FOSTERING QUALITY IMPROVEMENT EDUCATIONAL OUTCOMES IN UNDERGRADUTE NURSING CURRICULA: GRADUATES' PERCEPTIONS OF THEIR FOR PRACTICE CHANGE

Judith Honeyfield*, Deborah Sims, Adam Proverbs*** & Wendy Rowe******

**Dr Judith Honeyfield, Faculty Research Coordinator & Principal Lecturer, Department of Nursing/ Toi Ohomai Institute of Technology, Tauranga, New Zealand, E-Mail: Judith.honeyfield@toiohomai.ac.nz*
***Deborah Sims, Academic Leader, Department of Nursing, College / Toi Ohomai Institute of Technology, Tauranga, New Zealand, E-Mail: Deborah.sims@toiohomai.ac.nz*
****Adam Proverbs, Clinical Placement Lead, Department of Nursing, College / Toi Ohomai Institute of Technology, Tauranga, New Zealand, E-Mail: Adam.proverbs@toiohomai.ac.nz*
***** Wendy Rowe, Senior Lecturer, Department of Nursing, College / Toi Ohomai Institute of Technology, Tauranga, New Zealand, E-Mail: Wendy.Rowe@toiohomai.ac.nz*

ABSTRACT

Sustaining quality improvement practices in health and social services continues to be an international challenge. Measuring longitudinal graduate outcomes of quality improvement (QI) education and practice from an undergraduate nursing programme in New Zealand (NZ) is the focus of this paper. This reports on two interlinking research projects that followed a major collaborative curriculum redevelopment initiative and the inclusion of QI in 2017. Changes included implementing new learning, teaching and assessments; followed by a research project to measure the students' perceptions of this preparation at the conclusion of their transition to practice placement prior to registration and then again at the end of their first year of practice as registered nurses (RN's). The research team found reports of QI practice change and positive outcomes following the initial study with Bachelor of Nursing students in their final year. Using a questionnaire design, graduate nurses (n=31) perceptions and practice experiences relating to their undergraduate QI education and if this was useful in their practice as beginning RN's. Findings suggest that new graduates found their undergraduate (baseline knowledge) and subsequent workplace learning experiences supported them to engage with a range of QI tools and methods to improve patient/ outcomes and contribute positively to organisational performance. Yet barriers to engagement in QI were reported suggesting further improvements in undergraduate nursing and social science curricula are required to help students prepare to manage the competing challenges of workload, time, novice status, tiredness, and the impact of learning new role requirements as they transition to the workplace. Higher education academics, researchers and practice based educators and managers need to work collaboratively to improve learning in QI, and reduce barriers to ensure optimal health and social service sector outcomes.

Key words: Quality improvement, partnership, nursing education, new graduate nurse perspectives of QI, practice change

INTRODUCTION

Quality Improvement (QI) is essential health care business. Yet many health service users do not have a quality outcome experience. Health Quality Standards New Zealand (2017) report that 15% of people in hospital settings experience an unexpected/ avoidable adverse event that impacts their recovery. This same report estimates that improving quality would save an estimated $400 million annually in New Zealand (NZ). QI is defined by Djukic, Kovner, Brewer, Fatehi and Seltzer (2013), as "a range of formal approaches to analysing the quality of patient care and implementing systematic efforts to improve it" (p.13).

Developing a broad understanding of the importance and practice of QI in pre-registration nursing curricula to be prepared for their future roles as health professionals is essential to ensure mitigation of adverse events and improve sector outcomes. A national study in NZ of multiple health professional pre-registration education programmes identified teaching gaps in patient safety, and the need to improve QI methods and tools (Robb, Stolarek, Wells, & Bohm, 2017). The study further identified that a failure to address these gaps would compromise the ability of graduates to successfully implement and sustain improvements when transferring to the workplace.

LITERATURE REVIEW

Nurse educators have been concerned to remove barriers to effectively embedding QI into nursing curricula (James, Beattie, Shepherd, Armstrong & Wilkinson, 2016; Kyrkjebø, Hannssen & Haugland, 2001; Sherwood &

Barnsteiner, 2012). QI methods have been introduced into health care to facilitate service delivery that is safe, timely, effective, efficient, equitable and cost effective (Huber, 2016). QI leads the new focus of health care systems from managing and delivering outputs to improving patient experiences and outcomes (Health Quality and Safety Commission, 2017).

