Report for Research Committee

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How senior New Zealand nursing student's Quality Improvement projects can change practice.

Abstract

Developing a broad understanding of the importance of quality improvement (QI) in pre-registration nursing and health professional education unique to the dual heritage New Zealand context is vital for Bachelor of Nursing (BN) students. To meet the New Zealand Health Strategy (2016), He Korowai Oranga (Maori Health strategy, 2014) and future role requirements, students need intentional, well prepared and facilitated education and practice partnerships. This research project investigated the processes and outcomes of a partnership-based QI educational delivery model in a New Zealand BN programme. Researchers collected questionnaire and interview data from 16 key stakeholders and focus group data with 18 third year students. The investigation included student experiences of the theory and assessment components, experiences in practice, and perceptions of their skill development in preparation for their registered nurse roles. The QI projects completed by students (n=93) as an assessment during this learning were thematically analysed identifying selected QI topics, enablers, barriers and bicultural practices. This paper reports positive stakeholder feedback, a range and depth of student feedback and QI topic project selections including students' experiences in utilisation of their QI knowledge and beliefs about their ability to improve patient outcomes as registered nurses. The key findings are that BN students made changes in their practice settings, and reported their increased confidence in thinking about, identifying and beginning conversations to enact change around quality and safety issues. This research reinforces the importance of strong educational preparation utilising health sector resources, practice partnerships and leadership development.

Key words: Quality improvement, partnership, undergraduate nursing education, practice change

Background

Florence Nightingale, recognised as a founding theorist in nursing education offers,
"… the very first requirement in a hospital that it should do the sick no harm" (Nightingale, 1863, p. iii).
Yet for many health service users this is not the case. Health Quality Standards New Zealand (2017) report that 15% of people in acute care settings experience an unexpected and often

avoidable adverse event impacting their recovery. This same report estimates that improving quality to avoid unnecessary expenditure to resolve harm would save the country an estimated $400 million annually.

Quality Improvement (QI) is essential health care business. QI, according to Djukic, Kovner, Brewer, Fatehi and Seltzer (2013), "is 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 of QI in pre-registration nursing education unique to the New Zealand context is vital for nursing students in order to meet the requirements of the *New Zealand Health Strategy* (2016) and *He Korowai Oranga* (Maori Health Strategy, 2014) and be prepared for their future roles as health professionals. A national study in New Zealand of multiple health professional pre-registration education programmes identified teaching gaps in patient safety and the need to improve 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.

Nurse educators have long 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) diminishing the theory-practice gap (Benner, Sutphen, Leonard & Day, 2009) and improving quality in Bachelor of Nursing student placement experiences (Levett-Jones, Fahy, Parsons, & Mitchell, 2006). QI methods have been introduced into health care to facilitate care 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).

A study of the preparedness for QI reported by a national sample (N=436) of newly graduated Registered Nurses 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 registered nurses (Djukic et al, 2013) identified that in fewer than one third of the 400 Registered Nurse early career respondents across 15 states 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 didactic knowledge to real life improvement projects to enhance QI knowledge in practice.

Studies demonstrating the need to embed QI education in undergraduate nursing programmes include Kyrkjebø, et al, (2001) and in particular recognised QI methods such as Plan-do-study-act,(PDSA, Deming, 1986). PDSA provides an investigative, planning and action model to assist QI in response to issues in practice (Sherwood & Barnsteiner, 2012). Kyrkjebø, et al, (2001) utilised PDSA as a planning tool without an implementation phase,

finding that students positively reported this experience as well as recognising this initiative as important awareness raising and a starting point for ongoing QI development as registered nurses. 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 note the influential effect of local context and the need for formal evaluation of change, as well as the need to document each of the stages of the cycle to assist transferability of learning to another setting. Coles, Wells, Maxwell, Harris, Anderson, Gray, … and MacGillivray (2017) concur suggesting that identifying and overcoming contextual barriers at a local sector level is essential to implementing effective strategies and increasing sustainability and transferability. Accordingly, Reed and Card (2015) suggest that the intended outcome of PDSA is learning and informed action but it cannot promise that users will achieve their desired outcomes. Careful attention to all aspects of application are needed to avoid over simplification, or unrealistic expectations of outcomes for change. The PDSA model and language has been adopted by Health Quality & Safety Commission who developed an *Improving Together* programme with four e-learning modules as an introduction to quality improvement, available free to health and social service providers and consumers mirroring other international initiatives such as The Institute for Healthcare Improvement (IHI).

