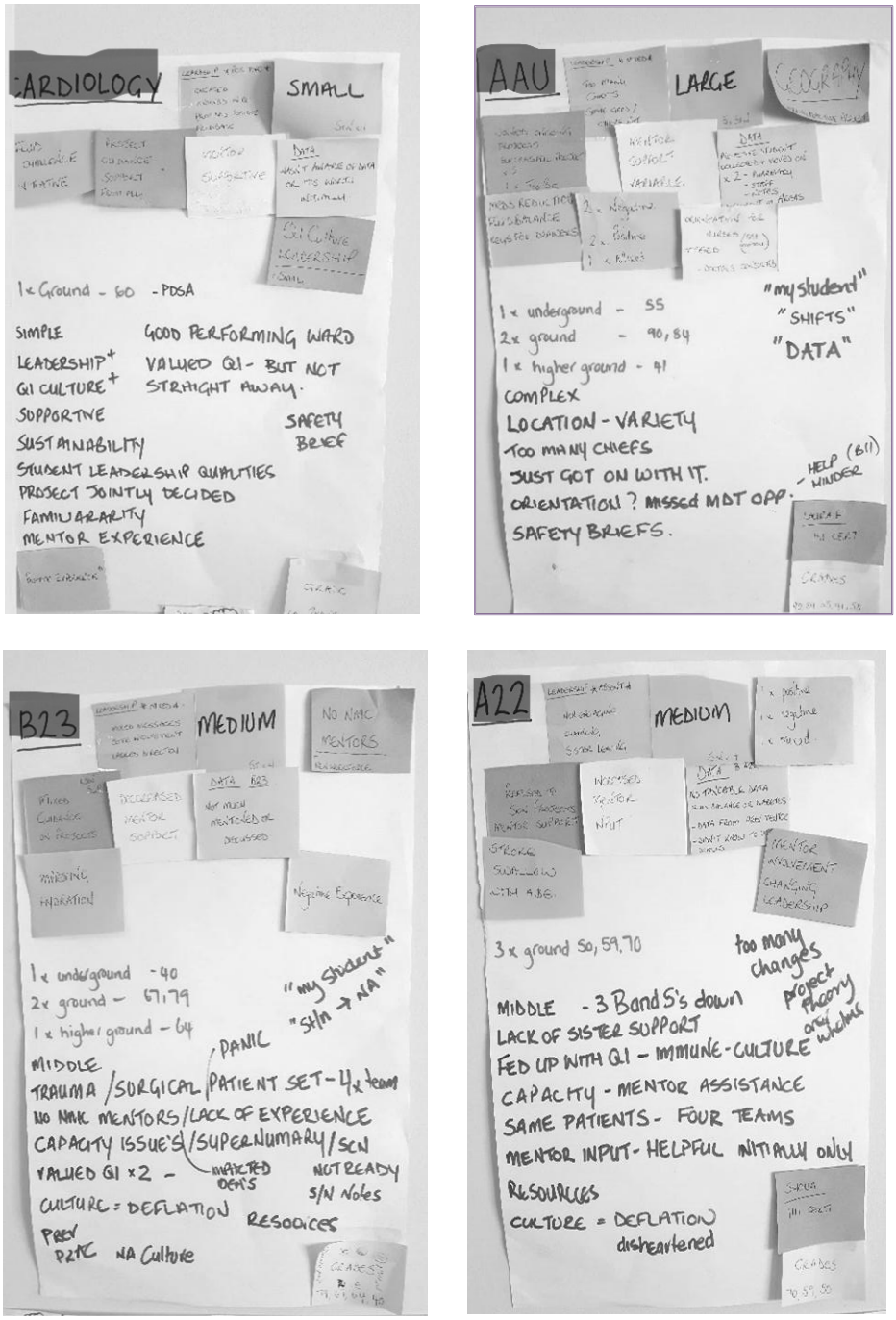
Figure 3.5 Individual Student Experiences



Manually applying post it notes to the practice settings on flip chart paper enabled me to gain a flow of thought and alter interpretations as they were supported or contradicted by the data (see Figure 3.6). Through this technique themes began to emerge such as 'data' and 'leadership'. Finally, determining the 'relative significance' as Murchison (2010) refers to it as, was the final step in the research process. Davies (2012) like many ethnographers, emphasise that the analysis continues throughout the write-up phase. The level of time, critical awareness and discipline to remain open to new emerging ideas at this phase was underestimated by me. Hammersley and Atkinson (2019) discuss how written language, such as the ethnographic narrative, is an analytical tool that fosters iterative thinking. During this analysis stage, theories can come into their own and begin to explain properties of the social world that were not previously identified (O'Reilly 2012).

This was an enlightening moment for me which, through the writing, uncovered a third level of unintentional analysis. The findings emerging from this phase formed a key finding of the thesis relating to the levels on which students were seen to engage with QI. The findings from the within-case analyses are presented in Chapter 4 and explore what contextual factors influenced students' QI learning experiences in the individual settings. Thereafter, Chapter 5 presents a cross-case analysis of the individual contextual factors that influenced students' QI learning experiences across practice settings.

Figure 3.6 Constant Comparison Cross-Case Analysis



Phase Two

Phase Two of the study was undertaken between December 2023 and August 2024 to answer the third question of the thesis, 'do student nurses continue their QI engagement as registered nurses and what are the influencing contextual factors?'. This phase of the research was peer reviewed and published in the Nursing Reports Journal on the 24th of October 2024 (see

Appendix 23). To report this phase of the study the consolidated criteria for reporting qualitative research (COREQ) checklist was used as a guide (Tong et al. 2007).

3.9 SAMPLING AND RECRUITMENT

The intention of Phase Two was to recruit participants following the QI Practicum to determine their level of QI engagement once qualified and used convenience sampling. Participants (n=31) were approached using the same email address and/or telephone number provided during Phase One, however, some were no longer valid. If responses were not received, a second attempt to contact participants was made and a message left on their voicemail. A final attempt to reach participants was made through searching public social media pages where participants were approached through a private messaging option. A total of (n=17) participants responded and were sent a study information sheet by email (see Appendix 19). Participants were provided with seven days to ask questions and decide whether to take part. The original ethics approval had permitted contact with participants to invite them to interview as registered nurses and consent to me contacting them at any time. However, due to the extended timeline between the QI Practicum and interviews with registered nurses, consent was re-established through email and recorded verbally at the start of each interview. Seven participants who had responded decided not to be interviewed due to being on maternity leave (n=3), expressing a lack of time through work commitments (n=2) or did not attend their allocated interview slot (n=2). Participants were contacted again to reschedule where they did not attend but no reply was received. The final inclusion of participants was reduced to a convenience sample (n=10). The mean age of participants was 38 (range 29-47) and the group consisted of 8 females and 2 males. Included in the sample were front-line staff nurses (n=6), senior staff nurses (charges n=3) and a former staff nurse who had recently left the profession (n=1). Table 3.8 displays the study sample characteristics.

Table 3.8 Characteristics of Participants (Phase Two)

Participant	Gender	Age	Current Designation	QI Practice Setting
A	Female	47	Staff Nurse Acute (medicine)	Ward Seven
B	Female	29	Senior Staff Nurse (community)	Ward One
C	Male	32	Senior Staff Nurse (acute medicine)	Ward Nine
D	Female	36	Staff Nurse (community)	Ward Nine
E	Female	47	Senior Staff Nurse (community)	Ward Two
F	Female	32	Staff Nurse (acute medicine)	Ward Five
G	Female	29	Staff Nurse (acute medicine)	Ward Seven
H	Male	34	Staff Nurse (acute medicine)	Ward Eight
I	Female	32	Staff Nurse (acute medicine)	Ward Four
J	Female	35	Former Staff Nurse (left profession)	Ward Four

3.10 DATA COLLECTION AND ANALYSIS

Data collection was undertaken between February and April 2024. To enable objectivity during the data collection process, a member of the supervisory team was present at the start of the first few interviews and contributed to refining future iterations of the interview schedule. A combination of face-to face interviews online through Microsoft Teams (n=5) and telephone (n=5) were undertaken. A semi-structured qualitative interview guide was designed and informed by the findings from the first phase of the study, which was predominantly centred around the contextual factors influencing students' engagement in the QI Practicum (see Appendix 20). A key focus of these interviews was to explore whether QI knowledge had been sustained and to explore the nuances involved with QI engagement at the point of qualification and within their current nursing practice.

Given the period between the first and second phase of the study, strategies to mitigate potential participant recall were undertaken. A preliminary meeting was held beforehand so that I could provide a summary of the QI practicum and individuals' reported experiences. Participants were given an opportunity to reflect and to ask questions before they participated

in the interview. The interview guide was piloted with one nurse and thereafter reviewed by me and supervisory team members through regular discussion. The interview guide was reviewed to ensure that it reflected the findings of the analysis from Phase One and to capture the study's aims and/or new and emerging ideas. Interviews lasted on average 22 minutes and were audio-recorded and automatically transcribed using Microsoft Teams. I read and reviewed all transcripts for accuracy of text and corrected any anomalies produced by Microsoft Teams. The supervisory team cross-checked ten per cent of transcriptions each for accuracy. The analysis of interviews followed a similar approach to that detailed above, paying particular attention to reflecting on previous contextual factors and identifying any new ones.

Table 3.9 Registered Nurse Interviews

No.	Date	Recording Name	Duration	Interviewer(s)	Gender
1	14/03/2024	Interview A	45:13	Researcher and supervisor	Female
2	21/03/2024	Interview B	26.10	Researcher and supervisor	Female
3	18/04/2024	Interview C	17.57	Researcher	Male
4	28/02/2024	Interview D	25.13	Researcher	Female
5	04/03/2024	Interview E	25.31	Researcher	Female
6	18/03/2024	Interview F	19.25	Researcher	Female
7	28/02/2024	Interview G	17.59	Researcher	Female
8	04/03/2024	Interview H	19.07	Researcher	Male
9	29/02/2024	Interview I	15.46	Researcher	Female
10	12/03/2024	Interview J	15.22	Researcher	Female

In sum, the methodological approach of this study is grounded in the disciplinary traditions of healthcare improvement science and nurse education. Ethnography was selected as the primary methodology in Phase One to capture the contextual and behavioural elements of

student nurses' engagement with QI in their practice placements, which aligned well to the complexity informed principles of healthcare improvement science (Kaplan et al. 2010; Medical Research Council 2008). The study draws on the nursing education literature, particularly experiential learning theory (Kolb 2015) and Bandura's social learning theory (1977) and emphasises the importance of learning through direct experience and social modelling. These theoretical foundations informed the decision to observe students within their clinical placements where QI behaviours are known to be shaped by the interactions with their mentors, teams, and the organisational culture. By situating the research within these two disciplines, the methodology can produce a greater understanding not only what students learn about QI but how they enact and sustain improvement behaviours in complex real-world settings once qualified.

3.11 SUMMARY

This chapter has discussed how answering the research questions through an ethnographic methodology is best suited to answer the study's research questions. It has explained how decisions were influenced by my philosophical assumptions and what methods were used throughout the process. To recap, the research occurred over two phases; the first which involved ethnographic enquiry with student nurses in an acute hospital setting and the second which involved semi-structured interviews with registered nurses. The next three chapters present the findings of the research.

4.0 INTRODUCTION

This chapter presents the findings of four descriptive within-case analyses of each practice setting to answer, 'what contextual factors influence the quality improvement (QI) learning experiences of third year student nurses in the practice setting?' By using descriptive within-case analyses, each case is situated within their ethnographic setting. The case descriptions are informed by 13 student nurse key informants and comprises two parts: firstly 'context' which illustrates the context of the practice setting and 'learning experience' which associates how the context was understood to influence students' QI projects. The 'context' part is described between the first and last observational field visit whereas 'QI learning experience' follows the four stages of the QI assignment: identify a project, prepare a project plan, test an aspect of the project and a reflective summary. Within-case descriptions provide the contexts and backgrounds for the cross-case analyses reported in Chapter 5. The case descriptions move fluently from ethnographic description to the beginnings of a within-case analysis and vary in length and complexity. A within-case analysis would usually include a more detailed description of the setting. However, to mitigate the risk of identifying wards and potentially associated staff, the description focused more on the contexts for QI. In true ethnographic style, the first person is used.

4.1 WARD ONE

The overarching contextual factors which influenced the student's QI learning experience in Ward One related to its smaller practice environment, its supportive leadership and its positive QI culture. As a result, staff engaged with the improvement project in a collaborative effort and the change was implemented during the student's placement.

Context

Ward One was the smallest practice setting with only one student nurse being allocated there. The compact environment housed a small team of nursing staff who mentored Katie, the student nurse, consistently throughout the placement. Katie had elected this ward as her first choice because she had worked here previously and enjoyed the experience. She attributed the smaller size of the ward to being able to adopt a flexible working pattern, and to being able to access unlimited practice mentorship on all her shifts:

‘It’s quite a small ward so like, it’s good if someone’s off sick, you’ve always got someone there to work with, you’re not like left like ‘oh, I have no-one.’

(Interview 2)

The support Katie was likely to receive for her QI project was apparent at our initial meeting with the SCN, at which I was present to discuss observational visits and our ground rules. Here, Katie was offered the rota and the autonomy to choose and change her shifts. This flexible arrangement reflected the extra staff capacity the SCN claimed to have:

> The SCN questioned me about why the University had not allocated her ward more students. She explained, that despite numerous emails to the practice education facilitator to express her ability to take a second student because of surplus resource (staff), that only one had ever been allocated. I signposted her to the appropriate person at the University to raise her request and she thanked me. She then turned to Katie and said, ‘oh well, looks like everyone is all yours again Katie’.

(Field note: 08.02.16)

The leadership support for Katie’s project was demonstrated at the first nursing handover. The SCN informed her small team that Katie’s improvement endeavour would involve tailoring a standard clinical investigation sheet to the patient population on the ward. This idea was initiated by the SCN herself, and she reassured Katie that her presence was perfectly timed to collaborate on the QI project. During an exchange with Katie later, a correlation was drawn between the pair’s shared purpose, and of improving documentation, and the belief that the change would be sustained:

‘The SCN gave me one (a project) she wanted to work on ‘cause she was like “that saves me doing that”. I think they’re going to keep it on permanently ‘cause it’s something the ward definitely needed themselves.’

(Interview 2)

Katie had conviction that the project would continue after she left the placement which was cemented by her perception that the ward exuded a positive QI culture. She escorted me proudly around the ward to highlight the QI conference posters and to highlight the staffs’

engagement in previous QI projects. This walk-around validated my own beliefs, that this ward had a reputation for innovation in QI. The staff who worked there had attended Quality and Safety conferences that I had attended, and had experts involved in the leading the local 'Quality Improvement Hub'. The ward was recognised for service innovation and for offering a supportive learning environment during my visit, and Katie attributed this improvement ethos to the positive SCN:

> 'Our senior charge nurse is really strict with all of the paperwork on the ward, and she is really into improvement – so everything is already great! I spoke with the Infection Control Nurse the other day, she said it's a really good performing ward, and all their statistics are excellent.'

(Field note: 08.02.16)

Despite the active improvement culture, Katie was frequently excluded from the improvement activities on the ward. On one visit, I observed her being excluded from an Action Learning Set (ALS), which are short briefs to share best practice. The QI hospital manager had warned me that ALS sessions were being conducted. Having been a student nurse, I experienced ALS as useful for learning and engaging with QI. Yet, as it took place, Katie was tasked by the SCN to be getting on with alternative duties. The priorities did not appear to be QI at this point, and instead developing Katie's management skills took precedence:

> The SCN, three nurses, a nursing assistant and a junior doctor listened intently. At the nurses' station there was an ALS taking place. The topic of fluid challenge was being led by a Medical Consultant, George. Katie stood to the side with her back to them and writing in the patients' notes. In the confined and quiet space, I shuffled towards Katie so as not to interrupt the meeting, but in the (now) awkward silence, the attention focused on us. The SCN ordered us away, 'Go on down that side, so you can speak there'. I asked Katie what QI activity was happening on the ward, she replied 'There is something going on, but I can't remember the name of it – I think that's why that guy's in'. I informed her that he was discussing improving fluid intake for patients, and she recalled 'Aw yeah, I think that might be it – I'm not sure, sorry, I am concentrating on my own patients this week'.

(Field note: 17.02.16)

Katie's mentor deliberately focused on allowing Katie to manage her own patient caseloads, to meet her placement objectives of building her leadership skills. Her leadership potential was indicative throughout our informal chats on the ward when she spoke of her headship role in the Girl Guides. However, during the QI Practicum she remained in her comfort zone, and when I asked how she felt about being excluded from the ALS, she claimed to be content:

'I didn't mind, as I didn't want to take on too much at one time, I felt like I just wanted to kinda get my bearings and get used to the actual nursing duties first and managing my caseloads.'

(Interview 2)

In sum, Katie was placed in a smaller ward with less students which allowed for the extra capacity to support Katie's QI project. Despite not being at the heart of the QI activity, she continued to experience a positive improvement culture, influenced by the supportive SCN.

QI learning experience

All students were to select a QI project and gain approval from the SCN in the first two weeks. At our first encounter, Katie spoke of her plan to examine the research literature and identify a problem and solution that was evidence based. Afterwards, she explained that this approach for selecting a project had been achievable as she was already familiar with the learning environment. Thus, there was greater scope to focus on the QI project:

'It was a benefit because I already knew the ward layout, what the drill was and what happens. I had more time to basically like work on what I wanted to work on, and I could think 'right, what do I want to do this assignment on', 'cause I already knew what I was doing in the ward.'

(Interview 2)

As the two-week timescale approached, Katie felt apprehensive as she deliberated her project ideas. Observingly, she sought feedback from the nursing staff about an idea in improving communication between the multi-disciplinary team, but they looked unsure about the idea. Katie clarified later that the SCN thought the project would exceed the realistic objectives of what could be achieved:

‘The SCN was quite supportive, I discussed wi’ her my different ideas, but she said they all seemed a bit too big to do in eight weeks, and she said they would need to be addressed by higher management.’

(Interview 2)

The SCN, instead, intervened to encourage Katie to make a small change to patient documentation. Katie misconstrued the SCN’s original comments to have hierarchical connotations, ‘well my idea was going to involve doctors. So, as a student nurse, I obviously can’t tell them what to do’. But when I spoke to the SCN her reasoning was clarified – she expressed that the small changes offered her closer oversight and facilitation of Katie’s QI project. The misunderstanding was left unaddressed, however, and Katie’s perception of hierarchy manifested. Responding to a query about potential QI collaborations with junior doctors as a newly qualified nurse, she remained hesitant:

‘Mmm, I don’t know, ‘cause like I feel like, you know, they’re a lot higher above me, if you know what I mean, so I just don’t know.’

(Interview 2)

Katie was confident developing her project and measurement plan within the nursing silo. At a meeting, arranged by the SCN to brainstorm ‘change ideas’, Katie felt comfortable discussing a fishbone diagram and endorsed her confidence to the previous developed relationships with staff in an earlier placement. Equally, her self-efficacy in designing new paperwork was attributed to administration skills she had learned from her outside past-times:

‘I feel very confident making this new investigation sheet because I make loads of different templates for the girl guides.’

(Field note: 25.02.16)

Katie’s mentors remained engaged as she tested the new investigation sheet using PDSA cycles. The smaller size of the practice environment was, at one point, regarded as useful by Katie, as she perceived fewer patients to mean less data to collect. However, on reflection,

Katie considered data collection to be time consuming, a task which distracted her from other nursing activities, such as learning about new diseases. Her coping strategy to balance her priorities of developing new skills whilst doing the project, was to proactively engage her mentors:

'When I wasn't there, or couldn't do it, I just said to like my mentor could you look at the data and see how many patients come in and check the investigation sheets. My mentors were quite good at like helping me wi' that' because they were always involved.'

(Interview 2)

Before Katie's placement came to an end, she had managed to undertake her QI project and complete her academic assignment, for which she received a 60% pass mark. She believed the project had been successful and was certain it improved the patient processes in the ward:

'I would say I have finished it, because like the investigation sheets are getting used like every day, like by every patient that comes in, everyone's using them, apart from the doctors.'

(Interview 2)

The SCN validated Katie's claim at our last meeting and asserted that the new investigation sheet would become permanent. On the other hand, Katie envisaged herself prioritising the 'nursing role' in future, before doing QI.

In sum, Katie's early view was that her previous experience equalled easier project selection, but the SCN was seen to direct Katie's project towards a smaller change within more achievable timescales. Katie felt confident in her own nursing silo due to her developed relationships, and her mentors' support and ability to draw on her own external skills influenced her QI project. Having less ownership and autonomy within the ward and wider multi-disciplinary team potentially encouraged less value to be placed upon QI by Katie. However, the change was valued by the SCN who intended to sustain the improvement.

4.2 WARD TWO

The overarching contextual factors which influenced the students' QI learning experiences in ward two related to jaded mentors' attitudes towards QI and a transitional period of senior staff changes. As a result, project selection was delayed and students focused on supporting their mentors' workloads. Despite their efforts, the students' QI project assignments remained hypothetical.

Context

The first visit to Ward Two was familiar to me having worked here before in a student nurse capacity. This acquaintance had given me early rise to attend regular staff tea breaks, at which imminent changes to senior positions transpired straightaway. Disheartened staff informed me that the long serving and respected SCN was retiring, and her deputy was demoting his position because of ward politics. Malcolm, to whom the latter applied, appeared jaded in general but particularly so about QI:

> We sat together for breakfast, giving me an opportunity to speak with Malcom. 'You're quite QI savvy Malcom – are you not?', he replied 'I've done bits and bobs'. Malcom implemented purple aprons on the ward with Plan-Do-Study-Act cycles. The project aimed to prevent interruptions during medical rounds. He confirmed it made a difference, and spoke of being invited to present his work, which only three people turned up to – 'You get invited to these things if you're involved with stuff like that … it started off with about 100 of us from different wards, and ended up only a handful of us left – everyone is fed up with it now (QI) – there's nothing to change – everything's done. But you need to be seen as improving, eh?' He reassured me that the mentors knew the purpose of the students' projects was to teach the improvement process, rather than improve outcomes, per se, but stressed 'it was big at the time (QI projects), and we thought "oh what's this" but now it's like, oh not again'.

(Field note: 18.02.16)

Malcolm did not try to conceal his cynical QI attitude from Karen, the student nurse he was mentoring. The pair had developed a working relationship from her first nursing placement, and regular shifts on the bank. She accepted Malcolm's pessimism, without question, as they laughed together at Karen's improvement ideas, which Malcolm 'shot down in flames'. Justifying his reaction, he explained that Karen required authority from 'way up above' to

change current practices, such as care and comfort charts. But even the project ideas at ward level remained subject to Malcolm's qualms, and his perception of the students' abilities to develop their QI projects, was doubtful:

> Karen said she would access some policies online for project ideas on nightshift, but Malcolm proclaimed, 'they were harder to track down than she thought'. She clarified that having log in details as a nursing assistant allowed her Intranet access, and explained this would avoid printing materials at home, only to be told the next day her ideas were not relevant. Malcom hesitated, because he believed she needed training for information governance. Karen informed him that she had completed the appropriate training, but he hesitated again … 'well OK, as long as all of the main physical heavy work is done, but you know, you might be demented in that office with all the changes that's going on, you know'. Her prospects of intranet browsing reduced further as Malcom stated: 'your time is best appropriated to learning skills on dayshift, new staff nurses don't do nightshift for six months until they know all the medications – it's quite scary'. Karen agreed, as she believed dayshift skills enhanced her job prospects once she qualified.

(Field note: 18.02.16)

Despite Malcolm's jaded attitudes towards QI, he asserted that the ward contributed to healthcare improvements. Prior to the SCN's departure, my visits involved being shown various clinical audits and run charts, concluded from previous QI projects. Equally, when conversing with mentors, they purported to contribute towards the students QI projects, more hands on than others. For instance, Ann, who mentored Lesley, admitted her contribution was not to interfere at all. She had supported a student's QI project the year before, and claimed her student got excellent grades and had secured a staff nurse post. Ann's approach involved letting the student 'just get on with it', checking-in only now or then. Lesley, her current student, also appreciated this distant support, but it was apparent later, this method was to the detriment of the perceived value she believed her mentor placed upon her QI project:

'My mentor was really good, she would ask, how's your assessment going, are you getting it done and she would just try tae encourage yae tae keep going. She had a student previously doing QI. It's more kinda moral support, they say "just keep going with it"

when it's done, it's done" kinda thing. But then, I was like, well that's obviously not going to stick when I leave (the QI project), it kinda makes you lose a bit of faith.'

(Focus group 5)

Another mentors' contribution towards their student's project echoed a slightly more tangible outcome. Bolade, a mentor, offered support through holding a brief informal collaborative brainstorming session with her student, Lianne. She claimed to have initiated the project idea before Lianne reaffirmed that it was a joint effort. However, regardless of the instigator, it was clear that Bolade's intention to help with the project initially, would cease from here on out:

'You happy with what she's doing?' Bolade asked. The ward faced challenges involving domestic staff providing patients with snack food prior to blood glucose testing, which interfered with their medication schedule. I responded encouragingly agreeing that the issue was suitable for a QI project. 'Good because it was my idea – is that my bit done now?' Her student interrupted, 'Well, it was both of our ideas, you've been helping haven't you'.

(Field note: 25.02.16)

Assistance for students' QI projects seemed to hover around picking a project idea for the SCN's approval. Where students and mentors did eventually agree upon an idea, the greatest contribution beyond this point gave the impression of advocacy; in particular mentors levying students' voices to promote their projects. This form of support was valued by students, who appreciated their mentor's backing:

'I took my mentor with me to get the project signed. Sister was leaving that week and refused to approve any projects. I went to Sister, and she said, "so what's your project?" I told her and she said "Oh, I'm no' too sure about that." But my mentor stepped in saying "it's been a good idea; it's something that needs changed". She said, "come on, the lassie just has to do a project to pass, she's not in wi' guns blazing trying tae change everything". That support from your mentor is vital.'

(Focus group 5)

In week three, the support from mentors not only hovered around selecting projects but then halted. This cessation mirrored the departure of the SCN and the uptake of the new senior team, who also welcomed a new deputy and medical consultant. The transition led to some temporary turmoil, witnessed one morning during some chaotic staff interactions. George, whom I had encountered several times now, arrived to facilitate an Action Learning Set (ALS) relating to patient hydration. The new SCN inadvertently overlooked his presence to troubleshoot her new online user details with IT, just while Ann claimed Lesley, who, I was observing, was off sick. She was unable to confirm her next shift, because only the SCN could access the shift schedule, which was online.

Respecting the mayhem, I meandered the ward as George, who had gone unnoticed, decided to leave and return at a more appropriate time. Similarly, at this point, it became apparent that Ann had been so consumed with shadowing Malcolm in her new deputy role, that she was not aware that her own student Lesley was not sick, and on shift taking patient observations. The evidence of disorder amongst staff during the transition was widespread, and its impact resonated further to a patient's family, who later acknowledged the disarray on a public patient forum:

> 'I have a family member in this ward, I'm very shocked at the difference since the Sister left through the week, the ward seems a shambles now, majority of staff are lovely and caring then others make you feel everything is too much bother, I understand it is a very busy ward and very sick people are in there, but my family member is a patient as well.'

(Patient opinion 1)

Progressively, during the placement, the supportive dynamics between mentors and students switched. While mentors assisted students' QI projects in the early stages, students were observed assisting their mentors' workloads in the latter stages. For instance, despite Malcolm's earlier deterrence of Karen doing nightshift, I witnessed her working alongside him one evening. She defended this change, attributing his lack of time for her during dayshift to training the new deputy, and considered the compromise would enable her interim placement review to be completed quicker:

‘Well initially the plan was dayshift, but then Malcolm said that it might be better to do a nightshift so that we could complete my OAR reviews and there would be more time on nightshift to do this, which was OK by me.’

(Field note: 09.03.16)

The final dayshifts consisted of students volunteering to lighten their mentors’ workloads by performing extra patient observations, doing extra glucose testing and updating most of the patients’ care plans. Upholding these additional tasks, came at the expense of engaging with their QI projects. While students were seen to thrive and take pride in assuming the extra nursing duties in their final year, they too believed the support offered was temporary, ‘an in between stage, where they were in limbo’. However, the permanency of the situation came to light only later, when students expressed feeling uneasy when trying to raise their QI projects again:

‘I feel like me and my mentor are way too busy tae even talk about the project, especially now, like I'm too busy tae …bring it up … 'cause that's the, the least o' their worries sort o' thing, I'd feel kinda guilty now with all the change.’

(Focus group 4)

In sum, low morale set the tone in Ward Two as mentors appeared jaded by QI and pressured because of senior staff changes. Students accepted their mentors’ attitudes as status quo and received limited support for their QI projects. Later, during the staff transitions, students sacrificed their projects to support their mentors’ workloads.

QI learning experiences

Joining students on their tea breaks gave me insight into the comprehensive ways they selected projects. Tactics included recall of ‘bugbears’, examining policy documents and/or research articles, learning from staff’s QI experiences and investigating ongoing projects. But, despite their enthusiastic efforts to choose a tangible project, their proposed ideas were influenced by factors outside of their own control. For instance, ideas to improve patients’ oral care was refused by the SCN given it required a doctor’s medical prescription of mouth

gel. Other students encountered issues with the perceived risk their projects would inflict on protecting their patients' identities:

'Yeah, it was like patient confidentiality, somebody's always throwing that as a reason for saying no to our ideas "yeah, well that's patient confidentiality – you can't do that."'

(Focus group 4)

Also challenging were the practicalities of how projects would align succinctly to staff and ward processes. For example, one student wished to improve her patients' physical recovery using daily exercises, yet the sporadic interactions with the physiotherapists finally stalled its fruition. Timescales of ongoing projects, such as one relating to the Malnutrition Universal Screen Tool (MUST), was also perceived as a struggle. While the topic generated interest, students were unable to fathom out how to align their projects to their assignments within a timely enough fashion:

'That's OK if their working on projects at the time as you're doing yours, but with the MUST thing, that's taking more time to plan over a longer period o' time, so I wouldn't have got the (data) outcome of it … but it would have been quite good if I could o' done that with them.'

(Focus group 4)

The transparency of other ongoing QI projects when situated in the ward was indistinguishable. For example, I only identified a project one day stumbling upon buried newsletters at the nurses' station, later learning of its circulation through social media networks. This Swallow Screening improvement project aimed to reduce aspiration pneumonia for patients with dysphagia and was also unbeknown to the students. They only became aware of it when I queried their knowledge of the ward's ongoing activity and presented them with a project poster photo during their penultimate week:

'Different things get monitored, there is loads o' audits but they're not spoken about …… it's very much in the background. Nobody has fed back to us about Swallow Screening.'

(Focus group 4)

Overall, students reflected on picking projects with often defeatist attitudes, in concluding that it was nerve-wracking and that it conflicted with generating positive first impressions as a valued member of the team:

‘The first two weeks were hardest, when I was doing my clinical skills. I wanted to concentrate on them, but trying to do everything else, it was stressful, still not knowing what I was doing! Obviously, you don’t want to look like an idiot, you want to be accepted as you're the new person, you want tae get on wi' everyone.’

(Focus group 5)

The students’ trade-off though of wanting to appease staff and gain self-respect, came the decision to prioritise their clinical skills over the next part of the assignment which was to prepare a project plan. Where opportunities arose, the value students placed on shadowing mentors surpassed that of learning about QI. For instance, one night, Lianne’s unusually quiet workload offered her a window to work on her project, however, she chose to run through the patient admissions system instead as computer access was usually scant. Generally, this phase saw most students’ initial drive for improvement dwindle and replaced by the cultural thinking of their jaded mentors:

‘Preparing your practicum takes you away from managing your patients, you want to make that your priority, 'cause that's what you’re going to do as a nurse, you're trying so hard tae get into the swing of being a nurse with your mentor, not doing QI.’

(Focus group 5)

This movement of thought was amplified again during the staff changes, as distance between the student-mentor duos widened and focus on students’ projects turned to supporting their mentors’ workloads. Equally though, halfway through placement, urgency around completing the assignment became apparent. Students realised they had unanswered queries about fishbone diagrams and run charts, that to submit their assignment on time, they would need to seek assistance from elsewhere.

One strategy the students opted to undertake was to seek support from those undertaking similar projects. For instance, two students improving fluid balance documentation planned

to divide data collection between themselves to lessen the burden individually. They predicted a team approach would clarify and aid understanding of interpretation of the data collected within the time limit remaining. However, working opposing shifts was challenging because of their lack of interaction which delayed their PDSA handovers. Addressing the glitch, students developed an online forum which aimed to accelerate the project. But, in practice both mentor and geographical inconsistencies hindered the data collection process:

‘I found it especially hard 'cause in the last three weeks my mentor has been on nights and holiday so I'm going with whoever the Staff Nurse is that day and they're not necessarily aware of what I’m doing, because they're not working in my team normally. I could be in team one, one day, team three next and then back tae team one so I’m not even getting the same data to collect all the time.’

(Focus group 4)

Another student sought an alternative route to engage with her previous nursing mentor. This specialist nurse had worked in the ward previously and was able to share some hospital statistics with the student. Lack of intranet and computer access often made this difficult for students and accessing support from outside of the ward was understood to be a mechanism which influenced the student’s overall project choice:

‘I had spoken to my old mentor that was in Ward Two, who’s now a diabetic nurse, so I've been able tae email her back and forward, that was also another reason why I thought well, I might just go ahead wi' that project, because she could give me data.’

(Focus group 4)

Whether students worked on joint or solo projects, data collection was equally challenging, and it became a task which was undertaken outside of the students’ daily activities. On my final visit, I saw Lianne covertly extracting data from patient files, before going home. Investigating later, she explained:

‘I just waited 'til the end o' my shift, it took me five minutes tae fire round to check the folders. I just thought right that’s me, I wasn’t going tae get interrupted, I could just grab and go… ‘stealthy mode’ I called it.’

(Focus group 4)

In the end, the students’ QI projects ceased and no PDSA tests of changes were undertaken, and students then submitted hypothetical QI projects for their assignments. Their reflections on their QI learning showed that they believed their challenges arose from lack of leadership and autonomy to initiate change, as well as having limited time to focus on the chosen project:

> ‘Whilst I understand the need for quality improvement to be carried out, this project has shown that unless the instruction is being passed down from the management then it can be hard to get any buy in from staff on the ward.’

(Student assignment 1)

> ‘I think if we had more time to look at what caused the problem, we would have a better chance of being able to make real, tangible changes, rather than a temporary plaster until we leave and then things return to normal.’

(Student assignment 2)

In sum, students in Ward Two experienced difficulties in picking projects at the start of the placement. They prioritised their clinical skills in the ward over the chosen project and turned to each other and previous mentors for help in completing their assignments. Students continued to face challenges around collecting data which resulted in their projects being submitted as theoretical.

4.3 WARD THREE

The overarching contextual factors which influenced students' QI learning experiences in Ward Three related to the ambiguity surrounding leadership roles and the lack of capacity to support their projects. As a result, conflicting priorities between ward staff were evident across multiple levels and students experienced difficulties selecting a project and accessing resources to test changes.

Context

Initially, my observations revealed a lack of consensus as to who was facilitating the four students' improvement projects in this ward. On the first visit for instance, the SCN had expressed a desire for one student to improve the documentation for fluid balance assessment. However, when asked if students were privy to her preference, she claimed it was not her intention to be directly involved:

> 'This information will eventually filter down to them, believe me, but ultimately it's students' responsibility for their own projects and updating their mentors regularly.'

(Field note: 08.02.16)

However, the speed at which her preferences filtered down to the students and mentors was slow. In the interim and in the absence of any dialogue, students continued to seek leadership from the SCN to facilitate problem finding and generate project ideas. These attempts were met with everyday practicalities such as the SCN's prolonged office activity and/or working opposing shifts, which subsequently limited the opportunity for QI discussions. However, even where opportunities did present, the students were observed demonstrating rather eluding behaviours:

> 'I'm avoiding her today, cause I'm always getting a hard time', or 'I'm not going to bother trying today, she's too busy.'

(Field note: 09.02.16)

Students elaborated on these comments towards the end of the placement which unveiled an underlying truth relating to a lack of trust in the SCN, which consequently meant they began

avoiding contact with her. For instance, one student spoke of her project idea to improve skin integrity using enhanced recording of pressure ulcers. The SCN would not approve the project because the problem identified had been considered a mandatory aspect of routine care which should have been recorded sufficiently already. Instead of acknowledging the student's observation as a method by which practice could be improved, the SCN approached her nursing staff directly to question their performance. Thereafter, students felt uncomfortable discussing their improvement ideas with her:

'I suggested a project, but then she then went and had a massive go at the rest of the staff nurses, so basically I felt I'd told tales on them, she didn't necessarily say who it was, but she went up to my mentor and went "I just spoke to your student" – so, that really put me off going to speak with her again.'

(Focus group 5)

Gradually, students diverted and sought leadership from their mentors to progress their project ideas. Identifying which student was being mentored by which nurse was not always straightforward, because it altered depending on annual leave, sickness and the shift rota. One student was observed pairing with different mentors at each visit while another worked consistently with hers for the placement duration. Despite the difference, the students' consensus was that their mentors dismissed their QI projects and perceived the reason to be attributed to the disengaged leadership from the SCN. However, mentors' attitudes towards the student projects stemmed from issues unrelated to the SCN. During earlier visits, I noted confusion around the various nursing leadership roles and responsibilities. One nurse approached me anxiously to express her concerns about not having completed her mentorship training, to adequately support her student. She recently transferred from a different health board and was unfamiliar with the ward's clinical processes, and in supporting QI. While the students continued to perceive it was the SCN's absent leadership influencing mentor involvement, they too understood the anxieties that existed:

'The Staff Nurses are concerned about not having experience of doing QI. How are they meant to mentor you if they haven't done it before? There's paperwork from the University to give your mentor but, I think they're nervous or worried about their lack of knowledge with how to support you …or how much they've got to be involved.'

(Focus group 5)

The context relating to the team's leadership issues was offered by the SCN at one of our infrequent encounters. She informed me that eight sign-off mentors had resigned and been replaced over the years by newly qualified nurses. The reduced leadership capacity was why, she said, students were always 'passed about'; that, and because several first-year student nurses in the ward similarly needed mentoring. Being under resourced added pressures to her staff because they were only just learning their own roles and beginning to develop their own nursing skills.

Leadership conflicts were observed frequently and often when the SCN was absent from the ward. For example, I noted one evening at the safety brief, a debate about who the Nurse in Charge had been the night before. A staff bank nurse with over 30 years of experience (and a close friend of the SCN) apologised to the team for automatically assuming the role of nurse in charge, claiming that this position had been delegated to her by the SCN. The confusion arose because the nurse, to be in charge, was already documented in the rota, and the sudden change led that nurse to feel inadequate and untrusted by the SCN. On another occasion whilst the SCN was on leave, the nursing staff became frustrated and disempowered again. This time because the nursing assistants, all of whom had many years of service, began delegating tasks to students without their mentors' acknowledgment. The ambiguity around leadership continued to cause conflict because the staff nurses never spoke up, meaning the students did not either, or as a result they felt pulled in different directions:

> 'It sounds terrible, but I just don't want to do this practicum anymore, we are expected to be everything in here, a nurse, a student, an auxiliary but we can't do it all! Today the auxiliary shouted "oh it's ok, we have a student on this side" … but they didn't, because I had been given my own patient load by my mentor. Not one of them helped me, but I was expected to help them, and they just claimed me as their own.'

(Field note: 02.03.16)

The predominantly newly qualified workforce in tandem with leadership challenges revealed the lack of capacity available to support the students' improvement projects. Sickness absence had also been high, meaning the team regularly comprised of staff nurses and nursing assistants from the staff bank. One morning, a student was observed wearing her student uniform which later got swapped to a nursing assistant's uniform. The SCN asked her to take a bank shift because she had greater experience than a general bank nursing assistant who may have been unfamiliar with the patient group and processes. She reluctantly

agreed to the shift, making her hours up later in the placement, but only to help the department's understaffed position, and to appease the SCN:

> 'I'm liking it here, and I have been here before, so I appear to be on the SCN's good side just now and want to stay there.'

(Field note: 15.02.16)

As the placement progressed it was apparent the improvement projects were not a priority for anyone, in fact, priorities appeared to conflict. The SCN clarified early that the improvement projects were not her priority, confirmed again later, when she was unable to recall the students' QI project topics at all. Her focus, rather, was to query how the University prepared students to undertake Aseptic Technique; an essential skill required in her ward. The staff nurses had their own priorities also, which related mainly to focusing on time management skills to organise their workloads as newly qualified staff and/or becoming self-taught mentors; a role suddenly thrust upon them. And, as for the students, their priorities lay firstly in passing placement and then supporting their mentors' workloads out of sympathy. Lastly, the nursing assistants prioritised delegating tasks to the students to ease their workload, and to perform procedures they could not do - such as Aseptic Technique.