Yet longitudinal knowledge post initial preparation of QI for nurses has been identified as a concern. A study of newly graduated nurses in the United States (USA), reported that 38.6% thought they were "poorly" or "very poorly" prepared in their undergraduate programmes (Kovner, Brewer, Yingrengreung, & Fairchild, 2010). A follow up study investigating the impact of post-registration employer education in QI for early career registered nurses (Djukic et al, 2013) identified a similar figure where fewer than one third of the 400 respondents reported being very prepared across all measured QI topics. These authors concluded that whilst post-registration education offered by employers could be substantially improved, nurse educators play a critical role in development and applying QI knowledge for practice.

One solution proposed by Kyrkjebø, et al, (2001) is the importance of utilising QI methods such as Plan-Do-Study-Act (PDSA, Deming, 1986, cited in Langley, Moen, Nolan, Nolan, Norman & Provost, 2009) and embed QI education and practice in undergraduate nursing programmes as a starting point for ongoing QI development as registered nurses. PDSA provides an investigative, planning and action model to assist QI in response to issues in practice (Sherwood & Barnsteiner, 2012). Yet Taylor, McNicholas, Nicolay, Darzi, Bell and Reed (2013) caution that implementation of QI using PDSA is not "a magic bullet" and practitioners need to appreciate the influential effect of local context, formal evaluation of change, and document each of the stages of the cycle to assist transferability of learning to another setting. Accordingly, Reed and Card (2015) suggest that careful attention to all aspects of application are needed to avoid over simplification, or unrealistic expectations of outcomes for change using PDSA. The PDSA model and language has been adopted by Health Quality and Safety Commission in New Zealand.

Based on evidence that challenged the need for improvements in QI in undergraduate education we followed, four key pedagogical approaches identified as effective in the literature including:

> *a combination of didactic and project-based work; link with health system improvement efforts; assess education outcomes; and role model QI in educational processes (Armstrong, Headrick, Spiese, Madigosky and Ogrinc, (2012: p.6).*

Health Quality and Safety New Zealand developed four e-learning modules as an introduction to quality health systems improvements, and students completed these as part of the course requirements. In addition, the teaching team developed interactive class experiences, using reports and examples of QI projects to develop theory and practice ideas. The teaching team developed a new project based assessment to be undertaken in practice. In parallel to this pedagogical, the academic leadership and clinical practice team met with key quality teams at our local hospital quality unit and with nurse leaders and managers to ensure congruence in outcomes and to assist removal of the contextual barriers to aid student outcomes.

The research team regularly discussed feedback and reflection for improvements reinforcing our beliefs that nurse educators and leaders in both the higher education and practice setting have an essential role to play in developing essential QI knowledge and skills to enable nurses to participate in QI at an entry level as new graduates (Kovner et al, 2010). Also required is students ability to demonstrate meeting professional competence requirements (Nursing Council of New Zealand, 2019) of health care systems and organisations.

Partly in response to Robb et al.'s (2017) warning of the inability of graduates to successfully implement and sustain QI when transferring to the workplace: and evidence of poor preparedness for undergraduate nursing education internationally (Kovner et al, 2010) the initial research project was developed to investigate the legitimacy and scope of these concerns and evaluate the outcomes of this QI educational redevelopment.

First Study – Transition to practice

In 2018, the research team conducted a research study that was motivated by our interest to discover the impact from key stakeholders of the newly implemented QI learning, teaching and assessment process in the Bachelor of Nursing curriculum in a regional polytechnic in NZ. The research team wanted to discover if these new, inclusive, and collaborative pedagogical approaches supported students' success in implementing practice change as well as identify the barriers/issues they encountered. Education for QI begins in year one of the curriculum, and is advanced in year two in different practice papers and settings. In year three (the final year in NZ) QI is a key component of a paper called *Advancing Professional Practice* which incorporates an assessment to investigate and apply the PDSA cycle completed as a project in an aged residential care practice placement. A range of theories and interactive scenarios were developed in class then reinforced in the practice setting with supervision

by student nurse educators who are employed by our higher education organisation to mentor students during practice placements. Essential to this model were previous partnership negotiations and support from clinical nurse managers and senior staff in the aged care settings to ensure students could undertake a small project in negotiation with the care setting's nursing management/leadership support. Students' were required to report their practice experiences including barriers, enablers, theories and links to broader national quality initiatives and health policy.