Whilst studies unique to the New Zealand context and nursing education in undergraduate programmes has been slow (James et al, 2016), nurse educators have an essential role to play in planning learning, teaching and assessment in QI to meet professional competence requirements (Nursing Council of New Zealand, 2019) and needs 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, evidence of poor preparedness for undergraduate nursing education internationally and partly arising from our own longstanding involvement in nursing education in QI, this research project was developed to investigate the legitimacy and scope of these concerns. The impact on students and their QI skill development as they prepare to enter the workforce is the focus of this evaluative qualitative research. This paper analyses the impact of redeveloping the QI component of a third year Bachelor of Nursing paper, *NURS.7117 Kōkiri Mahi Mātanga: Advancing professional practice.* The redevelopment followed four key pedagogical approaches identified as effective in the literature:

- 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).

In response to these findings, QI methodology models and utilisation of PDSA cycles were introduced, including an assessment requiring students to complete a QI project during a

four week aged residential care (ARC) practice placement. The educational and practice preparation was reinforced using a partnership approach utilising key QI theory models and case studies alongside completing four online courses from New Zealand Health Quality Safety Commission. Consultation and negotiations with local hospital quality teams and information exchanges with nurse leaders in ARC practice settings were essential to this QI development. The partnerships ensured we established clear communication and practice development processes as students entered the practice setting to utilise theory development. In addition these relationships supported students investigate and apply PDSA, providing them the maximum opportunity for learning, assisting the removal of contextual barriers and opportunities for improving nursing care. We particularly wanted students to experience contributing positively to patient outcomes and safety, and be equipped with QI skills prior to joining the workforce as new graduate nurses.

Aim of the research

To investigate the collaborative and partnership processes and learning, teaching and assessment practice to best facilitate third year nursing students' successful engagement in a QI assessment project leading to practice change.

Design - Methodology

A qualitative descriptive approach was used to develop an understanding and detailed insights into the pedagogical outcomes of the QI project theory and practice component in the BN programme. The process of developing partnerships and relationships with key practice stakeholders will be captured in a further paper to enable deeper insights into the background and practices of establishing and improving partnership experiences to impact QI teaching, learning and assessment practices.

Ethical approval was received on 17th September 2018 for this project from the Research and Ethics Committee at the regional Institute of Technology. Research funding to resource student focus group refreshment, travel and dissemination of findings was received from the same committee.

Participants and setting

The year three Bachelor of Nursing students who participated in this study were located at a regional tertiary education provider in New Zealand, where QI is facilitated and embedded in a unique curriculum. This Bachelor of Nursing is completed in three years leading to sitting a state final examination for registration as a nurse. This curriculum is developed strongly around quality, professional competence and bi-cultural practices. Its underpinning bi-cultural educational vision and uara (values) are based on the articles of Ti Tiriti o Waitangi and key Māori concepts of whakapono (honesty), whānaungatanga (inclusion/family), wairuatanga (spirituality), manaakitanga (caring and support), tumanakotanga (aspirations), aroha (unconditional care) and mohiotanga (lifelong learning).

This degree is dedicated to advancing Te Ao Māori values and beliefs within nursing and health care settings.

Eighteen year three Bachelor of Nursing students participated in focus groups during this research. The researchers sought consent to review the summative QI assessment project (n=93). Additional participants were key stakeholders (n=16) including aged residential care managers, senior nurses, clinical teaching staff, management staff in Bachelor of Nursing, and Quality Services Unit staff at a local hospital.

Methods

Qualitative methods were used in this evaluative study including an online questionnaire, face to face interviews and focus groups. A thematic analysis was undertaken of the student summative assessment reports (n=93) by the lead author. Students were asked for their consent to include their reports via their practice placement online learning platform. One student asked her report not be included.

A short online questionnaire was used to capture the experiences of educators and stakeholders in establishing the pedagogy and frameworks in practice to assist students engage in and maximise their QI projects. An email inviting participation with detailed information about the research was sent to 30 key stakeholders including teaching and clinical staff, local hospital staff, aged residential care managers and nurse leaders, with a link to the online questionnaire. Consent for the online questionnaire was gained via a statement in the introduction to the survey, reminding participants that by completing the questionnaire, they were giving consent for this research and assuring confidentiality and anonymity. A follow-up telephone or face to face interview was offered to assist data collection. All participants who identified as Māori were supported to participate in ways that support their full involvement as Māori via the Komiti Kaiako in the Department of Nursing. This Komiti nominated a team member to attend focus group interviews who was fluent in te reo Māori (language) and protocols to ensure full participation.