In sum, leadership and capacity challenges dominated the context of Ward Three during the study and as a result staff worked in their silos and focused on balancing their own priorities.

<u>QI learning experiences</u>

Project selection was the students' first task. During our initial conversations they appeared enthusiastic about their potential improvement opportunities but soon fed back certain difficulties. Slow progression was attributed to shift work, for example lack of face-to-face contact with the SCN on nightshift, or contrarily managing the busyness of dayshift, which stalled problem identification:

> 'On the first week of placement it was quite hard to take the time to think of the project as I was so caught up with other tasks, I had to do on that shift due to the ward being so busy. The second week was easier to think of a project, but that was because I was on nights and had the time to think about it.'

(Student email: 23.02.16)

An assumption existed that students with previous ward experience, as opposed to students new to the area, would have an advantage in gaining project approval. The theory being that more exposure to the learning environment equated to more ideas to draw upon. However, this was one student's misperception, whereas in reality, other students were slow to get their projects approved. Initially though, this perception catalysed one student's competitive nature, which led her to seek quick approval from the SCN, to protect her own improvement idea:

'A couple o' students have been there before on the ward … and I thought instantly, oh they're going know exactly what to do when they go intae that ward, but then it was those that were finding it difficult tae identify something … so off the back I was like right, OK – phew, I wanted tae just get out what I was doing, so that nae one else copied me.'

(Interview 8)

Of the four students' project ideas, the one referred to above *was* approved in the two-week timescale. This student's idea to introduce purple aprons during medication rounds to prevent nurse interruptions and thus improve medication safety, was witnessed in another ward. She believed its quick approval was the result of the SCN identifying its value. The SCN had also conveyed value in improving fluid balance assessment, however, because her idea was not directly articulated to the students, instead circulating as hearsay, students were reluctant to choose the topic without further direction:

'I didn't do the one that she suggested only because her suggestion went as far as "I'd like something done about this" … but it didn't go any further as to maybe how she saw what sort of changes she'd like implemented or anything …and since it wasn't something I'd thought of I couldn't really see a good solution of how to make the improvement on the ward in the space of time that we had, … if she'd had an idea of how to do it I would have been more willing to then consider it as an option but since it was just sort of a half-baked idea I kinda just dismissed it.'

(Focus group 5)

Project approval was difficult to achieve for students in the ward. Not because ideas were unidentified, as proposals were made to improve oral or catheter care and nutritional

assessment. Rather, their mentors deterred students from such ideas, in case it 'put them in a bad light'. Their apprehensions could be related to an earlier occurrence during the students' placement when the SCN called an urgent meeting to feedback the audit results of the Malnutrition Universal Screening Tool (MUST). The results highlighted poor record keeping, and consequently nurses' professional practice came under scrutiny. The students therefore experienced difficulties selecting a project because their mentors were cautious of their improvement ideas:

> 'I found some of the nursing staff difficult to work with as they were more concerned about how the ward would look, in terms of nursing care, if it was audited for example and they were found to be non-compliant.'

(Student assignment 3)

The SCN planned to improve the MUST documentation and discussed recording keeping measures at the safety brief. Despite one student recognising a key opportunity to link her improvement idea to this ongoing work, the scale of the project was considered off-putting and unachievable:

'My mentor and another healthcare assistant are working on training for MUSTs, that's a huge issue … but when we chatted about it more we were thinking "oh my God, no, I can't do that, it's too much tae try and do."'

(Focus group 5)

Eventually, in the third week the students obtained project approval from the SCN. The approved projects included improving bowel charts, reducing time for patients' assisted feeding, improving appropriate use of clinical waste bins and reducing interruptions during medication rounds. However, planning changes and undertaking PDSA cycles were met with challenges in relation to accessing project resources.

One student's project required reminder cards to be laminated to meet infection control standards, but in the SCN's absence, staff could not locate the laminator thus the student's PDSA cycle did not run. The medication project relied on keys to count stock in patients' drawers, but mentors felt uneasy giving the students keys and data collection became

dependent on their own rare window of opportunity. In another instance, a project was delayed by the process of the SCN ordering a domestic waste bin, and eventually students succumbed to the reality of not managing to do their PDSA cycles in full:

> 'I'll hopefully progress next week, on night shift, or maybe on Sunday when it's quiet'. Sister is off this week, so there is no chance we will get near the projects, maybe next week, we're meant to be supernumerary, but we aren't.'

(Field note: 09.03.16)

The students' PDSA cycles *did* progress on my final visit the following week, when the SCN returned. Notably different were the students' spirits, which were lifted. Laminator provision meant one student was relieved to be able to run short bi-daily PDSA cycles and then report the data at the safety brief.

Another student contemplated how her morale had changed this week in her reflective assignment diary, revealing that one positive comment had re-ignited her motivation to do quality improvement:

> 'In week seven, I was taken back by a comment on how organised and efficient our medication round was, and that my project made drug rounds less stressful. Having a member of staff recognise my efforts, felt really good and I was on a high for the rest of the shift knowing I had done something good.'

(Student assignment 4)

With one week to go, students began to focus on writing their projects in the format of the assignment. A sense of urgency emanated from them, as they grappled with transferring data into run charts. The impact of their early stagnated project progression had become apparent, and students struggled to secure academic support slots, which they considered essential for submitting their paperwork. For this reason, students only provided a verbal project handover to the SCN, as opposed to the written project:

> 'I actually said to Sister "I'll hand in my improvement project, if you want to read it" 'cause she said, "I've no seen anything", I went "well I'll send it tae yae once I've

formulated my data and done my run charts, and if you feel it's made a difference, pilot it in your ward". She just laughed, and said "well I'll read it toots, OK – I'll read it."'

(Interview 8)

The SCN's condescending response mirrored by the lack of leadership experience in Ward Three, did not prevent the students' attitudes towards QI in the future being encouraging. They believed being a staff nurse would open up more autonomous opportunities for them to initiate improvement, and appeared keen to seek QI roles for themselves once newly qualified:

'If I was offered a job to do quality improvement I totally would do it, because I liked tae see things that already exist become better. Or, find a way to make something a wee bit easier for someone else, or better for the patients.'

(Interview 8)

In sum, students in Ward Three experienced difficulties in selecting their projects and in the absence of the SCN, they lacked access to project resources to complete their projects within the time limit of their assignments.

4.4 WARD FOUR

The overarching contextual factors influencing students' QI learning experiences in Ward Four related to the scale of learning environment and the nuances of data. As a result, some students experienced more difficulties planning their projects than others, while data collected by some students was more appropriately linked to their assignments, than others.

Context

On the first visit I expected to join the students on an orientation shift which the SCN recommended. Ward Four was the largest of the hospital's practice settings, comprising four subdivisions with their own unique functions, staffing capacity and geographical layout. Consequently, students attended a ward introduction to become familiar with the complex areas and care delivered. Ahead of the session, however, the facilitator was sick, and the orientation shift was cancelled.

Students therefore arrived on day one, with those on their first visit, not knowing what to expect. Equally, the staff did not expect the students' QI projects. This uncertainty was evident at the first safety brief as the SCN questioned my presence. Only then, was it apparent to me that several SCNs existed. During the study's recruitment, I liaised with one SCN only; the one who knew of the students' projects. But when talking to the students later, it appeared she had remained the only one:

'Well, the two Sisters I first talked to weren't aware of what the practicum was, which I was quite surprised about, 'cause didn't everybody do it last year? But I talked to a different Sister, and it was fine.'

(Interview 3)

The safety brief offered me a chance to situate students' QI projects in the present context of the ward. It was a turbulent time, with nursing bank staff replacing those on extended sick and maternity leave. Alongside the student nurses, a new group of junior doctors, coined by the SCN as 'the newbies', had also arrived and were undertaking their own shift orientation. Despite the staffing situation, there was an ethos of improvement in Ward Four that created a contrasting contextual backdrop:

The safety brief was held in the treatment room tonight, because the herd of staff attending was too large for the nurses' station; a SCN, four nursing assistants, nine registered nurses, one student nurse, and me! Patient safety was the focus, before the emphasis turned to practice improvement. I listened for nuggets of information because I recalled, as a student, that these were insightful for identifying project ideas; and there were quite a few:

Issues regarding broken vials and drug key anomalies
Staff were urged to consider new effective processes from the 'newbies'
Staff were told to take tea breaks, because busyness was not an excuse
Nurses asked to encourage junior doctors to undertake venipuncture
Ideas were invited for new documentation packs to reduce paperwork
Ample medication was requested to be stocked for a new trial

The improvement culture was not solely reserved for the safety brief, either. Rather, it emanated widely. On my way to the meeting, I noted posters which displayed ongoing

improvement work; one project - a collaboration between the paramedics and nurses to Reduce Medication Waste. Data run charts dominated the walls of one corridor, with conference posters and team awards displayed on others. Published improvement work was available in plastic wallets and QI enthusiasts, whom I was privy to through social media, were also visible. At the safety brief, I queried Janet, the attending student, about her inklings for QI project ideas. She did not acknowledge the opportunities highlighted by the SCN, nor did she refer to any of the ongoing QI work.

(Field note: 10.02.16)

Parallel to Janet not identifying project ideas, was the sense of her being disorientated and isolated. The scale of this ward, alongside its diverse care provision, had influenced her decision to elect it for penultimate placement; the premise being greater opportunities existed to develop her clinical skills. Further, her peers advised that many opportunities existed in this ward for QI projects. She prioritised becoming proficient in her skills whilst she was here, to mitigate pressure in her final placement. However, the trade-off for these apparent advantages, came feelings of anxiety in a large complex ward.

She confided working in different areas daily and worked mostly with different nursing assistants. Seemingly, the cancelled orientation shift disadvantaged her selecting a project because she focused on learning the routines of whichever area she was placed. Ambiguity of students' locations were often witnessed. For instance, the ward white board displayed students' names and work locations on each shift but tracking them down was hard as they seldom resided in places opposite to that specified. Students alleged that the constant relocating was a solution to the staffing issues faced in Ward Four:

'They treated us as part o' the numbers, if there was a nursing assistant short, they wouldn't put them to Area C, instead they put a student there, so they could have the nursing assistant in Area A, with more experience.'

(Interview 3)

Area A was a large and busy subdivision hosting a bed capacity of 40, and a high turnover of patients. When Laura selected a project in week three, to improve falls risk handovers between staff, she predicted that Area A would be optimal for her project. Her justification

alluded to its high quantity of patients who were risk assessed for falls on admission. Nevertheless, Janet's lack of familiarity with the placement left her unprepared for how the unpredictable shift scheduling would influence her time spent there, which was captured one night in Area C:

> I passed Area C, surprised to see Janet. She was sitting with a nurse who wasn't her mentor. 'I didn't expect you to be working here tonight', I exclaimed. Area C was small with a bed capacity of seven and patients underwent monitoring here before being discharged. Janet enlightened me: 'This is my first shift here, students aren't normally here because we are just glorified healthcare assistants, but they're short tonight round in Area A, and needed another body, so I was moved round here!'. I asked her if she would work on her QI project as it was quiet: 'I don't even have my project with me tonight, we rarely get this time here, it is very frustrating that we can't plan our work because we move so often, and my data is about admissions, not discharge'. I asked if she had discussed these challenges with the SCN: 'I don't want to go and speak to her because I feel like I'm harassing her about everything'.

(Field note: 25.02.16)

My own encounter with the SCN was positive and she perceived the students to be 'no bother at all'. She recited their QI project ideas and clarified the QI supporting role was appropriated to her, given her experience of leading improvement initiatives. She believed students considered her approachable, as she had spoken to most of them and authorised their projects already. It was beyond this point, though, that I realised the students did not want to speak with her. For instance, I asked if students returned to request data (such as incident reports or quality statistics); to which she confirmed they had not, and nor had she offered.

She elaborated that online data systems were inaccessible to students and instead diverted my attention to the wall statistics, which she regarded sufficient for students' projects. The assumption that students recognised and/or understood the wall statistics, and how they coincided it with their projects, emphasised that discussions around data usage had not been held. One student, later validated this judgement, considering the wall data an afterthought and sparked only by photographic evidence I showed at the focus group, later:

‘I noticed different data on the walls but didn’t see any about falls, didn’t have time to be honest and I was always busy, I don’t have time to stand and read posters, there is clutter everywhere and there’s too much on the walls. I've actually not, until now, thought about it or put the two together. I don’t even know how they get that information.’

(Focus group 2)

There was consensus that the influx of wall data for some students was unhelpful and ambiguous. Even the waiting room was inundated with statistics, which when probed, the receptionist knew nothing about, and visitors confessed not paying attention to it because it made no sense to them at all.

In sum, the large scale of the ward dominated some students’ early QI learning experiences. Working across multiple locations distracted or inhibited them from identifying or planning their projects. Some students were oblivious to the existing improvement opportunities and lacked clarity around the abundance of wall data on display.

QI learning experiences

QI project selection revealed contrasting experiences depending on students’ familiarity of the ward. A delay arose for students without experience, while those *with* experience seemed to choose quicker. The process for one student was accelerated because she was regularly exposed to the ward as a bank nursing assistant. She had anticipated the QI project assignment and recorded ideas in advance of the placement. Equally, the speed at which she chose her project (to improve the efficiency of patient admissions using a checklist), was driven by an early departure to attend an exchange placement abroad:

‘I'm going tae America on Friday, so I phoned the ward to suggest I come in the week before. I don't mind coming in 'cause I work here as a bank auxiliary, and I've been a student in semester two, so I know how the ward runs and I know what things I can improve, I had ideas in my mind before I started. I went tae the charge nurse wi' a list and she leant towards this admissions checklist, so I thought ‘if you're happy for me to do that, I'm happy to do it’ and we both felt that it needed to be improved.’

(Focus group 5)

Being an experienced student was a benefit for project selection as their knowledge of environment could be applied. For instance, Bhavna knew already about a large batch of fluid balance leaflets, stored in a cupboard and had become a bugbear to the SCN. Similarly, she learned of a new protocol, to mandate fluid balance charts at a patient's bedside. Combining her insights, she chose to improve recordings of patients' fluid intake using the unused education leaflets. The project was an attractive proposition, given staff were already primed, and it allowed her to collect project data quickly:

> I met Bhavna in the corridor, where she told me she handed out 20 questionnaires to staff and students to determine their fluid knowledge. 'The staff have been really receptive, and I've got 14 back in total, this is my baseline data. I'm also going to involve patients (who are able) in the project'. She pointed to the patient monitor; 'It's quite a challenge though, patients move on so regularly, so sometimes you go for lunch and come back, and your patients are away, so it's hard to manage your data'.

(Field note: 23.02.16)

Data collection was challenging for students, irrespective of their experience, or lack of, in Ward Four. Some students generated their own baseline and PDSA data, whilst others sought to retrieve statistics from sources, such as ward reports. Either way, challenges arose due to data inaccessibility, the fast patient turnaround, or because several locations prevented opportunities for appropriate data:

'If you were in Area C, I couldn't run the project because you were too far away from the main ward to constantly nip back and forward, you could'nt just go away, also, patients are short stay there so don't need fluid management. So, I couldn't get data there.'

(Interview 4)

Strategies that enabled some students to collect sufficient data, just for their assignments, included involving their mentors:

'If I was working wi' one (mentor) at one side o' the ward, I would just ask the other to run it for me, so between the three of us we were collecting the data. Or if I had notes to hand in to the doctors, at the other side, I'd try and collect the data on my way back.'

(Interview 4)

In other instances, the opposite had occurred, and mentors used students to collect ongoing QI project data. One student, Eleanor was paired with mentors who were already undertaking a project with the paramedics, to reduce medication waste and costs after patient discharge. She had volunteered herself as 'data collector' and assumed this position because of her supernumerary status:

'I was an extra person, so I said I could do certain things … because any improvement work that had to be done, had to be done at home … nurses weren't given time in the ward to actually put anything into place … that's why I said, if there's anything you need me to do, because I'm not classified in the numbers technically … then I could do the legwork.'

(Interview 3)

Eleanor was seen collecting data from the pharmacists who were in the multi-disciplinary team. She explained that monthly statistics were printed out and she then gave these to her mentor. From a teacher's perspective, Eleanor's articulation of how the data related to the improvement process demonstrated her accurate understanding. However, in terms of linking the data to her own tests of change for her assignment, that was not as apparent:

Me: OK, so what kinda things were you measuring then?'

Eleanor: 'Em, well that was the problem, with it only being an eight-week placement - I could see the facts and figures for the total cost for this month, but there's only so much change you're going to see, it's going to be an on-going project, so you probably won't see my results. I'm planning on coming in next month to see if there's improvement again.'

Me: 'Did you collect any local data yourself?'

Eleanor: What do you mean?'

Me: 'Did you collect any data on a daily basis, as opposed to waiting for the data to come in from pharmacy?'

Eleanor: No because that was the way they worked on this improvement project, it's not like every week they tally up a little bit here and a little there, there wasn't weekly data, it was always monthly.'

(Interview 3)

Eleanor's mentors were impressed with her initiative to speak with the multi-disciplinary team regularly about the team's ongoing QI project. They valued her input, and she was invited to remain involved following her placement. However, despite demonstrating in practice her abilities to contribute towards QI in a real time ongoing QI project, her learning did not transfer to her assignment, for which she received the lowest grade of the research participants with 41%.

In sum, students with prior experience chose projects quickly, capitalising on their advanced insight and knowledge. Most students experienced challenges with data collection, but when it was generated by themselves and with mentor support, it could be aligned appropriately to the academic assignment. Data affiliation to the assignment, however, was more difficult where students joined ongoing QI work, even though mentors acknowledged the valuable and tangible contribution students offered in real time.

4.5 SUMMARY

This chapter presented four rich ethnographic descriptions using within-case analyses to illustrate how 13 student nurses experienced their QI learning in diverse practice settings. It has created unique narratives upon which to explore and interpret what contextual factors influenced their engagement with their QI projects. The four descriptions provide a foundation to undertake a cross-case analysis in the next chapter to investigate how the contextual factors interplayed throughout the QI learning experiences and across different practice settings.

5.0 INTRODUCTION

This chapter presents the findings from a cross-case analysis of the four practice settings to answer the second question of the thesis: how do contextual factors interplay throughout students' QI learning experiences and across practice placements? This chapter structures the contextual factors into six themes: (1) the practice learning environment, (2) the organisational culture, (3) leadership, (4) data, (5) the assignment and (6) the student nurse. Within these themes, sixteen contextual factors are discussed. A constant comparison of the students' experiences across practice settings using the cases from Chapter 4 is undertaken to highlight the similarities, differences and/or nuances that had emerged. The inter-related nature of the contextual factors means that some repetition occurs. For clarity, contextual factors (CF) are numbered sequentially, such as CF1, CF2 and so on.

5.1 THEME 1: PRACTICE LEARNING ENVIRONMENT

Background information

The practice learning environment theme encompassed the multiple components that contributed to how students' practice placements functioned and were structured. Analysis of the placement settings revealed that the practice learning environments varied and displayed a range of characteristics such as size, patient demographic, workload, shift times, and number of patients and staff.

Contextual factors

Acute service provision spanned all the practice learning environments; however, the contextual factors identified within them and how they influenced the students' QI learning experiences presented themselves in different ways. The contextual factors identified in this theme included the students' familiarity with the practice placement, its size, students' shifts and shift patterns, and prioritising workloads.

CF1: Placement familiarity

In third year, student nurses were given an opportunity to elect a practice placement of their choice and were informed a fortnight prior to starting their practice placement of their allocation. Some students chose to revisit placements from earlier in the BSc Nursing Programme, whereas others elected placements in which they had a clinical interest in that

area but had no experience. Students' earlier positive experiences of working in that environment as a student nurse or nursing assistant was a driver for electing a practice placement. They opted for placements based on perceived opportunities available to them to achieve their learning objectives and the potential QI projects they could undertake. Whether students had placement familiarity, or not, it influenced their experiences relating to 1) their feelings before starting placement, 2) the dedicated time spent on their projects and 3) their relationships with their mentors.

Influence 1: feelings before starting placement

In the first instance, placement familiarity influenced student nurses' feelings about starting a placement. Students with familiarity appeared optimistic towards their QI endeavour whereas as others who were unfamiliar felt apprehensive. Familiarity in the initial stages excited students who were prompted by knowledge of potential areas that could be improved. In contrast, unfamiliarity worried other students who were fearful of incurring a delay in identifying a project to work on. As an outlier, one student with no ward familiarity confidently spoke of the value the SCN identified in her which led to early project approval:

> 'I said I wanted to do something wi' medication rounds because it's something that I am a bit confident in. Straightaway, instantly she said, "great, do it, go for it. 'I knew that's what I wanted to do before I started, I hadn't been in the ward, but I'd been in a colorectal surgery ward, so I knew that that was something I had picked up before. The very first day I went on a drug round, and it was the same, constant interruptions, so I started collecting data on the second shift. We've known about the quality improvement project since, essentially day one, so it's no' like they've sprung it on us, it's just taking a bit more initiative about the whole thing.'
>
> (Interview 8)

Therefore, despite the challenges faced with placement familiarity some students had individual capacity to act. This shows that although there are barriers and facilitators in general, that some students were able to mitigate against these.

Influence 2: the dedicated time spent on their projects

Secondly, placement familiarity influenced the amount of dedicated time students had for their projects. On one hand, students who were familiar with the ward layout and care

processes demonstrated confidence in their own abilities and knowledge of care provision and claimed it was advantageous for dedicating more time to their QI projects. For others, this familiarity came at a disadvantage. For instance, the experience of one student nurse meant that she was asked by the SCN to change her student shift to a nursing assistant bank shift. To maintain safe staffing levels, the student agreed but this reduced their opportunity to work on their QI project on this day.

Influence 3: relationships with their mentors

Lastly, placement familiarity was seen to influence the relationships between students and the nursing staff which had advantages and disadvantages. The upside experienced by students who knew current nursing staff was that they stated feeling more confident when conversing at meetings around project ideas and could encourage staff engagement in QI brainstorming activities. The downside though was that students had a tendency to adopt their mentors' beliefs and attitudes towards the QI Practicum and the bond developed was seen to influence some of the students' negative opinions of QI. These damaging opinions appeared to be validated by other newly qualified nurses who had spoken to students before starting placement:

> 'Some of the newer nurses were aware of PDSA cycles and the Model for Improvement, 'cause they all did their project last year. They all hated it, they just felt like it was an added stress. It's quite off-putting as well, 'cause I knew them and knew they'd done it, I'm like, "I'm going to do this how did you find it?" "Oh no, no, no" they said. I was a bit dubious 'cause I was thinking oh my God, I'm going to go in and I'm just going to be hating this.'
>
> (Interview 6)

CF2: Size of practice environment

The size of the practice learning environments ranged from being geographically small to very large. Depending on its size, one or more senior charge nurses led the staff. Before attending placement, a perception existed that larger wards would offer greater scope for project selection. Size also coincided with the quantity and turnover of patients, the number of nursing staff and students, and the locations of patient care delivery. Thus, influence on the student nurses' QI learning experiences included 1) the number of consistent interactions

they encountered with staff, 2) the pressure of being at the right place, at the right time and 3) the repercussions of project fatigue.

Influence 1: the number of consistent interactions they encountered with staff

Firstly, the size of the practice learning environment was reported by student nurses because it impacted the number of 'consistent interactions', they had with nursing staff and patients. Small wards equalled fewer student and registered nurses which meant reliable and frequent exchanges between them were then experienced as the norm. A perception that 'small' equated to less patients, meant that dependable interactions were seen to occur for students to collect data quickly. On the other hand, in the largest ward, size was responsible for students feeling overwhelmed at the volume of staff. They encountered inconsistent interactions with staff who were able to offer support, and students became frustrated because they had to explain their QI objectives repeatedly to multiple people each day which slowed down data collection.

'It's when you weren't working with your mentors and you were trying tae tell the other staff, who were like "mmm, what are you doing?", that was more difficult, 'cause you weren't always with the same members o' staff, you work wi' three or four different people and you've always got tae explain what you're doing and then you need to let them agree to you putting the project out tae the patients, so like getting data just took longer.'

(Interview 4)

Influence 2: the pressure of being at the right place, at the right time

Secondly, the size of the practice learning environment had implications for students being in the 'right place, at the right time'. For instance, the frequency at which students were placed in different areas made it difficult for them to apply stability throughout their projects. In comparison to other students, who conducted their projects within a singular space and delivered care to a consistent patient group, some students started projects in one area with one patient group, soon to be told to work with a different patient group elsewhere. Project engagement was regarded by these students as serendipitous; with progress being 'just your luck':

‘Our shifts all roll into one and sometimes you’re on, like you’re on one, off one, on one, off one, and you’re wondering, where am I going to be tomorrow and constantly hoping that you get where you need for your data.’

(Interview 4)

Influence 3: the repercussions of project fatigue

Lastly, the size of the practice learning environment influenced the perceptions that staff were experiencing ‘project fatigue’. Size dictated the number of student allocations in any ward and thus the number of QI projects. One placement had fifty per cent student capacity with only one student, while others had full capacity with up to six. As many as ten students were observed in one ward at the start of fieldwork. Where multiple projects occurred simultaneously, students perceived that staff tired of them quickly:

‘I think the projects are a tick-box exercise, you're just a third year required to do a project, no-one’s expecting a change to happen or be long-term, it's more just a case of something you have to do to pass that assessment. So, you're happy, we're happy - and we'll forget all about it as soon as you leave until the next third year come, and we'll start it again.’

(Focus group 5)

Students were also cynical that their own projects would be sustained long-term, because the workload of multiple new projects was unrealistic for nursing staff. Contrastingly, the smallest ward embedded several QI projects into their daily practice, yet project fatigue was no issue here. Instead, collaboration on the student project was welcomed.

CF3: Shifts and shift patterns

Students acknowledged shifts and shift patterns as being a contextual factor that influenced their QI learning experiences across all wards. Working weekdays and weekends, their shifts ranged from 7 to 7.30 (days or night shift), 8am to 4pm (dayshift), 1pm to 9pm (twilight), 7 to 3pm (early) and 2 to 10pm (late). The average pattern included working three long days together or a week of dayshift and then off at weekends. Shift patterns influenced QI learning experiences in terms of the challenges around 1) sustaining project continuity, 2) being able to communicate effectively, and 3) altering student behaviours.

Influence 1: sustaining project continuity

Firstly, students' shift patterns in the practice learning environment influenced their ability to sustain 'project continuity'. On one hand, students were accountable for their own shifts and aligned these to the stage of their project to generate support at *their* convenience. However, not all students had this choice. Some were allocated shifts comprising three long days, followed by four days off, and then four days off followed by three long days. Large gaps of up to eight days away from placement were therefore created and students blamed unreliable and rapid changes to shift patterns for deterring project progress and not getting 'a good run at it'.

> 'I find it difficult 'cause you start the ball rolling, then you're off for five days or longer, then you're back in. By that time people have forgot about you and what you're doing, 'cause I kinda made a poster and it was away when I went back. So, you're putting it up and down, coming back and it's disappeared again'.
>
> (Focus group 5)

Influence 2: being able to communicate effectively

Secondly, shift patterns in the practice learning environment influenced students' ability to 'effectively communicate' with their peers. Students had opportunities to communicate face-to-face about their project ideas at induction on their first day. Others managed to convene over lunch in the canteen on day one and deliberate on collaborative QI projects. Beyond this initial meeting students' shifts became staggered meaning communication became infrequent. Some students tried to address this obstacle by engaging with each other between small group chats online, where larger mediums provoked worry:

> 'I've never used the Uni discussion board in the three years I've been there, I wouldn't know how to, 'cause we've got, a nursing page on Facebook. But everybody keeps posting questions, and hardly anybody knows the answers and it gives me anxiety.'
>
> (Focus group 1)

However, despite the online medium used for group chats such as social media, shift patterns continued to cause delays to the progress of the project because students had to negotiate who was doing what and when and then wait for the responses. Contrastingly, the student in

the smaller ward had no need to communicate with peers being the only student and had several opportunities to communicate with their mentor at each stage of the project.

Influence 3: altering student behaviours

Lastly, the students' 'behaviours' where these related to QI, were influenced by the type of shift they were on. Students on dayshift were seen to avoid working on their project altogether and instead focused on achieving their competencies and making a positive impression. As a result, they stayed beyond the end of the shift to collect information for their projects. Others, who intended to work on their projects during the night shift, were faced with making decisions about what took precedence. For example, learning how to navigate the online patient record keeping system for which they had no password was a rarity that occurred only when mentors had spare time to offer students training. Otherwise, the priority lay in having their Ongoing Achievement Records[1] completed.

CF4: Competing workloads

Final year student nurses encounter increased responsibilities prior to becoming a Registered Nurse. The QI Practicum took place prior to the students' final management placement, and it was believed its timing contributed to 'competing priorities' which influenced their QI learning experiences. The timing of the assignment in their penultimate placement posed implications for student nurses as they focused on 1) managing patient care, 2) acquiring skills to demonstrate proficiencies and 3) carving out time to complete extracurricular activities inside and outside of their degree.

Influence 1: managing patient care

Firstly, the students experienced competing priorities in practicum because of the QI Practicum which can generate conflict around patient care. Students reported resentment towards the assignment; perceiving it to interfere with being involved in wider learning opportunities, which meant sacrificing for instance, gaining knowledge of new patient demographics and/or diseases. Some spoke of being tasked with managing their own patient caseloads and assessed this obligation to be of greater importance than the QI Practicum. Despite not all students having an opportunity to evaluate the demands placed upon them, because mentors dictated when the urgent or 'heavy' work should occur, a consensus was held by students that patient care took precedence. Some went as far as asserting from the

[1] UK Nursing and Midwifery Council Competency Framework Documentation

outset that they would not be engaging with the QI project and instead support staff and be an effective team member.

‘I'm there tae become as good a nurse as I can possibly become, I'm not going tae learn that from sitting behind a desk doing a project, I know how busy the ward is … I'm there for my patients, and I have a certain amount o' loyalty tae my mentor, in fact all the staff on the ward, I'm not going to walk away, and be like “I'm away now to go and do my project” – nah … it, it just doesn't sit right wi' me.’

(Interview 7)

Influence 2: acquiring skills to demonstrate proficiencies

Secondly, student nurses raised the issue of prioritising workloads as a contextual factor that influenced contradictory encounters between demonstrating proficiencies and conducting their QI Practicum. Students initially opted to ‘learn the ropes’ and prove their abilities to mentors to get proficiencies signed off. Not finding a project to be authorised in the first two weeks was therefore regarded as an acceptable trade-off in favour of getting to grips early with the placement’s ins and outs. Students preferred to exploit skills opportunities as they arose, and was a tactic notoriously taken to alleviate the unnecessary pressure felt going into their final placement. Moreover, students ranked skills acquisition as a priority over the QI Practicum, not only for qualifying as a Registered Nurse, but also to display their talents for future job interviews.

‘A big thing that I feel right now, and I think it comes back to no’ being counted in the numbers, but this far on you’re trying tae make an impression and show you can manage six to eight patients and have that kinda responsibility, but then you’ve no’ got time to go and do that project.’

(Focus Group 2)

Influence 3: carving out time to complete extracurricular activities

Lastly, the contextual factor of competing priorities arose because of the influence of several competing extra-curricular activities happening during the QI Practicum. Student nurses had the opportunity towards the end of the placement to attend an exchange opportunity in America or Spain. The students who were going abroad had felt disadvantaged because they

had to travel during the write-up stage which led to anxiety submitting in a shorter time limit. Some students managed this complication by using their off-duty days to accelerate completion whilst others opted for extra shifts at placement or the nurse bank to make up lost practice hours or to supplement their bursaries. Students who chose to complete the QI Practicum in their spare time were associated with attempting real-time projects, as opposed to those that were hypothetical.

5.2 THEME 2: ORGANISATIONAL CULTURE

Background information

The organisational culture theme comprised several elements within the practice learning environments that related to the habits, behaviours, knowledge, beliefs and attitudes surrounding QI and the teams working within them.

Contextual factors

There were three contextual factors that dominated this theme which included the influence of ongoing improvement projects, the level of QI expertise, and the beliefs and attitudes around improvement.

CF5: Ongoing Improvement Projects

Several improvement projects implemented by ward staff already existed in the practice learning environment. Evidence of ongoing QI work was displayed as conference posters, annual reports, wall statistics and/or publications and disseminated in QI folders, newsletters and social media posts. Students were aware of projects relating to improving documentation of falls, SBAR[2], fluid balance, MUST[3] and PVC[4] bundles, but with minimal recall of where and when they had become aware of them, and some students were altogether oblivious of them. For instance, a collaboration involving the MDT[5] at an organisational level to improve the assessment and treatment of strokes was apparent; and a further project at the same level in all wards related to improving patient hydration was also underway. Smaller projects at ward level could be seen involving nursing staff to improve medication administration using alarm clocks, and purple aprons to minimise medicine round interruptions. At the level of the individual, improvements to hospital stay in all wards were underway through patient

[2] Situation Background Assessment Recommendation
[3] Malnutrition Universal Screening Tool
[4] Peripheral Vascular Cannula
[5] Multi-Disciplinary Team

experience surveys and involved the nursing staff. Ongoing improvement projects, and consequently students' awareness of them, influenced their QI learning experiences around 1) visibility of QI work, 2) timing 3) and project alignment.

Influence 1: visibility of QI work

First and foremost, the visibility of concurrent QI work in the practice learning environment influenced students' beliefs about that ward's improvement culture. Visual displays of real time projects raised students' awareness of them, which was understood to convey a positive QI culture and likelihood of their own projects being sustained. Contrastingly, students who were less exposed to visual QI displays were less cognisant of real time projects and viewed their wards as having a 'tick box' improvement culture:

Researcher: 'So do yous have rotas in your wards for auditing?'

Student 1: 'You say what you think'.

Student 2: Not that I know of no.'

Student 1: 'We do.'

Student 2: 'Do we?'

Student 1: Aye, see the board where all the names go up for who's on shift, there's actually an A4 sheet o' paper inside a poly pocket which tells you the four different things that get monitored and there's a different name against each o' them. It's just that they're not spoken about all the time, we don't hear or see anything, it's all very much in the background, a tick box.'

(Focus Group 4)

In one ward (observed at the beginning of the study), students acknowledged multiple QI projects happening. However, the positive improvement culture was equally believed to be a hindrance to selecting a practicum topic because students (and some staff) claimed 'everything is already being done'.

Influence 2: timing

Secondly, the timing of the improvement work influenced students' chances of becoming involved. For instance, QI projects at their infancy provided opportunities for students to steer improvement work forward with the SCN. Where early engagements and conversations were reported between students and their SCN, and where students had knowledge of the

ward or project topic, the endeavour transpired amicably for both parties. However, joining another ongoing QI project generated anxiety because students thought this may lead to assignment plagiarism. With the absence of clear guidance on how to join an ongoing project students avoided pursuing it further. Where ongoing projects *were* highlighted at induction meetings or the safety briefs, students expected there to be further conversations about their potential for joining those who were leading the projects. However, students were observed aimlessly querying staff about QI projects with little or no progression and at the end of their two-week authorisation window had mostly given up.

Influence 3: project alignment

Lastly, joining an ongoing QI project mid-way was not altogether impossible but was seen to influence the alignment of student's own data collection to their assignment. Students who joined QI projects at the point of inception managed to sway the direction of the project, perceiving themselves to have asserted a degree of ownership over the project and align their data collected in practice to their QI practicums. One student joined a project being led by their nursing mentors. This project at organisational level involved pharmacy and paramedics to improve retention of patients' own medications from admission to discharge. The student attended improvement meetings, collected data and was invited to continue working on the project after placement was completed. However, there were tensions that arose in this situation between the student receiving excellent hands-on QI learning experience with the team and perhaps getting a better grade for their project which raised the question as to what approach could be better in the longer term. This student was engaged in supportive QI activity and found the experience beneficial to enhance their QI knowledge and skills, however, it did not align to how they were assessed academically and may have been why the students passed with a low score of 41%. The marker's feedback on the students' assignment reflected this:

'The aims of the project were too broad; it would have been better if you'd focused on one aspect of the problem you identified. By trying to do a project too large and at one time you've not been able to delve into any one aspect of what you did in depth'.

(Student assignment 4)

CF6: Presence of QI expertise

The presence of QI expertise in the practice learning environment was a contextual factor that influenced student nurses' QI learning experiences. QI expertise was available across most of the practice learning environments. Students had the potential to tap into QI knowledge and acquire skills through various people such as the chair of the health board's 'Quality Improvement Hub', regular International Quality and Safety conference attendees, registered nurses who were undertaking CPD or MSc level QI education and/or NQN's with QI Practicum experience. This expertise that was accessible to the students influenced their learning experiences in terms of 1) exchanging information and 2) staff engagement.

Influence 1: exchanging information

Firstly, the presence of QI expertise influenced the exchange of information between staff and students that were seen to be both helpful and unhelpful. On a helpful note, students' initial project aims, which were often far greater than could be achieved in eight weeks, was a barrier identified by SCNs and mentors who had previous QI experience. This expertise was shared with the students who could then be diverted away from these pitfalls towards alternative projects that would be manageable in the timeframe.

An exchange of information was also shared by NQNs who had developed QI knowledge and skills in the previous year. This new generation of new staff was identified from those who had studied at the local University. The newly qualified nurses were helpful in that they could signpost students towards suitable QI resources and offer them emotional support around the challenges they faced in practice.

Subsequently, though, some of the information shared with students was unhelpful for their projects. NQNs had advised students not to overthink completing their projects in practice, and to 'do what it takes to get the assignment submitted'. These opinions influenced students' own perceptions of the importance of undertaking the assignment:

'One o' the nurses qualified last year, so she's been asking a lot, but she was like don't worry about it, it's mainly more what you write at the end than what happens on the ward kinda thing, so I'm not worrying.'

(Focus Group 4)

Influence 2: staff engagement

Halfway through the placement, some students claimed that they would not complete the practical element of the assignment, choosing instead to submit a theoretical QI project. The information provided by experienced nursing mentors may have influenced this choice, because while they engaged in QI for their annual appraisals and shared their professional experiences with students, their lack of familiarity with the QI Practicum guidelines meant they disengaged with the QI process. Alternatively, staff with QI expertise did engage however the lack of understanding of the QI Practicum process meant they unintentionally mislead students to do QI activities that misaligned to their assignments.

CF7: Beliefs and Attitudes

The beliefs and attitudes of individuals within the practice learning environment was a contextual factor that influenced the students' QI learning experiences. The opinions of and outlook towards QI varied between the SCN, the mentors, the healthcare assistants and the students themselves. The influences that imparted from individuals' attitudes and beliefs onto the students' QI learning experiences were centred around two points 1) fear of criticism and 2) the student role in QI.

Influence 1: fear of criticism

Firstly, beliefs and attitudes circulating in the practice learning environment related to a fear of criticism. Cautionary approaches were evident from many to avoid amplifying problems unnecessarily. For instance, when students highlighted areas for improvement, NQNs conveyed anxiety and anticipated being blamed by the SCN for a substandard performance. This level of worry was identified by students and influenced their choices to avoid potential project ideas to protect their mentors. A fear of criticism was understood to manifest by experienced members of the team, and students claimed that the SCN blocked feasible improvement ideas to mitigate unwanted attention around wrongdoing. In the event of misconduct being highlighted, nursing staff became wary of criticism and began to fix the problem areas discreetly, before the students had the chance:

'Students chose to add a box for patient name bands to the SBAR sheet, but the same week another nurse just copied the idea, I don't know why the nurse did that, it's like stealing our ideas and then she told the student "naw, you'll need to change your idea now, its sorted" – that was horrible.'

(Focus group 1)

Consequently, students experienced gaslighting as their ideas were then snubbed. They lost trust in staff and developed their own fears of criticism. Students reported comments from nursing staff that labelled them lazy when they engaged with their QI projects. This opinion influenced the distance between students and their QI work and turned their focus to passing placement.

Influence 2: student role in QI

Secondly, students' own beliefs and attitudes influenced how they viewed their role in doing QI. Most appreciated the methodology and claimed to understand its necessity to improve care and services; yet the point of doing a QI project in pre-registration education was deliberated. Students deemed their QI purpose worthless where mentors viewed their assignment as a tick box exercise and burden placed upon them. Further, students questioned their role in QI and regarded it as a futile exercise where interest within their practice setting could not be generated. Consequently, students lost faith that their projects would be sustained after leaving their placements.