METHODOLOGY

The research team completed two areas of research:

- Students: analysis of projects (n=93) and two focus groups (n=18)
- Practitioners: questionnaires and face to face interviews (n=16)

An evaluative qualitative research study was proposed using an online questionnaire using questions that reflect those asked by Kovner, Brewer, Yingrengreung, & Fairchild (2010). We chose this study from the USA as these researchers were concerned with perceptions of preparedness for newly licenced nurses (38.6% felt "poorly" or "very poorly" prepared in their preparation in QI). We felt this study would enable useful comparisons to be drawn across what we could expect to find in newly registered nurses perceptions of preparation for QI practice. The lead author (Kovner) gave permission for us to use and adapt questions.

Participant engagement

Because the research team was able to access a large group of graduates at two compulsory study days near the conclusion of their first year of practice being delivered by their employer, who is a key practice partner, we sent to all students via their work address and a print based data collection tool be used. This email explained the research via a comprehensive participant information sheet and seeking their consideration to participate. This email advised new graduates that a member of the research team would visit at their next study day with a 10-minute, questionnaire for those who agreed to participate. The questionnaire had an opening statement that by completing this data collection tool, participants were indicating they had read the participant information material and were giving their consent for their data to be collected, analysed and reported. Thirty -one of a total of 38 new graduates completed the 10 questions – eight of the questions asked for comments in support of their answers.

Data Analysis

As this paper is concerned with perception of preparedness the research team have analysed responses to the first two questions that focus on this component and of the usefulness and impact on using QI knowledge and skills taught in their undergraduate Bachelor of Nursing education. We also report on comments in response to a later question seeking information on their involvements in a specific clinical effort to improve a system or pattern of patient care in their units (question7). The findings from these three questions were statistically analysed. Additional comments provided by the participants were recorded verbatim, reported with reference to the data collected, and further supported by the literature review.

FINDINGS

Student project outcomes

Student projects are shown in Figure 1. Care planning and review (20%), infection prevention and control (18%), and wound care (11%) were the three most popular project topics. 'Other' topics (27%) were QI projects that address resources for specific topics/concerns. Examples QI projects which addressed topics such as constipation monitoring, manual handling, records confidentiality, medication safety, clothing labelling, restraint practices, secure unit alerts, and client satisfaction recording. One example was a nutritional monitoring resource initiative to support managing residents with dementia where a 'Blue plate' was used for their meal signalling to all staff that they needed to assist, observe and record/report the resident's nutrition intake.