Two focus groups (18 students out of 104) of current year three students were undertaken over approximately 45 minutes in the final study week prior to students sitting the national state final examination. Students were supplied with a participant information sheet online via the learning management platform prior to attending a focus group and a hard copy with a consent form was distributed at the two campus settings, (in two separate cites) prior to this data collection. Focus groups were conducted by senior Bachelor of Nursing staff not engaged in the teaching or assessment process in this course. The questions are outlined in table one.

Table 1. Focus group questions for year three BN students

1. What do you believed worked well for learning about QI in NURS.7117? 2. How did you find accessing Health Quality and Safety (MOH) online modules supported your learning?

3. Please talk about how well you feel you were prepared to meet the QI practice expectations and your assessment?
4. How did the placement setting assist you to complete your QI project during your practicum?
5. How well do you feel you were able to utilise this QI knowledge from NURS.7117 in your transition placement?
6. How well do you believe you will be able to actively engage in QI in practice as an RN?

Dictaphones were used to collect voice recordings and these were transcribed verbatim for theming. Students were offered the opportunity to be sent a transcription of the focus group by leaving their email address/contacting the lead researcher. Whilst the organisation where this teaching delivery and research took place funded this research, the proposal and ethics was independently peer reviewed by a range of staff across the organisation. Staff collecting data were not involved in assessing or teaching this subject. Additional Māori student support was supplied by experienced educators and staff not teaching the course.

Data Analysis

The student project data (n=93) was analysed by topic and QI issue. Each project's aim, outcomes, reported enabling factors, challenges, and reflections of bicultural practices/strategies were coded and categorised to identify emerging themes. Data analysis was triangulated across three researchers which ensured moderation. Once these were triangulated with interview data transcripts, again thematically analysed, with the three researchers separately then together to agree consensus of the key points. Four areas of commentary were identified as providing a useful framework for reporting the work placement QI experience and learning: critical thinking; having the conversation; confidence; and making change.

Findings and discussion

QI topics

Of interest to participants and colleagues with whom the raw data has been shared was the spread of topic areas selected by student nurses. Anecdotally, members of the programme teaching team had been aware of concerns that placements and QI project topics were in danger of becoming "saturated"; and this was actually referred to by one hospital manager during an interview. Preparation for the QI project in class emphasises the need to respond to individual resident, whanau (family) and professional nursing and placement setting demands, rather than just replicate a textbook case study project, regardless of relevance. Figure One below gives a numerical break down of the most commonly selected topics. Despite an isolated incidence of one manager and one site where there may have been a high similarity between projects over recent placements, the range and depth of areas

addressed suggests that our senior Bachelor of Nursing students are developing professional competence in preparation for Registered Nurse roles across a number of theory and practice experiences.