Similarly, some students who did experience engagement from mentors and SCNs questioned their QI role. Despite a supportive QI culture and QI expertise, students viewed QI as a disparate component of their program which they vowed to get involved in only after perfecting their 'actual' nursing role. Students reported the deterrents that influenced this decision. Students felt nervous asserting their QI position with medical staff and a perceived hierarchy was found between the medics and nurses. Students who felt inferior created their own limitations around project choice and remained confined to their nursing silos. Most believed that in a student nurse's capacity, they lacked autonomy, and this perception influenced a lack of engagement in their projects, and support they received. On the contrary, students who faced a greater number of adversities such as a lack of mentorship, QI expertise, staff engagement and/or project support, felt determined to undertake the QI Practicum and engage with future QI opportunities further.

'I feel like I've done it all off my own back with no support, but I totally get QI, and I would definitely do it now 'cause I've read it all and done it. I'm spotting so many things, that I can do to improve things when I'm a staff nurse.'

(Interview 8)

As such, while the student did not necessarily manage to undertake an effective QI project, the experience itself was beneficial because they could look critically at practice and be able to at least identify potential areas for improvement.

5.3 THEME 3: LEADERSHIP

Background information

The leadership theme encompassed the approaches, responses and behaviours of staff in the practice learning environment, where it related to the QI Practicum. The University establishment and practice learning environment had no agreement as to who would act as leader for student nurses completing their QI Practicums, however, students were encouraged to pursue staff with QI expertise, if possible.

Contextual factors

Prior to students arriving on placement, they knew to seek project approval from a senior member of the nursing team and provide a QI Practicum information handout to their mentors. The senior charge nurse had been emailed a study information sheet during the study's recruitment process. Students reported two contextual factors which influenced their QI learning experiences in this theme relating to early project collaboration and continuous project facilitation.

CF8: Early project collaboration

Early project collaboration was a contextual factor that influenced the QI learning experiences of student nurses. In the first instance, students approached SCNs for early leadership across all wards to fulfil the task of project authorisation. The levels of SCN engagement, opportunities for discussion around the QI Practicum and what their involvement entailed varied between wards. However, early project collaboration was reported by students as being a contextual factor that is show in influence 1) their ability to select a project idea.

Influence 1: ability to select a project idea.

In most cases, SCNs perceived themselves to be collaborating with students early in the process to help them identify areas for improvement. Contrastingly, some students perceived the SCN to be the least engaged staff member because of differing shifts, refusing accountability for projects amid taking up a new post, being oblivious to the QI Practicum

or through offering carte blanche to students. As a result, students felt SCNs were not prepared to approve their projects and lacked assurance when picking project ideas:

‘I met her (SCN) in the corridor, I was like, I'd like to explain what I'm doing, she was like “oh no, it'll be fine, talk about it in the Safety Brief, but good luck wi' the fluid balances, I'd love tae find somebody who can actually change that.” I was like …… thanks for the vote o' confidence.’

(Focus Group 2)

SCN project collaboration was, however, witnessed early during the students’ QI learning process. For example, during ward inductions and safety briefs, students were alerted to areas for improvement through insinuations or hints. These tip-offs were intended to be useful for students, however, the passive nature in which they were delivered led to students feeling like they received insufficient information to kickstart a project or missed the brief altogether:

‘The only thing she really said was …the board doesn’t get used well enough … there’s an idea … for your practicum, but then thinking about it, not one o’ us picked up on it.’

(Focus Group 4)

Further, students reported that SCN collaborations included signposting students to sources in QI example information folders and/or performance data presented on the walls. These engagements with students, though, came at a point later than was needed by students, and while it served as a useful lead to identifying a project, students found no value in the advice because they had already moved on. At times SCN involvement caused confusion, either because multiple SCNs provided different advice or because students received conflicting advice on their topic selection:

‘Someone was meant to be doing the same idea as me, fluid balance. My mentor was great with it. I went tae Sister and she was fine too. But then the other student was like “oh they told me no, 'cause it won't work,”, so you're getting mixed messages and it’s confusing.’

(Focus Group 3)

Student nurses preferred an explicit approach to project collaboration, whereby early interactions with the SCN led to prompt QI meetings, awareness raising of projects and/or timely input about their project ideas. In these wards, students met the project timelines and held the belief that their projects would be sustained. Hearsay also suggested that discernible collaboration with the SCN at an early point made the QI learning experience more enjoyable:

> 'The Ward Sister came to speak to us in University, she's the kind of person who really wants change and wants her ward to be the best. My friend's in her ward and they're getting on great wi' their practicums, she's involved right from the start, and like …you need to do this, you need to do that,… you've done enough here, you've got enough data, she's obviously really interested, so … she's quite enjoying it because she is getting the support she needs.'

(Focus Group 3)

CF9: Continuous project involvement

Continuous project involvement was a contextual factor that influenced students' QI learning experiences. Some students believed there was a general lack of interest in their projects and in QI generally. The engagement from previous newly qualified nurses, healthcare assistants, nursing mentors and the wider MDT to support the QI projects appeared to be serendipitous. Subsequently, the lack of project involvement was seen to influence 1) students' feelings of defeat with their projects and 2) doubt of its sustainability.

Influence 1: students' feelings of defeat

Ongoing project involvement from SCNs throughout the 8-week practice placement was a rare student experience. Through discussions with SCNs, it was evident that more pressing issues such as ensuring safe staffing, meeting the demands emerging during the busier winter months and supervising inexperienced staff were key priorities. Project involvement from the SCN observed in practice included check-ins to assess the students' project progress, the provision of data sets for students to analyse, and then authorise project resources. However, students did not perceive SCNs to be involved through all stages of their QI project, and attribute this to other staff not getting involved:

‘Nobody is involved, cause like when I first put my survey out people were like “fine, I’ll look at it”, but now it's fallen away by the wayside and I feel I'm having to go “can I please just remind you to do this” and I've put them at every nursing station, and they're still just sitting there.’

(Focus Group 3)

However, students believed that if SCNs were continuously involved in their projects, that a higher number of nursing mentors would get involved. The same was said in cases where SCN involvement was limited, as student believed this lack of involvement influenced the declining involvement from nursing mentors:

‘Every time I try tae get them (SCN) about this project they never had time, they’re very dismissive I find, and then the Staff Nurses, it’s hard tae kinda get them involved when you know your Sister’s not really involved.’

(Focus Group 5)

Nursing mentors did not exclude themselves altogether from getting involved in the students’ QI projects as they were reported to have offered moral support and encouragement to get the assignment completed. However, this lack of continuing involvement following the project selection stage was seen to discourage students and in many cases the momentum of their QI work slowed down. Towards the end of their placements, students appeared to have lost emphasis on trying to make improvements by the assignment deadline:

‘My mentor’s really good about it, but she doesn't get involved, she just said “you just do what you want with it, if you need help ask … otherwise I'll assume it's going fine”, so … I'll just implement my change at some point.’

(Focus Group 2)

Influence 2: project sustainability

In cases where involvement diminished entirely during the placement, students developed a belief that their improvement endeavours were not merited. The sustainability of their QI

work was doubted, and they lost confidence that the input needed to keep their work going would be guaranteed:

'The Ward Sister didn't seem interested after a while …… I feel like she didn't have much 'faith' and when you get that from such an important person, that's obviously managing the ward, it's like, obviously it's not going to get carried forward.'

(Focus Group 5)

In the small and large ward, mentors got involved during the projects and collected data alongside and in the absence of the students. In the students' views, the continuity of project involvement was enabled by the wards' positive QI ethos and valued SCN. This ongoing support empowered students to undertake tests of change regularly to apply theory to practice and develop their QI skills. Mentors became invested in the projects and would liaise regularly with the students:

'They're really respectful of her 'cause she is a good Sister and so they all listened to me, it doesn't hurt to have someone that they've worked under for years saying … "can you let us know your feedback" every day I was coming on I was getting feedback from staff nurses.'

(Interview 1)

In contrast, students who were exposed to a lack of leadership experienced project mentorship intermittently. Delays occurred between requests for resources and the point at which students received them which meant PDSA cycles needed to be postponed. Consequently, students omitted data collection in favour of submitting hypothetical data as time ran out, and PDSA cycles became hurried at the end of their placements.

5.4 THEME 4: DATA FOR IMPROVEMENT

Background information

The data theme covers the relationships between the information needed to evaluate and guide improvement and the students' QI practicums. Students were required to demonstrate evidence of collecting and documenting baseline data on a run chart and plot two further data points during their tests of change. Students in years two and three were asked to

undertake mandatory e-learning modules, a podcast, a lecture and a workshop on measuring improvement. Further, a reading list comprising primary and secondary QI research articles and reports were accessible to them through the University's portal.

Contextual factors

Data, and students' interactions with it, influenced their QI learning experience. Three contextual factors created this theme which related to students' understanding of data, the opportunities to access data and the challenges encountered when gathering data.

CF10: Understanding of data

Students' understanding of data was a contextual factor that influenced their QI learning experiences. The types of information that constituted data for improvement were taught during the theory lectures, and students were signposted to these sources which could be observed in all wards. Performance indicator boards were displayed, various audit results could be accessed in paper-based folders, a couple of wards displayed run charts and many practice settings collected patient feedback surveys. However, whether students understood data usage, or not, remained a factor that influenced 1) their perception around the worth of data and 2) their ability to translate data for improvement.

Influence 1: perception around the worth of data

Firstly, students' understanding of data to inform their projects was seen to influence their perception of the worth of data. Students demonstrated their knowledge of data for improvement during conversations, by making links between the wallboard statistics and/or audits and the ward's performance. However, some students only made a connection when shown photo prompts during the focus groups and interviews. These students had been exposed to excessive information such as charts and statistics at every turn in the large ward, yet they never made the connection between it being the ward's performance data and its potential relevance to their QI projects. They believed that too much information caused them to disengage and as a result did not place any worth on this data to inform their projects:

'They've got like posters and stuff of, God, I can't remember, there's too much, 'em, they display falls and stuff, and there's other stuff up like how they're doing and what they've achieved, what percentages for that month and stuff, hunners of other things …but I've no looked at it, it puts me off, I walk right past it.'

(Focus Group 2)

The worth of data was also downplayed by students who lacked understanding of the value of stakeholder feedback. Smaller data sets such as patient satisfaction scores from questionnaires/and or suggestion boxes were available, yet concerningly, students regarded patients' comments as 'silly' or 'random' when they suggested improvements such as better food or wanting extra channels on their television.

'There was a wee lady explaining tae me about like the questionnaires, she was doing like an audit or something and they got feedback, and I think they had like a couple o' complaints but they were wee silly things, like on a Wednesday they did'nae do fish and chips and things like that, it's quite silly.'

(Focus Group 1)

Students understood the data for improvement to relate to protocols and statistics in a broader sense, such as from the Scottish Intercollegiate Guidelines Network (SIGN), the National Institute for Health and Care Excellence (NICE), Healthcare Improvement Scotland, the Department of Health and/or the local Quality Improvement Hub. They didn't feel like they could change the food or televisions, so did not explore this feedback further. They placed greater emphasis on these sources in their assignment submissions which conveyed their understanding of using some sort of data to support their project choices.

Influence 2: ability to translate data for improvement

Secondly, students' understanding of data influenced their ability to translate data into practice. For instance, despite being attentive to one, or another type of data, only a handful of students translated it to the practice learning environment, appropriately. One student, with the support of a SCN with QI knowledge interpreted data from a patient hydration protocol and used a driver diagram to develop a set of applicable project measures. Another student, who articulated accurate accounts of data regularly during field work, capitalised on data available from a previous placement. This student benchmarked the problem of medication interruptions to their own practice learning environment and adopted the same measure to recreate data collection and establish a baseline figure:

'So, my surgical placement before, had the same problems about medications. We were told, look for things that seem to annoy ye', write it down. I wrote the data about interruptions and as soon as I came here, I checked, and they had the same issue. So, I just copied that improvement.'

(Interview 8)

For many students, efforts to translate wider data to the practice learning environment were not solely restricted to limited knowledge; rather it was also related to the challenge faced getting access to data.

CF11: Access to data

Access to data was also identified as a contextual factor that influenced students' QI learning experiences. Before entering a practice learning environment, a lecture was delivered to students outlining their responsibilities around patient information which covered Caldicott requirements, the Data Protection Act (1998), the Nursing and Midwifery Code (2018) and the Scottish Government Records Management: NHS Codes of Confidentiality (2010). When students arrived at their practice placements, a prerequisite to patient data and conducting QI projects was to obtain signed approval from the SCN. However, approval did not guarantee data access and could therefore 1) reduce their choice of QI project.

Influence 1: reduced choice of QI project

Firstly, students who tried to establish baseline data and/or identify problems encountered gatekeepers to the data sourced. Some students (and their mentors) claimed not to know how to access the data they needed and others experienced barriers relating to their student status. For instance, one SCN asserted that students were not permitted to access online data; an understanding mirrored by a mentor who raised concerns about the transferability of students' own data training to that of the organisation. Only in very few instances, was data access was not a concern because statistics had been provided by the SCN themselves on a voluntary basis to support the students' projects.

Other students reported not being able to access data within their practice placement which meant they had to search for alternative projects to work on. One student perceived the medical staff to have priority access over patients' paper notes. This hierarchical thinking reduced one student's self-confidence to pursue their improvement idea. On the other hand, restrictions to data led students to focus their energies outside of their practice placement towards other disciplines (pharmacy/blood laboratory), the wider MDT or previous mentors (nurse specialists) to get the information they needed:

'The only thing I've got from inside the hospital data-wise is from my old mentor who's a diabetic nurse she sent me statistics, but that's about it, like general statistics on, eh insulin-dependent diabetics that she carries out for this hospital.'

(Focus Group 5)

A few students succeeded in obtaining data by email or handouts but the timing of receiving this data was fundamental to inform their project selections. If data was accessed beyond the halfway mark, students reported it being too late and decided to submit their QI Practicums using data that was hypothetical. However, in the instances that data was retrieved in the first four weeks, students still had scope to contemplate an area of improvement to focus upon:

'They have the pharmacy technicians in my ward … she explained the stats to me early on … so you could see the biggest cost was inhalers … that's why I decided to print off all the facts and figures and work on that.'

(Interview 4)

With hindsight students reported at their interviews that if they were to do a QI project in future, the accessibility to data would dictate the project they selected.

CF12: Gathering data

Gathering data was a contextual factor that influenced the students' QI learning experiences. They were required to obtain data for one baseline measure, two process measures and one outcome measure for the assignment and had six weeks to run two PDSA cycles and plot the results on a run chart. A key influence surrounding this contextual factor related to 1) lost opportunities.

Influence 1: lost opportunities

Firstly, despite students trying to gather the data they needed, there were many lost opportunities. Some students perceived gathering data as demanding, and a distraction from other learning prospects. Others thought it was too complex a task to achieve if working in different locations. However, data was believed to be difficult to gather and interpret, for instance, because patients were admitted and discharged quickly, meaning that students missed out on their chances to continue gathering data. Students therefore avoided projects or changed them frequently. Further missed moments to collect data were evident on students' arduous attempts at collecting timely information. For instance, useful data to support worthwhile project ideas eventually filtered down by the SCN but came too late in the process to inform their projects; others struggled to generate data through their tests of change and through no fault of their own because they did not have the adequate resources which were required.

‘So I said “oh, could I do that for my project, putting bins in the rooms?” - so I put that in place, but then I had tae keep chasing them up tae order the bins, I asked her like three times, and she kept saying “aye, I'll do it” then I asked her yesterday and she'd just ordered them that morning …… so they're still not even in place for my PDSAs.’

(Focus Group 4)

These challenges led to students trialling alternative strategies to enable them to gather data in time for their assignment submission. Working in teams on the same project and sharing data collection was attempted in some wards with success in the early stages for developing baseline measures. In the later stages, the ability to study and act upon PDSA cycles became delayed because shifts between students differed leading to suboptimal communication.

‘I always seem tae be on shift on my own in the ward or along in the other area, so I’m just doing it myself, so I know I'm doing it right, and I don’t have to like arrange times to meet up and count on somebody else. Even though we're doing the same thing in the same department …we're not doing it together as we hardly see each other’.

(Focus Group 1)

Instead, students rushed to gather data at the last minute, which often involved staying beyond their shifts (like their mentors) to gather the information needed to complete their run charts and assignment. Other students claimed that success in gathering data was the result of undertaking smaller projects for which there were readily available datasets, such as patients nursing or medical notes. One student recommended that future cohorts undertaking the QI Practicum should take this into account for their own projects:

‘Pick something that’s already going on in the ward such as oxygen-use, fluid balance charts, care and comfort round, stool charts something that happens all the time that you know gets done several times a day, because it’s going to be so much easier and it’s going to give much more information.’

(Interview 7)

5.5 THEME 5: THE ASSIGNMENT

Background information

The QI Practicum assignment theme encompassed the students' perspectives and understanding of the teaching, resources, guidelines, practical activities, assignment paperwork and QI learning support. The academic assessment remained constant across students' experiences, yet their interactions with the pedagogical components such as lectures, workshops, podcasts and e-learning varied.

Contextual factors

The contextual factors that emerged from within this theme which students reported as being influential to their QI learning experiences related to undertaking an assignment with a different academic format, the ability (or not) to seek project approval and the timing of the QI Practicum assignment in the BSc program.

CF13: Academic format

The format of the assignment was a contextual factor that influenced students' QI learning experience. The format differentiated from previous assessment methods and was designed by faculty to guide learners through each stage of doing an improvement project in practice. Until now, students had worked at Level 9 on the Scottish Credit Qualification Framework (SCQF) and were about to embark on Level 10 for the QI Practicum. Students' ability to follow the timeline and structure of their assignment influenced 1) the progress of their projects.

Influence 1: progress of projects

Students' engagement with the assignment format in real time was rarely an event witnessed in practice. However, validation of students' intentions to follow the format and timelines was captured through their self-reports of brainstorming activities and using fishbone diagrams, sharing newly developed questionnaires, explaining PDSA cycles at the appropriate times (4), and pointing out changes such as laminated wall posters. Students appreciated the progressive action-learning philosophy underpinning their assignment and claimed it facilitated the project into manageable tasks:

> 'The forms are really good and easy to use and understand, I quite liked the boxes, they just told you at the top box what they were really looking for and you just had to expand which was easier.'
>
> (Interview 4)

If students tracked the format and timing, they fared better on completing their projects. The benefits consisted of sustained change as validated by one SCN, improvements to project measures in subsequent PDSA cycles as reported by students, and improvements to ward processes which were fed back by the wider nursing team. However, not all students exploited the step-by-step nature of the assignment. Some became disinterested and reported that it was repetitive, reducing the scope for creativity through its 'pigeon-holed' structure:

'You need to find define specifically what they want in each pigeonhole kind of thing but I think a wide search of the literature would be suited better to something like this … where you can be quite broad and then take it down. You can't really put in your thoughts and feelings in it to make it flow better, it was just asking the same things in each box.'

(Focus Group 4)

Students seldom brought their paperwork to practice as they felt confused or unclear about the expectations of working at a higher academic level and within practice. The lack of assignment interaction witnessed over the course of the project implicated how students eventually transferred their learning in practice to the assignment, and attempts came too late in the timeline given. Students showed frustration and blamed their perceived inexperience of the assignment style for the apprehension felt getting to grips with measurement and run charts. Even in cases of regular student involvement in collecting and charting data, for instance during ongoing ward projects, cognisance to integrate the assignment format in tandem to practice QI activity was then vacant. As a result, they had to contemplate ways to get practice information to fit into the assignment categories.

CF14: Project authorisation

In advance of the QI Practicum, an agreement was ratified between the faculty and partnering health board that projects had to be authorised by a SCN or SSN before students could commence. The assignment was designed to record this consent, and students were to send 'Form One' to the University detailing their project title and signatory. The process of obtaining approval for a chosen project was influential to students in their QI learning in terms of 1) the support received for their projects.

Influence1: support received for projects

Students in all wards approached their SCN by default to approve their projects. Although ideas materialised at different speeds as students familiarised themselves with their placements, two weeks for project selection and approval was thought insufficient. The authorisation process influenced students QI learning experiences in terms of what support they received. For instance, SCNs signed forms quicker where projects had potential value and/or where the idea was proposed by them. Early interaction with SCNs encouraged confidence in students to attempt real projects and influenced nurse mentors to get involved in students' projects being data driven:

'I found when I approached the Sister right at the start, that she was happy for me to do whatever I wanted to do, so I was happy she felt in the ward it was something needing improved, so my mentors help collect my data after that.'

(Focus Group 5)

Contrastingly, though, some students experienced postponed (or no) project approval from their SCN. Perceived deferments included working condensed shifts that reduced exposure to improvement areas and thus form completion. Students also asserted that unforeseen interactions with SCNs prevented in-depth conversations around improvement being held. And, in one case the SCN refused to approve projects altogether. Accordingly, students felt pressured to pick topics at random and then seek project approval from a senior nurse instead. After this, commitment to projects were seen to flounder and students struggled to adhere to recommended timelines because they started later in the process. Students swapped ideas several times before 'jumping on the bandwagon' of other students' projects and where the SCN had not approved projects in the first fortnight, the nurse mentors were unlikely to support the student:

'But it was just like quite unsettling, like 'cause you had like these ideas, but you couldn't really like do anything without the sister signing it, and you couldn't do anything with your mentor as they didn't know if they were allowed to support your idea, that was hard.'

(Focus Group 3)

CF15: Timing of the assignment

The students believed that the timing of the assignment was a contextual factor that influenced their QI learning experiences. Teaching and learning preparation commenced in the first year, continued into the second, and the assignment was undertaken in the third year. According to some students, this QI curriculum structure influenced their capability to recall information when required and interfered with practice at a crucial prequalifying stage of their program.

Influence 1: capability to recall information

Firstly, the timing of theory in the curriculum was a contextual factor that influenced students' QI learning experiences across all wards; specifically, the Institute for Healthcare Improvement e-modules. Many indicated completing them at the start of the curriculum often on nightshifts when it was quieter or on their days off. However, completing them in bulk caused a lack of information recall later in the program meaning students had to repeat the modules during the QI Practicum. Later in the program students argued that their significance had not been emphasised enough at the start of their programme and so they did not make the connection. On the other hand, the timing in which students undertook the IHI e-module was seen to assist other students with consolidating learning, and where e-modules were undertaken alongside coinciding lectures, students reported them to be useful:

'I thought they were quite good, there's the one for the run chart and the measurement, I had to get my head round the measurements, but it was quite good at kinda like explaining what they are and how you measure them and do a run chart and stuff like that, I thought that was quite good … I thought the videos were good 'cause it kind of explains it to you as you go along, and you can pause it and stuff, I thought that was useful.'

(Interview 2)

Overall, students fed back that the content within the IHI e-modules felt out of context given its American heritage and complained of the modules being too long. Consequently, students used different resources to understand healthcare improvement such as the Scottish QI Hub because it better related to their own practice environments on the ward. One student summarised the view of many:

‘The importance of them wasn’t stressed enough at the start, so it's quite hard to understand, there's a lot of American jargon in it, 'cause even, their acronyms are different and hard to understand …I did them …but I don’t think they've helped and it's difficult to put it into a context that we know … maybe something from this country would be better.’

(Interview 6)

Influence 2: interfering with practice

Secondly, the timing of the QI Practicum assignment itself was a contextual factor that influenced students’ QI learning experiences. Students disagreed with it being a suitable third year assignment; and more appropriate to second year. They perceived having more time on practice placements in second year due to less pre-qualifying responsibilities which made it a suitable period to apply more focus to QI. Conducting the QI Practicum in year three caused many conflicting priorities which appeared to reduce the overall value of the assignment. A suggestion made was to apply QI knowledge to practice at an earlier point in the curriculum to cement their learning.

‘It might have been nicer in second year when we’re not trying to do our bloods, ECGs, medicines, ‘cause like there’s a lot more responsibility on us now, they make us do more, then you’re like, “well I’ve actually got to run around the ward now to collect questionnaires”, you know, that kind of thing, it would have been better earlier on I think.’

(Focus Group 2)

5.6 THEME 6: THE STUDENT NURSE

Background information

The student nurse theme encompassed the personal factors that remained unrelated to the practice environment yet influenced students’ QI learning experiences. Previous studies examining QI education in pre-registration nursing have not focused on understanding how personal factors influence students’ QI experiences.

Contextual factors

Student nurses influenced their own QI learning experiences in the practice learning environment. A contextual factor identified in this theme related to student determinants.

While it is discussed here distinctly, the findings overlap with multiple contextual factors discussed in this chapter.

CF16: Student determinants

Student determinants were a contextual factor that influenced students' QI learning experiences in all wards. These included the students' intrinsic/extrinsic motivations (seeking employment, making good impressions, improving patient care), intrapersonal skills (leadership, proactivity, resilience), characteristics (age, experience), attributes (loyalty, confidence to speak up, knowledge), feelings (stress, guilt, apprehension) and beliefs (hierarchy, self-efficacy). The interactions between these student determinants and the preceding contextual factors were seen to influence 1) the level of engagement on which student nurses undertook their QI projects.

Influence 1: level of QI engagement

There were four levels of engagement identified on which student nurses undertook their QI projects in the practice learning environment which included the:

(a) Student Level; hypothetical QI projects. Students chose not to engage nursing staff or were unable to. QI project assignments were commonly undertaken at this level and identified in Ward 2, 3 and 4.

(b) Patient Level; facilitated small scale QI projects. Students engaged nursing staff at some point in the QI learning process. QI project assignments were mostly undertaken at this level and identified in all wards.

(c) Ward Level; student-led or multi-disciplinary QI projects. Students engaged nursing and/or multi-disciplinary staff within and beyond the practice learning environment. QI project assignments were uncommon at this level and only identified in Ward 2, and 7.

(d) Organisational Level; large-scale QI initiatives. Students were engaged by nursing and multi-disciplinary staff to contribute towards health board projects. These projects were unnoticed or avoided by most students at this level and only identified in Ward 4.

These levels of engagement were determined by multiple, complex and infinite pairings of student determinants and inter-related contextual factors. Some students remained engaged at the same level during their practice placements while others moved between levels.

Firstly, students intrinsic and extrinsic motivations can influence the levels of engagement on which they conducted their QI projects. Pessimistic students who disregarded QI as their role had already decided to submit a theoretical project with estimated data before arriving on placement and had no intention of engaging in the practical side of the QI assignment:

> ‘See being honest … because it was again, and it sounds like a massive cop-out – it was just too busy and I wasn’t about to sit in a safety meeting and preach tae doctors and consultants: “yous have to sign this because I’ve to a uni project to do” – I just wasn’t’ doing it, but don’t worry – it will get done.’
>
> (Interview 7)

These students confined themselves to working at the level of the ‘student’ and were motivated instead by undertaking patient care and displaying their employable skills for the future. Some of these students had initially engaged at the level of the ‘patient’ and were enthusiastic about exploring how to improve patient care processes. However, when more inviting opportunities arose to support their mentors, the motivations for potentially securing a job superseded the benefits of undertaking QI. Thus, by the end of the QI learning process those students had disengaged with their QI projects and worked at the ’student’ level.

Secondly, students’ intrapersonal skills were a contextual factor that influenced the level upon which they engaged with their QI projects. Proactive students demonstrated their state of QI readiness by initiating early contact with their placements, arranging visits and/or developing ideas in advance. Such preparations yielded early project approval for some students who began the QI process engaged at the level of the ‘patient’ or ‘ward’. These students’ projects could be sustained at these levels throughout the placements in the presence of supportive mentorship and or efficacious students who initiated and delegated QI tasks. Further, where students’ displayed resilience, they were able to overcome the adversities within the practice environment to avoid submitting hypothetical QI projects:

‘I just think some folk are just no’ proactive in what they do, some students are just like “aw, I’ll do it then, I’ll do it then” but you need to just get in there and just get it done, it’s your project, and if anything else is happening on the ward, aye, it’s important, but you just need tae think well, I need tae get this done, so I’ll do this the day …
That’s the way I thought about it anyway.’

(Focus Group 5)

Thirdly, having the confidence to speak up was a contextual factor that influenced the level of engagement in students’ QI learning. Some expressed fear of speaking up to suggest improvement ideas, in case they highlighted wrongdoing. Others held hierarchal beliefs which prevented them speaking up to the multi-disciplinary team. Students were worried about being an inconvenience to the SCN or their nurse mentors. In most cases, students’ opportunities to engage in meaningful projects at the ‘patient’ or ‘ward’ level was reduced. Where students did speak up, for instance, to challenge their supernumerary status or voice their concerns over the challenges they faced, they were observed securing themselves the time needed to engage with their projects at the ‘patient’ level.

‘There was one point where I did take time out to go through the notes to get my data, and one of the Band 6s said “oh, could you not go and help do the obs?” I actually said to her, “well actually I'm doing my project right now” and she goes “oh, but the obs need done” and I had to remind her that students were actually supernumerary, and you would have coped if I hadn’t been on shift …*presumably*, therefore me taking half an hour out to do work that I need to do to achieve this placement shouldn’t be an issue? And reminding them that we shouldn’t be counted in the numbers did actually help.’

(Focus Group 5)

The consequences of not speaking up had implications for other students. For example, students who undertook QI but were excluded from additional QI meetings on the ward were also seen having a lack of QI project ownership. While strong leadership and a supportive QI culture meant the student operated at the ‘patient’ level, most of the project was led by the SCN instead of the student. Few challenges were encountered by this student who experienced positive contextual factors and when interviewed later they did not wish to prioritise QI as a newly qualified nurse. Contrastingly, one student who experience difficult challenges such as a lack of leadership, mentor engagement and no project resources, had

converted the adversities into determination and thus wanted to seek a QI nurse post after qualifying.

Lastly, student determinants such as an understanding of the QI process influenced students' QI learning experiences. Student nurses who managed to work collaboratively with QI experts to undertake a QI project at the level of the 'organisation', which was seen in the project to reduce medication wastage, had the opportunity to develop QI knowledge and experience real life challenges of multi-disciplinary working. However, their understanding of the data collection process was misconstrued and the student struggled to align the data received by the QI team to the two small PDSA cycles for her assignment. While many reasons do exist as to why students received lower grades, in this case a lack of QI understanding contributed to this student receiving one of the lowest academic grades in the cohort despite being engaged in a supportive QI culture.

5.7 CONCEPTUALISING QI NURSING EDUCATION

The findings in this chapter have informed the development of the Quality Improvement Engagement in Pre-registration Nursing Model (QiNEP). This model is presented and explained within the discussion section of Chapter 7.

5.8 SUMMARY

This chapter has presented the findings from a cross-case analysis of the contextual factors that influenced student nurses' QI learning experiences across practice settings. There were six themes emerging from this data which included (1) The Practice Learning Environment, (2) Organisational Culture, (3) Leadership, (4) Data for Improvement, (5) The Assignment and (6) The Student Nurse. The analysis identified that the student nurses engaged on one of four levels when undertaking their QI projects which included the 'student', 'patient', 'ward' and 'organisational' level. While each contextual factor contributed to the engagement level upon which students undertook their QI projects, the determinants of the individual student played a fundamental role in influencing movement between levels during the QI Practicum. Prior to the discussion of these findings in Chapter 7 the findings from the interviews with registered nurses in presented next.

6.0 INTRODUCTION

This chapter presents the findings from the qualitative semi-structured interviews undertaken with participants once qualified. The purpose of these interviews was to determine whether the registered nurses had sustained their QI knowledge, engaged in QI activity in their workplaces and to identify what contextual factors influenced their engagement in QI as registered nurses. Eight key themes emerged during the semi-structured interviews with the nurses, and these included: (1) Transition to Newly Qualified Nurse, (2) QI Knowledge Decline, (3) Hierarchy, (4) Leadership, (5) Covid-19 Pandemic, (6) Data Access, (7) Location, and (8) Transferrable Skills.

6.1 THEME 1: TRANSITION TO NEWLY QUALIFIED NURSE

The QI Practicum had intended to equip the next generation of students and registered nurses with the knowledge and skills required by the NMC. Several newly qualified nurses (NQNs) reported placing a value on undertaking QI and included their skills and experiences in their job applications and curriculum vitaes (CV). Some had drawn upon their QI experience during job interviews which led to one NQN being offered a job in the ward where she had completed her QI project:

‘I put that in my CV and then discussed it at length with the Charge Nurse at my interview, because she obviously helped me implement it. We kept it running in the ward and when I started there, I used it for my flying start and became one of the link nurses for QI.’

(Interview D)

Further, NQNs did not contemplate adding QI skills to their CV or job application. They reported that managers in their preceptorship year asked them to focus on learning the basic skills of an NQN for at least 6-8 months before increasing their responsibilities. This manager’s advice aligned to students’ beliefs that QI felt like an unnecessary extra as well as being an unsuitable time to be involved during their first year:

‘Immediately after I qualified my first goal was to actually get more experience because you don’t really know anything. So, my first goal was to learn my skills, and just be enough. I don’t think my focus was on improvement.’

(Interview A)

6.2 THEME 2: QI KNOWLEDGE DECLINE

Beyond preceptorship the registered nurses discussed QI behaviours but also demonstrated less knowledge. They spoke of writing reflective accounts about QI during their NMC revalidation and being involved in improving admissions paperwork, enhancing patient transition to short stay wards, and creating sustainable healthcare delivery through single-use medication cups. Despite associating their behaviours with improvement, the registered nurses admitted to using a less formal QI process:

'The basics of QI are straightforward, you do it without thinking about it – it's just that I've not necessarily used all the diagrams and everything, there were no charts that we used.'

(Interview E)

'I have engaged in improvement, but not in a proper assessed way you know, it doesn't go through a process, but it's just me wanting to work better to improve.'

(Interview A)

Although as student nurses they had been taught the Model for Improvement (MFI) during their degree, their recall of QI knowledge and terminology during interviews was vague. They admitted revisiting old coursework prior to their interview to remind themselves of the QI process. A 'use it or lose it' attitude towards QI was evident as registered nurses reported losing their learning:

'I had to look back over my practicum before we started this chat. Looking back in practice, it's not something I've come across, or think about daily. To get involved, I would need to study again for more knowledge, and then maybe some of this stuff would come back to me.'

(Interview G)

6.3 THEME 3: HIERARCHY

After qualifying some of the participants claimed they had no exposure to QI activity. One nurse stated that QI was usually done by management or staff working towards promotion and often in their own time. A hierarchy deterred registered nurses from engaging in QI:

‘It was mostly higher up that were initiating the changes – one of my colleagues tried quality improvement stuff, but she got a lot of push back by higher up management, so you need to jump these barriers all the time.’

(Interview H)

This hierarchical exposure to QI was validated as one nurse, now in a senior post, spoke of only just getting exposure to the information needed to engage with QI once promoted. This nurse reported having full autonomy and greater insight into how the organisation functioned, now that they were more involved and keener to advance their services:

‘It’s quite good to be accepting of change. In my previous post, I feel like I didn't have the opportunity for QI, whereas I feel now that I'm in a senior role, I feel like I can take a step back and identify ideas that I want to change and make improvements.’

(Interview C)

6.4 THEME 4: LEADERSHIP

The registered nurses were able to draw upon their QI educational experience as a student to identify factors they believed influenced their current QI engagement. Regardless of being a preceptor or senior staff nurse, those engaged with QI further reported the experience of supportive leadership during their QI Practicums:

‘I was very lucky, our SCN at the time was just so up for QI and so positive and transparent with data. I felt so supported and felt that I had control over doing QI projects when I became a registered nurse.’

(Interview D)

While this transformational leadership style influenced nurses’ engagement in QI, others experienced a more laissez-faire leadership style producing opposite effects. Registered nurses without greater line-management input perceived that they lacked the permission to initiate change, and without clear direction, they did not see the point engaging in QI. One registered nurse requested that clearer expectations from management around the nurses’ role in QI were needed:

‘There is a real lack of management expectations – but you need authority from them to go and do QI, you need, like a recognised person to say go and do it. If you do it yourself, it’s more difficult.’

(Interview H)

Despite the leadership style demonstrated by nurse managers, there was a recognition by the registered nurses that staff in all roles were under constant pressure which meant committing to QI was difficult and this included management:

‘I would like to take forward my QI project, but we are not given the time for that, I’m not blaming my manager, she’s under so much pressure on every part. It doesn’t seem to matter what level of the system that you’re actually at; everybody is struggling to make things their priority.’

(Interview A)

6.5 THEME 5: COVID-19 PANDEMIC

The Covid-19 pandemic was referred to by many of the registered nurses as a reason they did not participate in QI, even where they had retained QI knowledge or experienced supportive leadership. One nurse reported that their QI project involving the interprofessional team was put on hold to deal with the core requirements of working in the pandemic. While this nurse reported getting involved in QI again as services returned to normal, others emphasised that the lasting effects of Covid-19 had been *‘hellish’* and ‘chaotic’. This experience had resulted in burnout for some of them and hindered their engagement in QI:

‘The aftermath of Covid was actually worse, the atmosphere is just totally different, and it’s been a really hard year, and I haven’t got a break. Everyone is just done. Even if you see people trying to improve something, a lot of people just aren’t interested.*’*

(Interview F)

Burnout from the Covid-19 pandemic was reported to come from caring for sicker patients and managing the ever-changing demands placed upon them throughout this alternating time. As a result, registered nurses reported having to psychologically prioritise their

families over their work and do only what was necessary in practice before going home. However, there was an indication that while Covid-19 no longer posed the same set of challenges, its lasting effects, such as increased workloads and reduced staffing, also led to a lack of engagement in QI:

'Covid has a lot to say about forgetting about QI for me. It's also been a good excuse for people not returning to some key principles that we should be focused on.'

(Interview A)

6.6 THEME 6: DATA ACCESS

When the registered nurses were asked if they could access the information needed to identify areas for improvement, some demonstrated negativity towards statistics. For instance, those who had progressed into senior positions reported feeling confident when asking for the necessary data, but those remaining at the front line admitted not knowing where to retrieve it and associated data with negative performance:

'We don't get like statistics on things as a staff nurse unless it's something negative. You know, you get your audits for things, where we are told where we need to improve. I wouldn't know where to start in terms of getting access to other data though.'

(Interview H)

Some of the participants asserted that despite being registered nurses, their experience of needing permission to access data through gatekeepers remained like their experience of being a student nurse during the QI Practicum. Consequently, nurses lacked the necessary information needed to engage in QI and so they did not try. Contrastingly, other nurses retrieved data with ease which they attributed to having login credentials for online health systems where they could explore problems. These registered nurses were able to demonstrate their retained QI knowledge and positive attitudes round the importance of data:

'It wasn't a problem for us to collect data as registered nurses, our manager was open about it, you know, just being honest, it's good to have that transparency, we knew exactly where we were. You could implement changes because you know the data was accurate. I know others in the hospital struggle, so I don't know if that's just because of where we were.'

(Interview D)

6.7 THEME 7: LOCATION

The registered nurses had developed their QI learning as students during the QI Practicum within the same acute hospital setting. As registered nurses though they were drawing upon their experiences of QI engagement from acute and community settings across different regions in Scotland.

'So, when I moved from one health board to another, I was a charge nurse and really keen to implement a lot of changes. But, when I got there, I experienced a lot of barriers and there was more politics in that hospital than in my last one.'

(Interview D)

The practice setting in which registered nurses worked was a key influence on QI engagement. Despite displaying positive individual characteristics such as embracing challenges, having an intrinsic value to do better, upholding a passion for nursing and practicing a growth mindset, if the location did not exude a positive QI culture, engagement was difficult:

'Location and the staff you work with has a lot to do with QI – it really depends on where you are, some health boards are very clique and hierarchical.'

(Interview B)

6.8 THEME 8: TRANSFERRABLE SKILLS

There was evidence that the registered nurses transferred their QI knowledge and skills inside and outside of the healthcare environment. One nurse who had substantial experience of supporting QI spoke of drawing upon their expertise in a new post. In their annual professional development plan, they had objectives to create a 'QI link nurse' role and mentor others:

'Just before I went on parental leave, I had my annual review and I agreed to go back and develop a role in QI, I would love to be able to do that again. I love where I work, and they are big on QI.'

(Interview D)

Moving beyond the healthcare environment, one nurse described their engagement with their son's school improvement agenda to enhance the learning experience of young people in primary education. They had transferred QI knowledge and skills learned during their degree to benefit the wider community:

> 'I'm engaging a lot more with the community and have found a lot of purpose in improving well-being. QI can be used in all areas, and I'm engaged with the school for example to develop a community garden initiative. For me, I would work in the community for health improvement, but I don't see a lot of opportunities for that.'
>
> (Interview A)

Lastly, despite the challenges faced, most registered nurses agreed that QI was a transferable skill, where they remained engaged. They saw the importance of QI as a taught component to continue within degree level nursing education and identified its value in raising awareness of change and ensuring the future generation of registered nurses continue to make improvements.

6.10 SUMMARY

This chapter presented the findings from 10 semi-structured interviews with participants as registered nurses. The findings determined that engagement could be sustained in QI and was correlated to a positive QI Practicum experience. However, the findings suggest that registered nurses face similar challenges to that of students such as influences from a lack of leadership, experiencing hierarchy, no data access and positive QI culture being dependent on location. Registered nurses in practice lost their knowledge where there was a lack of QI opportunities, however, there was evidence that QI skills could be transferred to outside of nursing practice.