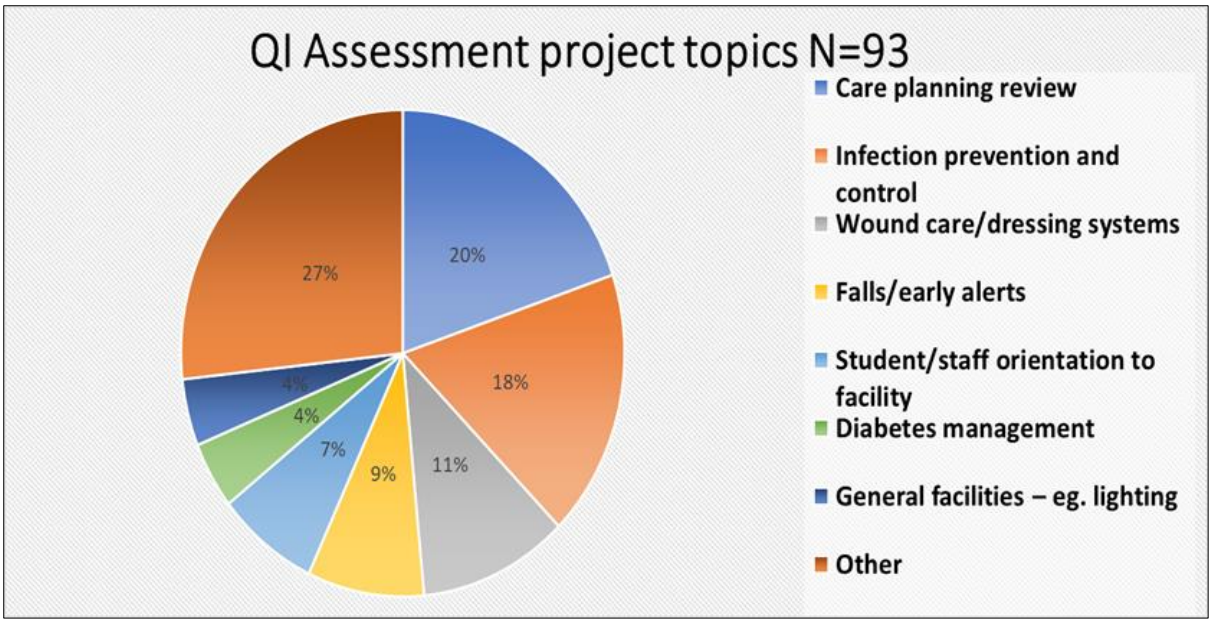

Figure 1: QI project topics selected by third year Bachelor of nursing students (N=93).

The wide variation in topics mainly reflected client/patient needs and the health care setting. Leadership and management support, students' personal interests, and insights and efforts to assist QI initiatives already underway in the workplace, were also covered.

Key enabling factors reported in over half of the projects was clinical nurse leader/manager support and engagement. Less support was provided by supervising nurse educators; students assigned to registered nurses reported that heavy workloads impacted on the students' ability to get support in enacting their QI project.

The major barriers reported by students were time (both to negotiate, review and implement projects), knowledge deficits, the need for professional development in their placement units across the range of topics chosen, clinical areas not practicing within their own policies, and the need for new practice guidelines and resources.

Four areas of commentary used to report the QI project experience were:

- critical thinking (E.g. are your pedagogical efforts increasing critical thinking?)
- having the conversation (E.g. can students' role play "having a conversation" to develop a project in response to a practice issue for improvement?)
- confidence (E.g. have you built feedback loops and tools to help student monitor their own development and confidence in QI as a key practice competence?)
- making change (E.g. are change practices and theories embedded in learning activities?)

The following student comment captures the importance of models, shared language and frameworks for QI processes and practice that reflect the four themes that emerged:

*"*being able to go to a manager and say, "look, I want to look into this", and say this is the format I am going to use …"

Theory and practice development in QI with in class activities contributed positively to students engagement in practice change. One student responded that learning experiences:

"…gave me awareness that was the first thing... of the different resources available to RNs [registered nurses] and from where you can make change and which I did – twice in two placements

This research confirmed that students understand the importance of congruent theory, pedagogical preparation, and a supportive practice setting to both investigate, plan and solve quality issues to improve health outcomes for consumers and health care organisations. Students negotiated and completed projects in practice to link theory and QI tools such as PDSA. They also demonstrated professional attitudes towards QI and articulate their responsibilities as registered practitioners.

Practitioners value students' QI contributions

Feedback from practice questionnaires and interviews enabled us to identify a high level of support for the redevelopment in QI education 80% were in support of the changed QI teaching approach, 71% identified positive student preparation for engaging in QI and 86% reported congruent outcomes with the aged residential care placements QI initiatives.

Whilst the research team found reports of practice change and positive responses across the key stakeholders in this research, we were unable to gauge if the optimism shared by students at the conclusion of their undergraduate programme, translated to ongoing engagement in QI and practice change to their workplace. Thus we proposed a further research study timed to be undertaken at the completion of participants first year of practice as registered nurses.