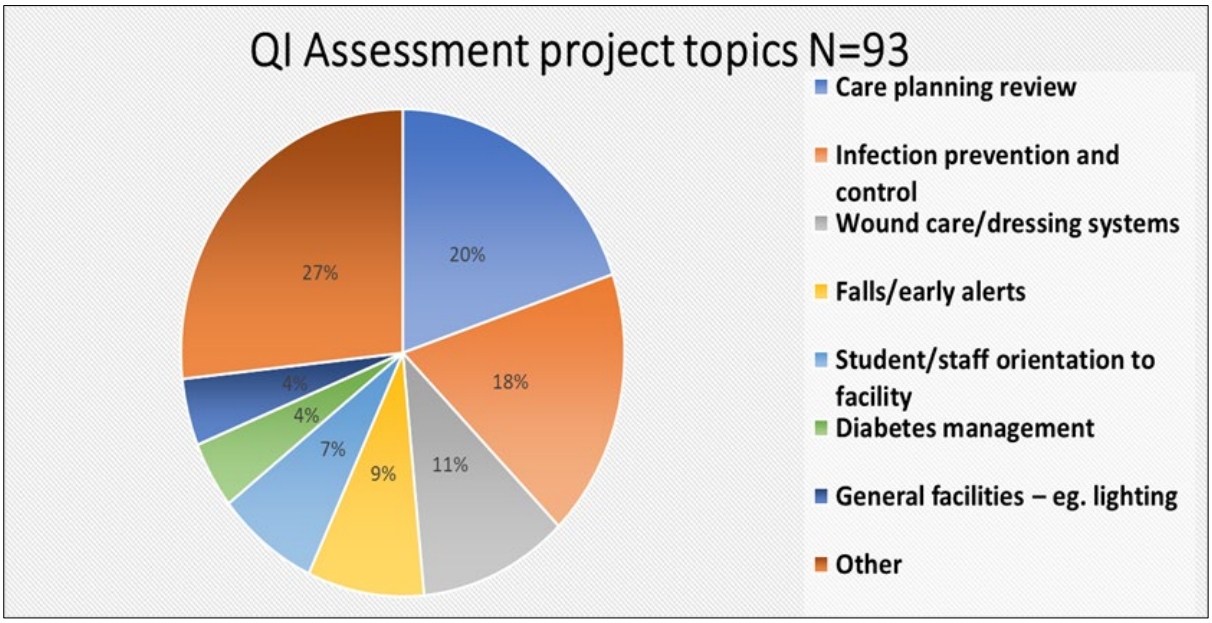

Figure One. Assessment projects identified by Bachelor of Nursing students

As shown in Figure One, the most frequently selected topics were care planning and review, infection prevention and control, wound care/dressings, falls/early alerts, orientation, diabetes management and physical facilities (lighting etc.). Included in 26% of 'other' topics were QI projects which addressed constipation monitoring, managing dementia, manual handling, improving cultural activities, call bells/noise, records confidentiality, medication safety, clothing labelling, restraint practices, secure unit alerts, and client satisfaction recording. Student nurses were investigating and planning interventions around issues such as poor nutritional intake and the need for closer monitoring for some residents with dementia. A 'Blue plate' project – where residents whose nutritional intake needed to be monitored were given their meal on a blue plate, signalling to all staff that they needed to assist, observe and record/report the resident's nutrition intake.

Another project was an investigation to improve blood glucose level monitoring by enrolled nurses and health care assistants through professional development education to improve storage, individual equipment usage, comprehensive blood glucose monitoring to ensure accuracy of results and insulin administration.

Students also produced a number of posters and visual resources to personalise care needs, record favourite activities for residents to be engaged in and additional safe lifting and positioning information to reduce falls.

Seven student QI projects addressed Te Ao Maori, Bachelor of Nursing curriculum cultural values or Ti Tiriti o Waitangi concepts. Fewer students selected this topic area than

expected, given that this is a core focus of our nursing curriculum, and indeed, of all higher education delivery in our bi-cultural nation. Maori as an ethnicity are over-represented in almost every area of our health system (Ministry of Health, 2016) and preparing our graduates to work with effectively Māori is a vital part of our role. Realising the low uptake of QI projects in this area will be one of the most useful findings for our qualification development and delivery teams arising from this research.

Theme 1. Critical thinking

Student focus group data was very rich with a high level of congruency in feedback across both focus groups. One topic was the way in which the word 'think' and 'thinking' was used by a number of the respondents in relation to ongoing QI and practice change – one student stated: …" *you get to the stage of just about thinking*". The following student noted,

> *"You start …thinking about it, doing it, voicing it and realising we might have something here because other people agree* "

Another student recognised the thinking component amongst the conceptualisation and planning component of QI and the importance of congruence with in a team:

> *"One of the things that it taught me is that it needs to be people powered and requires a bit of planning, thinking and documenting, it's like a puzzle*"

Theme 2. Having the conversation

Students noted the importance of the framework in QI to start and continue "the conversation" which links closely to the other three themes,

> *"…skills to start the conversations … you will consciously bring it with you wherever you go"*

> *"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 …"*

Theme 3. Confidence

Bachelor of Nursing students reported their ability to engage in QI with all members of the health care team in their placement setting was in part due to having a model and shared language and resources as well as peer support. Theory and practice development within class activities contributed to this reported confidence. One student stated,

> *"…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… gave me confidence that you can do it..."*

A further student statement captures the interlinking need to communicate with management through increased confidence and developing negotiation skills, as this student identified,

> *"…having confidence of how you would talk to management and how you would in some settings, negotiate a partnership toward change"*

Theme 4. Making change

Enacting change came through strongly in student reports with a number of comments linked to "*knowing you can make a change", p*ulling together concepts and practice through a deeper understanding of QI. One student remark captured a number of the key themes,