7.0 INTRODUCTION

This chapter discusses the findings from Phase One and Phase Two of the research and is structured into the three main research questions of this thesis. To set the scene for the discussion, the Model for Quality Improvement Nursing Engagement in Practice (QiNEP) is introduced. Thereafter, an in-depth analysis of the contextual factors that influenced student nurses' QI learning experiences is considered in tandem with the QI education literature and the implications of the findings are highlighted. The depth provided in this section is fundamental for reducing the gap of previous research which often explores the barriers and facilitators to QI education as isolated elements from their environments. Next, an explanation of how the contextual factors interrelated to influence student nurses' engagement during their QI projects is provided. The implications of engaging at the different levels of the model are discussed and lastly, the sustainability of the registered nurses' QI engagement is discussed in tandem with the wider nursing literature.

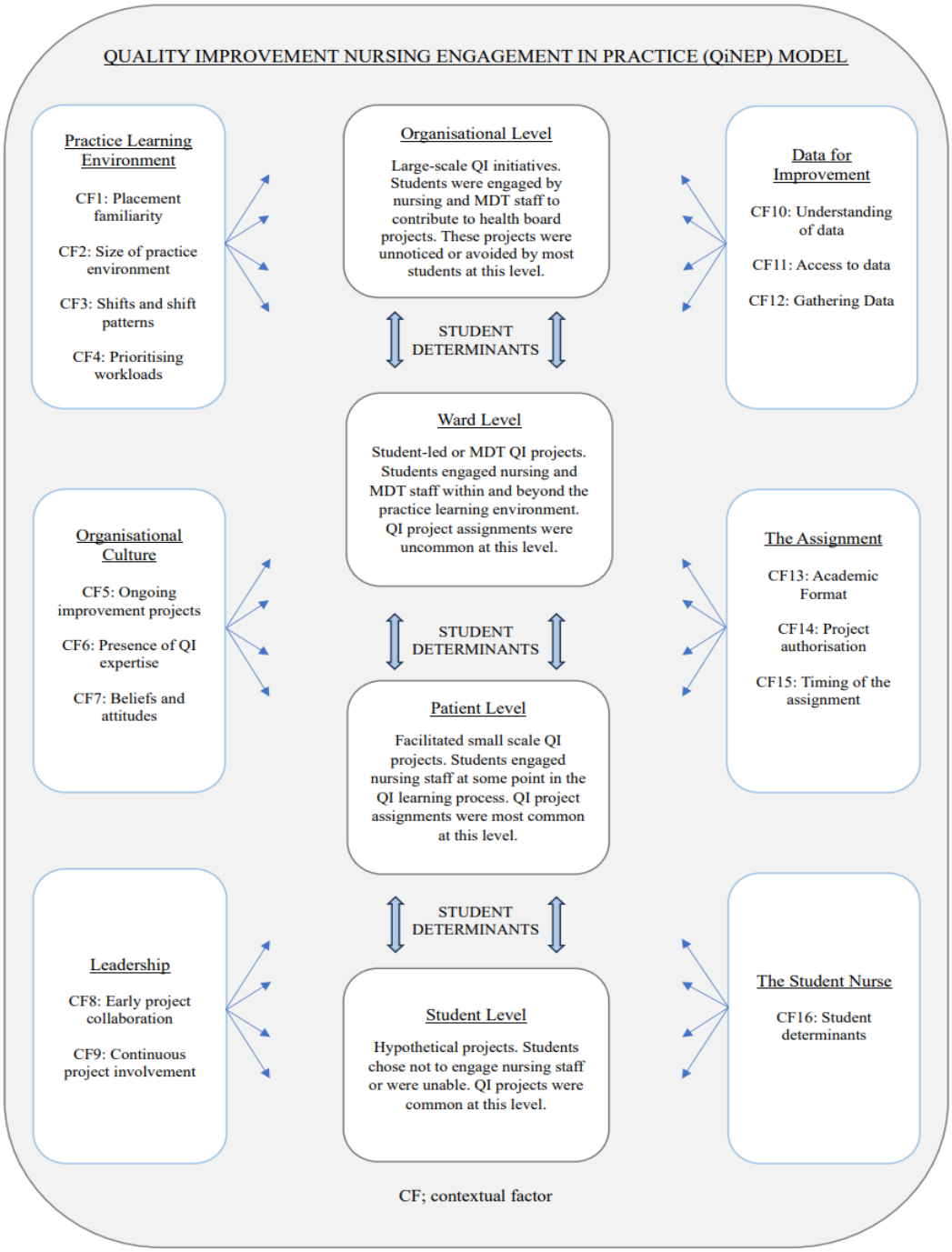
7.1 QI NURSING ENGAGEMENT IN PRACTICE MODEL (QiNEP)

The QiNEP Model was developed from the research findings to illustrate the contextual factors that influenced student nurses' QI learning experiences and how their behaviours influenced their engagement with QI (see Diagram 7.1.) Drawing upon the healthcare improvement literature (Langley et al. 2009) and contextual frameworks (Kaplan et al. 2010), the QiNEP model highlights how practice environments shape the feasibility and sustainability of student nurses QI related behaviours. The model is also grounded in ethnographic research to understand nurse education from the perspective of experiential learning theory (Kolb 2015) and Bandura's social learning theory (1977) which helps to explain how students learn and model improvement behaviours in practice. The integration of these disciplinary lenses address the recognised gap in the literature around the lack of behavioural understanding in QI education and offers actionable insights for educators and practice leaders to embed healthcare improvement science meaningfully into nursing curricula and practice.

The QiNEP Model illustrates the six themes identified during the cross-case analysis and includes the individual contextual factors that emerged. The inward pointing arrows represent the direction of influence from the contextual factors on student nurses' QI

behaviours, and their subsequent engagement at the different level situated at the centre. The two-way vertical arrows indicate the movement that was possible between engagement levels which occurred because of one or more contextual factors, but predominantly because of a variety of students' determinants. The findings of this model are now discussed throughout this chapter and presented in line with the research questions determined at the beginning of the research process.

Diagram 7.1 Quality Improvement Nursing Engagement in Practice (QiNEP) Model



7.2 INFLUENCING CONTEXTUAL FACTORS IN QI NURSE EDUCATION

Research Question 1: What Contextual Factors Influence the QI Learning Experiences of Third Year Student Nurses in the Practice Setting?

CF1 Placement Familiarity

Student nurses experienced apprehension right from the start of the QI learning process. This aligns to previous research where students felt worried before placement because of not knowing what staff would expect of them (Strand and Tveit 2020). Prior to the QI Practicum, student nurses felt nervous due to the emphasis they placed on visiting unfamiliar placements. Indeed, as reported by Baillie et al. (2014), student nurses had trouble selecting projects in unfamiliar settings. Mentors in previous studies have also noted that students lack confidence in QI when learning in new environments (Burnett et al. 2018). While these studies highlight the disadvantages of students being in unfamiliar settings, my study found that similar drawbacks also existed in familiar settings. During the QI Practicum students had difficulties selecting projects in wards where they were equally acquainted and were seen to adopt the cultural norms that existed in their environments such as negative QI attitudes. While faculty had encouraged students to contact placement areas in advance to discuss their project ideas, most students reported challenges in speaking to the appropriate person due to their limited availability. These findings highlight a greater need to address early student perceptions of unfamiliar placements through open and reliable communication channels with practice to reduce unnecessary anxieties and ensure they speak to an appropriate person on contact.

A potential solution to alleviate apprehension early in the QI educational process and one recommended by others is the provision of eligible projects for students to work on (Honeyfield et al. 2022; Lee and Jauncey-Cooke 2023). Compelling evidence suggests that faculties can support students at this critical early stage by aligning educational goals to relevant clinical indicators. Previous research has described how building an academic-practice partnership has allowed improvement departments to identify QI projects for students in advance (Flores et al. 2013). The benefit of this approach is endorsed by Kirkby and Good (2020) who testify that projects arranged before student nurses arrive have resulted in positive policy and protocol changes in practice. My research indicates that this approach might mitigate problems with engagement on behalf of senior staff and ensure students

tackle QI projects that are both achievable and desirable. This would also avoid perceptions of nursing students 'fixing things' or implying criticism of existing practices.

CF2 Size of Practice Environment

The size of a practice environment was an important factor in enabling or hindering student projects. The findings showed that smaller wards with repeated daily tasks posed fewer challenges than in larger wards presenting variable complex activities. Earlier research alludes to the factors in the learning environment that can hinder students' QI educational experiences such as disorganisation, lack of support and resistance (Levitt et al. 2012; Strand and Tveit 2020). However, this study is the first to identify how the disparity in geographical layout and size across different settings can influence students QI educational experience. This is surprising given the variety of settings student nurses are reported to conduct QI within, including medical centres, long-term care facilities, community trusts, nursing homes and outpatient departments (Koffel et al. 2017; Baillie et al. 2016; James et al. 2016; Jones et al. 2013; Odell 2011; Gleason et al. 2019). While a degree of challenge is to be expected in any practice environment, the unmodifiable factors that hinder students' abilities to undertake a QI project, such as size and layout will require careful consideration by faculty and practice during the QI curriculum development phase. More research into how these unmodifiable factors influence students' QI projects outside of the acute sector would be useful.

Practice learning environments are complex and demanding, and students interact with diverse healthcare staff to enrich their learning experiences. Day and Smith (2007) have discussed that certain characteristics of the environment can maximise students QI learning. They explain that students working in smaller single units can get to know the QI issues pertaining to the patient population and gain a sense of belonging. As was evident in my study, some students moved between units regularly, where they encountered various patients with multiple diagnoses and treatments. Therefore, students gained only snippets of information for their projects and were seen to struggle to monitor improvements over a period. Nahm et al. (2022) have reported how nurse educationalists developing QI education have overcome challenges working in large groups across various settings which involved using a set of 'guiding principles' that were tailored to individual practice settings. How this knowledge transfers to student nurses' QI educational experiences in practice would be an interesting development. For instance, faculty may wish to create and test a more flexible QI educational experience using a set of 'guiding principles' and evaluate its impact on reducing

the challenges currently faced by students undertaking a QI project with restrictive timelines. This could be a worthy alteration to ensure that faculties and practice continue to provide QI educational experiences that are equitable during students' nursing degree. Future teaching evaluations in this area would be useful to make recommendations for educators designing novel QI educational approaches in nursing curriculums.

CF3 Shifts and Shift Patterns

An interesting finding to emerge was the lack of continuity students experienced undertaking their projects because of shift work. Students' engagement in their QI activities such as collecting data was determined by their shift type. Dayshift and nightshift created different challenges and opportunities depending on students' locations. This contextual factor has been consistently reported over the years. Baillie et al. (2014) reported that over a decade ago student nurses' shift patterns hindered their ability to gather information for QI and recently, Lee and Jauncey-Cooke (2023) alluded to these challenges again, reporting that students working different shifts struggled to manage issues and had endured poor staff communication. My findings add that students attributed shift work to the communication problems they face when attempting to work in groups for their QI project. This obstacle has wider QI learning implications because the experiential approach adopted for the QI Practicum intended to enrich the social psychological aspects of QI. Ironically, shift work reduced the opportunities to engage in important interactions which made group QI projects difficult.

Working in groups to learn about QI in practice has been reported in several studies (Flores et al. 2013; Baillie et al. 2014; Day and Smith 2007; Kirkby and Good 2020; Strand and Tveit 2020). Students in these studies are reported to have gained benefits from peer-to-peer support at various stages during their QI educational experience, leading to an appreciation for collaboration with others. Kirkby and Good (2020) who paired together junior and senior students to work on a community-based QI project reported that students enhanced their leadership and delegation skills. If this is to be the case, then creating a QI educational infrastructure that fosters groupwork and allows social interaction between students should be piloted, if faculties consider this as a feasible option in their own academic-practice contexts. Previous research reports that 81% of students rated group work the most helpful factor in selecting QI projects if regular opportunities to hold group discussions were held in practice (Baillie et al. 2014). Therefore, it is reasonable to suggest that groupwork in QI education needs to be a supplementary pedagogical approach in practice, outside of students'

practice placement environment if issues of shift work are to be overcome and opportunities for collaboration is to be had. If students had worked in groups during the QI Practicum it could have also reduced the pressure some placement areas experienced with project fatigue and greater awareness of what students were trying to achieve could have been more apparent.

CF4 Competing Priorities

An unsurprising finding showed that student nurses felt pressured in the first fortnight of placement due to competing priorities. They reported undergoing a period of socialisation, learning new tasks and undertaking patient care which clashed with selecting a topic for a QI project. These revelations are consistent with previous research where there are reports of students having insufficient time to acquaint themselves with the practice environment before being expected to do QI (Burnett et al. 2018). These findings emphasise a long-standing issue that students perceive QI as a contention that interferes with their everyday duties. Gould et al. (2002) reported two decades ago that students believed doing QI was an inefficient use of time given their educational demands. Granted, these findings emerged at the infancy of QI educational research, but they do remain current as Honeyfield et al. (2022) recently concluded that competing practice obligations remain an ongoing challenge in QI education. While some of my students reported similarly, other student nurses were able to evaluate their priorities and plan workloads effectively through the provision of protected time.

Structured protected time early in the QI process and during the students' placements is a feasible solution. Students who completed the QI Practicum suggested that protected time should be included to support future student nurses. However, as my research clearly shows, it cannot be assumed that practice staff can allocate the necessary time for students to engage with their QI projects. In Strand and Tveit's (2020) research students perceived that staff valued QI but did not permit them time to work on their projects. If faculty had explicitly instructed practice leaders to allocate time for students to participate in their QI projects, students may have felt less conflict with competing prioritises. Kirkby and Good (2020) took this approach in their QI education and justified to practice that the time spent collaborating inter- and intra- professionally to identify a QI problem was balanced with direct patient care. The authors do not assert a causal link here but do imply that students who gave more time to their QI projects, experienced internal rewards such as feelings of inclusiveness and confidence (Kirkby and Good 2020). Similarly, my research shows that some students'

confidence was increased where protected time was provided, however it did not always result in a sense of belongingness in the ward's QI culture. However, if students are to receive protected time for QI activity it does raise the question as to whether this only validates the attitudes and beliefs that QI activity lies outside of a nurse's everyday responsibilities. It is therefore critical that QI workloads in practice are realistic and manageable for students.

CF5 Ongoing Improvement Projects

My research was unique in finding that student nurses' potential to contribute towards ongoing improvement work in the practice setting was underutilised. Similarly to the 71% of students in Kyrkjebo's (2006) study, most students lacked awareness of QI activity in their practice settings. Increasing the visibility and exposure to ongoing improvement work is important because students get to see the value of the QI projects they can be involved in (Odell 2011). Capable students may succeed in seeking out and contributing to ongoing improvements and meet learning outcomes, but this cannot be generalised to all students. While difficulties existed for students who sought to work alongside ongoing projects and the ability to align real-world improvements to their academic timeline, student nurses still inferred that their QI knowledge and ability to contribute towards ongoing projects was valued more by practice staff. These findings suggest there is scope to explore alternative or adjunct QI learning activities outside of the QI Practicum structure which offer meaningful QI educational opportunities.

Nahm et al. (2022) described how their faculty actively facilitated engagement of students into ongoing projects to help them develop their project outcomes and data collection plans which aligned to their educational goals. Lee and Jauncey-Cooke (2023) assert that by consulting students early in the process they become confident when contributing to ongoing improvements. When the QI practicum was developed, stakeholder engagement was sought to establish the feasibility of supporting students in their chosen practice, however the subsequent alignment of students to ongoing project work was not. VanGraafeiland (2019) highlights that students can offer organisations the added capacity and support to implement improvement projects which was clear in my research. Thus, faculties should explore how to align students to ongoing projects in practice during curriculum development. However, partnering with practice to identify relevant QI mentors to support students in ongoing improvement work requires time and clear communication as many of the students in my study struggled to get mentors with QI expertise. Lee and Jauncey-Cooke (2023) reported that up to three-months was needed to undertake this process, although the size of the student

cohort is unclear. I am currently undertaking a realist review to explore how practice and academia collaborate to align student nurses to ongoing improvement work and will make future recommendations (Armstrong et al. 2023).

CF6 Presence of QI Expertise

This study found that there were a growing number of both senior and junior QI educated registered nurses, but access to this expertise varied across the different practice settings. Some of the multi-disciplinary team exhibited QI knowledge, but students rarely accessed networks outside of their nursing silos due to lack of confidence and they did not know who to approach if their mentors lacked QI knowledge. James et al. (2016) discussed that QI expertise was not a necessity for nursing mentors whose role was to instead mediate between students and QI resources. However, my research suggests that QI expertise was a facilitator in students' QI learning experiences. Further, Honeyfield et al. (2022) advocate that nursing staff should be trained in QI and PDSA concepts to enable them to support students' improvement endeavours. In the UK, professional standards stipulate that all registered nurses must be proficient in quality and safety competencies (NMC 2018).

To prepare nurse mentors to move beyond a facilitating role when supporting students' improvement projects to one that offers reliable mentorship, development in QI capability would be essential. Undertaking training in the basic QI principles and remaining cognisant and objective about their own QI experiences will be key so that students do not become deterred in QI. The students in my research also tried to reach out to academic staff for support with their QI projects and experienced a similar lack of QI capacity and capability to support them. A lack of QI expertise in faculty staff has been a challenge also reported elsewhere in the literature (Barnsteiner 2013). During the QI Practicum, only one academic staff member with QI expertise was able to offer a small quantity of short appointments on a first come first served basis. While support has been offered by faculty in previous studies for students undertaking QI in practice (Baillie et al. 2014; Burnett et al. 2018; Lee and Jauncey-Cooke 2023), faculties still face being under resourced and cannot always offer additional support. The findings therein strengthen the claim that a significant gap in faculty and practice QI support continues to exist across nursing degree programmes and efforts may wish to focus on how the wider system can connect to support student nurses undertaking QI education in practice.

Nahm et al. (2022) suggests creating a QI competency-based name list that could be accessed by students in each practice setting. However, the literature cautions the reliability upon individuals such as 'QI champions' for expertise due to the likelihood of staff turnover (McComb and Kirkpatrick 2017; Kirkby and Good 2020). Given the evidence of QI expertise found across the interprofessional team, within my research, they could be an underutilised resource when support is needed for student nurses during their QI projects. Interprofessional working is valued by health professions as students who have demonstrated increased QI knowledge when working within interprofessional groups (Gleason et al. 2019; Skledar and McAvaney 2009), and my study demonstrates that working with the interprofessional team is possible. A central hub of QI experts could be an option to reduce the challenges of relying upon small pockets of individuals for QI expertise and could offer more accessible support to students undertaking QI education in practice.

Jones et al. (2013) spoke of developing a community of multi-disciplinary students, faculty and practice staff through the Institute for Healthcare Improvement (IHI) Open School Chapter. This student-led chapter is organised locally between the universities and health boards. The purpose is for students to engage with one another about QI issues and it has offered peer-to-peer discussions that are effective for QI learning (Kirkby and Good 2020). Developing a core team with QI expertise could have prevented the students aimlessly searching for assistance during their QI projects as was seen during the QI Practicum. There are now reports that UK health boards are forming and evaluating 'QI Academies' (NHS 2024a). Future research should examine what role these QI academies will play in supporting student nurses' QI educational experiences in practice and what impact they may influence.

CF7 Beliefs and Attitudes

The study revealed that negative beliefs and attitudes about QI existed from staff in most practice settings. A belief that students were critics of ward performance existed and is consistent with previous research that identified students not wanting to cause offence or imply poor practice with their ideas (James et al. 2016; Kyrkjebo 2006). Fostering positive attitudes and beliefs should be considered an important aspect of developing any QI curriculum and organisational culture, because poor attitudes resulted in resistance to engaging with improvement during the QI Practicum. Brown et al. (2019) suggest that evaluating beliefs and attitudes towards QI may be predictive of QI engagement in the real world. Students have reported positive beliefs and attitudes when undertaking QI projects in practice (Levitt et al. 2012; Christiansen et al. 2010; Baillie et al. 2014; James et al. 2016).

However, a strong relationship between staffs' negative QI beliefs and students' attitudes was witnessed in this study. These findings raise a critical area for practice leaders who may need to consider the impact of their staffs' beliefs and attitudes towards QI on student nurses. The BASic-QI tool has been developed and validated for this purpose and measures attitudes and beliefs towards QI across most practice settings (Brown et al. 2019). In an ideal world, nursing leaders could better understand the QI beliefs and attitudes of their staff using the BASic-QI tool and explore what strategies might be successful to improve them. However, there are considerable time and capacity constraints on nursing staff already which might make this unrealistic. Future research with the BASic-QI tool could be valuable in this area.

The findings also suggest that staff worried about the students' QI projects exposing areas of sub-optimum practice or even misconduct. Some of the problem areas that were identified by students were '*fixed'* quickly by nursing staff rather than to serve as a viable QI project for students. Burnett et al. (2018) reported that students believed they did not have the experience to challenge decisions about QI in practice. Similarly, the student nurses during the QI Practicum chose not to dispute the actions taken by staff to correct the problems they had identified due to a fear of the consequences. These findings indicate that staff and students did not feel empowered to speak up in the event of wrongdoing. Edmondson and Bransby (2023) describe psychological safety as a work environment where people believe that being honest and transparent is expected and possible. Registered nurses are required to uphold their professional duty of candour, be open and encourage others to raise concerns where appropriate (NMC 2018). A recent systematic review identified that the issue of low psychological safety is prevalent in the healthcare setting, and concludes that the situational context e.g. individual confidence, senior leadership and hierarchy all contribute (Grailey et al. 2021). Indeed, these issues affected students speaking up in my research which influenced a lack of engagement with their QI projects, however, they have wider implications because where staff do not feel psychologically safe to speak up, lower clinical performance is seen (Mannion and Smith 2018) This evidence reinforces the need to examine the nursing subcultures that exist and how they affect psychological safety and the improvement culture.

In the interim, offering student nurses a degree of confidentiality and support to identify problem areas will be essential in shaping their own attitudes and beliefs towards QI. During the QI Practicum, if staff were disinterested in the students' projects, the students failed to believe that QI was a part of their student nurse role. If QI beliefs and attitudes are a predictor of engagement in registered nurses, then leadership strategies should be mindful to engage

students in candid conversations about areas for improvement without fear of retribution and disengagement (Brown et al. 2019). Undertaking ongoing audit activities to track and measure adherence to standards is beneficial here because managers and students can act upon information together and decide what action to take (Day and Smith 2007). This collaborative approach between students and nurse leaders during the QI practicum was experienced by some of the students and a more positive QI learning experience by them was reported. The role of psychological safety in speaking up in practice where it relates to student nurses QI educational experiences would be useful to inform future QI curriculum developments in this area.

CF8 Early Project Collaboration

The findings of the study confirmed that student nurses required visible and well-versed leadership to collaborate early within their QI projects. The importance of getting timely input with comprehensive guidance has also been reported elsewhere as being key to getting students to complete QI projects effectively and on time (Burnett et al. 2018). Students who secured early collaboration with their SCN during the QI Practicum reported a positive learning experience. These leaders worked in partnership with the students to determine areas for QI, to provide the resources needed, permitted time, and supervised the overall project progress. Similar findings are reported by Robinson and Gelling (2019) who assert that QI engagement from nurse leaders can positively impact nursing staffs' QI experiences. However, this level of QI engagement in students' QI projects at the start of the process was a challenge for many nursing leaders. Some of the student nurses viewed them as the least engaged member of the team which does coincide with findings reported elsewhere (Alexander et al. 2022a). The role of the nurse leader in supporting students' projects was not the aim of this study; however, their perspectives need to be understood within the demands of their everyday challenges to ensure they can be supported to engage with QI education.

Lee and Jauncey-Cooke (2023) established that a key challenge in preliminary stages of students' QI educational experiences was the level of support required by industry to enable them to select QI project ideas. This challenge was amplified early in the QI Practicum across practice settings because SCNs were faced themselves with conflicting priorities such as staffing issues. While many SCNs did attempt to suggest potential areas for improvements, albeit subtly, students required clearer direction to get their projects started. However, the QI Practicum was a new intervention at the time and many staff at all levels were unfamiliar

with the process. It is potentially the case that SCNs were cautious in agreeing students' projects due to the confidentiality and ethical implications that were mentioned frequently. The ambiguity in ethical requirements is discussed in the literature and efforts to streamline ethical processes in QI practice and research is of interest (Lynn et al. 2007; Bottrell et al. 2020). Backhouse (2020) highlights that where key QI ethical principles are not understood between staff, a mismatch in expectations about QI is likely. The study findings therefore suggest that greater clarity between academia and practice will be needed to determine an appropriate and realistic level of support for students undertaking QI education in practice. Previous studies have since reported effective strategies used in these preliminary stages which involve faculty visiting sites to facilitate information exchange opportunities and increasing support to those mentoring students' (Lee and Jauncey-Cooke 2023).

CF9 Continuous Project Engagement

Student nurses sought support from the SCN at the start of the QI project to identify an area for improvement and this support was equally pursued throughout the improvement process. This finding mirrors the experiences of student nurses in Craig and Machin's (2020) study who engaged with service improvement activity. They reported a need for manager feedback into their QI projects and viewed them as imperative for fostering a positive QI culture. Through observations, the findings in this thesis identify wider implications of SCNs' not engaging. For instance, manager engagement is pivotal in creating a positive QI culture in any nursing team (O'Dell 2011). However, their behaviour can also determine whether nurse mentors engage or not in students' projects. My study reveals that where SCN's engagement was sporadic or did not exist, nursing mentors tended to model similar behaviours of their leader. Nursing mentorship has shown to be integral to empowering and supporting student nurses to undertake QI projects and is significant in developing their beliefs about QI being an essential nursing responsibility (James et al. 2016). To enable student nurses' confidence to develop QI behaviours, mentorship and leadership capacity should be central to all QI education models in pre-registration nursing curricula (Gleason et al. 2019).

CF10 Understanding of Data

This study is the first to examine the influences of data on student nurses' QI educational experiences. Understanding data in healthcare improvement is central to interpreting performance measures, generating reports and displaying results on run charts (Provost and Murray 2022). The findings revealed that some students became overwhelmed at determining what information constituted data in practice and this has mirrored previous

research that reports students having difficulty defining data sources and outcome, process and balancing measures (Levitt et al. 2012; Skledar and McKaveney 2009). At the beginning of the students' degree, they learn to evaluate the effectiveness of nursing care by measuring patients' temperature, blood pressure and respirations. Following a care or treatment intervention, they collect more data to determine if there was an improvement to their patients' condition. They also participate in handwashing audits to bring about continuous improvements which demonstrates that student nurses already enact a cycle of evaluation and change by using data. However, the problem during the QI Practicum appeared to be with identifying the types of data that supported their improvement projects. Langley et al. (2009) note that types of data include continuous measurement (time to complete tasks), counts of observation (number of complaints), what people think (responses to questions), ratings (strongly agree to strongly disagree) and rankings (most to least important). These types of data are closely related to patients, carers and service users who experience healthcare services, yet many students discarded the value of this local data in favour of seeking national data and statistics that were not appropriate to undertaking improvement locally.

These findings indicate that student nurses could benefit from additional learning activities and greater exposure to a variety of potential data sets that can support improvements in practice. A recommendation could be to develop student nurses' understanding of what constitutes patient experience data for improvement, such as patient stories and free text survey feedback. For most students, a great proportion of their day involves interacting with patients, meaning they are well placed to collect data on patient experience for improvement, and this was evident from the students who collected data from patient's notes in my study. However, other research agrees that patient experience data continues to be an under-utilised source in practice due to a lack of confidence in how it can be used and the uncertainty around how this information is governed (Locock et al. 2020). Similarly, mentors supporting the QI Practicum frequently raised concerns over the access and use of patient data in terms of ethical practice. Therefore, academic and practice partners will need to understand the organisation's policy relating to patient experience so that student nurses can act ethically with the correct knowledge and have the confidence to use this data as a reliable source of evidence for improvement. If student nurses focus on making improvements at the level of the patient, they not only develop a greater appreciation of how to involve patients in QI, but they can uphold the principles of improvement which is to start small. Further, it could be a strategy to help overcome the issues student nurses face when trying to access data.

CF11 Access to Data

An important finding to emerge from this study showed that the student nurses' role did not allow for a wide exploration of data to enable them to choose a project. This finding is consistent with previous research that identified only 4 out of 22 nursing schools in the U.S.A reported students having access to real-time information (Disch et al. 2013). The acute setting is saturated in data relating to nurse sensitive indicators (falls, pressure wounds, infections, adverse drug events) and students are expected to 'effectively and responsibly use a range of digital technologies to access, input, share and apply information and data within teams and between agencies' (NMC 2018). Thus, accessing data is key to comparing the quality of care being delivered and was essential to support students' project choices. However, the findings of my study highlighted that student nurses faced barriers when accessing data and despite large volumes of informatics being available in healthcare, access to routinely collected data in the correct form and by the necessary timescale is reported to remain a key challenge (Shah 2019). During the QI Practicum, computer availability during busy shifts and ambiguity around students' training prevented them accessing data and resulted in disengagement with their QI projects. However, their perception that hierarchical gatekeeping from the SCN existed could be an underlying factor worth exploring. While the study highlighted the influence of SCNs on student nurses' QI educational experiences, it was not a factor thoroughly explored. There is evidence in the improvement literature to suggest that hierarchy is a common barrier experienced by registered nurses accessing data (Alexander et al. 2022b). Certainly, for some nursing mentors in my study, access to data was an unfamiliar QI activity. However, it is also reported that almost a third of nurse leaders experience their own difficulties accessing data for improvement (Blok et al. 2022). Understanding the views that SCNs hold around data access and supporting student nurses to be involved with digital technologies, will be an important development that will be essential for student nurses to meet their professional nursing competencies (NMC 2018).

CF12 Gathering Data

While access to data and understanding what constituted data was found to be an issue for students, they also found it difficult to gather their own data due to working in larger settings, working with a high turnover of patients and a lack of resources to complete PDSA cycles. Previous QI education studies in nursing have not explored how students gather data, however, there are reports that frontline nurses' experience challenges (Blok et al. 2022). The students who managed to gather timely data and complete a PDSA cycle did so with evidence available 'at their fingertips' such as patients' case notes. However, others stayed

beyond their shift to get 'just enough' data for their assignment. This finding adds to the body of literature which reports that clinical nurses do not engage with QI in the hospital setting because of having no time to gather the necessary information for improvement (Blok et al. 2022; Zoutman and Ford 2017) and explains why nurse mentors were observed during the QI Practicum taking their QI work home. While QI often attracts committed and enthusiastic individuals, these behaviours demonstrated by nurse mentors only normalise the challenges faced by the nursing workforce such as being understaffed and under resourced (Tamata and Mohammednedhaz 2023). We know that student nurses' experiences in the practice setting shape their future attitudes and behaviours towards QI (Bandura 1977). It is therefore essential that frontline nurses lead by example and influence QI behaviours that do not lead to staff burnout. However, this may be difficult for some frontline nurses in the current nursing climate because as many as a quarter of registered nurses report that QI efforts place a burden on them and negatively affects their workload (Quigley et al. 2023).

Academic and practice partners will need to carefully consider how student nurses can be supported to gather data for improvement in ways that avoid replicating negative experiences faced by frontline nurses. The consequences of burdensome workloads are well documented in the nursing literature and have resulted in registered nurses feeling demoralised and wanting to leave the profession (Senek 2020). It was clear that student nurses undertaking the QI Practicum found it difficult to balance their already burdensome workloads. While this research study did not explore the link between students undertaking a QI project during the third year of their degree and its influence on student nurse retention, future educational approaches need to be mindful not to apply unnecessary pressures on students' workloads.

CF13 Academic Format

The QI Practicum intended to offer a proactive approach to learning within the practice setting using QI tools and methods in real time rather than to be written retrospectively (James et al. 2016). The study findings suggest that this approach was suited to only a small student minority who were able to adapt to new formats. Some students co-ordinated their activities in real-time and adhered to recommended timescales and structured templates, reaping positive outcomes such as sustained or improved change ideas. However, many students felt that the tightly prescribed nature of the assignment misaligned to realistic practice timescales, and they felt underprepared to co-ordinate the QI project steps. Experiential learning influenced the design of the assignment because QI is an action-oriented activity that requires data to be collected in the context of the improvement. The

integrative review in Chapter 2 identified experiential learning as effective in improving students' QI knowledge and skills and it remains a defining element of recent QI nursing curriculums (Kirkby and Good 2020; Strand and Tveit 2020; Gleason et al. 2019; Honeyfield et al. 2022; Lee and Jauncey-Cooke 2023; VanGraafeiland et al. 2019). However, the study findings point to a need to rethink student-led, time-bound QI projects that may only succeed where all contextual factors align in favour of the student.

In rethinking the QI project method, faculties will need to ensure they develop QI educational interventions that are theory driven. Goldman et al. (2020) endorse new and innovative QI teaching activities on the back of learners having no control over their workplace conditions which affect their abilities to complete QI projects. Reconceptualising student learning through Etienne Wenger's communities of practice (CoP) theory could be useful here (Wenger 1998). Previous nurse education studies have applied this theory to practice learning but not to QI education (Morely 2016). The theory hypothesises that individuals work to a common purpose defined by knowledge rather than a task, and that contextual learning and participation is situated in a wider social network (Lave and Wenger 2009). It implies that knowing arises from active engagement across disciplinary boundaries and geographical regions in which identities and behaviours are moulded through historical experiences. The application of this theory to student nurses' QI practice is feasible because they learn in the broader health board systems (wider social network). Students could be provided opportunities to engage in QI learning activities (common purpose), through multiple practice placements (disciplinary boundaries and geographical regions) during their degree (historical experiences). This approach has potential for students to develop QI identities and behaviours that can be contemplated, adapted and enriched over time. Future research that is informed by theory and explores the application of CoP to QI nurse education would assist faculties who are developing innovative approaches beyond the traditional QI project.

CF14 Project Authorisation

In tandem with previous research, the findings demonstrate that project approval is a stressful step in the QI process for student nurses (Lee and Jauncey-Cooke 2023). Time limitations mean there is minimal scope to research their project topic or justify change before reaching an agreement with the SCN. These findings are consistent with a recent study which reports time limitations for third-year student nurses' agreeing QI projects in nursing homes (Strand and Tveit 2020). However, students are not alone. Placements are

also reported to have difficulties during the consultation and planning stages of students' QI projects due to the increased workload they endure (Lee and Jauncey-Cooke 2023). Another issue faced by placements who authorise QI projects is the responsibility they face in addressing multiple issues raised by students within a short time frame (Honeyfield et al. 2022).

Where student nurses are expected to undertake or contribute to QI in practice through project work, faculty and practice education facilitators may need to reconsider a different approach to secure agreement for QI projects. As noted earlier, there may be potential to build upon the idea of projects being agreed in advance of students commencing placement as VanGraafeiland et al. (2019) identified that up to 80% of students successfully agreed a project before placement. However, this study included only 20 students over two semesters, and it is difficult to generalise the findings to larger cohorts. Alternative solutions to gain project authorisation should be explored by faculty and practice.

CF15 Assignment Timing

The findings of the study highlighted that student nurses viewed the timing of the assignment in their third year as overwhelming due to the increased responsibilities they faced in their final year, which is supported by previous research (Strand and Tveit 2020). However, another contributing factor to feeling this way might have been associated with the disconnect students felt between their theoretical QI learning in the first two years and their readiness to undertake the QI Practicum in their third year. For instance, students' QI recall from lectures and the IHI e-learning modules was low as they approached the QI Practicum and students argued that the importance of QI had not been well emphasised. These findings support the current literature that continues to demonstrate that student nurses feel least prepared to undertake QI when compared to other topics such as patient safety, teamwork, informatics, patient-centred care and evidence-based practice (Cenzig et al. 2020).

However, it was possible that other factors accounted for students feeling unprepared for QI. Firstly, students complained about the Institute for Healthcare Improvement (IHI) e-learning modules being out of context for the UK healthcare system. They found the terminology to be confusing due to it being modelled upon an internationally based healthcare systems (U.S.A). At the time, the modules had been evaluated well and were integrated because few alternatives existed. There are now new modules available within the UK from the national education and training body for Scotland (NHS Education for Scotland 2025). These

modules provide information and resources to support people with experience at all levels of QI to develop their knowledge and these have since replaced the IHI modules within the nursing degree programme. Evaluating these modules will be useful to determine if students engage more with the educational content which is UK based.

Secondly, students may have felt unprepared for QI because of their learning being theoretical in the first two years. This would support the notion that for students to engage and develop QI skills, knowledge and behaviours that theory alone will be insufficient. Student nurses should have QI experiential learning opportunities straight from the start of their degree if they to prepare to undertake a full QI project. Kirkby and Good (2020) discuss their QI curriculum which involves students undertaking practice-based QI activities alongside didactic lectures from year one. Here, the students develop QI tools to measure small systems problems which are applied in early placements. Then, in the second year, students advance towards analysing problems through data collection in the hospital setting followed by undertaking an improvement project in their final year. This approach is in keeping with a spiral curriculum first described by Jerome Bruner in his seminal text 'The Process of Education' (1960). In spiral curricula, subjects are revisited iteratively with increasing levels of complexity by which students' competence increases gradually as new learning is related to previous learning (Bruner 1960). When developing QI content within nursing curriculums, faculty may wish to adopt a spiral curriculum approach to develop the QI content in their nursing programmes. In doing so, student nurses may feel that the timing of the QI assignment has less impact on their studies during their final year and feel more prepared.

CF16 Student Nurse Determinants

Although there were some clear barriers and facilitators to undertaking a QI project, the individual student determinants had an impact on their QI learning experiences which enabled some of them to overcome barriers that were perceived as serious impediments to others. Many students did this through being proactive and having confidence to advocate for their projects. This demonstrates a need to support the development of these interpersonal skills in students so they can demonstrate resilience in the face of difficulties in practice. While the focus of QI education in healthcare is to gain practical experience of the QI process by using data, choosing measures and determining outcomes, it is as much about the soft skills associated with QI such as how student nurses behave in teams, what motivates them and how they communicate and engage with others (Health Foundation 2014; Lucas and Nacer 2015). Many of the students in my research were affected by their own feelings of

apprehension to undertake the QI Practicum, had a lack of self-worth and/or autonomy to facilitate the QI process and felt intimidated and stressed in practice. These student determinants all affected students' ability to engage in their QI projects. Recently, Craig and Machin (2020) have begun to explore the QI behaviours of student nurses and the integrative review in Chapter 2 identified QI behaviours as a gap and necessary area for investigation. In my study, many students felt guilty to engage with their QI projects because of the heavy workloads endured by their mentors. If these student determinants had been as much of a focus throughout the students' degree, perhaps their QI learning experiences would not have seemed as difficult. However, an interesting finding is that some student demonstrated resilience, initiation and confidence considering many barriers placed in front of them and were still able to complete a QI project. Students did not need to be academically astute or get a good mark to feel like they were inspired by the QI experience. Therefore, faculty, need to ensure that students inter-personal skills are developed throughout their degree to enable them to deal with many of the common adversities they will encounter throughout their nursing practice and when contributing to QI activity. Further, it is worth reconsidering how QI in practice is assessed as there appears to be a disconnect between the experience and the assignment.

7.3 CONCEPTUALISING STUDENT NURSES' ENGAGEMENT IN QI

Research Question 2: How Do These Contextual Factors Interplay throughout the QI Learning Process and Across Different Practice Settings?

In the previous section the contextual factors that influenced student nurses' QI learning experiences were discussed in the context in which the QI projects occurred, but it should not be assumed that student nurses experienced them in isolation which is often reported in previous studies (Christiansen et al. 2010; Baillie et al. 2014; James et al. 2016; Kirkby and Good 2020 and Strand and Tveit 2020). This study demonstrated that the QI Practicum consisted of multiple, interacting, complex contextual factors that involved the student, practice learning environment, the educational assignment, leadership, the organisational culture and data for improvement (Skivington et al. 2021). However, ethnographic enquiry has brought the practice setting to the forefront of the research to provide a rich description of student nurses QI learning experiences. The underpinning idea that QI outcomes manifest themselves in complex, dynamic and non-linear ways, rather than oversimplifying or reducing its findings (Greenhalgh and Papoutsi 2018), has enabled a new perspective of

students' QI learning experiences to be gleaned. Thus, the inter-relationships that existed between each contextual factor, the practice settings and the student nurses have contributed novel insights to this phenomenon which is greater than the sum of its parts. The study has conceptualised how student nurses engage with their QI projects at different levels in the practice setting.