Study two – one year on

The research team proposed a subsequent research project to discover the graduates' longitudinal perception of the preparation of their undergraduate QI learning, and their practice experiences at the end of their first postgraduate year in a hospital setting using QI processes. Questions included,

- How prepared or unprepared were you by your undergraduate nursing programme in the following QI topics such as: team work and collaboration; evidence-based practice; infection control; pain management
- Using QI PDSA model
- Project implementation
- Ability to systematically apply tools and methods to improve performance

The first question asked students to score their undergraduate preparation from one (1) least prepared to six (6) most prepared. Four students (12.4%), reported three (3) or below on the scale, while 15 (48.3%) scored four (4) and 11 (35.4%) scored five. One student scored six (6) at "most prepared". The medium across 31 responses was 4.19. Thus 86.9% reported positively to their undergraduate preparation of QI for their new role. Students commented:

"The learning was helpful as it refreshes this knowledge and was helpful to apply to learning and practice" …. "the QI assessments helped immensely" … "the QI paper in BN really helped to improve my skills in my NETP [new graduate] positions" … "I can identify areas where QI will be beneficial"

In terms of negative responses, one student reported:

"Due to stress in three years was difficult to reflect back what was learnt from BN paper", yet went on to confirm "Examples of PDSA models were helpful and positively impacted on client care"

Another student reported:

"I didn't feel comfortable identifying areas for QI and carrying out a QI project in a clinical context"

Of interest to participants and colleagues with whom the raw data has been shared was the spread and variation of experiences reported of their preparation and indications of barriers that they reported later in the questionnaire (question 7) as well as use key language used in the health sector QI initiatives (for example PDSA).

Question 2 asked more detail on the actual topics that were a focus of the renewed pedagogical efforts; *How prepared were you by your BN Undergraduate nursing programme in the following QI topics?*

This question elicited a variety and spread of responses captured in Figure 2 below.

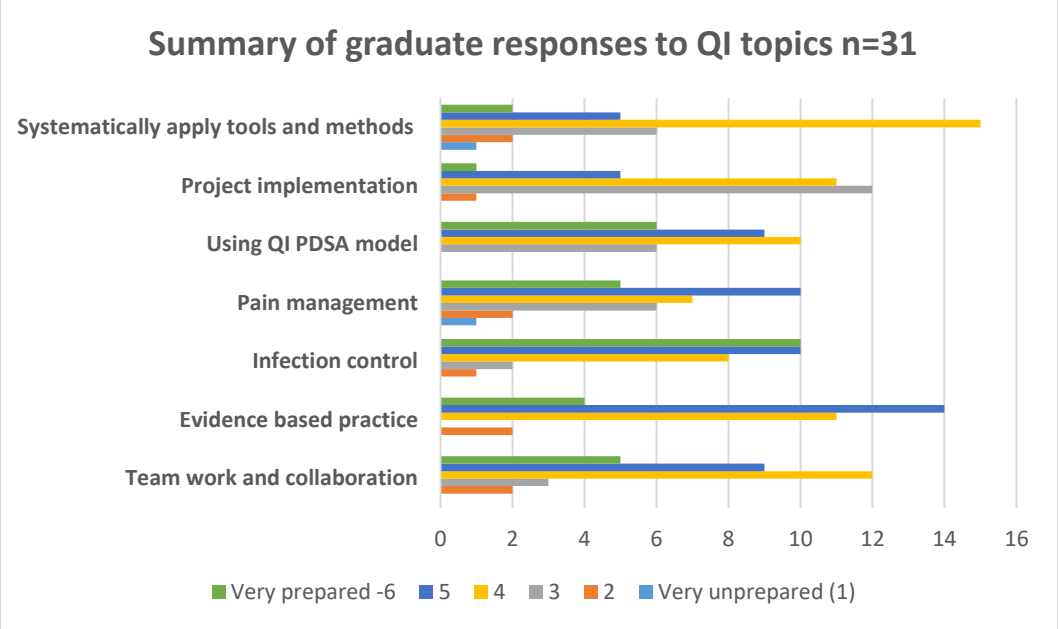

Figure 2: How prepared were you by your BN Undergraduate nursing programme in the following QI topics?

The majority of responses were in the upper half (4 to 6) with the highest mean score (4.8) for infection control. Evidence based practice, pain management and team work and collaboration scored (4.4) closely followed by using QI PDSA models (4.32). The lowest mean was project implementation (3.5) and systematically apply tools and methods to improve performance (3.8). The analysis of question 7 narrative responses assists in analysing why these two area that related to projects and tool application were reported closer to the lower half of the scores.