> *"being able to identify a target for the benefit of the patient and be accurate with improvements…. already with some experiences with the approach… to be more effective, quicker and more confident"*

Enabling features for QI projects

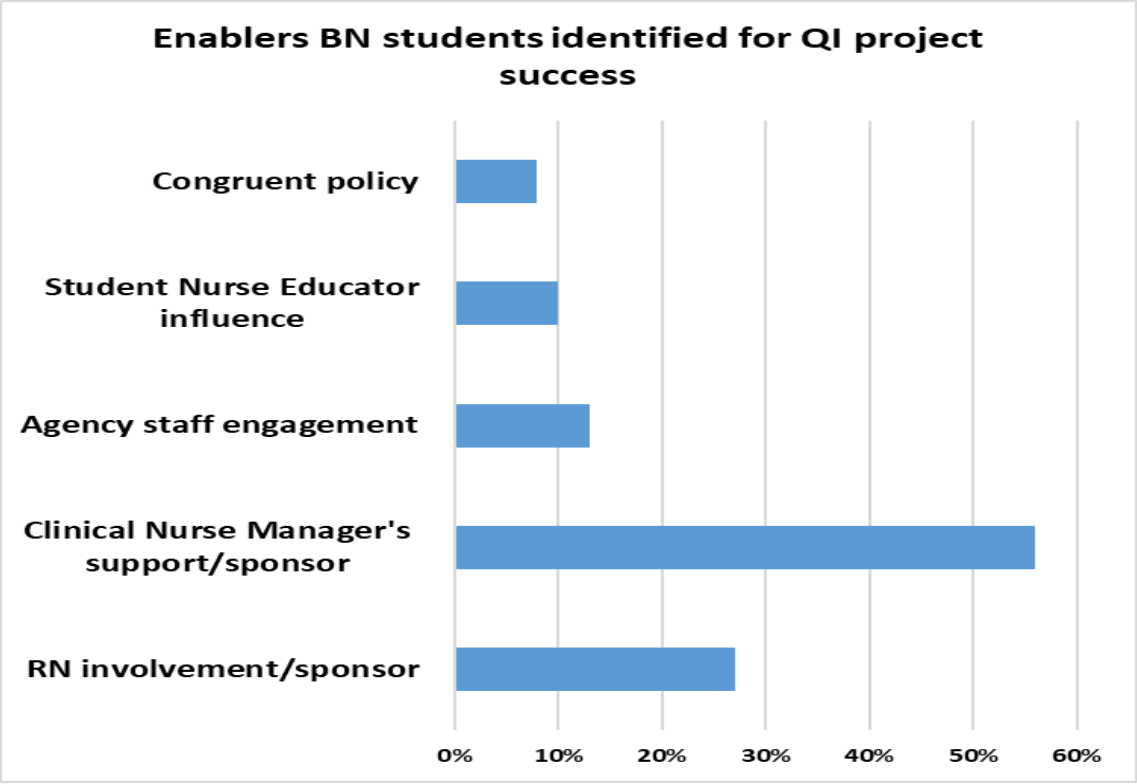

Table 2 Enablers identified by BN students undertaking QI projects in practice

Table two identifies the enabling factors with over half of the projects identifying the clinical nurse leaders/managers as a key support. This figure may be under reported as the assessment instructions required students to negotiate the QI project with nursing

leadership. The number of students identifying the Student Nurse Educator (SNE) as enabling support was expected to be somewhat lower than clinical nurse managers/leaders as students previously had to contact tutorial staff to discuss selected projects. The presence of, and involvement with registered nurses during QI projects, was reported lower than expected. Students reported these staff as having heavy workloads and lack of time that impacted on their availability and ability to utilise them when enacting their QI project. Less than 10% of students identified the impact of policy to enable their project and this finding is addressed further in their analysis of barriers.

Barriers to enactment and change

Table three records the barriers/challenges noted by students in their project summaries. This data set also looks under reported in only 60 of the 93 projects overtly identifying these in their analysis.

Time, both to review and implement projects, was recognised as a key barrier, found by other researchers (James et al, 2016) and congruent with expectations given the four-week practice placement. Students identified a need for staff and professional development across the range of topics chosen to improve quality and patient outcomes. The area of most concern was the 15 projects that identified that the organisations were not practising within their own policies and reinforced the student reporting of need for staff professional development. The need for new practice guidelines, greater compliance and resources were also discussed within student projects as barriers for change.