Student Level

The QiNEP model illustrates that it was common for student nurses to operate at the 'student' level where they had no engagement with their QI projects in practice. The contextual factors that mostly influenced students' disengagement at this level included negative attitudes and beliefs about QI not being the responsibility of a student nurse and/or a lack of leadership. The few student nurses who navigated away from this level demonstrated resilient characters and confidence to advocate their need to undertake a QI project to pass their final assignment. These behaviours were important to enable the student nurses to interact with their mentors to talk about their QI projects and this engagement early on is critical for influencing positive outcomes such as QI project ideas being accepted in practice (Craig and Machin 2020).

The consequence of student nurses remaining at the 'student' level however, is that less opportunities exist to develop the essential QI behaviours necessary for longer-term QI engagement (Lucas and Nacer 2015). The QI Practicum intervention was designed to enable student nurses to learn in the social setting by continuously interacting with others to experience behavioural modelling (Bandura 1977). At the 'student' level this interaction did not occur and student nurses QI behaviours were not developed or changed. While student nurses were able to apply their knowledge to their QI Practicum assignment and receive a pass, the use of theoretical data to support their projects ideas counteracted the purpose of the experiential teaching approach used to develop the QI Practicum. Therefore, students nurses operating at this level will be unlikely to develop the QI capabilities that is required by their professional regulations or contribute to improving nursing workforce issues and complex healthcare systems in future (Scottish Government 2017; NMC 2018).

The beliefs and attitudes of student nurses surrounding QI will need to be addressed before they engage in QI learning activities in the social context, because this is clearly an indication of students' intent to engage with their QI learning activities. The NMC (2018) stipulate that student nurses should discuss the importance of QI with their mentors in first year. However, these early conversations are not enough to ascertain if students' QI beliefs and attitudes

change throughout the programme. If student nurses are exposed to a mentor with negative attitudes towards QI in the first or second year of their programme, then students are likely to model this behaviour during their QI projects and beyond, once qualified (Bandura 1977).

These findings have implications for how nursing faculties will structure QI teaching and learning content throughout their nursing programmes. Ongoing assessment of students' QI attitudes and beliefs need to be central to ensure that timely and effective interventions can be put into place and support students to enter the profession and ready to contribute to a positive QI culture. Future studies should explore the applicability of the 'Beliefs, Attitudes, Skills, and Confidence in Quality Improvement (BASIC-QI) Scale' (Brown et al. 2019) that was previously highlighted to determine students' QI engagement. Further, the study findings have implications for practice leaders. Inevitably, not all student nurses will develop the confidence to speak up at this level and as such practice leaders need to be aware of these students to initiate early interaction and offer support to maximise their QI engagement. Academic and practice partnerships are therefore essential to the success of students' ability to engage in QI in practice and findings from a realist review examining how these partners collaborate will make future recommendations (Armstrong et. al 2023; Mak et al. 2023).

Patient Level

The QiNEP model illustrates that it was common for student nurses to operate at the 'patient' level where they had engagement with their QI projects and other nurses. The contextual factors that mostly influenced students' engagement at this level included access to data and mentorship involvement. Student nurses who did not maintain their engagement at this level demonstrated a lack of self-efficacy and/or confidence due to lack of mentorship and is problematic for those who did want to engage with their QI projects (Craig and Machin 2020). Operating at this level had greater implications for practice mentors because despite students nurses' intentions to engage in their QI projects, mentors did not have the capacity to support an 8-week QI project during the student nurses' practice placements. As such the the feasibility of the QI Practicum as an educational approach for all settings should be reconsidered. Nursing staff are currently facing ongoing psychological pressures following the Covid-19 pandemic, and so consideration must be given to the impact that supporting QI projects places upon them to avoid increasing the incidents of burnout, apathy and poor mental health. Evidence has further demonstrated that the psychological impact because of the Covid-19 pandemic could worsen the safety and quality of patient care (Jun et al. 2021;

Couper et al. 2022). Therefore, it should be questioned as to whether student nurses' QI projects which are intended to improve patient care, ironically worsen patient care.

However, students operating at the 'patient' level were well placed to achieve the quality and safety competencies set out by the NMC (2018) with supportive nursing mentorship. Student nurses need to be proficient in paricipating in audit activity and be able to consider how the outcomes can inform improvements. Further, it is a requirement that they participate in activities that enable them to work with patients, families, carers and colleagues to share feedback (NMC 2018). At the 'patient' level, student nurses were more likely to access patient data and undertake small QI projects that were achievable within an 8-week practice placement. Where value to patients is identified, the literature reports that positive QI attitudes and beliefs can be developed, and is essential for future QI engagement (Ogrinc et al. 2007). Students at this level were successful in using a range of QI tools such as process mapping, pareto charts, run charts, cause/effect diagrams and bar graphs. In previous studies engagement with these QI tools has amplified their importance for problem solving, enhancing understanding of QI principles, emphasising the unpredictable nature of change and highlighting the necessity to obtain staff engagement and feedback (Kyrkjebo 2006; Skledar and McKaveney 2009; James et al. 2016). Therefore, faculties need to continue to offer students opportunities to work at the 'patient' level to equip them with the tools necessary for evaluating and improving complex care systems (Scottish Government 2017) but develop QI learning activities that do not require ongoing support from nursing mentors.

Ward Level

The QiNEP model illustrates that it was uncommon for student nurses to operate at the 'ward' level where there was engagement with their QI projects, nurses and the multi-disciplinary team across departments. The contextual factors that influenced students' engagement at this level related to early collaboration with leadership and students' own determinants such as confidence, a strong self-will and a belief in the value of their QI projects. Leadership is integral to many nurse-led projects because it can empower perceptions of automony and confidence (Machin and Craig 2020). The autonomy that student nurses' experienced at this level enabled them to demonstrate QI knowledge, skills and leadership capabilities to initiate real-time small improvements. Leadership competencies such as leading discussions to formulate improvement activities was also evident at the 'patient' level, however, students at the 'ward' level demonstrated more project ownership to appraise, monitor and evaluate their changes.

Working at the 'ward' level though was a disadvantage to students' ablity to balancing their workloads and students mostly worked beyond their allocated shift hours to manage their QI projects. This presented a risk of students' becoming acclimitised to the workforce culture that validated QI as being a separate entity to the core responsibility of the nursing profession. On the other hand, the 'ward' level presented an optimal platform for student nurses to learn about the complex nature of QI. Student nurses need to be able to demonstrate their understanding of organisational dynamics and different cultural settings (NMC 2018). At this level students were exposed to new healthcare systems such as the haematology lab, where opportunities to explore challenges in different parts of the organisation could contribute to their QI projects. Complex systems and complex adaptive systems are key to understanding how QI is influenced and students at this level were able to apply their learning of systems thinking theories to interpret how individuals behaved in these nonlinear and unpredictable systems (Campbell et al. 2007; Braithwaite et al. 2018; Long et al. 2018: Health Foundation 2010; Kannampallil et al. 2011; Greenhalgh and Papoutsi 2018).

However, most student nurses did not work at the 'patient' level due to hierarchical lack of support or a belief that QI projects had no value if they were not to be sustained. While student nurses do work with multi-disciplinary teams prior to registering as a newly qualified nurse, they did not work collaboratively with them during their QI projects which is critical for understanding the realistic tensions that exist between disciplines involved in improving similar outcomes (Vincent et al. 2011). This study identified that potential opportunities exist for student nurses and student doctors to work together on a joint QI project where they commence placement at the same time. Students find this an excellent way to learn about the skills and expertise within different disciplines. However, many challenges exist in trying to align multi-professional curriculums, placement timelines and QI training (Toma et al. 2023). More research is needed to create innovative ways for student nurses to work with the multi-disciplinary team to ensure a complex systems perspective of QI can be developed.

Organisational Level

The QiNEP model illustrates that it was rare for students to operate at the 'organisational' level. Here, students were engaged by nursing mentors and the multi-disciplinary team to work on large QI initiatives that aligned to relevant performance indicators. The contextual factors that mostly influenced students on this level related to access to QI expertise and access to work alongside an ongoing improvement project. The serendipitous nature of

working at the organisational level meant that most student nurses were unaware of what QI initiatives were happening. This lack of awareness was attributed to the lack of QI culture, particularly the exclusivity of students in conversations about wider organisational improvements which reflects an ongoing challenge reported in the literature (Gray et al. 2021). To improve quality and patient safey, nurses need to be able to measure performance that aligns to the organisations key priorities. The future nursing workforce will need to be able to initiate and manage change as healthcare systems become more complex (NHS 2021). In this study, working at the 'organisational' level enabled the student nurses to converse about real-time data. The collection and management of performance data in large QI inititatives is reported to be a challenge due to time (Gray et al. 2021), and is why student nurses are valuable to clinical teams because they can act as data collectors, as was observed during this study.

However, working at the 'organisational' level had implications for student nurses who did not meet their weekly QI objectives, and these students stuggled to demonstrate their QI knowledge for their assessments. This complication was not a true reflection of student nurses' QI learning experience though as they did work in QI teams, discuss real time challenges and link performance data to organisational priorities. As an alternative, students could benefit from undertaking a critical reflective assessment which would have allowed more flexibility to discuss their engagement with the QI experts and initiative they were involved in within their own learning contexts. Therefore, the study findings agree with others in the healthcare education who have discussed moving QI education beyond the 'QI project' to engage with QI as core business (Myers and Wong 2019). The potential to provide student nurses with a valuable QI learning experience is feasible at this level, however, QI engagement of students needs to be driven by an inclusive QI culture and supported by QI expertise. Further, faculties need to ensure that student beliefs and attitudes towards QI are maximised to encourage future QI engagement. Designing flexible QI learning activities and assessments could prevent students from becoming disheartened by assessment formats that are unrealistic.

Quality Improvement Nursing Engagement in Practice (QiNEP)

Overall, the QiNEP Model demonstrated that student nurses who undertook a QI project during their degree had the potential to operate on four levels of engagement. These findings present a new perspective on the feasibility of using small-scale projects to teach QI to student nurses. The analysis suggested that students operated on one level or another during

their QI projects which meant they were unlikely to be exposed to the wider QI learning opportunities available at other levels. This shortfall presents a risk to student nurses as they may not be able to develop their QI proficiencies before qualifying as a registered nurse (NMC 2018). Adversely, those working at the 'student' level passed their assessments without engaging in their QI projects. While these students developed some QI knowledge and skills, their QI behaviours could not be thoroughly developed. These findings emphasise the need for faculties to reconsider the traditional QI project. Ongoing reflective port-folios that are developed throughout student nurses' degree could be a feasible solution, as students perceive that reflection helps bridge the theory-practice gap, develops resilient QI behaviours and facilitates growth in their identities as improvers (Craig and Machin 2020).

7.4 SUSTAINABILITY OF QI ENGAGEMENT IN REGISTERED NURSES

Research Question 3: Do Student Nurses Continue Their Qi Engagement as Registered Nurses and What Are the Influencing Contextual Factors?

This section discusses the third question of the thesis which involved the findings relating to the sustained QI engagement of participants as registered nurses. The discussion is structured by the contextual factors that influenced their sustained QI engagement in practice.

Transition to Newly Qualified Nurse (NQN)

The registered nurses entered the profession as newly qualified staff nurses and held different views on the value of having received QI education and doing a QI project. Throughout their degree the unique position that they had been exposed to, in terms of receiving QI education, had been regularly emphasised to them during their lectures. As they began to prepare for new employment, several newly qualified nurses had capitalised on their QI knowledge and considered it to be an attribute that would enhance their prospects of securing their first post. However, the study findings demonstrated that some of the newly qualified nurses and their employers did not regard QI as an essential skill for early career registered nurses to attain. This perception at this time could have been influenced by a programme of learning that new nurses were expected to complete during their first year called the Flying Start Programme (2019). This programme made no reference to QI standards at the time but has since been revised to reflect the changing needs of healthcare delivery and professional nursing standards in QI (NMC 2018). As such, new nurses are now required to reflect upon and attain

evidence linked to QI and healthcare employers will be compelled to provided new nurses with opportunities to engage in QI (NHS 2017).

This responsibility has implications for practice leaders, because they will need to reassess their own nursing team's QI engagement to plan inclusive QI learning activities for new nurses to be able to evidence their ongoing professional development. As new nurses enter the profession, they will need to become accountable for their learning and actively seek out QI opportunities to become involved in. There is evidence that new nurses believe they have fresh ideas and a willingness to improve (Craig and Machin 2020). It is therefore essential that this motivation is nurtured, because while not all students had a positive experience doing their QI Practicum, their drive for improving patient care was evident.

In the past five years QI nurse educational research has demonstrated that there is greater alignment between educational providers and professional nursing standards (Armstrong et al. 2017; Kirkby and Good 2020; Strand and Tveit 2020; Mak et al. 2023; Honeyfield et al. 2022). Given this shift, increased opportunities to investigate new nurses' experiences within and across different practice settings are available, and research should focus on determining what value they place on their current QI education and engagement with QI in practice. The requirements of healthcare employers to support new registered nurses to engage with QI activities also needs to be better understood so that effective strategies can be put in place. Practice education and future research should prioritise this area to ensure newly qualified nurses QI knowledge and enthusiasm continues to be of benefit in practice.

QI Knowledge Decline

There is a professional requirement and desire from practice partners to prepare student nurses to enter the profession with sufficient knowledge of improvement theories and tools (NHS 2018; McComb and Kirkpatrick 2017), and the registered nurses in this study were positioned to join the profession with QI knowledge, skills and some demonstrating QI behaviours. As previously discussed, faculties have adopted experiential learning to teach student nurses about QI due to its effectiveness in increasing QI knowledge and skills (Armstrong et al. 2017). However, the findings highlighted that these educational efforts to equip future registered nurses with QI knowledge and skills could be reversed if a lack of engagement opportunities exist in the practice setting. The most reported barrier to QI engagement is registered nurses' lack of knowledge (Alexander et al. 2022b; Djukic et al. 2015). As such, there will need to be greater alignment between academia and practice to

create an infrastructure that builds upon new nurses' QI capabilities and supports their ongoing professional development (McComb and Kirkpatrick 2017; Armstrong et al. 2023). Fostering QI engagement activities for registered nurses was important for creating future QI leaders and was facilitated through the specialist roles they took on such as the QI link nurse. Building capacity this way could be a solution to increase QI knowledge of front-line early career nurse leaders of which only 30% report feeling prepared to undertake QI (Djukic et al. 2015). In the literature, nurse leaders and registered nurses at the front-line report wanting to learn together through workshops and drop-in seminars, and they seek to partner together to work on QI projects (Tschannen et al. 2021). My findings suggested that where students and leaders worked together during the QI Practicum, that the students had greater success in completing their QI projects. Therefore, learning through QI academies which are emerging currently in UK health boards could enable such QI partnerships to be developed (NHS 2024a). Future research should examine the feasibility of new nurses and nurse leaders partnering in QI activities and determine how QI academies might help to sustain new nurses' QI knowledge once qualified.

Hierarchy

The study found that QI activity was considered by the registered nurses to be a progressive responsibility adopted as their roles advanced. Interestingly, this view was held as a student nurse during the QI Practicum as they believed that QI was a progressive responsibility once they became qualified. This view exposes an ongoing issue relating to nursing culture that says QI is not considered part of a nurse's role. Hierarchy in organisations is often reported by registered nurses as a barrier that prevents them engaging in QI activity (Alexander et al. 2022b). The findings highlight that registered nurses brought ideas for change forward but did not feel like their managers listened, similarly to the students undertaking their QI projects. A potential reason for this lack of consultation may be due to nurse leaders facing their own hierarchical barriers such as disproportional fundings for QI projects between disciplines and lack of physician buy-in which can take several months of persuasion (Alexander et al. 2022a). A lack of autonomy and ability to speak up to challenge leaders was discussed by some of the registered nurses. These challenges were also faced by the participants when they were student nurses. This skill is necessary to enable registered nurses to advocate for change and improve patient care and services, however, if it is not developed during student nurses' degree, these findings suggest that these avoidant QI behaviours remain an ongoing issue. Further investigation into the personal attributes of registered nurses and how they influence QI engagement would be useful. Future research that

investigates how the power dynamics between disciplines impact upon nurses' QI engagement would be interesting to develop strategies that enable nurses at all levels to have a voice which reinforces the values and behaviours that underpin high quality care.

Leadership

The findings showed that where nurse leaders modelled positive QI values and behaviours during the student nurses' QI Practicums, that the registered nurses reported sustained engagement in QI. Leadership has been significantly associated with the success of QI and attributed to high functioning teams (Kaplan et al. 2010). Registered nurses believe leaders are highly influential in encouraging engagement in QI where they adopt transformational leadership styles through creating buy-in, supporting a just culture, and working in partnership with more junior staff (Alexander et al. 2022a). In contrast, the findings showed that where co-operation between registered nurses and leaders was based upon a laissez-faire approach where QI activities did not exist, it led to unclear expectations about their QI roles. This confusion hindered active QI engagement and mirrors findings found within other studies (Elizalde et al. 2024). Leadership influence in QI appears to begin during student nurses' degree and has potential to affect engagement in QI once qualified. Therefore, leaders involved with QI will need to assess and reflect upon their own leadership styles when supporting student nurses undertaking QI in practice as well as registered nurses. Students were allocated to one of the many practice settings to undertake their QI project. Thus, students' exposure to a leader who modelled positive QI values and behaviours was serendipitous. Students would therefore benefit from undertaking QI activities across a range of settings to optimise their chances of working in a culture conducive to QI and thus increase the likelihood of engaging in QI once qualified. Again, these changes would have implications for how QI is taught in educational programmes, because curriculum developers would need to redesign their modular content to include more frequent learning opportunities for students to engage in QI activity.

Covid-19 Pandemic

During the Covid-19 pandemic, opportunities for rapid improvements and catalysing change efforts were at the forefront of all health professionals' practice (Foster and Stack 2020; Zarasvand et al. 2020; Sorensen et al. 2021; Pesch et al. 2022). For the registered nurses in this study, however, it was a stressful period during which QI activity was postponed and no engagement in QI was reported. These findings should be interpreted with caution though, as the registered nurses referred to Covid-19 being used as a cover-up to justify why

engagement in QI had not resumed post-Covid-19 and thus there may have been other contextual factors that influenced QI engagement. The emotional stress that registered nurses faced during this period potentially skewed their memories during such events.

Data Access

Using data to monitor performance is the cornerstone of improving patient care and services. Student nurses are expected to acquire knowledge of data before qualifying and during their degree, students were to collect, analyse and display data using run charts for the QI Practicum (NMC 2018). Earlier studies report that students lacked information about where to collect data, perceived data to be tedious, uninteresting, boring, or non-educational and irrelevant and 60% of students in a survey replied they had not collected any data using fishbone diagrams or process maps during their QI projects (Trent et al. 2017; Skledar and McKaveney 2009). If student nurses' QI learning experiences influence their engagement in QI once qualified, then faculty need to ensure effective QI learning activities around data are developed. The registered nurses in this study reported having access to data only when they were involved in QI roles or senior positions which was a similar case during their QI Practicum. This outcome aligns to a survey in which nurse leaders were more likely to report access to data as a facilitator of engagement in QI than registered nurses at the front-line (Blok et al. 2022). However, data must be used to generate open and transparent conversations about improvements between leaders and registered nurses if a culture of psychological safety is to be developed, as indeed this is why students did not speak up during the QI Practicum. Scrutiny of the analysis reveals that as registered nurses developed a negative association with clinical indicator data and had a fear of wrongdoing. As the student nurses also reported this concern, the findings suggest that the nursing profession continues to harbour a blame and shame culture as opposed to a just culture in which improvement activity is thought to thrive. Nursing leaders should act with caution when sharing data for the purpose of making change in practice, as my research clearly shows that staff are not motivated by data where it was used as leverage to better performance.

Location

The registered nurses in this study displayed positive beliefs and attitudes about QI and had a will to engage in generating new knowledge and improvements. Despite these best intentions, they asserted that QI engagement was decided upon by the location in which they worked. This finding is unsurprising given the discussions already had about the contextual nature upon which QI depends for success (Kaplan et al. 2010). Location is reported to

encompasses many interacting contextual factors that influence engagement in QI such as leadership, mentorship, data, culture, and hierarchy (Alexander et al. 2022a; Blok et al. 2022). The observations in Phase One of this study confirmed that student nurses' locations presented challenges for not engaging with their QI Practicums, such as familiarity and size of the setting, shift type and patterns, balancing workloads, and the presence of QI expertise. While the registered nurses did not allude to these individual factors, they could be key to planning effective engagement in QI for registered nurses and thus warrant further investigation.

Transferability of QI Skills

Lastly, a surprising finding to appear related to the transferability of registered nurses QI skills. While some registered nurses transferred their QI knowledge and skills to advanced nursing roles, others applied them to real-world issues outside of healthcare such as early years education. These findings coincide with attempts seen to optimise QI education and improve wider societal concerns. In undergraduate medical education, the SusQI education framework links concepts of sustainable healthcare with QI methods (Spooner et al. 2022). Further, in New Zealand nurse education programmes aligns cultural agendas to the QI curriculum to improve equity and inclusion of the Māori culture (Honeyfield et al. 2022). These findings highlight the potential reach of QI education and the possibility of exploring the application of QI projects within different environmental contexts. Student nurses do report being more motivated and engaged in QI where there is a shared vision or personal preference in the QI topic being undertaken (Clery et al. 2021). While the need for small QI projects in the practice setting still exists, the global demands and responsibilities placed upon the nursing profession are greater than ever before. As a result, more innovative and engaging pedagogical approaches to educate student and registered nurses in QI are desired.

7.5 VALUE OF THE QI PRACTICUM

The findings of this study suggest that the QI Practicum does hold considerable value within undergraduate nursing education, but not surprisingly, its effectiveness is highly dependent on the context in which it is delivered as is many educational or improvement initiatives (Reed and Card 2016). However, when supported by strong mentorship, leadership engagement, and a positive organisational culture, the QI Practicum demonstrates its worth by promoting meaningful learning and continued professional development in the nursing profession. The students who experienced such enabling conditions reported increased confidence, a sense of ownership over their projects and a deeper understanding of

improvement science. One student reflected, ‘having a member of staff recognise my efforts felt really good and I was on a high for the rest of the shift knowing I had done something good,’ and illustrates the motivational impact of real-time feedback and engagement in QI. Further, the QI Practicum helped students develop transferable skills such as teamwork, leadership, and critical thinking which were seen as valuable in their transition to becoming a registered nurse.

However, the study reveals significant limitations that challenge the wider application of the QI Practicum in nursing education. In several practice settings, students encountered barriers including hierarchical constraints, limited autonomy, and inconsistent mentorship. These factors often led to disengagement, with some students opting to submit theoretical projects due to lack of support or time. One participant stated, ‘I’m there tae become as good a nurse as I can possibly become, I’m not going tae learn that from sitting behind a desk doing a project,” which highlights the perceived disconnect between QI activities and core practice learning. Additionally, students were sometimes treated as supplementary staff rather than supernumerary learners which compromised their ability to engage with the QI Practicum in a meaningful way. In some cases, students joined ongoing QI projects but struggled to align their contributions with the academic assessment criteria, resulting in lower grades, despite active participation.

In summary, these findings suggest that while the QI Practicum is pedagogically sound, its success and value is contingent on robust academic-practice partnerships, adequate staff capacity and a culture that values improvement. Without these conditions, the QI Practicum risks becoming a superficial exercise rather than a transformative educational experience that aims to develop QI related behaviours for the future.

7.6 SUMMARY

This chapter has discussed the findings of this research study and its implications alongside the wider literature. It provided an in-depth discussion of the contextual factors which influenced student nurses QI learning experiences in the practice settings. The QiNEP model components were explained and discussed in tandem with the wider theoretical QI literature. The model illustrated how the complex nature of contextual factors inter-related to influence the level on which students engaged with their QI projects. The chapter discussed what contextual factors influenced participants engagement in QI once qualified and considered whether the QI Practicum remains worthwhile. The conclusion of the research study is offered next.

Chapter 8 Conclusion

8.0 INTRODUCTION

This chapter concludes the thesis by summarising the research and highlighting how the findings contribute new knowledge to the field of QI education in pre-registration nursing. The implications of this new knowledge for education and practice are confirmed, and the strengths and limitations of the study are considered. Areas for potential future research are recommended, and my reflections are provided prior to the concluding remarks.

8.1 SUMMARY OF THE RESEARCH

This study set out to explore the experiences of student nurses who received education about QI during their undergraduate degree and who undertook a QI project in the practice setting. The purpose of the small-scale improvement projects that were adopted by nursing educators intended to offer students the opportunity to participate in real-time QI activities through experiential learning (Kyrkjebo 2006; Smith et al. 2014; Baillie et al. 2014; James et al. 2016). Undertaking this research was important because UK registered nurses need to be prepared to contribute to and lead practice improvements and use QI methods to enhance people's experiences of care and services (NMC 2018). Due to a lack of knowledge about how these QI projects in practice influenced student nurses' QI learning experiences, further research was fundamental to develop effective QI education within pre-registration nursing curriculums (Robinson and Gelling 2019; Craig and Machin 2020). This study adopted ethnography to become immersed into the different practice settings where student nurses undertook their QI projects and to provide insights into the contextual factors that influenced their QI behaviours and engagement. The aim of the study was to determine what contextual factors influenced students' QI projects, consider how these interrelated during students' experiences in different settings, and discover if QI engagement was sustained as registered nurses. The key findings from the research are listed below:

- Experiential learning alongside didactic lectures works to enhance student nurses' QI knowledge and skills but not necessarily to develop QI behaviour change in practice.

- Quality improvement education is complex, and it includes multiple components that require suitable research methods to capture its complexities, the cultures and the behaviours within the contexts in which it occurs.

- Ethnography is a suitable methodology to capture the multiple perspectives of QI education that exist within the realities of the social world and can provide rich insights into student nurses' QI learning experiences.

- The study found that 16 contextual factors emerged across six themes and influenced student nurses' QI learning experiences. These were the practice learning environment, organisational culture, leadership, data for improvement, the assignment and the student nurse determinants. These factors were experienced by students across all practice settings where they were manifested as a facilitator or barrier and interacted in dynamic and non-linear ways.

- These non-linear inter-relationships influenced student nurses' level of QI engagement where four levels were identified and included: the student, the patient, the ward and the organisation. Movement between these levels was influenced by a range of contextual factors and determined mainly by students' own determinants.

- Student nurses who undertook their QI projects at the student level were less likely to develop the QI behaviours required for long-term engagement because of negative QI beliefs and attitudes or a lack of early support for QI in practice.

- Benefits and consequences to working on the patient, the ward and the organisation level were identified. However, student nurses working at one level were unlikely to be exposed to the potential QI learning opportunities and benefits available at the other levels which was important to develop a comprehensive set of QI proficiencies.

- Registered nurses who reported sustained QI engagement reported experiences of supportive leadership during their QI projects and had been involved in QI activities once qualified. Some of these nurses were in leadership roles and others had applied their QI knowledge and skills to community projects outside of healthcare.

- Registered nurses who reported no sustained QI engagement had no exposure to QI during their first year of practice which resulted in a decline of their QI knowledge. These nurses experienced similar contextual factors pre and post qualification such as hierarchy, lack of leadership, the negative impact from Covid-19, a lack of access to data, and QI culture being dependent upon their work location.

8.2 CONTRIBUTION OF THE STUDY

This is the first ethnographic study to investigate student nurses' experiences of QI education. The research is unique because it combines healthcare improvement concepts of complexity and context with educational concepts of behaviour change to investigate the QI behaviours of student nurses who undertook QI projects in practice. This novel perspective advances knowledge for nursing education and practice through its illustration and explanation of how contextual factors inter-relate and influence student nurses' engagement during their degree and once qualified as registered nurses. To date no known studies have studied QI nurse education using ethnography and academics continue to advocate for its use to enhance the understanding of QI behaviours in healthcare practice (Black et al. 2021). Specifically, the following contributions have been made:

- This study is the first to apply the Kirkpatrick Education Evaluation Model (1967) to the pre-registration health professions' population to explore outcomes, barriers and facilitators associated with QI education. These rare findings were documented through an integrative review of the literature that argued the need for researchers and academics to focus their efforts on understanding students' QI behaviours.

- This study builds on the empirical findings of what is already known about the QI learning experiences of student nurses in practice. Specifically, it strengthens the findings of previous research that identifies the barriers and facilitators to QI education. These include: the teaching approach, faculty and practice support, information provision, curriculum balance and data. By adopting ethnography, an understanding of these barriers and facilitators have been enhanced through in-depth analysis of the student nurses' natural practice settings and triangulated with focus groups and individual interviews. This methodology has not been applied to previous QI nursing education studies. It therefore sheds new light on new important contextual factors such as those within the practice learning environment, the organisational culture, the assignment structure and the influence of students' own determinants on QI engagement.

- This study has produced a conceptual model for Qi Nursing Engagement in Practice which is significant as this illustrates the importance of 'engagement' as its central tenet. This model can be used by faculties and practice educators internationally to develop QI activities within the scope of their curriculums and practice

environments, because it offers a comprehensive overview of the contextual factors that can influence student nurses' QI engagement. The QiNEP model demonstrates that 'engagement' is an essential educational outcome to measure and emphasises its importance for long-term QI behaviour change. The QiNEP model could be used in tandem with the Kirkpatrick Education Evaluation Model where Level 3 (behaviours) could integrate a sublevel simply relating to Level 3a (engagement). The model is the first to highlight the proximity of QI behaviours with engagement and intends to influence how QI educational outcomes are measured in broader health professions' education.

- This study builds on the empirical findings of what is already known about the QI experiences of registered nurses in practice. Specifically, it strengthens the findings of previous research that identifies the importance of continued engagement in QI for newly qualified nurses in their first year of practice to ensure QI knowledge decline is minimised. This study is unique because the longitudinal data is captured beyond the newly qualified phase and provides new insights into registered nurses QI behaviours where formal QI education has been undertaken. This new knowledge is strengthened as the analysis and interpretation of the findings was informed by the first phase of the study which included the rich ethnographic cases and understanding of engagement through the QiNEP model. The study confirms that students and registered nurses experienced similar contextual factors in the practice setting. Leadership was a central mechanism to a positive QI culture and access to data, and in its absence, hierarchy and lack of QI engagement was identified. This study infers that student nurses who experienced supportive leadership during their QI projects were more likely to sustain their QI engagement as registered nurses.

Some of the contributions discussed here have led to impact during and following the research study and these can be viewed in Appendix 23.

8.3 IMPLICATIONS FOR NURSING EDUCATION AND PRACTICE

Nursing Education

The study findings have implications for all educational establishments who provide QI education within their nursing programmes in the UK and internationally. The evidence that experiential learning in the practice setting increases students' QI knowledge and skills

means that faculties need to ensure that their curriculums are designed to offer such opportunities. Therefore, it will be important that faculty are educated in QI, and provisions should be made for staff to engage with training as part of CPD. For educational providers who already offer experiential learning through small-scale QI projects in practice, this research will be important because it suggests that this approach is less effective for long-term QI behaviour change and engagement, and that regular and ongoing QI activity could offer a more comprehensive QI educational experience. Therefore, educators will need to review how they teach QI to student nurses and make the necessary changes to their programmes such as designing longitudinal QI portfolios. The findings provide significant insights into the student determinants that influence QI learning experiences, and thus faculty should ensure there are inter-active opportunities for student nurses to develop these skills throughout their nursing degree.

Nursing Practice

The study findings have implications for all practice areas who are supporting student nurses to engage with QI educational activities. Practice areas need to ensure that students are exposed to a positive QI culture, in which student nurses can model positive behaviours from QI educated leaders and mentors. Practice areas need to establish what negative attitudes and beliefs towards QI exist so that these can be addressed. This research suggests that it will be important for practice areas to be transparent about the QI work being undertaken and they need to consider how student nurses can get involved in a supportive way. This means that practice areas should consider whether there is an issue of data gatekeeping and instead build a culture in which learning from data, and indeed QI, becomes part of everyday practice. Of course, the findings have implications for how educational establishments and practice areas need to collaborate to develop, support and evaluate QI education. These collaborations will be essential because QI education cannot be designed by faculty without being realistic about the potential opportunities that exist across the different practice settings. Therefore, QI education should be considered a hybrid curriculum that is regularly reviewed in line with the evolving practice and academic contexts. The findings will be important to practice education facilitators because the research suggests that ongoing professional development in QI is an indicator of longer-term QI engagement once nurses qualify.

8.4 RESEARCH STRENGTHS AND LIMITATIONS

This study represents one University programme in central Scotland, and the findings should be seen within this context. The study included adult student nurses and not those in mental health, children or learning disability fields. However, the purpose of the research was to unveil the rich and detailed descriptions of the cultures and contexts in which student nurses undertook QI projects and the findings will be relevant for educators, researchers and practitioners in healthcare improvement who should interpret and apply the findings to their own situations/fields of nursing. It is likely that the contextual factors discussed in this thesis will be broadly applicable to other disciplines that engage in healthcare quality improvement, such as midwifery, medicine or the allied health professions, although there may be enablers or barriers unique to these professions.

A key strength of this QI education study lies with its ethnographic approach which was informed by the concepts of context and complexity and interpreted through researcher reflexivity, all of which are essential for understanding QI behaviours (Black et al. 2021). Adopting ethnography can be a challenge for healthcare researchers who frequently experience funding limitations, resource restrictions and short timescales for analysing the time-intensive and 'messy' data that ethnography can produce (Davies 2012). My post-graduate student status was an advantage because it allowed for greater flexibility to become deeply embedded in the social and cultural environment where students undertook QI projects. A gap in understanding student nurses QI behaviours was highlighted at the start of the study, and it was discussed that QI barriers and facilitators lacked meaning without context (Ovretveit 2011; Dixon-woods 2014). By employing ethnography, it reduced this gap because real-time observations within and across multiple contexts were captured to add depth and different perspectives about *how* contextual factors influenced student nurses QI learning experiences. Developing multiple perspectives thereafter allowed a deeper level of analysis to emerge which provided insight into the levels on which student nurses engaged with their projects. While this produced new knowledge, future studies should build on these findings by applying a more focused analytical lens such as those seen in realist approaches (Pawson 2013). Realist methods identify context, mechanism and outcome configurations and have potential to recognise clearer patterns of how contextual factors inter-related to influence QI engagement. This deeper level of analysis would lead to a more prescriptive set of possible interventions and recommendations to be made for those supporting frontline QI education.

A limitation to be considered in all ethnographic research is the influence of researcher bias. In this study potential bias related to me being a student nurse initially and then acting as a nurse QI teacher with an affiliation to the faculty. This meant that my cultural and experiential background in QI education shaped the values and ideologies that influenced the direction of the research (Fusch et al. 2017). The credibility of the research conduct and the confirmability of the findings were strengthened by reflexive journaling, which enabled continuous self-evaluation relating to how decisions were made (Roller and Lavrakas 2015). The decisions were not an indication themselves of research confirmability but as a mechanism to be scrutinised during regular supervisory meetings. My thoughts, knowledge, experience and biases were questioned through rich conversations prompted by 'outside' and 'inside' perspectives, such as one supervisor being a nurse and familiar with QI and the other a social anthropologist with no prior knowledge of QI methodology. This process was pivotal to help identify 'blind spots' in the data collection and analysis (Davies 2012). Further, while ethical restrictions prevent participant details being shared in ethnography, the transparency of the study data was enhanced through meticulous audit trails of manual and electronic records. These were available to me and the supervisory team throughout the study and served as an organised (but not linear) research process (Murphy et. al 2021).

A limitation of this study related to the extended period that arose between student nurses completing their QI projects and the semi-structured interviews as registered nurses in Phase 2. Recruitment during this phase was planned to be undertaken by me in the first quarter of 2020 but postponed due to research being temporarily ceased by the University where it was not related to Covid-19. This delay potentially resulted in recruiting only ten participants from the original sample of thirty and because of invalid contact details. Further, student nurses may no longer have seen the relevance of taking part in the research or affected by the attrition of nurses leaving the profession following the Covid-19 pandemic (See et al. 2023). While there was also potential for selection bias, such as nurses who were more involved in QI post-registration agreeing to be interviewed, the participants included nurses not involved in QI and those no longer in the profession. Consistent with other qualitative studies, the sample was sufficient within the parameters of the study aims, and data saturation occurred before the end of the data collection period (Hennink and Kaiser 2022).

Secondly, the extended period potentially affected the reliability of nurses' recall during the earlier years which included transitioning into being a newly qualified nurse. Thus, cognisance of the accuracy of registered nurses' lived experiences should be considered by

others when interpreting the findings. For instance, it may have resulted in events being over or under reported or in heightened states during the pandemic leading to distorted nurses' memories. However, given the similarity and consistency of participants' interview responses in line with the wider literature and earlier phase of the study, a degree of confidence that the findings are trustworthy and a valid depiction of nurses' QI engagement post-registration can be asserted.

8.5 FUTURE DEVELOPMENT OPPORTUNITIES

The findings of this study will be used to identify and develop new educational interventions to be tested and implemented in practice to educate future cohorts of student nurses in QI. Nursing leaders will be central to this investigation through realist evaluation approaches, to determine how best to support student nurses given the capacity constraints they face and to explore and implement new QI educational approaches.

Drawing on the findings from this study and the wider literature reviewed, it is clear that QI education must advance to meet the complexities and diversity of modern educational environments while maintaining the essential elements of the improvement process. Future developments could adopt a longitudinal, scaffolded portfolios that span the entire nursing curriculum rather than undertaking isolated, time-bound QI projects that are vulnerable to contextual barriers. This could begin with early exposure to QI concepts through simulation, structured e-learning and case-based learning and aligned to early practice learning activities such as understanding and following the patient journey using simple process maps to better understand the system.

Central to students' early QI education and practice-based QI activities should be an explicit emphasis on data literacy as students often struggled to access, interpret, and apply data in their QI projects. Nursing programmes should introduce foundational concepts of data for improvement from the first year, including how to collect, analyse and present data using QI tools such as run charts. Embedding data literacy early could empower students to engage more confidently with improvement work in early practice placements and better understand the relationship between evidence, measurement and change.

To ensure that students have an opportunity to develop aims, select measures and consider ideas for change, nursing programmes could embed opportunities for students to undertake

personal improvement projects while in practice at the mid-way point throughout the programme which focuses on improving their own health and wellbeing. Consolidating the improvement process in this way requires less dependency on contextual barriers in practice while emphasising the important of self-care to prevent burnout.

Underpinning QI education should be the integration of reflective journaling in QI practice. Students who engaged with journalling and critical dialogue about their QI experiences during this study developed deeper insights into the complexities of improvement work. Structured reflection through guided debriefs, portfolio entries and peer discussion should be embedded across all years of study to help students internalise QI principles and develop critical thinking skills necessary for sustained QI engagement.

Encapsulating this approach to embedding QI education should be Wenger's (1998) Communities of Practice theory which can offer nursing programmes a framework to develop students' professional identities as change agents in the healthcare system. This approach would foster student participation in ongoing improvement initiatives across multiple placements and contribute more meaningfully and individually to real-world QI without being penalised for misalignment with rigid academic criteria. Flexible assessments should be designed to enable students in their final year to critically reflect on their QI experiences and portfolio both academically and practically, and to consider how their own QI related behaviours have and will continue to be shaped as registered nurses.

8.6 RESEARCHER REFLECTIONS

Through studying QI education, the knowledge and experience has complimented my teaching and learning practice as a lecturer in nursing and influenced my CPD activity within the past decade. A great achievement in doing this doctorate has come from the tangible and ongoing learning that I have transferred to student nurses and academic staff. This learning remains an ongoing part of my professional practice because as an insider, I continue to experience the challenges around QI educational implementation. Following two periods of maternity leave and the Covid-19 pandemic, I was able to distance myself from QI research and teaching to gain a different perspective. I observed high staff turnover, a decline in QI expertise and a reduction in QI content as education transferred online during Covid-19. I returned to work with my systems thinking lens and seen that the challenges were not because of one individual decision, but as a wider system issue that needed to be addressed

to deliver effective QI education. This exciting turning point has influenced wider research activity with international colleagues and provided me with the opportunity to apply my ongoing knowledge of realist methodology with others working on QI educational research.

A future research objective for me is to develop the skills and knowledge to undertake an auto-ethnography. This would involve me connecting my own reflexive experiences in the faculty as an educator to the wider social, political, cultural meanings and understandings of QI. Given the multiple positions that I have held in QI education during this research process, it could provide rich in-depth insights into this area where there are currently minimal insights. My commitment to developing and evaluating QI education in nursing is ongoing and I have developed an application to submit to the Higher Education Academy for Senior Fellowship. However, as a lecturer in nursing and an early career researcher, my findings suggest that QI education continues to be a challenge internationally for nursing staff. This study will help to springboard our understanding of students' and qualified nurses' QI learning experiences, to generate solutions that nurture their QI behaviours and ongoing QI future engagement.