Question 7focused on participant's involvement in specific clinical efforts to improve care their . Whilst most responses reported "1-2 times", a number recorded reasons for this low response. Comments offered by participants included:

"Interesting to know what others have done but feel as a new grad, learning shift work +job is busy enough and we are not familiar with the environment, background systems enough to identify issues to change"

Three participants identified lack of opportunity:

*"*Only a few opportunities were presented to be able to implement QI processes

Novice status and not having time was also reported:

"In my unit there is a QI group of volunteer RNs as I have been doing NETP I have not had time. Will join next year" … "I expect it to be more helpful next year*"*

One participant identified both time and resources:

"Hard to find time and resources to execute QI projects in practice

And finally one most concerning statement:,

"I don't use QI"

DISCUSSION

The first research project focused on the results of applying QI methods in a placement setting, while the second focused on student nurses' *perception* of preparation in their first year in the workplace. We were able to further validate the importance of effective QI education using a partnership model to mediate issues raised in the literature about new graduate preparation for QI (Djukic et al, 2013; Kovner et al, 2010; Robb, et al, 2017; Sherwood & Drenkard, 2007) and PDSA implementation (Coles et al, 2017; James et al, 2016; Reed & Card,

2015; Taylor et al, 2013). This research confirms the importance of congruent learning, teaching and assessment activities alongside relationships with clinical partners' efforts and use of national QI resources to embed learning outcomes. Yet the beliefs of the nursing faculty that students need real life experiences linking theory and practice, and a supportive practice setting to investigate, plan and provide some solutions for quality issues using QI tools such as PDSA were also challenged. Graduates report of their low preparation for project implementation and system improvement tools impacted on their ability to transfer learning to the workplace. The competing challenges of workload, time, novice status, tiredness and the impact of learning new role requirements as they transition to the workplace were impediments to initiating QI into practice. Indeed, one student identified that that they did not use QI, and did not elaborate further for us to draw further implications from this statement. Generally participant responses confirmed further development of professional attitudes and recognising QI as an actioned-orientated and practice discipline (James et al, 2016) and willingness to enact QI as registered practitioners.

To prepare for registered nurse practice, nursing curricula need to continue to provide opportunities for undergraduate nursing students to be active contributors to change, increase their confidence and capability to implement projects and apply tools to improve safety in practice, for clients/patients and contribute to improved organisational outcomes. Students' insights and developing understanding of QI needs to be fostered and supported by student nurse educators, registered nurses and clinical nurse leaders, who have a large influence in determining how students relate to the need to embed QI into all aspects of their practice (James et at, 2016). Yet the research teams experience of redeveloping the QI component meant we, as educators, needed to be fully cognisant of the QI endeavours across the health care sector (Buerhaus, 2010) and prepared for a range of feedback throughout this redevelopment to ensure mutually beneficial academic – practice partnerships (Sherwood & Drenkard, 2007).

CONCLUSION

The impact on students and their QI skill development as they prepared to enter the workforce and how well prepared they felt at the end of their first year of practice was the focus of this evaluative qualitative research. As the largest regulated heath workforce, registered nurses have a key role in leading continuous QI in all settings they work. Graduate nurses' feedback on their preparedness as they reflect on their learning from their undergraduate nursing programme and applying QI in their current practice as registered nurses at the end of their first year of practice, provided essential evidence of the effectiveness in the redevelopment of the curricula. The teaching team continue to work closely with practice partners to improve the QI learning teaching and assessment component and on preparing graduates for the complex workplaces and roles/expectations new graduates encounter. A continual focus on managing life as a new graduate that participants discussed is an ongoing challenge in all health and social service preparation. The two evaluative research projects have provided an important vehicle to focus on QI preparation for role development. The results demonstrate the importance of the multifaceted components of theory, QI models, aligned assessment and partnerships within industry through a deliberate negotiated approach, that contributed to successful outcomes. Students reporting of their learning, confidence, positive preparation and skill acquisition indicates they are the ultimate benefactors of their successful practice based projects. This aids in preparation for the workplace, the people they will care for and the systems they will work in.

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