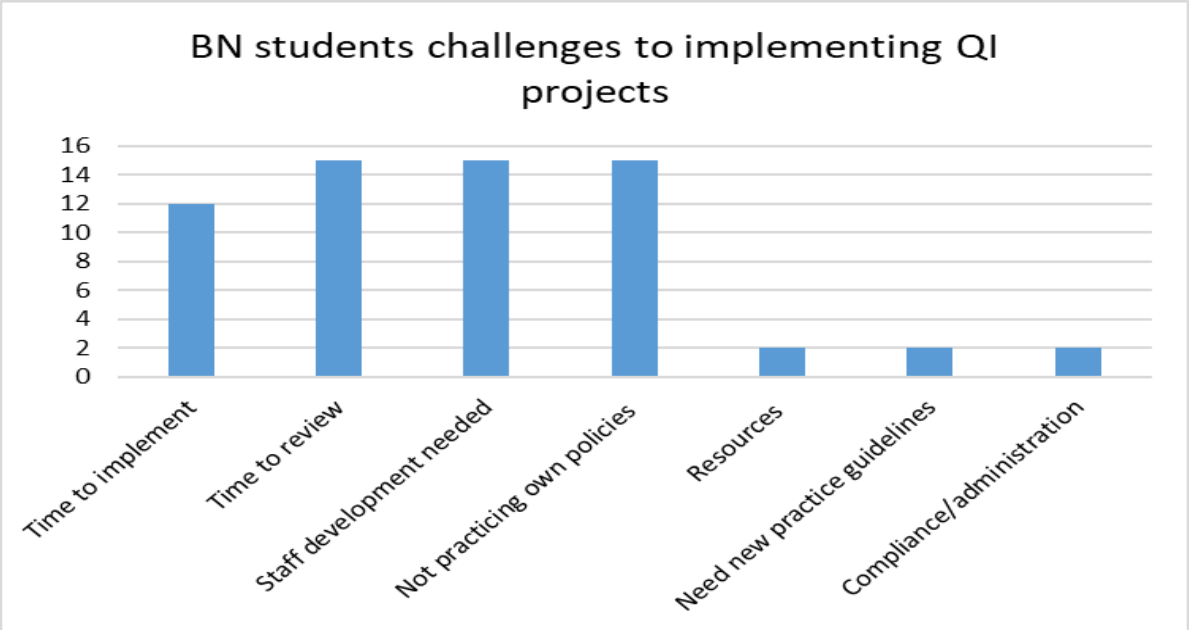

Table 3 Challenges identified by BN students undertaking QI projects in practice

Practice valuing students' QI contributions

The online questionnaire and data from key stakeholder elicited mixed results. Whilst 30 invitations to participate were distributed we analysed 16 returned surveys; six from aged

residential care, five clinical/SNE staff and six face to face interviews with participants who selected this option.

The qualitative comments were very supportive of the initiative with 80% in support of the changed QI teaching approach, 71% identifying positive student's preparation for engaging in QI and 86% reporting congruent outcomes with the ARC placements QI initiatives. Senior managers and nurses identified a range of projects that were implemented and led to practice change including the 'blue plate initiative, blood glucose monitoring, falls risk tools, hand hygiene reminder tools and staff education packages, resident satisfaction assessment and reporting tools, wound dressing management to improved ordering/availability and a range of staff professional development materials.

The responses from members of the Service Improvement Team responsible for QI initiatives and improving safety were confirming in the teaching approaches and projects utilising PDSA and included:

> *"What is exciting for us about what you are doing is that it is a huge chunk of our future nursing staff are having a look at QI before they get into the workforce and we are growing our own"*

A further statement reinforces the importance of both theoretical methodology and change practices:

> *"What we try to do with our service QI is to get as many people on board with change methodology and change language"*

A final comment from the sector noted the importance of empowerment and confidence

> *"We want a culture in our organisation where people feel empowered to make changes and a lot of changes are within their ability to do so"*

Summary

The results presented from QI research validate the importance of effective QI education using a partnership model to attempt to alleviate 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 need for congruent learning, teaching and assessment activities alongside partnership relationships with regional health service providers and access to national quality and standard resources for optimal educational outcomes. This research confirms our beliefs as a 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. Experiencing improving health outcomes for consumers and health care organisations reinforced learning, skill development and change. Such experiences assisted students further develop professional attitudes and recognising QI as an actioned-

orientated and practice discipline (James et al, 2016). They were further able to articulate their responsibilities and increased confidence and capability to potentially propose and enact QI in their practice as registered practitioners.