8.7 CONCLUDING REMARKS

Quality improvement is an action-oriented approach to change. Professional regulations stipulate that student nurses need to be competent in QI knowledge and skills prior to qualifying as a registered nurse to enable them to contribute to improvements to patient care and healthcare services. This can be achieved by student nurses undertaking a QI project in practice. However, to enhance QI activity engagement, and to foster long-term behaviour change in QI as registered nurses, faculty should consider integrating alternative teaching approaches. These approaches should be considerate of the capacity and capability of healthcare staff in practice to support small-scale change projects and be mindful of what contextual factors enable an effective QI student learning experience. This research concludes that student nurses would benefit from the opportunity to engage in earlier and ongoing QI activities across a variety of practice contexts throughout their undergraduate degree. Effective academic-practice partnerships will be central to this agenda to develop a collaborative learning infrastructure that endorses QI as part of the everyday culture. To build on these study findings, future research should consider the different complex contexts in which student nurses undertake QI education. This study has provided a critical new perspective into QI education that is useful for nursing education and will be insightful for health professions delivering QI education.

Abbas, M.R., Quince, T.A., Wood, D.F. and Benson, J.A. (2011) Attitudes of medical students to medical leadership and management: a systematic review to inform curriculum development. *BMC Medical Education*, 11:93, pp. 1-8.

Ahmed, M., Arora, S., Baker, P., Hayden, J., Vincent, C. and Sevdalis, N. (2013) Building capacity and capability for patient safety education: a train-the-trainers programme for senior doctors. *BMJ Quality & Safety*, 22 (8), pp. 618-625.

Akers, J., Aguiar-Ibáñez, R. and Baba-Akbari, A. (2009) *Systematic reviews: CRD's guidance for undertaking reviews in healthcare*. University of York.

Alexander, C.C, Tschannen, D., Argetsinger, D., Hakim, H. and Milner, K.A. (2022a) A qualitative study on barriers and facilitators of quality improvement engagement by frontline nurses and leaders. *Journal of Nursing Management*, 30 (3), pp. 694-701.

Alexander, C.C., Tschannen, D., Hays, D., Clouse, M., Zellefrow, C., Amer, K.S., Lambert-Davis, J., Watson, T.H., Tovar, E.G. and Milner, K.A. (2022b) An integrative review of the barriers and facilitators to nurse engagement in quality improvement in the clinical practice setting. *Journal of Nursing Care Quality*, 37 (1), pp. 94-100.

Alexander, J.A. and Hearld, L.R. (2011) The science of quality improvement implementation: developing capacity to make a difference. *Medical Care*, 49, pp. S6-S20.

Allen, L., Hay, M. and Palermo, C. (2021) Evaluation in health professions education – is measuring outcomes enough? *Medical Education*, 56, pp. 127-136.

Anderson, N. (1925) *The Sociology of the Homeless Man.* PhD: University of Chicago.

Armstrong, L., Harris, F. and Shepherd, A. (2022) Understanding the influence of context on final year student nurses' experiences of improvement science education in practice: an eight-week ethnographic multiple-case study of thirty adult field pre-registration nurses across nine clinical settings in Scotland. *8th International Nurse Education Conference.* Sitges, Spain, 19th-22nd October 2022.

Armstrong, L., Lauder, W. and Shepherd, A. (2015) An evaluation of methods used to teach quality improvement to undergraduate healthcare students to inform curriculum development within pre-registration nurse education: a protocol for systematic review and narrative synthesis. *Systematic Reviews*, 4, pp. 1-8.

Armstrong, L., Moir, C. and Taylor, P. (2023) How, and under what contexts, do academic–practice partnerships collaborate to implement healthcare improvement education into pre-registration nursing curriculums: a realist review protocol. *BMJ Open*, 13 (10), pp. 1-8.

Armstrong, L., Shepherd, A. and Harris, F. (2017) An evaluation of approaches used to teach quality improvement to pre-registration healthcare professionals: an integrative review. *International Journal of Nursing Studies*, 73, pp. 70-84.

Armstrong, L., Shepherd, A. and Harris, F. (2024a) Adapting improvement education to context: small-scale projects or diverse and reflective portfolios? *International Forum on Quality and Safety in Healthcare*. ExCeL London, UK, 10th-12th April 2024.

Armstrong, L., Shepherd, A. and Harris, F. (2024b) Experiences of newly qualified nurses' engagement with quality improvement in practice: a qualitative follow-up study. *Nursing Reports,* 14 (4), pp. 2290-3006.

Baillie, L., Bromley, B., Walker, M., Jones, R. and Mhlanga, F. (2014) Implementing service improvement projects within pre-registration nursing education: a multi-method case study evaluation. *Nurse Education in Practice*, 14 (1), pp. 62-68.

Bandura, A. (1977) *Social learning theory*. New Jersey: John Wiley & Sons.

Barnsteiner, J., Disch, J., Johnson, J., McGuinn, K., Chappell, K. and Swartwout, E. (2013) Diffusing QSEN competencies across schools of nursing: the AACN/RWJF faculty development institutes. *Journal of Professional Nursing*, 29 (2), pp. 68-74.

Batalden, P.B. and Davidoff, F. (2007) What is "quality improvement" and how can it transform healthcare? *BMJ Quality & Safety*, 16 (1), pp. 2-3.

Bate, P. (2014) Context is everything: perspectives on context. *The Health Foundation,* pp. 59-85.

Becker, H.S. (1961) *Boys in white: student culture in medical school*. Toronto: University of Chicago Press.

Bengtsson, M. and Ohlsson, B. (2010) The nursing and medical students' motivation to attain knowledge. *Nurse Education Today*, 30 (2), pp. 150-156.

Benn, J., Burnett, S., Parand, A., Pinto, A., Iskander, S. and Vincent, C. (2009) Perceptions of the impact of a large-scale collaborative improvement programme: experience in the UK safer patients' initiative. *Journal of Evaluation in Clinical Practice*, 15 (3), pp. 524-540.

Best, M. and Neuhauser, D. (2006) Walter A Shewhart, 1924, and the Hawthorne factory. *BMJ Quality & Safety*, 15 (2), pp. 142-143.

Black, G., Os, V.S., Machen, S. and Fulop, N.J. (2021) Ethnographic research as an evolving method for supporting healthcare improvement skills: a scoping review. *BMC Medical Research Methodology,* 21:274, pp. 1-12.

Blok, A.C., Alexander, C.C., Tschannen, D. and Milner, K.A. (2022) Quality improvement engagement: barriers and facilitators. *Nursing Management*, 53 (3), pp. 16-24.

Blumer, H. (2022) Symbolic interactionism. In: Calhoun, C., Gerteis, J., Moody, J., Ofaff, S. and Virk, I., eds. *Contemporary Sociological Theory*. 4th ed. Oxford: Blackwell Publishing, pp. 51-61.

Boonyasai, R.T., Windish, D.M., Chakraborti, C., Feldman, L.S., Rubin, H.R. and Bass, E.B. (2007) Effectiveness of teaching quality improvement to clinicians: a systematic review. *JAMA*, 298 (9), pp. 1023-1037.

Borbasi, S., Jackson, D. and Lockwood, C. (2010) Undertaking a clinical audit. In: Courtney, M. and McCutcheon, H., eds. *Using Evidence to Guide Nursing Practice.* 2nd ed. London: Churchill Livingstone, pp. 113-132.

Bottrell, M.M., Simon, A., Geppert, C., Chang, E.T., Asch, S.M. and Rubenstein, L. (2020) Facilitating ethical quality improvement initiatives: Design and implementation of an initiative-specifics ethics committee. *Healthcare,* 8, pp. 1-8.

Braithwaite, J., Churruca, K., Long, J.C. Ellis, L.A. and Herkes, J. (2018) When complexity science meets implementation sciences: a theoretical and empirical analysis of systems change. *BMC Medicine,* 16:63, pp. 1-14.

Brewer, J. (2000) *Ethnography*. Buckingham: Open University Press.

Brown, A., Nidumolu, A., McConnell, M., Hecker, K. and Grierson, L. (2019) Development and psychometric evaluation of an instrument to measure knowledge, skills, and attitudes towards quality improvement in health professions education: the beliefs, attitudes, skills, and confidence in quality improvement (Basic-QI) scale. *Perspectives on Medical Education*, 8, pp. 167-176.

Bryman, A. (2016) *Social Research Methods*. 5th ed. Oxford: Oxford University Press.

Bryman, A., Becker, S. and Sempik, J. (2008) Quality criteria for quantitative, qualitative and mixed methods research: a view from social policy. *International Journal of Social Research Methodology*, 11 (4), pp. 261-276.

Buerhaus, P.I. and Norman, L. (2001) It's time to require theory and methods of quality improvement in basic and graduate nursing education. *Nursing Outlook*, 49 (2), pp. 67-69.

Burnett, E., Davey, P., Gray, N., Tully, V. and Breckenridge, J. (2018) Medical students as agents of change: a qualitative exploratory study. *BMJ Open Quality*, 7 (3), p.e000420.

Burton, C., Elliott, A., Cochran, A. and Love, T. (2018) Do healthcare service behave as complex systems? Analysis of patterns of attendance and implications for service delivery. *BMC Medicine,* 16:138, pp. 1-15.

Campbell, N.C., Murray, E., Darbyshire, J., Emery, J., Farmer, A., Griffiths, F. Guthrie, B., Lester, H., Wilson, P. and Kinmonth, A.L. (2007). Designing and evaluating complex interventions to improve healthcare. *BMJ,* 334, pp. 455-459.

Cepero, J. (2011) Differences among quality improvement, evidence-based practice, and research. *Journal of Neuroscience Nursing*, 43 (4), pp. 230-232.

Charmaz, K. (2024) *Constructing grounded theory: A practical guide through qualitative analysis*. 3rd ed. London: Sage Publications Ltd.

Chesnay, M.D. (2015) *Nursing Research Using Ethnography: qualitative design and methods in nursing.* New York: Springer Publishing.

Christiansen, A., Robson, L. and Griffith-Evans, C. (2010) Creating an improvement culture for enhanced patient safety: service improvement learning in pre-registration education. *Journal of Nursing Management*, 18 (7), pp. 782-788.

Christmals, C.D. and Gross, J.J. (2017) An integrative literature review framework for postgraduate nursing research reviews. *European Journal of Research in Medical Science*, 5 (1), pp. 7-15.

Clery, P., d'Arch Smith, S., Marsden, O. and Leedham-Green, K. (2021) Sustainability in quality improvement (SusQI): a case-study in undergraduate medical education. *BMC Medical Education*, 21 (1), pp. 1-16.

Coffey, A. (1999) *The Ethnographic Self: fieldwork and the representation of identity*. London: Sage Publications Ltd.

Cohen, L. Manion, L., and Morrison, K. (2018) *Research Methods in Education.* 8th ed. Oxon: Routledge.

Coles, E., Anderson, J., Maxwell, M., Harris, F.M., Gray, N.M., Milner, G. and MacGillivray, S. (2020) The influence of contextual factors on healthcare quality improvement initiatives: a realist review. *Systematic Reviews,* 9:94, pp. 1-22.

Conroy, T. (2017) A beginner's guide to ethnographic observation in nursing research. *Nurse Researcher*, 24 (4), pp.10-14.

Corbin, J. and Strauss, A. (2015) *Basics of Qualitative Research: techniques and procedures for developing grounded theory*. 4th ed. London: Sage Publications.

Cornish, F., Breton, N., Moreno-Tabarez, U., Delgado, J., Rua, M., de-Graft Aikins, A., and Hodgetts, D. (2023) Participatory action research. *Nature Reviews Methods Primers*, 3 (1), p.34.

Corti, L., Thompson, P. and Fink, J. (2004) Preserving, sharing and reusing data from qualitative research: methods and strategies. In: Cassell, C. and Symon, G., eds. *Essential Guide to Qualitative Methods in Organizational Research*. London: Sage Publications, pp. 288-300.

Couper, K., Murrells, T., Sanders, J., Anderson, J.E., Black, H., Kelly, D., Kent, B., Maben, J., Rafferty, A.M., Taylor, R.M. and Harris, R. (2022). The impact of COVID-19 on the wellbeing of the UK nursing and midwifery workforce during the first pandemic wave: A longitudinal survey study. *International Journal of Nursing Studies,* 127, pp. 1-14.

Craig, L. and Machin, A. (2020) Developing and sustaining nurses' service improvement capability: a phenomenological study. *British Journal of Nursing,* 29 (11), pp. 618-626.

Cresswell, K., Howe, A., Steven, A., Smith, P., Ashcroft, D., Fairhurst, K., Bradley, F., Magnusson, C., McArthur, M., Pearson, P. and Sheikh, A. (2013) Patient safety in healthcare pre-registration educational curricula: multiple case study-based investigations of eight medicine, nursing, pharmacy and physiotherapy university courses. *BMJ Quality & Safety*, 22 (10), pp. 843-854.

Creswell, J.W. and Poth, N. (2017) *Qualitative Inquiry and Research Design: choosing among five approaches*. 4th ed. London: Sage Publications Ltd.

Creswell, J.W. and Creswell, J.D. (2018) *Research Design: qualitative, quantitative, and mixed methods approaches*. 5th ed. London: Sage Publications Ltd.

Cupit, C., Mackintosh, N., & Armstrong, N. (2018). Using ethnography to study improving healthcare: reflections on the 'ethnographic' label. *BMJ Quality & Safety*, *27*(4), 258-260.

Data Protection Act (1998), c.29. Available: https://www.legislation.gov.uk/ukpga/1998/29 [Accessed: 7 September 2024].

Davidoff, F., Batalden, P., Stevens, D., Ogrinc, G. and Mooney, S. (2008) Publication guidelines for quality improvement in health care: evolution of the SQUIRE project. *BMJ Quality & Safety*, 17 (Suppl 1), pp. i3-i9. Available: https://doi.org/10.1136/qshc.2008.029066 [Accessed: 9 September 2024].

Davies, C.A. (2012) *Reflexive Ethnography: a guide to researching selves and others*. 2nd ed. London: Routledge.

Day, L. and Smith, E.L. (2007) Integrating quality and safety content into clinical teaching in the acute care setting. *Nursing Outlook*, 55 (3), pp. 138-143.

Delamont, S. (2016) *Fieldwork in Educational Settings: methods, pitfalls and perspectives*. 3rd ed. London: Routledge.

Deming, W.E. (1986) *Out of the Crisis.* Cambridge, MA: MIT Press.

Denzin, N.K. and Lincoln, Y.S. (2012) *Collecting and Interpreting Qualitative Materials*. 4th ed. Thousand Oaks: Sage Publications Ltd.

Denzin, N.K. and Lincoln, Y.S. (2017) Introduction: the discipline and practice of qualitative research. 5th ed. *The Sage Handbook of Qualitative Research.* Thousand Oaks: Sage Publications Ltd.

Didion, J. Kozy, M., Koffell, C. and Oneail, K. (2013) Academic/clinical partnership and collaboration in quality and safety education for nurses' education. *Journal of Professional Nursing,* 29 (2), pp. 88-94.

Disch, J., Barnsteiner, J. and McGuinn, K. (2013) Take a 'deep dive' on integrating QSEN content in San Francisco Bay area schools of nursing. *Journal of Professional Nursing,* 29 (2), pp. 75-81.

Dixon-Woods, M. (2003) What can ethnography do for quality and safety in health care? *BMJ Quality & Safety*, 12 (5), pp. 326-327.

Dixon-Woods, M. (2014) *Perspectives on context: the problem of context in quality improvement.* Health Foundation: London.

Dixon-Woods, M., Baker, R., Charles, K., Dawson, J., Jerzembek, G., Martin, G., McCarthy, I., McKee, L., Minion, J., Ozieranski, P. and Willars, J. (2014) Culture and behaviour in the English national health service: overview of lessons from a large multimethod study. *BMJ Quality & Safety*, 23 (2), pp. 106-115.

Dixon-Woods, M., and Martin, G. P. (2016) Does quality improvement improve quality? *Future Hospital Journal*, 3 (3), pp. 191-194.

Dixon-Woods, M., Shaw, R.L., Agarwal, S. and Smith, J.A. (2004) The problem of appraising qualitative research. *BMJ Quality & Safety*, 13 (3), pp. 223-225.

Djukic, M., Kovner, C.T., Brewer, C.S., Fatehi, F. and Jun, J. (2015) Educational gaps and solutions for early-career nurse managers' education and participation in quality improvement. *JONA: The Journal of Nursing Administration*, 45 (4), pp. 206-211.

Dossey, B.M., Rosa, W.E. and Beck, D.M. (2019) Nursing and the sustainable development goals: from nightingale to now. *American Journal of Nursing*, 119 (5), pp. 44-49.

Eather, B. I., Chiarella, M. E., and Donoghue, J. (2013) Plan, do, study, act cycles, as an alternate to action research for clinically based inquiry. *International Journal of Research in Nursing*, 4 (2), p. 34.

Edmondson, A.C. and Bransby, D.P. (2023) Psychological safety comes of age: observed themes in an established literature. *Annual Review of Organizational Psychology and Organizational Behaviour*, 10 (1), pp. 55-78.

Elizalde, J., Lumibao, J. and Lizarondo, L. (2024) Barriers and facilitators to health professionals' engagement in quality improvement initiatives: a mixed-methods systematic review. *International Journal for Quality in Health Care*, 36 (2).

Elliott, D. and Wolf-Meyer, M. J. (2024). *Naked Fieldnotes: a rough guide to ethnographic writing*. University of Minnesota Press.

Emerson, R.M., Fretz, R.I. and Shaw, L.L. (2011) *Writing Ethnographic Fieldnotes*. 2nd ed. Chicago: University of Chicago Press.

Evidence for Policy and Practice Information (EPPI) (2005) *Guideline for the reporting of primary empirical research student in education*. Available: http://eppi.ioe.ac.uk/cms/ [Accessed: 07 September 2024].

Fater, K. and Ready, R. (2011) An education-service partnership to achieve safety and quality improvement competencies in nursing. *Journal of Nursing Education,* 50 (12), pp. 693-696.

Fetterman, D. M. (2019) *Ethnography: step-by-step.* 4th ed. London: Sage Publications Ltd.

Flick, U. (2018) *The Handbook of Qualitative Data Collection.* London: Sage Publications Ltd.

Flin, R. and Yule, S. (2004) Leadership for safety: industrial experience. *BMJ Quality & Safety*, 13 (suppl 2), pp. ii45-ii51.

Flores, D., Hickenlooper, G. and Saxton, R. (2013) An academic practice partnership: helping new registered nurses to advance quality and patient safety. *Online Journal of Issues in Nursing* 18 (3), p. 1.

Flott, E.A. and Linden, L. (2016) The clinical learning environment in nursing education: a concept analysis. *Journal of Advanced Nursing*, 72 (3), pp. 501-513.

Flynn, R., Scott, S.D., Rotter, T., and Hartfield, D. (2017) The potential for nurses to contribute to and lead improvement science in health care. *Journal of Advanced Nursing*, 73 (1), pp. 97-107.

Foster, A.A and Stack, A.M. (2020) Quality improvement in a pandemic. *Paediatric Quality and Safety* 5 (4), e321.

Francis R. (2013) *Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry.* London: The Stationery Office.

Fulop, N. and Robert, G. (2015) *Context for successful quality improvement: evidence review.* London: Health Foundation.

Geary, U. (2024) Healthcare quality improvement: it's time to update the Donabedian approach with a complex systems perspective. *The International Journal of Health Planning and Management,* 39 (5), pp. 1669-1672.

Geertz, C. (2017) *The Interpretation of Cultures*. London: Routledge.

Glaser, B. and Strauss, A. (2017) *Discovery of Grounded Theory: strategies for qualitative research*. Abingdon: Routledge.

Gleason, K.T., VanGraafeiland, B., Commodore-Mensah, Y., Walrath, J., Immelt, S., Ray, E. and Dennison Himmelfarb, C.R. (2019) The impact of an innovative curriculum to introduce patient safety and quality improvement content. *BMC Medical Education*, 19, pp. 1-8.

Gonsenhauser, I., Beal, E., Shihadeh, F., Mekhjian, H.S. and Moffatt-Bruce, S.D. (2012) Development and assessment of quality improvement education for medical students at the Ohio state university medical center. *The Journal for Healthcare Quality (JHQ)*, 34 (6), pp. 36-42.

Gordon, M., Darbyshire, D. and Baker, P. (2012) Non-technical skills training to enhance patient safety: a systematic review. *Medical Education*, 46 (11), pp. 1042-1054.

Gough, D. (2007) Weight of evidence: a framework for the appraisal of the quality and relevance of evidence. *Assessing Quality in Applied and Practice-based Research in Education*, pp. 103-118.

Gough, D., Thomas, J. and Oliver, S. (2017) *An Introduction to Systematic Reviews*. 2nd ed. London: SAGE Publications Ltd.

Gould, B.E., Grey, M.R., Huntington, C.G., Gruman, C., Rosen, J.H., Storey, E., Abrahamson, L., Conaty, A.M., Curry, L., Ferreira, M. and Harrington, K.L. (2002) Improving patient care outcomes by teaching quality improvement to medical students in community-based practices. *Academic Medicine*, 77 (10), pp. 1011-1018.

Grailey, K.E., Murray, E., Reader, T. and Brett, S.J. (2021) The presence and potential impact of psychological safety in the healthcare setting: an evidence synthesis. *BMC Health Services Research*, 21, pp. 1-15.

Greenhalgh, J. and Manzano, A. (2021). Understanding 'context' in realist evaluation and synthesis. *International Journal of Social Research Methodology*, 25 (5), pp. 583-595.

Greenhalgh, T. and Papoutsi, C. (2018) Studying complexity in health services research: desperately seeking an overdue paradigm shift. *BMC Medicine,* 16:95, pp. 1-6.

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P. and Kyriakidou, O. (2004) Diffusion of innovations in service organizations: systematic review and recommendations. *The Milbank Quarterly*, 82 (4), pp. 581-629.

Guba, E.G. and Lincoln, Y.S. (2017) Paradigmatic controversies, contradictions, and emerging confluences. In: N.K. Denzin and Y.S. Lincoln, eds. *Handbook of Qualitative Research.* 5th ed. London: Sage Publications, pp. 97-150.

Hammersley, M. (2006) Ethnography: problems and prospects. *Ethnography and Education*, 1 (1), pp. 3-14.

Hammersley, P. and Atkinson, P. (2019) *Ethnography: principles in practice.* 4th ed. London: Routledge.

Hanchett, M. (2012) Performance improvement and implementation science: infection prevention competencies for current and future role development. *American Journal of Infection Control*, 40 (4), pp. 304-308.

Health Foundation (2010) *Evidence scan: complex adaptive systems.* London: Health Foundation.

Health Foundation (2011) *Evidence scan: improvement science.* London: Health Foundation.

Health Foundation (2012) *Quality improvement training for healthcare professionals.* London: Health Foundation.

Health Foundation (2014) *Skilled for improvement? Learning communities and the skills needed to improve care: an evaluative service development.* London: Health Foundation.

Health Foundation (2017) *Rising pressure: the NHS workforce challenge: workforce profile and trends of the NHS England*. London: Health Foundation.

Health Foundation (2021) *Quality Improvement made simple. What everyone should know about quality improvement.* London: Health Foundation.

Healthcare Improvement Scotland (2024) *Essentials of Safe Care: creating the conditions for safe care for every person, within every setting, every time*. Available: https://ihub.scot/improvement-programmes/scottish-patient-safety-programme-spsp/spsp-essentials-of-safe-care/ [Accessed: 21 January 2025].

Hennink, M. and Kaiser, B.N. (2022) Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*, 292, p.114523.

Holloway, I. and Galvin, K. (2016) *Qualitative Research in Nursing and Healthcare.* 4th ed. Oxford: Blackwell Publishing Ltd.

Honeyfield, D.J., Sims, D. and Proverbs, A. (2022) Teaching quality improvement In: pre-registration nursing education: changing thinking, changing practice. *ITP Research Symposium,* New Zealand, 25th-26th November.

Hughes, F. (2006) Nurses at the forefront of innovation. *International Nursing Review,* 53 (2), pp. 94-101.

Inayat, H., Torti, J., Hemmett, J, Lingard, L., Chau, B., Inayat, A. Elzinga, J.L. and Sultan, N. (2023) An approach to leadership development and patient safety and quality improvement education in the context of professional identity formation in pre-clinical medical students. *Journal of Medical Education and Curricular Development,* 10.

Institute for Healthcare Improvement (IHI) (2010) *IHI Open School Quality Improvement Practicum Faculty Advisor Guide*. Available: https://www.ihi.org/sites/default/files/lms/legacy/education/IHIOpenSchool/Courses/Documents/PracticumDocuments/FacultyHandbook2.docx [Accessed: 22 January 2025].

Institute of Medicine (IOM) (2000) *To Err is Human*: *building a safer health system*. Washington: National Academies Press.

Institute of Medicine (IOM) (2001) *Crossing the Quality Chasm: a new health system for the 21st century*. Washington: National Academies Press.

Institute of Medicine (IOM) (2003) *Health Professions Education: a bridge to quality.* Washington: National Academies Press.

Ishikawa, K. (1985). *What is Total Quality Control? The Japanese Way.* New Jersey: Prentice Hall.

James, B., Beattie, M. and Shepherd, A. (2012) *Quality and safety in practice: why theory matters.* [Poster]. Enhancing Nursing Through Educational Research (ENTER): Inaugural Scottish Conference, University of Stirling, 28th November.

James, B., Beattie, M., Shepherd, A., Armstrong, L. and Wilkinson, J. (2016) Time, fear and transformation: student nurses' experiences of doing a practicum (quality improvement project) in practice. *Nurse Education in Practice*, 19, pp. 70-78.

Jeffs, L., Abramovich, I.A., Hayes, C., Smith, O., Tregunno, D., Chan, W.H. and Reeves, S. (2013) Implementing an interprofessional patient safety learning initiative: insights from participants, project leads and steering committee members. *BMJ Quality & Safety*, 22 (11), pp. 923-930.

Jones, A., Williams, A. and Carson-Stevens, A. (2013) Integrating quality improvement into pre-registration education. *Nursing Standard*, 27 (29), p. 44-48.

Jones, A.C., Shipman, S.A. and Ogrinc, G. (2015) Republished: key characteristics of successful quality improvement curricula in physician education: a realist review. *Postgraduate Medical Journal*, 91 (1072), pp. 102-113.

Jun, J., Ojemeni, M.M, Kalamani, R., Tong, J. and Crecelius, M.L. (2020) Relationship between nurse burnout, patient and organisational outcomes: systematic review. *International Journal of Nursing Studies*, 119, 103933.

Kannampallil, T.G., Schauer, G.F., Cohen, T. and Patel, V.L (2011). Considering complexity in healthcare systems. *Journal of Biomedical Informatics,* 44, pp. 943-947.

Kaplan, H.C., Brady, P.W., Dritz, M.C., Hooper, D.K., Linam, W.M., Froehle, C.M. and Margolis, P. (2010) The influence of context on quality improvement success in health care: a systematic review of the literature. *The Milbank Quarterly*, 88 (4), pp. 500-559.

Kaplan, H.C., Provost, L.P., Froehle, C.M. and Margolis, P.A. (2012) The model for understanding success in quality (MUSIQ): building a theory of context in healthcare quality improvement. *BMJ Quality and Safety,* 21, pp.13-20.

Kirby, K.F. and Good, B. (2020) From education to practice: incorporating quality improvement projects into a baccalaureate nursing curriculum. *AORN Journal*, 111 (5), pp. 527-535.

Kirkpatrick, D.L. (1967) Evaluation of training. In: R.L Craig, eds. *Training and Development Handbook*. New York: McGraw Hill, pp. 35-56.

Koffel, C., Burke, K.G., McGuinn, K. and Miltner, R.S. (2017) Integration of quality and safety education for nurses into practice: academic-practice partnership's role. *Nurse Educator*, 42 (5S), pp. S49-S52.

Kolb, D.A. (2015) *Experiential Learning: experience as the source of learning and development*. New Jersey: Pearson Education.

Kovner, C.T., Brewer, C.S., Yingrengreung, S. and Fairchild, S. (2010) New nurses' views of quality improvement education. *The Joint Commission Journal on Quality and Patient Safety*, 36 (1), pp. 29-35.

Kumar, R. (2019) *Research Methodology: a step-by-step for beginners*. 5th ed. London: Sage Publications Ltd.

Kyrkjebø, J.M. (2006) Teaching quality improvement in the classroom and clinic: getting it wrong and getting it right. *Journal of Nursing Education*, 45 (3) p. 109.

Kyrkjebø, J.M. and Hage, I. (2005) What we know and what they do: nursing students' experiences of improvement knowledge in clinical practice. *Nurse Education Today*, 25 (3), pp. 167-175.

Kyrkjebø, J.M., Hanssen, T.A. and Haugland, B.Ø. (2001) Introducing quality improvement to pre-qualification nursing students: evaluation of an experiential programme. *BMJ Quality & Safety*, 10 (4), pp. 204-210.

Kuhn, T. (2012) *The Structure of Scientific Revolutions*. 4th ed. Chicago: University of Chicago.

Langley, G.J., Moen, R.D., Nolan, K.M., Nolan, T.W., Norman, C.L. and Provost, L.P. (2009) *The Improvement Guide: a practical approach to enhancing organizational performance*. London: John Wiley & Sons.

LaSala, C.A., Connors, P.M., Pedro, J.T., Phipps, M. (2007) The role of the clinical nurse specialist in promoting evidence-based practice and effecting positive patient outcomes. *The Journal of Continuing Education in Nursing*, 38 (6), pp. 262-270.

LeCompte, M.D. and Goetz, J.P. (1982) Problems of reliability and validity in ethnographic research. *Review of Educational Research*, 52 (1), pp. 31-60.

LeCompte, M.D. and Schensul, J.J. (2010) *Designing & Conducting Ethnographic Research: an introduction.* 2nd ed. Plymouth: AltaMira Press.

Lee, N. and Jauncey-Cooke, J. (2023) A collaborative approach to engaging undergraduate students in learning and developing evidence-based practice. *Focus on Health Professional Education: A Multi-Professional Journal*, 24 (1), pp. 63-68.

Leslie, M., Paradis, E., Gropper, M.A., Reeves, S. and Kitto, S. (2014) Applying ethnography to the study of context in healthcare quality and safety. *BMJ Quality & Safety*, 23 (2), pp. 99-105.

Levitt, D.S., Hauer, K.E., Poncelet, A. and Mookherjee, S. (2012) An innovative quality improvement curriculum for third-year medical students. *Medical Education Online*, 17 (1), p.18391.

Long, K.M., McDermott, F. and Meadows, G.N. (2018) Being pragmatic about healthcare complexity: our experiences applying complexity theory and pragmatism to health services research. *BMJ Medicine,* 16:94, pp. 1-9.

Lucas, B. and Nacer, H. (2015) *The Habits of an Improver: thinking about learning for improvement in healthcare.* London: The Health Foundation.

Lynn, J., Baily, M., Bottrell, M., Jennings, B., Levine, R., Davidoff, F., Casarett, D., Corrigan, J., Fox, E., Wynia, M.K., Agich, G.J., O'Kane, M., Speroff, T., Schyve, P., Batalden, P., Tunis, S., Berlinger, N., Cronenwett, L., Fitzmaurice, J.M., Neveloff Dubler, N. and James, B. (2007) The ethics of using quality improvement methods in healthcare. *Annals of Internal Medicine,* 146 (9), pp. 666-673.

Madden, R. (2023) *Being Ethnographic: a guide to the theory and practice of ethnography.* 3rd ed. London: Sage Publications Ltd.

Majid, U. and Vanstone M. (2018) Appraising qualitative research for evidence syntheses: a compendium of quality appraisal tools. *Qualitative Health Research*, 28 (13) pp. 2115-2131.

Mak, V., Brand, G. and Morphet, J. (2023) Partnering with healthcare organisations to teach pre-registration health professions students about quality improvement: A systematic review. *Journal of Clinical Nursing*, 32 (13-14), pp. 3219-3232.

Mak, V., Morphet, J. and Brand, G. (2025) Envisioning quality improvement education partnerships to teach pre-registration nursing students: a qualitative study. *Nurse Education Today,* 146, (106530), pp. 1-9.

Malinowski, B. (2013) *Argonauts of the western Pacific: an account of native enterprise and adventure in the archipelagos of Melanesian New Guinea [1922/1994]*. London: Routledge.

Mannion, R. and Smith, J. (2018) Hospital culture and clinical performance: where next? *BMJ Quality & Safety*, 27 (3), pp. 179-181.

Marcus, G.E. (1998) *Ethnography through thick and thin*. New Jersey: Princeton University Press.

Marshall, M., Pronovost, P. and Dixon-Woods, M. (2013) Promotion of improvement as a science. *The Lancet*, 381 (9864), pp. 419-421.

McComb, S.A. and Kirkpatrick, J.M. (2017) Infusing systems and quality improvement throughout an undergraduate nursing curriculum. *Journal of Nursing Education*, 56 (12), pp. 752-757.

McCormack, B., Kitson, A., Harvey, G., Rycroft-Malone, J., Titchen, A. and Seers, K. (2002) Getting evidence into practice: the meaning of 'context'. *Journal of Advanced Nursing,* 38 (1), pp. 94-104.

McKown, T., McKown, L. and Webb, S. (2011) Using quality and safety education for nurses to guide clinical teaching on a new dedicated education unit. *Journal of Nursing Education,* 50 (12), pp. 707-710.

Medical Research Council (MRC) (2008) *Developing and evaluating complex interventions: new guidance*. London: Medical Research Council.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G. (2009) Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Annals of Internal Medicine*, 151 (4), pp. 264-269.

Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., Shekelle, P., Stewart, L., PRISMA-P Group (2015) Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*, 4 (1), p.1.

Money, M. (2023) *Decreasing Nurse Burnout Through the Implementation of a Mindfulness-Based Stress Reduction Program: a quality improvement project.* PhD, Northwestern State University of Louisiana.

Morrison, K. and van der Werf, G. (2016) Searching for causality in educational research. *Educational Research and Evaluation*, 22 (1-2), pp. 1-5.

Murchison, J. (2010) *Ethnography Essentials: designing, conducting and presenting your research.* San-Francisco: Jossey-Bass.

Murphy, A. K., Jerolmack, C., and Smith, D. (2021) Ethnography, data transparency, and the information age. *Annual Review of Sociology*, 47 (1), pp. 41-61.

Musa, M.A. and Othman, A.M (2016) Business process reengineering in healthcare: literature review on methodologies and approaches. *Review on European Studies,* 8 (1), pp. 20-34.

Myers, J.S. and Wong, B.M. (2019) Measuring outcomes in quality improvement education: success is in the eye of the beholder. *BMJ Quality & Safety*, 28 (5), pp. 345-348.

Nadeem, E., Olin, S.S., Hill, L.C., Hoagwood, K.E. and Horwitz, S.M. (2013) Understanding the components of quality improvement collaboratives: a systematic literature review. *The Milbank Quarterly*, 91 (2), pp. 354-394.

Nahm, E.S., Mills, M.E., Raymond, G., Costa, L., Chen, L., Nair, P., Seidl, K., Day, J., Murray, L., Rowen, L. and Kirschling, J. (2022) Development of an academic-practice partnership model to anchor care coordination and population health. *Nursing Outlook*, 70 (1), pp. 193-203.

National Health Service (NHS) Education for Scotland (2017) *Flying Start: the definitive guide to the programme.* Edinburgh: NHS Education for Scotland.

National Health Service (NHS) Education for Scotland (2025) TURAS Quality Improvement Zone. *Safety, Skills and Improvement – Quality Improvement - QI Tools.* Available: https://learn.nes.nhs.scot/1262/quality-improvement-zone/qi-tools [Accessed 23 January 2025].

National Health Service (NHS) Education for Scotland (2024) *Quality Improvement Hub Homepage.* Available: http://www.qihub.scot.nhs.uk/default.aspx [Accessed 6 September 2024].

National Health Service (NHS) England and NHS Improvement (2021) *The Future of NHS Human Resources and Organisational Development*. London: NHS.

National Health Service (NHS) Forth Valley Quality Improvement Academy (2024a) *6-month Progress Report May-Dec 2023*. Forth Valley: NHS.

National Health Service (NHS) Innovation and improvement (2007) *Going Lean in the NHS*. London: NHS.

Nursing and Midwifery Council (NMC) (2010) *Standards for Pre-registration Nursing Programmes*. London: NMC.

Nursing and Midwifery Council (NMC) (2018) *The Code: professional standards of practice and behaviour for nurses, midwives and nursing associates*. London: NMC.

Nursing and Midwifery Council (NMC) (2019) *Standards for Pre-registration Nursing Programmes*. London: NMC.

Nursing and Midwifery Council (NMC) (2024) *Insights Spotlight on Nursing and Midwifery Report*. London: NMC.

Odell, E. (2011) Teaching quality improvement to the next generation of nurses: what nurse managers can do to help. *The Journal of Nursing Administration*, 41 (12), pp. 553-557.

Ogden, T. and Fixsen, D. (2014) Implementation science: a brief overview and a look ahead. *Zeitschrift fur Psychologie*, 222 (1), pp. 4-11.

Ogrinc, G., Davies, L., Goodman, D., Batalden, P., Davidoff, F. and Stevens, D. (2016) SQUIRE 2.0 (standards for quality improvement reporting excellence): revised publication guidelines from a detailed consensus process. *BMJ Quality and Safety,* 25, pp. 986-992.

Ogrinc, G., West, A., Eliassen, M.S., Liuw, S., Schiffman, J. and Cochran, N. (2007) Integrating practice-based learning and improvement into medical student learning:

evaluating complex curricular innovations. *Teaching and Learning in Medicine*, 19 (3), pp. 221-229.

Okuyama, A., Martowirono, K. and Bijnen, B. (2011) Assessing the patient safety competencies of healthcare professionals: a systematic review. *BMJ Quality & Safety*, 20 (11), pp. 991-1000.

O'Reilly, K. (2012) *Ethnographic Methods*. London: Routledge.

Ovretveit, J. (2011) Understanding the conditions for improvement: research to discover which context influences affect improvement success. *BMJ Quality and Safety,* 20 (suppl 1), pp. 18-23.

Pagador, F., Barone, M., Manoukian, M., Xu, W. and Kim, L. (2022) Effective holistic approaches to reducing nurse stress and burnout during COVID-19. *American Journal of Nursing,* 122 (5), pp. 40-47.

Paley, J. and Lilford, R. (2011) Qualitative methods: an alternative view. *BMJ*, 342.

Panagioti, M., Khan, K., Keers, R.N., Abuzour, A., Phipps, D., Kontopantelis, E., Bower, P., Campbell, S., Haneef, R. Avery, A.J, Ashcroft, D. (2019) Prevalence, severity, and nature of preventable patient harm across medical care settings: systematic review and meta-analysis. *BMJ*, 366: l4185.

Patton, M.Q. (2015) *Qualitative Research & Evaluation Methods: integrating theory and practice.* 4th ed. London: Sage Publications.

Pawson, R. (2013). *The Science of Evaluation: a realist manifesto*. London: Sage Publications.

Peräkylä, A. (2004) Validity in research on naturally occurring social interaction. In: C. Seale, S. Gobo, J.F. Gubrium and D. Silverman, eds. *Qualitative Research Practice*, pp. 365-384.

Pesch, L., Stafford, T., Hunter, J., Stewart, G. and Miltner, R. (2022) Utilisation of improvement methodologies by healthcare quality professionals during the COVID-19 pandemic. *Journal for Healthcare Quality,* 44 (3) pp. 123-130.

Peters, D.H., Adam, T., Alonge, O., Agyepong, I.A. and Tran, N. (2013) Implementation research: what it is and how to do it. *BMJ*, 347, f6753.

Pink, S. (2007) Visual Methods. In: C. Seale, S. Gobo, J.F. Gubrium and D. Silverman, eds. *Qualitative Research Practice*, pp. 361-376.

Plesk, P.E. and Greenhalgh, T. (2001) Complexity science: The challenge of complexity in healthcare. *BMJ,* 323 (7313), pp. 625-628.

Pope, C. and Mays, N. (2019) *Qualitative Research in Healthcare.* 4th ed. London: John Wiley & Sons.

Powell, A.E., Rushmer, R. and Davies, H.T.O. (2009) *A systematic narrative review of quality improvement models in health care*. NHS Quality Improvement Scotland.

Provost, L.P. and Murray, S.K. (2022) *The Healthcare Data Guide: learning from data for improvement*. London: John Wiley & Sons.

Quigley, D.D., Slaughter, M.E., Qureshi, N., Gidengil, C. and Hays, R.D. (2023). Associations of paediatric nurse burnout with involvement in quality improvement. *Journal of Paediatric Nursing*, 70, pp. e9-e16.

Reed, D., Price, E.G., Windish, D.M., Wright, S.M., Gozu, A., Hsu, E.B., Beach, M.C., Kern, D. and Bass, E.B. (2005) Challenges in systematic reviews of educational intervention studies. *Annals of Internal Medicine*, 142, pp. 1080-1089.

Reed, J. E., and Card, A. J. (2016) The problem with plan-do-study-act cycles. *BMJ quality & safety*, 25(3), pp. 147-152.

Reed, J.E., Davey, N. and Woodcock, T. (2016) The foundations of quality improvement science. *Future Hospital Journal*, 3 (3), pp. 199-202.

Reio, T. G., Rocco, T. S., Smith, D. H., and Chang, E. (2017). A critique of Kirkpatrick's evaluation model. *New Horizons in Adult Education and Human Resource Development*, 29 (2), pp. 35-53.

Robb, G., Wells, S., Stolarek, I. and Bohm, G. (2017) The state of quality improvement and patient safety teaching in health professional education in New Zealand. *New Zealand Medical Association,* 130 (1464), pp.13-24.

Robinson, J. and Gelling, L. (2019) Nurses+ QI= better hospital performance? A critical review of the literature. *Nursing Management*, 30 (5).

Roddy, L. and Polfuss, M. (2020) Employing design thinking methods in nursing to improve patient outcomes. *Nursing Forum,* 55 (4), pp. 553-558.

Roller, M. R. and Lavrakas, P. J. (2015). *Applied Qualitative Research Design: a total quality framework approach*. New York: The Guilford Press.

Rooney, K. and Beattie, M. (2012) Quality and safety in nurse education: are we in a state of readiness? *Nurse Education Today*, 32 (6), pp. 622-623.

Russ, S.J., Green, J., Winter, L.D., Herrington, E., Hughes-Hallett, A., Taylor, J.M. and Sevdalis, N. (2023) An introduction to quality improvement. *Journal of Clinical Urology*, 0, pp. 1-9.

Schmalbach, C.E. (2015) Patient Safety/Quality Improvement (PS/QI): Florence Nightingale prevails. *Otolaryngology Head and Neck Surgery*, 152 (5), pp. 771-773.

Schouten, L.M., Hulscher, M.E., van Everdingen, J.J., Huijsman, R. and Grol, R.P. (2008) Evidence for the impact of quality improvement collaboratives: systematic review. *BMJ*, *336* (7659), pp. 1491-1494.

Scottish Government (2010) *The Healthcare Quality Strategy for NHSScotland*. Edinburgh: Scottish Government.

Scottish Government (2017) *Nursing 2030 Vision: promoting confident, competent and collaborative nursing for Scotland's future*. Scottish Government: Edinburgh.

Scottish Government Records Management (2010) *NHS Code of Practice*. Scottish Government: Edinburgh.

Seale, C. (2007) Quality in qualitative research. In: C. Seale, S. Gobo, J.F. Gubrium and D. Silverman, eds. *Qualitative Research Practice*, pp. 379-389.

Seale, C., Gobo, G., Gubrium, J., Silverman, D. (2007) *Qualitative Research Practice.* London: Sage Publications Ltd.

See, E.C.W., Koh, S.S.L., Baladram, S. and Shorey, S. (2023) Role transition of newly graduated nurses from nursing students to registered nurses: a qualitative systematic review. *Nurse Education Today*, 121, p. 105702.

Shah, A. (2019). Using data for improvement. *Bmj*, *364*.

Silverman, D. (2019) *Interpreting Qualitative Data*. 6th ed. London: Sage Publications Ltd.

Singh, M.K., Ogrinc, G., Cox, K.R., Dolansky, M., Brandt, J., Morrison, L.J., Harwood, B., Petroski, G., West, A. and Headrick, L.A. (2014) The quality improvement knowledge application tool revised (QIKAT-R). *Academic Medicine*, 89 (10), pp. 1386-1391.

Skivington, K., Matthews, L., Simpson, S. A., Craig, P., Baird, J., Blazeby, J. M., and Moore, L. (2021) A new framework for developing and evaluating complex interventions: update of Medical Research Council guidance. *BMJ*, *374*, n2061.

Skledar, S.J. and McKaveney, T.P. (2009) A method for teaching continuous quality improvement to student pharmacists through a practical application project. *Currents in Pharmacy Teaching and Learning*, 1 (2), pp. 79-86.

Smith, D. E. (2005). *Institutional ethnography: A sociology for people*. Rowman Altamira.

Smith, E.L., Cronenwett, L. and Sherwood, G. (2007) Current assessments of quality and safety education in nursing. *Nursing Outlook*, 55 (3), pp. 132-137.

Sobo, E., Bowman, C., Halloran, J., Aarons, G., Asch, S. and Gifford, A. (2008) Enhancing organizational change and improvement prospects: Lessons from an HIV testing intervention for veterans. *Human Organization*, 67 (4), pp. 443-453.

Sorensen, J., Kadowaki, L., Kervin, L., Hamilton, C., Berndt, A., Dhadda, S., Irfan, A., Leong, E. and Mithani, A. (2024) Quality improvement collaborative approach to COVID-19 pandemic preparedness in long-term care homes: a mixed-methods implementation study. *BMJ Open Quality*, 13, e002589.

Spooner, R., Stanford, V., Parslow-Williams, S., Mortimer, F. and Leedham-Green, K. (2022) “Concrete ways we can make a difference”: A multi-centre, multi-professional evaluation of sustainability in quality improvement education. *Medical Teacher*, 44 (10), pp. 1116-1124.

Spradley, J.P. (2016) *Participant Observation*. Minnesota: Holt, Rinehart and Winston.

Stake, R. (1995) *The Art of Case Study Research*. Thousand Oaks: Sage Publications Ltd.

Strand, K. and Tveit, B. (2020) Planning and implementing quality improvement projects in clinical practice: Third-year nursing students' learning experiences. *Journal of Clinical Nursing*, 29 (23-24), pp. 4769-4783.

Taylor, M.J., McNicholas, C., Nicolay, C., Darzi, A., Bell, D. and Reed, J.E. (2014) Systematic review of the application of the plan-do-study-act-method to improve quality in healthcare. *BMJ Quality and Safety,* 23 (4), pp. 290-298.

Tella, S., Lukka, M., Jamookeeah, D., Smith, N.J., Partanen, P. and Turunen, H. (2014) What do nursing students learn about patient safety? An integrative literature review. *Journal of Nursing Education*, 53 (1), pp. 7-13.

Thomas, G. (2007) *Education and Theory: strangers in paradigms*. Maidenhead: Open University Press.

Thornlow, D.K. and McGuinn, K. (2010) A necessary sea change for nurse faculty development: spotlight on quality and safety. *Journal of Professional Nursing*, 26 (2), pp. 71-81.

Tong, A., Sainsbury, P. and Craig, J. (2007) Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, 19 (6), pp. 349-357.

Tschannen, D., Alexander, C., Taylor, S., Tovar, E.G., Ghosh, B., Zellefrow, C. and Milner, K.A. (2021) Quality improvement engagement and competence: a comparison between frontline nurses and nurse leaders. *Nursing Outlook*, 69 (5), pp. 836-847.

Van Hoof, T.J. and Meehan, T.P. (2011) Integrating essential components of quality improvement into a new paradigm for continuing education. *Journal of Continuing Education in the Health Professions*, 31 (3), pp. 207-214.

VanGraafeiland, B., Sloand, E., Silbert-Flagg, J., Gleason, K. and Himmelfarb, C.D. (2019) Academic-clinical service partnerships are innovative strategies to advance patient safety competence and leadership in prelicensure nursing students. *Nursing Outlook*, 67 (1), pp. 49-53.

Vincent, C., Batalden, P. and Davidoff, F. (2011) Multidisciplinary centres for safety and quality improvement: learning from climate change science. *BMJ Quality & Safety,* 20, i73-78.

Vincent, C. and Amalberti, R. (2016) *Safer Healthcare: strategies for the real-world strategies.* Oxford: Springer Open.

Vindrola-Padros, C., & Vindrola-Padros, B. (2018). Quick and dirty? A systematic review of the use of rapid ethnographies in healthcare organisation and delivery. *BMJ Quality & Safety*, *27*(4), 321-330.

Walker, M., Owens, T., Dopp, M., Brown, E.B., Brant, R., Cousino, W., Fitzpatrick, L. and Long, J. (2024) Decreasing burnout: one unit's story of small process improvements which impacted nurse well-being. *Journal of PeriAnesthesia Nursing,* 39, (4), e37.

Walshe, K. (2007) Understanding what works and why in quality improvement: the need for theory-driven evaluation. *International Journal for Quality in Health Care*, 19 (2), pp. 57-59.

Wells, S., Tamir, O., Gray, J., Naidoo, D., Bekhit, M., and Goldmann, D. (2018) Are quality improvement collaboratives effective? A systematic review. *BMJ quality & safety*, 27 (3), pp. 226-240.

Whittemore, R. and Knafl, K. (2005) The integrative review: updated methodology. *Journal of Advanced Nursing*, 52 (5), pp. 546-553.

Williams, K.S. (2001) Development, implementation and evaluation of a new nurse-led continence service: a pilot study. *Journal of Clinical Nursing,* 9, (4), pp. 566-573.

Windish, D.M., Reed, D.A., Boonyasai, R.T., Chakraborti, C. and Bass, E.B. (2009) Methodological rigor of quality improvement curricula for physician trainees: a systematic review and recommendations for change. *Academic Medicine*, 84 (12), pp. 1677-1692.

Wong, B.M., Etchells, E.E., Kuper, A., Levinson, W. and Shojania, K.G. (2010) Teaching quality improvement and patient safety to trainees: a systematic review. *Academic Medicine*, 85 (9), pp. 1425-1439.

World Health Organisation (WHO) (2020) *State of the world's nursing: investing in education, jobs and leadership.* Geneva: WHO.

Zarasvand, S., Bayar, E., Malko, A., Mountain, K., Lewis, H. Joash, K. Teoh, T.G. Bennett, P.R., Das, S. and Sykes, L. (2020) Rapid quality improvement in a preterm

birth clinic care pathway during the COVID-19 pandemic: *BMJ Open Quality*, e001049.

Zoutman, D.E. and Ford, B.D. (2017) Quality improvement in hospitals: barriers and facilitators. *International Journal of Health Care Quality Assurance*, 30 (1) pp. 16-24

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Review

An evaluation of approaches used to teach quality improvement to pre-registration healthcare professionals: An integrative review

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ABSTRACT

Background: Improving the quality of healthcare remains central to UK and international policy, practice and research. In 2003, The Institute of Medicine's '*Health Professions Education: A Bridge to Quality*', advocated quality improvement as a core competency for all healthcare professionals. As a result, developing capacity and capability of those applying improvement methodologies in the pre-registration population has risen, yet, little is known about the teaching approaches employed for this purpose.

Objectives: To describe and analyse educational approaches used to teach quality improvement to pre-registration healthcare professionals and identify enabling and impeding factors.

Design: Integrative review.

Data sources: CINAHL, PsychINFO, MEDLINE, ERIC, ASSIA, SCOPUS and Google Scholar were accessed for papers published between 2000 and 2016.

Review methods: Publications where quality improvement education was delivered to pre-registration healthcare professionals were eligible. One author independently screened papers, extracted data using a modified version of the Reporting of Primary Studies in Education Guideline and evaluated methodological quality using the Weight of Evidence Framework. The Kirkpatrick Education Evaluation Model was used to explore the impact of teaching approaches. Enabling and impeding factors were thematically analysed. A narrative synthesis of findings is presented.

Results: Ten papers were included, representing nursing, pharmacy and medicine from UK, Norway and USA. Studies comprised four quantitative, four mixed method, one qualitative and one cluster randomised trial, all allocated medium Weight of Evidence. Teaching approaches included experiential learning cited in all studies, didactics in seven, group work in four, seminars in three, self-directed learning in three and simulation in one. Most studies measured Level 1 of the Kirkpatrick Model (reaction), all but one measured Level 2 (skills, knowledge or attitudes), none measured Level 3 (behaviour) and one measured Level 4 (patient outcomes). Enabling and impeding themes included: Teaching Approaches, Clinical/Faculty support, Information Provision, Curriculum Balance and Data.

Conclusions: Evaluating quality improvement education is complex. Experiential learning combined with didactics is the favoured approach; however, attributing causality to educational intervention proves difficult in light of poor methodological rigour, lack of validated tools and complex clinical settings. Clarity regarding which quality improvement competencies are priority for this population would be useful to streamline future educational development and evaluation. Stronger collaboration between educators and clinicians is recommended to explore the multiple components and contextual factors associated with quality improvement education in practice. Ethnographic enquiry may be a logical next step to advance knowledge within the field.

1. Background

Quality improvement remains at the forefront of political and educational agendas internationally, continuing to be a key priority within healthcare (Scottish Government, 2010; Health Foundation, 2012a; Institute of Medicine, 2001; Academy of Medical Royal Colleges, 2016). In 2003, *Health Professions Education: A Bridge to Quality* (Institute of Medicine, 2003) recommended quality improvement as a core competency for US healthcare curricula. The UK Nursing and Midwifery Council's education standards now insist that in order to

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SYSTEMATIC REVIEWS

PROTOCOL Open Access

An evaluation of methods used to teach quality improvement to undergraduate healthcare students to inform curriculum development within preregistration nurse education: a protocol for systematic review and narrative synthesis

Lorraine Armstrong[1*], William Lauder[2] and Ashley Shepherd[1]

Abstract

Background: Despite criticism, quality improvement (QI) continues to drive political and educational priorities within health care. Until recently, QI educational interventions have varied, targeting mainly postgraduates, middle management and the medical profession. However, there is now consensus within the UK, USA and beyond to integrate QI explicitly into nurse education, and faculties may require redesign of their QI curriculum to achieve this. Whilst growth in QI preregistration nurse education is emerging, little empirical evidence exists to determine such effects. Furthermore, previous healthcare studies evaluating QI educational interventions lend little in the way of support and have instead been subject to criticism. They reveal methodological weakness such as no reporting of theoretical underpinnings, insufficient intervention description, poor evaluation methods, little clinical or patient impact and lack of sustainability. This study aims therefore to identify, evaluate and synthesise teaching methods used within the undergraduate population to aid development of QI curriculum within preregistration nurse education.

Methods/design: A systematic review of the literature will be conducted. Electronic databases, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Psychological Information (PsychINFO), Education Resources Information Centre (ERIC), Medical Literature Analysis and Retrieval System Online (MEDLINE) and Applied Social Sciences Index and Abstracts (ASSIA), will be searched alongside reference list scanning and a grey literature search. Peer-reviewed studies from 2000–2014 will be identified using key terms quality improvement, education, curriculum, training, undergraduate, teaching methods, students and evaluation. Studies describing a QI themed educational intervention aimed at undergraduate healthcare students will be included and data extracted using a modified version of the Reporting of Primary Studies in Education (REPOSE) Guidelines. Studies will be judged for quality and relevance using the Evidence for Policy and Practice Information and Co-ordinating Centre's (EPPI) Weight of Evidence framework and a narrative synthesis of the findings provided.

Discussion: This study aims to identify, evaluate and synthesise the teaching methods used in quality improvement education for undergraduate healthcare students where currently this is lacking. This will enable nursing faculty to adopt the most effective methods when developing QI education within their curriculum.

Systematic review registration: Prospero CRD42014013847

Keywords: Systematic review protocol, Quality improvement, Curriculum, Education, Preregistration nursing, Teaching methods, Evaluation, Narrative synthesis

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Title	Implementing service improvement projects with pre-registration nursing education: a multi-method case study evaluation
Year	2014
Author	Lesley Baillie, Barbara Bromley, Moira Walker, Rebecca Jones and Fortune Mhlanga
Journal	Nurse Education in Practice
Country of Origin	UK
Discipline	Nursing
Volume/Issue	14 p 62-68
Study Aims	To evaluate the implementation of service improvement projects within a pre-registration nursing curriculum. The objectives: elicit student nurses' perceptions of service improvement following educational input, explores the experience of student nurses who are conducting service improvement projects in practice placements, as the basis for their dissertations and explores academic staff experiences of preparing and supporting practice placements and students with service improvement projects.
Study Questions	-
Theoretical Underpinning	None mentioned
Research Design	Qualitative, multi-method case study Yin 2009 – holistic single case
Outcome measure(s)	Experience
Sample Strategy	One university
Data collection and analysis	Questionnaires (ALL students 42 degree/47 diploma), focus groups x 2 (totalling 25 degree students 14/11) and academics x 2 totalling (7 4/3), 5 observation of action learning sets (2hr each). Questionnaire data SPSS, focus group and observations data framework approach (Ritchie and spencer) coding and themes.
Kirkpatrick Level	2
Evaluation Model/Method	None stated
Intervention Description	There is pre-intervention preparation curriculum information from phase 1. This study however reports findings within phase 3 and is part of a larger multi-method evaluation. Service improvement projects carried out over 9 weeks by degree nursing students in 2011 approx. – 46 (60 doing diploma). The projects were supported by mentors and ALS facilitators. Link tutors helped to prepare the practice placement s and were an additional source of support in practice. ALS sessions held on 2 occasions over the 9 weeks holding 6-8 degree students.,

QI Model utilised	PDSA Langley
Teaching Method	Class based and project
Results	Degree/project students more likely felt they know more about service improvement than the diploma students (statically significant) and more confident to get involved in projects (not statistically significant). Themes included: Project focus (1), process and challenges (2), support for student projects (3): (1) Projects ideas too large or complex or could find a topic, students tried to include staff, students experienced easy acceptance and negativity from staff, discomfort from staff of students exploring practice improvement. (2) Student activities could be misinterpreted for doing 'nothing'. Busyness and shift patterns hindered data collection; student found it hard to change culture and change was influenced by staff acceptance. ~Mentors seemed unsure of their role, (3) ALS groups were helpful for exploring projects and getting peer support, link lectures supportive
Learning Environment	Classroom and for the projects: wards, units and community teams (Mental Health and Adult).
Learners	Diploma and Degree students. 3rd year nursing students (1st semester). Only degree students undertook a service improvement project.
Facilitating factor(s)	Degree students only – ALS sessions were most useful, university training, support from placement and university staff, listening to service users and carers to get ideas, it helped that it was required for the degree, supernumerary as a student.
Hindering factor(s)	Degree students only – not enough time and insufficient resources in the NHS, not understanding training content, lack of autonomy, unwillingness of staff to change, insufficient examples given, lack of relevance of training to real life, view as a specialist role.
Conclusion	Careful planning required between faculty and NHS, ongoing support required, ALS a valuable contribution and student overall are positive
Follow up	No follow up.
Comments	Although observations used within this study, these were only of action learning sets on 5 occasions. This was only held on 2 occasions for each student and therefore does not truly reflect their lived experiences or ethnographic inquiry.
Weight of Evidence	a) medium, b) medium C) medium

PH/SN

UNIVERSITY of STIRLING

7 December 2015

Mrs L Armstrong
Postgraduate Research Student
School of Health Sciences
University of Stirling
Stirling
FK9 4LA

Web: http://www.stir.ac.uk/health-sciences/research/ethics/

Professor Pat Hoddinott
Chair
School Research Ethics Committee

School of Health Sciences
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Email: shs.ethics@stir.ac.uk

Dear Lorraine

Evaluating the impact and experience of quality improvement education in pre-registration nursing practice: an ethnographic study
SREC 15/16 – Paper No.42 – Version 1

Thank you for responding to the SREC communication of 10 November 2015, and including the following documents marked with track changes:

- Covering letter
- Appendix 1 - Clinical Placement Information (Version 2)
- Appendix 2 - Mentor Information Observation (Version 2)
- Appendix 2a – Mentor Information focus Group (Version 1)
- Appendix 2b – Mentor Information Semi-structured Interviews
- Appendix 3 – Mentor Consent Form Observation (Version 2)
- Appendix 3a – Mentor Consent Form Focus Group
- Appendix 3b – Mentor Consent Form Semi-structured Interviews
- Appendix 4 – Student Poster
- Appendix 5 – Student Information Observation (Version 2)
- Appendix 5a – Student Information Focus Group
- Appendix 5b – Student Information Semi-structured Interviews
- Appendix 6 – Student Consent Form Observation (Version 2)
- Appendix 6a – Student Consent Form Focus Group
- Appendix 6b – Student Consent Form Semi-structured Interviews
- Appendix 7a – Student Focus Group Interview Schedule (Version 2)
- Appendix 7b – Mentor Focus Group Interview Schedule (Version 2)
- Appendix 8 – Student Interview Schedule (Version 2)
- Appendix 9 – Mentor Interview Schedule (Version 2)
- Appendix 10 – RanD Approval
- Appendix 11 – NHS Ethics
- Evaluating Impact and Experience of QI Education SREC Doc Revised

I note that you have undertaken the minor amendments requested, and am now pleased to advise that your study has been formally approved.

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16/06/2015

Dear Ashley,

As per your e-mail dated 15/06/2015, I have attached the requested information. I would like to confirm at this stage that this is only brief and will be expanded within my NHS Ethics and R&D Management Approval. However, I hope this will suffice for now. If you require any further information, please do not hesitate to contact me and I can provide this.

Yours sincerely,

Lorraine Armstrong
Clinical Academic Fellow

Study Title: Exploring the experiences and behaviours of student nurses and their mentors during a practice based quality improvement assignment: an ethnographic study.

Principal Investigator: Lorraine Armstrong (Clinical Academic Fellow)

Location: NHS Forth Valley Royal Hospital

Clarification of Questions

Impact on the students

Observational studies conducted between a student and a researcher, who is also a University staff member, has potential to apply unnecessary pressure and possibly stress for students in clinical placement. This is primarily due to the power dynamics of the 'teacher' and 'student' where the student feels the need to perform. The researcher has adopted the following strategies to reduce this risk:

Throughout this particular student cohort (from the start of their course until now), the researcher has refrained from any contact within a teaching, assessing or support capacity with any of the students. The first occasion that the researcher will be introduced to this student cohort will be during recruitment where the researcher will be introduced as a postgraduate research student. This will allow the power dynamics to be levelled before the study commences. Additionally, the researcher will make explicit her previous experience of conducting a quality improvement project as student nurse, as a way of sharing a common ground with students, building early relationships and alleviating any pressure or stress relating to the assignment or my presence during observations.

The researcher has also adopted an 'observer as participant' role within this study which has potential to impact positively on the students' learning experience. This role is most suited to the researchers' professional capacity in that she cannot fully participate in the delivery of patient care yet she can maintain an *'overt'* stance, allowing interaction with participants. Primarily this will include the researcher adopting an 'academic support role' by which guidance and direction will be given when asked, where this relates *only* to the students' QI practice-based assignment. Students will be made aware that no assessment or observation of their clinical skills or delivery of patient care will be in the researchers remit. This will therefore reduce the risk of students perceiving the researchers' role as threatening, intimidating or suspicious. Additionally, students will only be observed if they have consented to be in the study.

Protecting the patients identity

This study forms the basis of an educational evaluation, primarily assessing the feasibility and logistics of continuing the QI Practicum, as a practice-based assignment for student nurses and the clinical area. Therefore assessing 'patient impact' is out with the remit of this study. However, there may be occasions where patients are identified within the clinical environment during the practice-based assignment. For that reason, all patients (and/or their carers/families) will be given an information leaflet to advise them that an observational study will be taking place within the ward. Patients would be given 24 hours to consider whether they would like to be included or excluded from the observation. It will always be made clear that the focus of the observation is to explore the students' interactions/behaviours and not the patients. Additionally, it would be made clear in the information leaflet that *only* observations relating to the students engaging with their project would be made. Consent from patients would be taken verbally on a daily basis, if an interaction occurs. Observations including a student-patient interaction will be assigned a pseudonym and a study code to describe the patient. Any field notes taken in relation to that observation will be typed and saved into the University Hard Drive (through VPN access) on a password protected laptop. This will be disconnect prior to leaving the ward setting and the field notes will be shredded or discarded within confidential waste. At no point would patients' notes be viewed.

Hindering factors identified that compromise patients or professional practice

Hindering factors that have been identified within previous studies evaluating QI education include, for example, difficulties in deciding on a project topic, collecting the right data, working to deadlines, balancing the academic assignment with achieving clinical competencies and lack of QI knowledge in practice, etc. Whilst this study will take both a formative and summative approach to evaluation whereby findings will be relayed back to the Senior Charge, students and mentors at an interim and final period, any factors identified that comprise patients or professional practice will be dealt with on an individual basis. Clarification of my role in relation to the reporting of patient safety issues or misconduct as per NMC guidelines will be made clear to participants at the beginning of the study. In an unlikely event of this being identified the researcher will inform the Nurse in charge and the Head of Nursing at the earliest convenience.

Study location

To overcome the shortcomings of previous studies that have evaluated QI education (primarily lack of intervention description and poor study methodologies), this study has adopted an ethnographic design. The aim here is to provide a 'thick description' of the intervention within its naturally occurring context and this study will therefore focus on only one adult/general based medical or surgical ward with NHS Forth Valley Royal Hospital for the full duration of 7 weeks.

Lorraine Armstrong

From: RandD-depart (NHS FORTH VALLEY) <FV-UHB.RandD-depart@nhs.net>
Sent: 31 August 2015 15:11
To: Lorraine Armstrong
Subject: RE: An ethnographic case-study impact evaluation of the Quality Improvement Practicum in clinical practice

Hi Lorraine,

We had previously discussed the above project and advised it would require NHS R&D Management Approval to begin in NHS Forth Valley.

We have recently revisited your proposal and consider your PhD study to be a service evaluation of an educational programme. Therefore you will not require NHS R&D Management approval but need to register the study with Quality Improvement using the following link http://www.qifv.scot.nhs.uk/CE_RegisterProject.asp

I understand that you have been in touch with Sarah Dickie about nurse participation in the study.
Before you can come in to NHS Forth Valley to conduct the study you will need a Letter of Access.
We will be happy to organise this for you.

I will require the following documentation in order to progress this

Research Passport Document (if available) CV

Please give me a call if you require any more information

Kind regards,
Ashley

Research and Development Office
NHS Forth Valley
Falkirk Community Hospital
Administration Offices
Westburn Avenue
Falkirk FK1 5SU
tel. 01324 677564
fax 01324 678523

Quality Improvement Dept
Basement Corridor
Falkirk Community Hospital
Westburn Avenue
Falkirk FK1 5SU
Tel 01324 677564

PRIVATE & CONFIDENTIAL

Date: 03 February 2016

Mrs Lorraine Armstrong
88 Reilly Gardens
High Bonnybridge
Bonnybridge
FK4 2BB

Dear Mrs Armstrong

Letter of Access: An ethnographic case-study impact evaluation of the Quality Improvement Practicum in clinical practice

This letter confirms your right of access to conduct this evaluation through NHS [redacted] for the purpose and on the terms and conditions set out below. This right of access commences **when you return a signed copy of this Letter** and ends on **the end date of the project** unless terminated earlier in accordance with the clauses below

DETAILS OF ACCESS

You have a right of access to conduct such activity as confirmed in writing in the letter of permission from this NHS organisation. Please note that you cannot start the activity until the Chief Investigator for the project has received a letter from us giving permission to conduct the project.

The information supplied about your role at NHS [redacted] has been reviewed and you do not require an honorary research contract with this NHS organisation. We are satisfied that such pre-engagement checks as we consider necessary have been carried out. If your current role or involvement changes, or any of the information provided in your Research Passport changes, you must inform your employer through their normal procedures. You must also inform your nominated manager in this NHS organisation.

Your activities in NHS [redacted] under this agreement will be **conducting observations, semi-structured interviews and an analysis of student documentation.**
Your named contact for the duration of the study will be [redacted]**, Quality Improvement Manager.**

CONDUCT

You must carry out your duties under this contract in accordance with policies, practices and procedures established by the Board and varied from time to time. While carrying out this evaluation within NHS [redacted] you must comply with all reporting requirements, systems and duties of action put in place by the Board to deliver governance where this is relevant to your work with the Board. You are also required to comply with all laws and statutes applicable to the performance of the study including, but not limited to, the Human Rights Act 1998, the Data Protection Act 1998, the Medicines Act 1968. You are required to co-operate with NHS [redacted] in discharging its duties under the Health and Safety at Work etc Act 1974 and other health and safety legislation and to take reasonable care for the health and safety of yourself and others while on NHS [redacted] premises. You must observe the same standards of care and propriety in dealing with patients, staff, visitors, equipment and premises as is expected of any other contract holder and you must act appropriately, responsibly and professionally at all times.

You are required to ensure that all information regarding patients or staff remains secure and *strictly confidential* at all times. You must ensure that you understand and comply with the requirements of the NHS Confidentiality Code of Practice and the Data Protection Act 1998. Furthermore, you should be aware that under the Act, unauthorised disclosure of information is an offence and such disclosures may lead to prosecution. In the course of your duties, you may have access to information about staff or patients or other aspects of the Board's activities, about which you have a duty to maintain confidentiality at all times. In common with all other staff you have, in addition, a responsibility to ensure that information relating to your work and the operation of the Board in general is kept and maintained securely and you are obliged to receive, store and dispose of data in accordance with Board policies and good practice. In particular, the disclosure of commercial or other confidential information which may affect the Board's business interests or endangers the survival of any of its services will be regarded as a fundamental breach of the mutual confidence which must exist between the Board and yourself. You should seek advice from the Medical Director or the Board's Data Protection Officer if you are in any doubt whatsoever. Unauthorised disclosure or removal of information may lead to consideration of termination of the honorary appointment. You are further obligated under this agreement to report to your Quality Improvement contact person any infringements either by accident or otherwise which constitute a breach of confidentiality. The Quality Improvement contact person will then be responsible for notifying the data-protection officer for NHS [redacted].

You should ensure that, where you are issued with an identity or security card, a bleep number, email or library account, keys or protective clothing, these are returned upon termination of this arrangement. Please also ensure that while on the premises you wear your ID badge at all times or are able to prove your identity if challenged. Please note that this NHS organisation accepts no responsibility for damage to or loss of personal property, with the exception of property handed over and accepted on behalf of the Board for safe custody. You are therefore advised to cover yourself against any such risk by taking out appropriate insurance.

The Board operates a "Tobacco Policy". Smoking is not permitted anywhere within Board premises, grounds or Board vehicles. Failure to comply with this policy will be considered a disciplinary matter.

While undertaking this evaluation through NHS [redacted] you will remain accountable to your employer but you are required to follow the reasonable instructions of **Head of relevant NHS Department** in this NHS organisation or those given on her/his behalf in relation to the terms of this right of access.

LEGAL POSITION AND INDEMNITY

You are considered to be a legal visitor to NHS [redacted] premises. You are not entitled to any form of payment or access to other benefits provided by this NHS organisation to employees and this letter does not give rise to any other relationship between you and this NHS organisation, in particular that of an employee. This agreement does not affect the terms and conditions of any other employment you may currently hold with another employer, who will remain responsible for you and for any disciplinary matters that may arise.

Your substantive employer will remain liable for your acts or omissions in the course of the project covered by this letter, and must ensure they maintain appropriate indemnity insurance for this purpose. Where any third party claim is made, whether or not legal proceedings are issued, arising out of or in connection with your right of access, you are required to co-operate fully with any investigation by this NHS organisation in connection with any such claim and to give all such assistance as may reasonably be required regarding the conduct of any legal proceedings.

We may terminate your right to attend at any time either by giving seven days' written notice to you or immediately without any notice if you are in breach of any of the terms or conditions described in this letter or if you commit any act that we reasonably consider to amount to serious misconduct or to be disruptive and/or prejudicial to the interests and/or business of this NHS organisation or if you are convicted of any criminal offence. Where required by law, your employer will initiate your Independent Safeguarding Authority (ISA) registration, and thereafter, will continue to monitor your

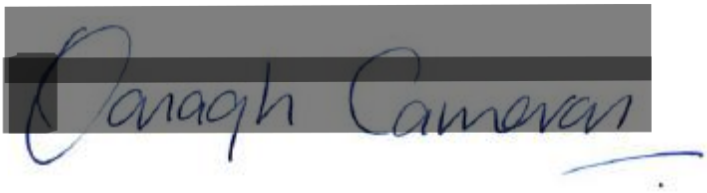
ISA registration status via the on-line ISA service. Should you cease to be ISA-registered, this letter of access is immediately terminated. Your employer will immediately withdraw you from undertaking this or any other regulated activity. You MUST stop undertaking any regulated activity.

Your substantive employer is responsible for your conduct during this project and may in the circumstances described above instigate disciplinary action against you.

NHS [redacted] will not indemnify you against any liability incurred as a result of any breach of confidentiality or breach of the Data Protection Act 1998. Any breach of the Data Protection Act 1998 may result in legal action against you and/or your substantive employer.

If you agree to accept this agreement on the terms indicated above, please sign the statement of acceptance and return one copy contract to me at the address overleaf, retaining the other for your own reference. A further copy has been sent to **your main employer's personnel office** for your records.

Yours sincerely



Oonagh Cameron

QUALITY IMPROVEMENT MANAGER

cc: HR department of the substantive employer

DO NOT DETACH

I accept the conditions of this Letter of Access agreement as detailed above

Name Lorraine Armstrong

Signed: Date: 4th February 2016



14th December 2015

Good Morning,

Further to recent Ethical Approval, I am very pleased to confirm that the above **Service Evaluation of Quality Improvement Education** will take place at [redacted] Royal Hospital week beginning **15th February 2016**.

We would be very grateful to obtain **access to your department** during this evaluation to allow for observation of student nurses undertaking Quality Improvement Projects.

Attached is an Information Sheet providing further details about the evaluation and we would be most grateful if you could **confirm your participation within one week by replying to this email**, after which we will be able to approach the nursing students (and mentors) who will be involved.

I look forward to hearing from you at your earliest convenience.

Best wishes,

Lorraine Armstrong
Clinical Academic Fellow
Quality Improvement
School of Health Sciences
University of Stirling
Stirling
FK9 4LA

Tel: 01786 466117

Twitter: LarmstrongQi

Armstrong L, Lauder W and Shepherd A, (2014). An evaluation of methods used to teach quality improvement to undergraduate healthcare students to inform curriculum development within pre-registration nurse education: a protocol for systematic review and narrative synthesis. Systematic Reviews, 4:8 http://www.systematicreviewsjournal.com/content/4/1/8

Appendix 1 - 03/12/15 Version 3

Ref: SREC 15/16 – Paper No.42



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Evaluating quality improvement education in pre-registration nursing practice.

Participant Information Sheet for Clinical Placements- Observations

Invitation

My name is Lorraine Armstrong, a Registered Adult Nurse and teaching assistant based within the School of Health Sciences at the University of Stirling. I am interested in exploring the experiences of Semester 8 student nurses and mentors who will be involved in practice-based Quality Improvement (QI) education during their clinical placement in February 2016. I would like to invite your clinical area to participate in this evaluation. Participating is entirely up to you, before you decide I would like you to understand why this evaluation is being done and what it would involve if you were to participate.

I have provided further information on the next page about the purpose of this educational evaluation and what will happen if your department takes part. I would be very happy to answer any questions that you have and will be available to talk with you.

Yours sincerely,

Lorraine Armstrong

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What are the possible benefits of taking part?

There may not be any benefits to you personally from participating in this study. However, you may find it helpful to reflect on QI education in practice. The information obtained from this study may help to understand how QI education in pre-registration nursing is impacting clinical mentors and may help to implement change or support strategies to improve QI education in future.

What are the possible disadvantages of taking part?

Every effort will be made by the researcher to understand the barriers and facilitators of undertaking QI assignments. Sometimes participants can feel uncomfortable during an evaluation. The researcher will be sensitive to this and remind you of your right to withdraw from the research at any point.

What will happen to the results of the evaluation?

The results of the evaluation will be documented in a PhD Thesis and may be published in a research article or presented at a conference. All information collected including comments or quotations will be used anonymously and no identifiable data will be attributable to your practice area.

Who has approved this evaluation?

This evaluation has been approved by the University of Stirling, School of Health Sciences Research Ethics Committee and has been approved by NHS Forth Valley Research & Development Department as Service Evaluation.

What happens next?

If you wish to participate, please contact me within 1 week and I will send you a consent form. Following this time I will contact you to confirm whether you would like to participate or not.

What is the purpose of this study?

Currently, there is little known about the impact that QI education in pre-registration nursing has on clinical staff or practice placements. The aim of this study is to evaluate the impact and ascertain the in-depth views and experiences of clinical staff and students during this process and to determine what support is needed on clinical placement (if any).

Why have I been chosen?

Your clinical area has been chosen to take part in this study because you will be supporting Semester 8 nursing students during their QI assignment in February 2016. I would like your department to take part so that the views and experiences of the staff and students involved in this process can be better understood and help improve QI education in pre-registration nursing in future.

Your decision to take part, do I have to take part?

Participation is voluntary and can be withdrawn at any time. Any information gathered will be used anonymously and kept secure.

What would taking part involve?

If you volunteer, I would ask for your permission to the following:

1. **Access to your department** for the duration of the students Semester 8 placement, approximately 7 weeks. Visits would occur on between 1 and 3 days per week and last between 1-2 hours. During these visits I will be acting in the capacity of non-participant observer and will aim to have as little impact as possible on usual ward practices, staff and student time. This means that although I can assist in giving direction as an educator, my main role will be that of researcher.

2. **To indirectly observe the context of the ward environment** such as layout, staff roles, processes, wall flyers or events where these relate to QI e.g. safety briefs.

3. **To indirectly observe student and mentor interactions** where these relate only to the QI assignment. Students' skill acquisition in relation to their Ongoing Achievement Record will not be observed nor will the delivery of patient care.

4. **To speak informally to clinical staff and students** about their experience and perspective of QI education, where this is appropriate to do so and always mindful of not impinging on staff time during busy periods.



Attention Semester 8 Adult nursing students attending

ICU, AAU, CAU, A22, B23, B31 or Cardiology

The Semester 8 Quality Improvement Practicum is being evaluated in these areas and I would like to know **your experiences in clinical practice**.

I will be coming to speak to you about the evaluation on the 21st January 2016. If you are interested in taking part, please email me or **come along to the session to find out more!**

Lorraine Armstrong
Tel: +44 (0) 1786 466117
Email: Lorraine.armstrong@stir.ac.uk



Appendix 5 03/12/2015 Version 3

Ref: SREC 15/16 – Paper No.42



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Fax: +44 (0) 1786 46 6333
Email: Lorraine.armstrong@stir.ac.uk

Title: Evaluating quality improvement education in pre-registration nursing practice

Participant Information Sheet for Nursing Students - Observations

Invitation

My name is Lorraine Armstrong, a Registered Adult Nurse, postgraduate research student and teaching assistant in the School of Health Sciences. I am interested in exploring the experiences of Semester 8 students and mentors who will be involved in the practice-based QI educational assignment during clinical placement in February 2016.

I would like to invite you to participate in the evaluation. Participating is entirely up to you, before you decide I would like you to understand why this evaluation is being done and what it would involve if you were to participate.

I have provided further information on the next page about the purpose of this educational evaluation and what will happen if you take part. I would be very happy to answer any questions that you have and will be available to talk with you.

Yours sincerely,

Lorraine Armstrong

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What are the possible disadvantages of taking part?

Every effort will be made by the researcher to understand the barriers and facilitators of undertaking QI assignments. Sometimes participants can feel uncomfortable during an evaluation. The researcher will be sensitive to this and remind you of your right to withdraw from the research at any point.

What will happen to the results of the evaluation?

The results of the evaluation will be documented in a PhD Thesis and may be published in a research article or presented at a conference. All information collected including comments or quotations will be used anonymously and no identifiable data will be attributable to you.

Who has approved this evaluation?

This evaluation has been approved by the University of Stirling, School of Health Sciences Research Ethics Committee and has been approved by NHS Forth Valley Research & Development Department as Service Evaluation.

What happens next?

If you wish to participate, please contact me within 1 week and I will send you a consent form. Following this time I will contact you to confirm whether you would like to participate or not.

For further information my contact details can be found at the beginning of this letter. Alternatively, please contact one of the researchers below:

Dr Fiona Harris: NMAHP Research Unit, University of Stirling, Innovation Park, FK9 4NF
Fiona.harris@stir.ac.uk Tel: 01786 466104

Ashley Shepherd: School of Health Sciences, University of Stirling, Stirling, FK9 4LA
Ashley.Shepherd@stir.ac.uk Tel: 01786 466334

If you wish to speak to someone who knows about this study and who can provide independent advice, please contact:

Prof Andrew Watterson, School of Health Sciences - Research, University of Stirling, 01786 466283, a.e.watterson@stir.ac.uk

Evaluating quality improvement
education in pre-registration nursing practice

UNIVERSITY OF STIRLING

PLEASE INITIAL, RATHER THAN TICK
THE BOXES BELOW

Lorraine Armstrong
Clinical Academic Fellow
Quality Improvement
School of Health Sciences
University of Stirling
Stirling
FK9 4LA

Tel: +44 (0) 1786 466117
Fax: +44 (0) 1786 46 6333
Email: Lorraine.armstrong@stir.ac.uk

Student Participant Consent Form	Please initial if you consent
1. I confirm that I have read the information sheet and understand the purpose of this research. Time and an opportunity to ask questions have been provided and satisfactorily answered.	
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason and without my participation in the Pre-Registration Programme being affected.	
3. I understand the researcher will observe and record written information about me that I give informally. This will be dealt with confidentially, protecting anonymity and I will not be named in any reports.	
4. I understand that information gathered about me will be compliant with the Data Protection Act (1998) and that any identifiable data will be stored securely in a locked filing cabinet. Only anonymous information will be stored on a secure password protected network on the University of Stirling hard drive. Only the researcher (and direct supervisory team) will have access.	
5. I permit the researcher to make contact with me with an invitation to be interviewed, participate in a focus group or view my QI project.	

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6. I am aware that the views of participants may be used in a report or published paper, and if so, it will not be attributable to me.	
7. I agree to participate in this study.	

Name of participant	Signature	Date
Name of researcher	Signature	Date

Complete 2 copies: 1 for participant; 1 for researcher's site file

Appendix 5a Version 1 – 17/11/2015

Ref: SREC 15/16 – Paper No.42 – Version 1



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Email: Lorraine.armstrong@stir.ac.uk

Title: Evaluating quality improvement education in pre-registration nursing practice

Participant Information Sheet for **Nursing Students – Focus Group**

Invitation

My name is Lorraine Armstrong, a Registered Adult Nurse, Postgraduate Research student and teaching assistant based within the School of Health Sciences at the University of Stirling. I am interested in exploring further the variety of experiences and views of Semester 8 students who conducted their practice-based quality improvement (QI) assignment during clinical placement in February 2016.

I would like to invite you to participate in the evaluation. Participating is entirely up to you, before you decide I would like you to understand why this evaluation is being done and what it would involve if you were to participate.

I have provided further information on the next page about the purpose of this evaluation and what will happen if you take part. I would be very happy to answer any questions that you have and will be available to talk you through the process.

Yours sincerely,
Lorraine Armstrong

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The University of Stirling is recognised as a Scottish Charity with number SC011159

What is the purpose of this study?

Currently, there is little known about how students conduct QI projects in pre-registration nursing practice or what their experiences and views are. The aim of this study is to evaluate the contribution that students make to improvement in practice and ascertain their experiences and views of how QI education in practice could be improved and what support is needed (if any).

Why have I been chosen?

You have been chosen to take part in this study because you have conducted the QI education assignment required for Semester 8. I would like you to take part in a focus group about your views and experiences of this process and to explore how you feel QI education in pre-registration nursing could be improved. I will be inviting around 7-10 people to take part.

Your decision to take part, do I have to take part?

Participation is voluntary and can be withdrawn at any time without this decision affecting your progression on the Pre-registration Nursing Programme. Any information gathered will be used anonymously and kept secure. You do not have to participate because your clinical placement area has agreed to take part in the research.

What would taking part involve?

You will be given this information sheet to keep and if you volunteer you will be given a consent form to sign to say that you are happy to take part. You will also be given a choice of times that the focus group may take place. Following this I would ask:

- For you to spare around 1 hour of your time to attend the focus group discussion that will take place in the University during campus hours and refreshments will be provided.

- To share your experience of doing a QI project, your views about pre-registration students conducting QI and what your support needs are (if any).

The focus group discussion will be conducted anonymously and audio recorded to get an accurate record of what was said. You can instruct for this to be stopped at any time. Following the discussion the recording will be transcribed using a service that the University have confidential agreements with and participants can request to view this and have any information that has been given excluded. Although I have capacity as an educator, my role within this evaluation at this stage will be that of a researcher in which confidentiality and anonymity will be protected at every possible opportunity.

What are the possible problems or disadvantages of taking part?

It is not anticipated that any problems will arise as a result of you taking part in this focus group. You may choose to answer or not answer the questions asked.

What are the possible benefits of taking part?

The information obtained from this study may help to understand how QI education in pre-registration nursing is impacting students and may help to implement change or support strategies to improve QI education in future. Students may also find it helpful to discuss issues around their QI assignment with other students in the University.

What will happen to the results of the evaluation?

The results of the evaluation will be documented in a PhD Thesis and may be published in a research article or presented at a conference. All information collected including comments or quotations will be used anonymously and no identifiable data will be attributable to you.

Who has approved this evaluation?

This evaluation has been approved by the University of Stirling, School of Health Sciences Research Ethics Committee and has been approved by NHS Forth Valley Research & Development Department as Service Evaluation.

What happens next?

If you wish to participate, please contact me within 1 week or return the consent form. Following this time I will contact you to confirm whether you would like to participate or not.

For further information my contact details can be found at the beginning of this letter. Alternatively, please contact one of the researchers below:

Dr Fiona Harris: NMAHP Research Unit, University of Stirling, Innovation Park, FK9 4NF
Fiona.harris@stir.ac.uk Tel: 01786 466104

Ashley Shepherd: School of Health Sciences, University of Stirling, Stirling, FK9 4LA
Ashley.Shepherd@stir.ac.uk Tel: 01786 466334

If you wish to speak to someone who knows about this study and who can provide independent advice, please contact:

Prof Andrew Watterson, School of Health Sciences - Research, University of Stirling, 01786 466283, a.e.watterson@stir.ac.uk

Appendix 5b – 17/11/15 Version 1

Ref: SREC 15/16 – Paper No.42 – Version 1



UNIVERSITY OF STIRLING

Lorraine Armstrong
Clinical Academic Fellow
Quality Improvement
School of Health Sciences
University of Stirling
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FK9 4LA

Tel: +44 (0) 1786 466117
Fax: +44 (0) 1786 46 6333
Email: Lorraine.armstrong@stir.ac.uk

Title: Evaluating quality improvement education in pre-registration nursing practice

Participant Information Sheet for **Nursing Students – Individual Interviews**

Invitation

My name is Lorraine Armstrong, a Registered Adult Nurse, Postgraduate Research student and teaching assistant based within the School of Health Sciences at the University of Stirling. I am interested in exploring deeper the experiences and views of Semester 8 students who conducted their practice-based Quality Improvement (QI) assignment during clinical placement in February 2016.

I would like to invite you to participate in the evaluation. Participating is entirely up to you, before you decide I would like you to understand why individual discussions are being held and what it would involve if you were to participate.

I have provided further information on the next page about the purpose of this evaluation and what will happen if you take part. I would be very happy to answer any questions that you have and will be available to talk you through the process.

Yours sincerely,
Lorraine Armstrong

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The University of Stirling is recognised as a Scottish Charity with number SC011159

What is the purpose of this study?

Currently, there is little known about how students conduct QI projects in pre-registration nursing practice or what their experiences and views are. The aim of this study is to evaluate the contribution that students make to improvement in practice and ascertain their experiences and views of how QI education in practice could be improved and what support is needed (if any).

Why have I been chosen?

You have been chosen to take part in this study because you have conducted the QI education assignment required for Semester 8. I would like you to take part in an individual discussion about your views and experiences of this process and to explore how you feel QI education in pre-registration nursing could be improved.

Your decision to take part, do I have to take part?

Participation is voluntary and can be withdrawn at any time without this decision affecting your progression on the Pre-registration Nursing Programme. Any information gathered will be used anonymously and kept secure. You do not have to participate because your clinical placement area has agreed to take part in the research.

What would taking part involve?

You will be given this information sheet to keep and if you volunteer you will be given a consent form to sign to say that you are happy to take part. You will be able to choose a time and place for the discussion that is convenient for you and can be face-to-face or over the telephone. I would ask:

- That you spare around 1 hour of your time to discuss your experience of conducting your QI project, your views about pre-registration students doing QI in practice and what your support needs are (if any).

The individual discussion will be conducted anonymously and audio recorded to get an accurate record of what was said. You can instruct for this to be stopped at any time. Following the discussion the recording will be transcribed using a service that the University has confidentially agreements with. If you wish you can request to view this and have any information that you have given excluded. Although I have capacity as an educator, my role within this evaluation at this stage will be that of a researcher in which confidentiality and anonymity will be protected at every possible opportunity.

What are the possible problems or disadvantages of taking part?

It is not anticipated that any problems will arise as a result of you taking part in this individual discussion. You may choose to answer or not answer the questions asked.

What are the possible benefits of taking part?

The information obtained from this study may help to understand how QI education in pre-registration nursing is impacting nursing students and may help to implement change or support strategies to improve QI education in future. Students may also find it helpful to discuss issues around their QI assignment with someone impartial.

What will happen to the results of the evaluation?

The results of this study will be documented in a PhD Thesis and may be published in a research article or presented at a conference. All information collected including comments or quotations will be used anonymously and no identifiable data will be attributable to you.

Who has approved this evaluation?

This evaluation has been approved by the University of Stirling, School of Health Sciences Research Ethics Committee and has been approved by NHS Forth Valley Research & Development Department as Service Evaluation.

What happens next?

If you wish to participate, please contact me within 1 week or return the consent form. Following this time I will contact you to confirm whether you would like to participate or not.

For further information my contact details can be found at the beginning of this letter. Alternatively, please contact one of the researchers below:

Dr Fiona Harris: NMAHP Research Unit, University of Stirling, Innovation Park, FK9 4NF
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Ashley Shepherd: School of Health Sciences, University of Stirling, Stirling, FK9 4LA
Ashley.Shepherd@stir.ac.uk Tel: 01786 466334

If you wish to speak to someone who knows about this study and who can provide independent advice, please contact:

Prof Andrew Watterson, School of Health Sciences - Research, University of Stirling, 01786 466283, a.e.watterson@stir.ac.uk

Appendix 6a Version 1 – 17/11/2015 Ref: SREC 15/16 – Paper No.42 – Version 1

Title: Evaluating quality improvement education in pre-registration nursing practice – **Student Nurse Focus Group**

UNIVERSITY OF STIRLING

PLEASE INITIAL, RATHER THAN TICK THE BOXES BELOW

Lorraine Armstrong
Clinical Academic Fellow
Quality Improvement
School of Health Sciences
University of Stirling
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FK9 4LA

Tel: +44 (0) 1786 466117
Fax: +44 (0) 1786 46 6333
Email: Lorraine.armstrong@stir.ac.uk

Student Participant Consent Form- Focus Group	Please initial if you consent
1. I confirm that I have read the information sheet and understand the purpose of this research. Time and an opportunity to ask questions have been provided and satisfactorily answered.	
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason and without my participation in the Pre-Registration Programme being affected.	
3. I understand the researcher will audio record information that I provide during the focus group. This will be dealt with in a confidential manner that protects anonymity and I will not be mentioned or be attributable in any reports.	
4. I understand that information I give will be used in compliance with the Data Protection Act (1998) and that any identifiable data will be stored securely in a locked filing cabinet. Only anonymous information will be stored on a secure password protected network on the University of Stirling hard drive, which only the researcher (and direct supervisory team) will have access.	
5. I permit the researcher to make contact with me with an invitation to view my QI assignment, be in a follow up study or complete a questionnaire.	

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Fax: +44 (0) 1851 706070

The University of Stirling is recognised as a Scottish Charity with number SC011159

6. I am aware that the views of participants may be used in a report or published paper, and if so, it will not be attributable to me.	
7. I agree to participate in this study.	

Name of participant	Signature	Date
Name of researcher	Signature	Date

Complete 2 copies: 1 for participant; 1 for researcher's site file

Appendix 6b Version 1 – 17/11/2015 Ref: SREC 15/16 – Paper No.42 – Version 1

Title: Evaluating quality improvement education in pre-registration nursing practice – Student Nurse Individual Interviews

UNIVERSITY OF STIRLING

PLEASE INITIAL, RATHER THAN TICK THE BOXES BELOW

Lorraine Armstrong
Clinical Academic Fellow
Quality Improvement
School of Health Sciences
University of Stirling
Stirling
FK9 4LA

Tel: +44 (0) 1786 466117
Fax: +44 (0) 1786 46 6333
Email: Lorraine.armstrong@stir.ac.uk

Student Participant Consent Form – Interviews		Please initial if you consent
1.	I confirm that I have read the information sheet and understand the purpose of this research. Time and an opportunity to ask questions have been provided and satisfactorily answered.	
2.	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason and without my participation in the Pre-Registration Programme being affected.	
3.	I understand the researcher will audio record information that I provide during the individual interview. This will be dealt with in a confidential manner that protects anonymity and I will not be mentioned or be attributable in any reports.	
4.	I understand that information I give will be used in compliance with the Data Protection Act (1998) and that any identifiable data will be stored securely in a locked filing cabinet. Only anonymous information will be stored on a secure password protected network on the University of Stirling hard drive, which only the researcher (and direct supervisory team) will have access.	
5.	I permit the researcher to make contact with me with an invitation to view my QI assignment, be in a follow up study or complete a questionnaire.	

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6. I am aware that the views of participants may be used in a report or published paper, and if so, will not be attributable to me.	
7. I agree to participate in this study.	

Name of participant	Signature	Date
Name of researcher	Signature	Date

Complete 2 copies: 1 for participant; 1 for researcher's site file

1910328 – Evaluation Quality Improvement Education in pre-registration Nursing

Focus Group Topic Guide for the Quality Improvement Practicum in Pre-registration Nursing

General – 10 minutes

- Thanks and welcome
- Nature of focus group (informal, exploratory, all views)
- There are no right or wrong answers
- Audio recording
- Complete consent forms
- Colleague viewing
- Help self to refreshments
- Talking about the Practicum
- Questions or concerns?
- *Start Recording*

Introduction and Warm up – 5 minutes

- Name
- Department
- Brief summary of chosen project

1. Introducing your project – 10 minutes

I'd just like to start off by talking about your initial contact with the placement ……

- How did you feel about introducing your project to the placement area and what was you're your approach?
- What were the initial reactions that you received from staff? How did this make you feel?
- How much did Sister and your mentor know about the project? Were they familiar with QI?

2. Picking a project and obtaining agreement to it -15 minutes

I'd like to understand a little more about the process of picking a project to work on ……..

EXPLORE ……..

- What informed your decision to pick the topic?
  - How did you identify there was a problem?
- Who was involved during this process? Did you actively engage anyone?

- What kind of information did you have access to when picking a project?

SHOW PICTURES OF QUALITY INDICATOR BOARD – PATIENT OPINON PRINT OUTS

- Were there other resources in practice that you could have accessed to help you make a decision?
- Why did you choose a single or team project?
- How would you describe the level of support at this point with your project?
- How receptive was your idea to Sister, Mentor, others ….
- How do you think the practicum has impacted your experience of clinical practice in the first two weeks?
- What support strategies would you find beneficial in the first two weeks?
- What do you think of the idea of picking 'personal' improvement project?

3. Collecting data and PDSA cycles – 15 minutes

Ok, so returning to the assignment, the next stage was to collect data & complete 2 PDSA cycles.

EXPLORE …..

- What was your experience of collecting data in the ward environment?
- What were the main obstacles you encountered?
- How did your shifts e.g. dayshift or nightshift impact on your ability to collect data?
- Similarly, how did working in different/the same area impact your ability to collect data?
- Who was involved in collecting your data?
- What kinds of changes were you making between each PDSA cycle? Was this easier/harder than you expected?
- How receptive were staff to the changes you were making?

4. Balancing clinical skills – 15 minutes

Considering that this is the first time you have completed an assignment whilst on placement ….

EXPLORE …..

- What was your experience of having to complete the project and learn about a new placement?

- How did you manage your time between the assignment and your Ongoing Achievement Record competencies?
- Did you have to negotiate time to spend on the project? How did you feel about this?
- How flexible was the placement in allowing you time to work on it? Were some times throughout your shift better than others?
- How do you think your placement area prioritised your project over other tasks on the ward?
- How did you prioritise your project compared to other tasks on the ward?
- Are there any suggestions that you would make to help students in practice balance their project and their OAR?

5. Support Mechanisms -10 minutes

Moving on to think about the different types of support during the Practicum ……

EXPLORE …..

- What support did the Sister/Mentor of the ward provide for you to do your project?
- Were there other support structures that you engaged with outside of placement?
- What University support do you think would have been helpful during placement?
- What kinds of support do you think is necessary to complete the project in practice?
- Who was the most/least supportive person you engaged with during the project, and why?
- Did anyone speak with any students who had completed the practicum last year? Was this supportive, how?

6. Culture of Quality Improvement -10 minutes

I am interested to hear your perspective about QI in practice …..

EXPLORE….

- Do you think that there is a QI culture where you were on placement? Why do you say that?
- Were you aware of QI activities which were currently being undertaken?

- Who in the department was involved in QI activity?
- Was there any interest in your QI project? Why do you think that was?
- What improvement did your project make?
- Do you think you made any contribution to QI in practice? Why do you say that?
- Have the department given any indication that they will continue the project?
- What is your perception of QI now that you have undertaken a project in practice?
- Are you going to provide feedback to the placement area about your improvement? If so/not, why or how?

7. *Information Provision – 10 minutes*

Lastly, I would like to hear what your opinions are about the education/information delivered …

EXPLORE …..

- How useful were the Institute of Healthcare Improvement (IHI) modules throughout your programme? How could they be improved?
- What was your experience of the Quality Improvement lectures?
- Do you think there is a better way to teach QI to nursing students? What would this look like?
- What are your thoughts about the QI information resources made available to you in Succeed?
- What is your perspective on the QI Practicum Assignment e.g. the paperwork/format?
- If you could provide one piece of advice to the students next year what would it be?

8. *Concluding the discussion – 10 minutes*

- Is there anything else you would like to discuss
- Thank them for attending
- All information will remain confidential
- Reminder I may contact them in future – request personal emails
- Good Luck with assignment



UNIVERSITY of STIRLING

Name Lorraine Armstrong
Lecturer

Faculty of Health Sciences and Sport
University of Stirling
Stirling FK9 4LA
Scotland UK

E : Lorraine.armstrong@stir.ac.uk
W : https://www.stir.ac.uk/people/257140

Title: Evaluating the longitudinal effects of undertaking quality improvement education in pre-registration nursing practice: the final follow-up phase.

Invitation

My name is Lorraine Armstrong, a Registered Adult Nurse, Researcher and Lecturer based within the School of Health Sciences at the University of Stirling. In 2016, you kindly participated in a research study exploring student nurses' experiences of undertaking Quality Improvement in practice and consented to further contact in a follow up phase of the study.

This final phase is happening now. The purpose of this phase of the study before it concludes is to determine what engagement, if any you have had with Quality Improvement as a, now, Registered Nurse.

Therefore, I would like to invite you to participate in a short, follow-up interview. Participating is entirely up to you, before you decide I would like you to understand why individual discussions are being held and what it would involve if you were to participate.

I have provided further information on the next page about the purpose of this evaluation and what will happen if you take part. I would be happy to answer any questions that you have and will be available to talk you through the process.

Yours sincerely,
Lorraine Armstrong

The University of Stirling is a charity registered in Scotland, number SC 011159.

BE THE DIFFERENCE

What is the purpose of this study?

Currently, there is little known about how students engage with QI following their BSc education. The aim of this phase in the study is to determine what opportunities Registered Nurses have to contribute to QI and to determine the level of their engagement in QI as Registered Nurses.

Why have I been chosen?

You have been chosen to take part in this study because you participated in the earlier phase of the study and consented to be contacted for a follow up interview after you qualified as a Registered Nurse. The findings of the early phase will be shared with you and I would like to invite you to take part in an individual discussion about your views and experiences of your engagement in QI as a Registered Nurse and discuss how your QI education in the BSc Programme has impacted your engagement, if any.

Your decision to take part, do I have to take part?

Participation is voluntary and can be withdrawn at any time. Any information gathered will be used anonymously and kept secure.

What would taking part involve?

You will be able to choose a time and day for the discussion that is convenient for you and can be face-to-face or on Teams. I would ask:

- That you spare around 10-15 minutes of your time to discuss your experience of having contributed to QI since qualifying as a Registered nurse and to consider whether your BSc QI education had has influenced any engagement with QI.

The individual discussion will be conducted anonymously, and audio recorded to get an accurate record of what was said. You can instruct for this to be stopped at any time. Following the discussion the recording will be transcribed. If you wish you can request to view this and have any information that you have given excluded. Although I have capacity as an educator, my role within this evaluation is that of a researcher in which confidentiality and anonymity will be protected at every possible opportunity.

The University of Stirling is a charity registered in Scotland, number SC 011159.

BE THE DIFFERENCE

UNIVERSITY of STIRLING

What are the possible problems or disadvantages of taking part?

It is not anticipated that any problems will arise as a result of your taking part in this individual discussion. You may choose to answer or not answer the questions asked.

What are the possible benefits of taking part?

The information obtained from this study may help to understand how QI education in pre-registration nursing is impacting nurse engagement with QI after they qualify and help to influence policy and education standards within nursing.

What will happen to the results of the evaluation?

The results of this study will be documented in a PhD Thesis and may be published in a research article or presented at a conference. All information collected, including comments or quotations will be used anonymously and no identifiable data will be attributable to you.

Who has approved this evaluation?

This evaluation has been approved by the University of Stirling, School of Health Sciences Research Ethics Committee and has been approved by NHS Forth Valley Research & Development Department as Service Evaluation.

What happens next?

If you wish to participate, please contact me within 1 week to arrange a suitable time to be contacted. Following this time, I will contact you to confirm whether you would like to participate or not.

For further information my contact details can be found at the beginning of this letter.

If you wish to speak to someone who knows about this study and who can provide independent advice, please contact:

Ashley Shepherd: Faculty of Health Sciences and Sport, University of Stirling, FK9 4LA
Ashley.Shepherd@stir.ac.uk Tel: 01786 466334

The University of Stirling is a charity registered in Scotland, number SC 011159

BE THE DIFFERENCE

Lorraine Armstrong
PhD Candidate
Lecturer in Nursing
University of Stirling

Follow-Up Study Topic Guide for interviewing nurses who participated in the Quality Improvement Practicum

General – 10 minutes

- Thanks and welcome
- Nature of interview
- There are no right or wrong answers
- Audio recording process
- Gain verbal consent
- Explain colleague viewing
- Re-iterate participant can stop interview at any time
- Remind nurse about their previous reported experience of QI Practicum
- Check that this information correct – and update if necessary
- Questions or concerns?
- *Start Recording*

CONSENT TO READING INFORMATION LEAFLET AND TO PARTICIPATE IN STUDY

Contextual information

1. Where do you work now?
2. What is role as a nurse now?
3. Have you been in different roles in the past 8 years?

Transition to Newly Qualified Nurse

4. In hindsight, what benefits (or not) did undertaking QI have on your ability to get a job?
5. Have employers ever asked you about your QI expertise?
6. Have you ever included it in your CV or job application?
7. Have you included any QI reflections/PDP within your Revalidation?

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Current engagement in QI

8. What further training or learning around QI have you done since your BSc?
9. What knowledge do you believe that you have retained about QI since then?
10. How would you regard your own QI expertise?
11. Since graduating have you ever had the opportunity to apply your knowledge in practice?
12. What QI work is ongoing in your own environment?
13. How would you describe the QI culture where you work?
14. How would you describe your level of engagement with QI now?
15. Now that you are experienced, what factors in your ward influence engagement with QI?
16. Do you/or would you feel confident supporting others in doing QI? How do you do this?

Drawing upon ethnography experiences

17. Lack of autonomy to do QI was a factor as a student nurse, how do you perceive your level of autonomy to influence your engagement with QI now you are experienced?
18. Students' access to data was limited for undertaking QI, what impact does your understanding of data or access to data have now on doing QI?
19. Student determinants played a key role in students engaging in QI, what do you think are the key attributes required to do QI now as a registered nurse?
20. Often students identified a fear culture in highlighting wrongdoing when selecting QI work? What is your experience of this type of culture now in the wards as a registrant?
21. The study identified a new culture of nurses knowledgeable in QI – do you think the NQN workforce is beginning to impact the overall knowledge of QI in practice?

Attitudes and beliefs about QI

22. What are your beliefs about the nurse's role in doing QI?
23. What value do believe exists in pre-registration nurses undertaking QI in practice?
24. Have you supported any students who are conducting QI in practice or doing an assignment?
25. Was your own experience useful in supporting these students?
26. Would you consider a job in QI?
27. What would influence you to become more involved in QI?
28. Would you recommend QI for pre-registration nurse now?

Appendix 20 Coding Frame Example

Name	Sources
THE QI PROJECT	13
Project Selection	13
LIMITATIONS	10
Form 1	8
Missed QI Opportunities	6
Feeling Forced	3
Conflicting Messages	2
Consent and Confidentiality	1
Management Approval	1
UTILISING STAFF	10
Mentors	7
Sister	5
Staff Suggestions	5
Patients	3
Previous Practicum Students	2
Networking	1
PERSONAL REASONS	9
Personal Interest	5
Ward Experience	6
EVIDENCE BASED	8
Observation	5
Supporting Literature	2
IR1's	1
Benchmarking	1
Audit	1
Scrutiny	1
Recent learning	1
Project Process	12
Group or Solo	8
Things to Change	10
Progress of Project	4
Postponed Ideas	3
Difficulty Choosing	2
Communicating Project	1
Protection over ideas	1
Project Reaction	11
Awareness	10
Fobbed off	5
Lack of respect for Projects	5
Worthwhile but disregarded	5
Receptivity	5
Revoked Involvement	3
Everything is Done	2
Newbies	2
Fluid Balance	10
Problem	6
Perception	5

Documentation	4
Audit	3
Supporting Literature	2
Project Impact	5
TEACHING AND LEARNING	13
Assignment	13
Format	9
Form 1	8
Timing	10
QI Tools	8
Repetitive	2
Making it Up	2
Exemplar	2
Enjoyment	1
Flipping Assignment	1
Recommendations	13
Protected Time	5
Prior access to ward	5
Be prepared	6
Examples of Previous Projects	2
Longer placement Allocation	3
Designated Project Area	1
Pick something that will help!	3
Support for Away Placement	2
Communication	2
Smaller Class Size	1
Speak up	1
General Aim	1
IHI	12
Lectures	7
Action Learning Sets	7
Theory Practice Disconnect	7
Experiential Learning	7
Clinical Learning Culture	1
Engagement with literature	3
QI Hub	2
Videos	2
CLINICAL ENVIRONMENT	13
Too Busy - No Time	12
Locality	13
Student Perception	8
Data collection	6
Continuity of Staff	8
Picking a Project	3
Reduced Peer Interaction	1
Data Display	1
Shifts	9
Quantity of Staff	10
Patient Turnover	5
Placement Familiarity	7
Supernumerary	7

Social Learning Influence	6
Resources	4
Quantity of Students	2
QUALITY IMPROVEMENT CULTURE	13
The Clinical Placement	13
Ongoing Projects	13
Lack of engagement	10
Sustainability	9
Engagement	10
Resistance to improvement	6
Not a nursing skill	4
Safety Brief	3
Emerging Culture	2
Implicit improvement methodology	1
The Student	13
Future Career in QI	11
Evidence of Student Projects	6
Student Perception of QI	6
Lack of Autonomy	5
Isolation	5
Terminology	2
Speaking up	3
Exclusion	2
Individuals	10
Hierarchy	8
QI Silo	6
Criticising	2
IPL	4
Knowledge	4
Generational	2
Nobody talks about it	1
Perception of Students	2
STUDENT INTERACTIONS	13
WHOM	13
Sister	12
Mentors	13
Staff Nurses	7
Previous Practicum Students	8
Patients	4
Multi-disciplinary	6
Junior Doctors	7
Auxiliaries	7
Senior Charge Nurse	5
Consultants	5
Lab Technicians	1
WHAT	5
Communication	3
Rushed	1
No Participation Needed	1
Delegation	1
Engagement	2

Feedback	1
Apprehension	1
WHERE	6
Briefs and Meetings	5
Locality	1
PRE-REGISTRATION NURSE	11
Apprehension	9
Lack of Autonomy	7
Proactive	4
Guilt	5
Stress	7
Resilience	4
Self-worth	5
Intimidated	5
Demotivated	3
Loyalty	1
Fear of Failure	2
Downplaying Improvement	4
Burden	2
Acceptance	2
Disappointment	1
Age	2
Sneaking around	1
Overwhelming	1
Delegation	1
Leadership	1
Understanding	1
Realistic Expectations	1
BALANCING PRIORITIES	13
OAR ESC	12
Patient Care	11
3rd Year Expectations	10
Experience for qualifying	7
University Packages	5
Work Life Balance	5
Away Placement	2
Bank Work	3
Passing placement	3
Semester 7 Assignment	1
Making Hours Up	1
Applying for Jobs	1
LEADERSHIP	11
Negative	8
Role	11
Positive	9
Absence	7
CLINICAL OR FACULTY SUPPORT	13
Staff	9
University	11
Social Media Groups	5
Student Peer Group	5

Previous Practicum Students	2
Researcher presence	2
NHS Library	1
Policy Protocol	1
DATA	13
Collection	13
Sources	8
PDSA Cycles	7
Keeping it small	7
Overload	3
CASES	5
Observed FT	0
Ward Four	5
Ward Three	3
Ward Two	2
Ward One	1
Ward Six	1
Observed PT	0
Ward Seven	3
Ward Nine	4
Ward Five	2
Ward Eight	2

Open access Protocol

BMJ Open

How, and under what contexts, do academic–practice partnerships collaborate to implement healthcare improvement education into preregistration nursing curriculums: a realist review protocol

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ABSTRACT

Introduction Internationally, healthcare improvement remains a clinical and educational priority. Consensus in Europe, Canada and the USA to implement quality improvement (QI) education into preregistration nursing curricula ensures students become equipped with the skills and knowledge required to improve practice. Now, New Zealand and Australia are beginning to implement QI education into their nursing curricula. However, QI education is complex; comprising multiple components, each influenced by the contexts under which they are developed and implemented. Evaluation studies of QI education unanimously acknowledge that academic and practice partnerships (APPs) are essential to optimally embed QI into preregistration curricula, yet it is not understood how, and under what contexts, APPs collaborate to achieve this.

Methods and analysis A realist review to determine how, and under what contexts, APPs collaborate to implement QI education in pre-registration nursing will be conducted using the Realist and Meta-narrative Evidence Syntheses: Evolving Standards Guidelines. International stakeholders will be consulted at each stage which includes (1) clarifying the scope of the review through empirical literature and tacit expert knowledge, (2) searching for evidence in healthcare and social science databases/grey literature, (3) appraising studies using the Evidence for Policy and Practice Information and Co-ordinating Centre weight of evidence framework and extracting data using Standards for QUality Improvement Reporting Excellence in Education Publication Guidelines, (4) synthesising evidence and drawing conclusions through the creation of context, mechanism and outcome configurations and (5) disseminating findings through conferences and peer-reviewed publications.

Ethics and dissemination Ethical approval was not required for this study. Findings will be disseminated to international nurse educators, leaders and front-line staff implementing QI education within their own academic and practice contexts through conferences and peer-reviewed publications.

PROSPERO registration number CRD42021282424.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Realist review is novel to explore quality improvement (QI) education in preregistration nursing.
- ⇒ Understanding academic–practice partnerships in developing QI education is novel.
- ⇒ Focus on the influence of context on QI education builds on the current literature.
- ⇒ A limitation of the study is that only English articles will be included.

INTRODUCTION

Healthcare improvement in nurse education

This millennium has witnessed a surge in healthcare improvement practice and educational development in response to practice errors and increased risk to patients' safety.[1] Therefore, developing workforce capacity and capability in improvement knowledge, skills and behaviours remains a priority on policy and educational agendas internationally.[2–6] In the past decade, countries such as the UK, Sweden, Spain, Canada and USA have developed consensus that quality improvement (QI) education in preregistration nursing curricula should be a regular and ongoing process, if students are to contribute to and lead practice improvements.[4 6–9] Recently, New Zealand has begun to embark on QI curricular integration, having established from 49 educational institutions that few display the foundations of quality and safety education.[10] It is recognised that failure to address this gap compromises graduate nurses' abilities to implement and sustain healthcare improvement. A similar drive for QI education in preregistration nursing curricula has also emerged from Australia where much of the focus is around partnership working.[11] The

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Experiences of Newly Qualified Nurses' Engagement with Quality Improvement in Practice: A Qualitative Follow-Up Study

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Abstract: Background: Nurse education plays an essential role in preparing future nurses to engage with quality improvement (QI) initiatives in their organisations and improve patient care. However, frontline nurses continue to report that a lack of QI knowledge hinders their abilities to engage in improvement work. In the UK, student nurses are now trained in QI within their degree to enable them to contribute to improvements once qualified. Objectives: This qualitative follow-up study investigated the sustainability of QI engagement in nurses who undertook QI training and a QI project during their degree and explored the factors influencing their engagement in QI once qualified. Methods: This paper followed the COREQ criteria to report upon 10 semi-structured interviews undertaken with registered nurses and focuses on their experiences of QI engagement post-registration. The data were investigated using an inductive thematic analysis and Nvivo 14. Findings: Five themes emerged: transition to a newly qualified nurse, QI knowledge decline, influencing factors (hierarchy, leadership, COVID-19 pandemic, data access and location), and skill transferability. Conclusions: This study showed that qualified nurses can sustain their QI knowledge and remain engaged with QI where they experience positive QI leadership and were exposed to ongoing QI activity in their preceptorship year. However, a lack of QI opportunities and a culture which does not consider QI a responsibility of new nurses is seen to hinder engagement. Educational institutions and practice partners require careful collaboration to assess and develop ongoing QI learning activities that support new nurses to engage in QI.

Keywords: quality improvement; nursing students; degree-level education; practice; qualitative analysis; follow-up; nurses; engagement; lived experience

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1. Introduction

There is a drive in the UK (United Kingdom) and internationally to increase quality and service improvement content within nursing degree programmes to prepare future nurses to improve health and care services. This initiative is in response to professional standards set out by the Nursing and Midwifery Council (NMC) who make safety and quality of care an explicit proficiency to achieve [1]. To help inform faculties on how to develop and evaluate quality improvement (QI) curricular content in their programmes, a collection of research reviews and international primary research articles have focused on exploring QI in degree level nurse education [2–6]. This evidence confirms that student nurses learn to contribute to systematic change through practice-based QI projects and there is compelling evidence to suggest this pedagogical approach, in the right context, can foster QI-related behaviour change [7].

In 2016, a Scottish university in partnership with their local health board serving a population of around 300,000, facilitated a QI practice-based educational assessment called the QI Practicum. The development phase and QI intervention are described elsewhere [8] and detailed in Table 1.

Appendix 23 Study Impact

Impact 1

This study has demonstrated impact through its rigorous, timely and comprehensive review of the literature in QI nursing education which led to two peer reviewed academic journal articles:

- Armstrong, L., Lauder, W. and Shepherd, A. (2015) An evaluation of methods used to teach quality improvement to undergraduate healthcare students to inform curriculum development within pre-registration nurse education: a protocol for systematic review and narrative synthesis. Systematic Reviews, 4, pp. 1-8.

- Armstrong, L., Shepherd, A. and Harris, F. (2017) An evaluation of approaches used to teach quality improvement to pre-registration healthcare professionals: an integrative review. International Journal of Nursing Studies, 73, pp. 70-84.

Since the publication of these articles, 56 citations have been recorded in the wider literature relating to QI education and educational evaluation. The interest, and the importance as well as the relevance of this research continues to be demonstrated, as 37 of these citations were recorded in the past five years. The influence of this research has been far reaching and has catalysed new international research collaborations with myself and nurse academics and practitioners in New Zealand at the Ara Institute of Canterbury and the University of Otago, and at Monash University in Australia. Further research is now being undertaken with these colleagues to explore the context in which academia and practice collaborate to implement QI education into pre-registration nursing programmes. This thesis has already highlighted the necessity of undertaking this research and it continues to be important to generate best practice examples for the nursing academics and practitioners who are developing and evaluating QI education. A realist review has been adopted to undertake this research in which stakeholder engagement was critical to the methodology. During this exercise input into from international experts such as nursing academics, journal editors, directors of nursing, newly qualified nurses and student nurses was sought. This increased level of input indicates a continued need to explore academic-practice partnerships and thus the protocol was published in BMJ Open. This project is currently undergoing the analysis phase:

- Armstrong, L., Moir, C. and Taylor, P. (2023) How and in what contexts do academic-practice partnerships collaborate to integrate QI education into pre-registration nursing curriculums? A realist review protocol. BMJ Open, 13:e077784.

Impact 2

The findings of the research have been shared with multi-professional improvement experts and nursing academics at many international conferences. The interest in the research has been generated through social media platforms to raise the awareness of its importance. This dissemination has led to many networks being created, and mentoring opportunities to be undertaken with leading experts in the field such as Helen Bevan, who is a leader and facilitator of large-scale change in healthcare. This research has led to knowledge exchange activities with the Institute for Healthcare Improvement (IHI) and the BMJ conference planning team to inform the development of educational sessions for international students who have attended the IHI Open School lunchtime symposiums:

- Armstrong, L., Shepherd, A. and Harris, F. (2019) Putting QI education into context for pre-registration nurse education: an ethnographic multiple-case study. International Forum on Quality and Safety in Healthcare. 26-29th March, The Scottish Exhibition Conference Centre, Glasgow: Poster Presentation.

- Armstrong, L., Davie, P. (2019) Student and Healthcare Professional Lunch Session: Building your QI Community: Measuring the Value of Student Involvement. International Form on Quality and Safety in Healthcare. 26-29th March, The Scottish Exhibition Conference, Glasgow: Conference Facilitator.

- Armstrong, L., Harris, F. and Shepherd, A. (2022) Understanding the influence of context on final year student nurses' experiences of improvement science education in practice. 8th International Nurse Education Conference. 19th-22nd October, Sitges, Spain: Speaker Presentation.

Impact 3

Historically, pre-registration nursing education programmes in the UK undergo revalidation by the Nursing and Midwifery Council every three years to ensure that nursing curriculums are fit for purpose (NMC 2018). In 2020, my University underwent a nursing programme revalidation by the NMC for which the QiNEP model was drawn upon. The model enabled

the new education standards to be mapped to the pre-registration nurses' proficiencies and informed the design of the new quality and safety nursing curriculum. An evidence-based proposal was developed based on the findings of this thesis and a proposal to include reflective QI portfolios for student nurses to develop through increased engagement in QI activities in the practice settings. The QI e-learning modules used previously in the programme were removed because of student nurses lack of satisfaction with their content and renewed to reflect the UK context in which student nurses developed their QI knowledge and skills. This QI educational proposal was approved by the faculty and the NMC during the programme's revalidation in 2020. The findings of the QiNEP model and experience of integrating the new approach to teaching QI to pre-registration nursing students was shared with multi-professional international delegates at a recent conference:

- Armstrong, L., Shepherd, A. and Harris, F. (2024a). Adapting improvement education to context: small-scale projects or diverse and reflective portfolios? International Forum on Quality and Safety in Healthcare. ExCeL London, UK, 10th-12th April 2024, Speaker.

The findings were also presented to senior leaders within the university's partnering health board who included the Lead for Quality and Safety and the Directors of Nursing. This knowledge exchange activity presented the argument for the inclusion of nursing students' and newly qualified nurses' to be more involved in QI activities. The impact has resulted in the inclusion of students' and newly qualified nurses' attending the new QI training academy and students have been provided with opportunities to work alongside ongoing QI projects during their placements with QI advisors. Opportunities to attend the QI academy have also been negotiated for academic and research staff who have attended to develop faculty capability and capacity to support QI education and QI initiatives locally. As a result of the study findings, there are ongoing discussions with the QI team to evaluate the educational outcomes of the health board's QI academy training programme with a focus on engagement. Therefore, this research has led to important collaborations between academia and practice on QI education and remains at the forefront of the agenda to equip healthcare professionals with QI knowledge and skills to contribute to improving patient care and healthcare services.

The value of this research has been recognised and peer-reviewed in a recent QI special edition within the Nursing Reports Journal.

- Armstrong, L., Shepherd, A. and Harris, F. (2024b) Experiences of newly qualified nurses' engagement in quality improvement (QI) in practice: a qualitative follow-up study. Nursing Reports, 14, (4) pp. 2990-3006.

Since publication in October 2024 this research has been cited twice in the regions of the UK and Australia. This early interest demonstrates the continued relevance of this research within the nursing profession. These findings enable ongoing conversations to be had with QI advisors in the local health board and the practice education facilitators. Their role is to support newly qualified nurses during their first year and to create more explicit QI learning opportunities for them to be involved with and to evaluate their effectiveness in sustaining longer term QI engagement.