Bachelor of Nursing students appeared to benefit from engaging in the research process, as we modelled the importance of our own evaluative QI research as educators. Focus groups gave students the opportunity to reflect on their learning and listen to others' experiences in applying PDSA and QI in their practice settings, as well as identifying the skills they have gained through interactions and connected conversations as part of the research process. The utilisation of research to improve practice and enact change through using PDSA was important for students as part of their transition to practice (Sherwood and Drenkard, 2007), and modelling evidence based practice.

To prepare for registered nurse practice, nursing curricula need to provide opportunities for Bachelor of Nursing students to be active contributors to change that increases their confidence and capability to improve safety in practice. Students' insights and developing understanding of QI needs to be fostered and supported by student nurse educators (SNE), registered nurses and clinical nurse leaders, who have a large influence, determining how students relate to the need to embed QI into all aspects of their practice (James et at, 2016). Yet our experience of redeveloping the QI component addressed earlier meant we, as educators, needed to take an active role in the preparation and congruence of both theory and practice for students, and be fully cognisant of the QI endeavours across the health care sector (Buerhaus, 2010). We also needed to be prepared for a range of feedback throughout this redevelopment to ensure mutually beneficial academic – practice partnerships (Sherwood & Drenkard, 2007), and mitigate issues students would raise implementing PDSA in a short time frame.

Recommendations

A range of insights were developed by the research team to enhance the education – practice partnership of delivering this QI learning, teaching and assessment component, which we believe to be of value to continue to improve student experiences and outcomes.

1. The cultural context and Ti Triti O Waitangi responsiveness needs to be embedded in all aspects of learning, teaching and assessment in QI practice.
2. The QI project assessment utilizing PDSA is effective in leading to practice change when it responds to issues found in the holistic patient/client assessment completed by the student during their practicum. Utilizing the patient/client assessment also reinforces the importance of improving patient outcomes and assists to negate the idea of topic saturation reported by one nurse manager.
3. Qi must be taught through interlinking components of theoretical preparation, online learning resources reflecting the Health sector national standards, language and approaches and reinforced in a well prepared practice environment.

4. As practice based discipline, QI needs strong theories of change and – 'how you might start the conversation about your QI initiative', based on scenarios to assist skill development is advised for the next offering
5. More support is needed for student nurse educators prior to practice to provide detailed explanatory notes on the QI assessment and pre-practice to improve their positive impact to support enacting projects.
6. A further research project suggested to assess the effectiveness of the introduction of this renewed QI component with these same students who are now new graduate nurses to gather their feedback about their enduring knowledge for registered nurse practice(also supported findings by James et al, 2016).

Conclusion

The impact on students and their QI skill development as they prepare to enter the workforce was the focus of this evaluative qualitative research. Four areas of commentary used to report the work placement QI project experience and learning were critical thinking; having the conversation; confidence; and making change, provided researchers with evidence of the effectiveness of the renewed QI education in a third year BN paper. Student and stakeholder feedback were highly congruent with each data set analysis demonstrating the importance of the multifaceted components of theory, QI models, aligned assessment and partnerships within industry and clinical practice staff through a deliberate negotiated approach, contributed to successful outcomes. The unique BN curriculum and associated values means the findings may not be generalizable to other programmes of nursing without modifications.

Barriers to implementation and issues for ongoing development of student learning were identified from their projects and along with focus group data, enabled the teaching team to confirm the approach to reinforced student thinking, confidence development and ability to effect change. Improvements for the next offering of the course were able to be summarised and reported to further improve student experiences and outcomes.

Students report of their learning and skill acquisition indicates they are the ultimate benefactors of theirs successful practice based projects alongside the people they will care for and the systems they will work in.

References

Armstrong, G., Headrick, L., Spiese, H. M., Madigosky, W., & Ogrinc, G. (2012). Designing education to improve care. *The Joint Commission Journal on Quality and Patients Safety. 30*(1) 5-14

Benner, P., Sutphen, M., Leonard,V., & Day, L. (2009). *Educating nurses: A call for radical transformation.* San Francisco, CA: Jossey-Bass.

Buerhaus, P., (2010) Quality Improvement Education for Nurses: We can do better. *The Joint Commission Journal on Quality and Patient Safety,* 36 (1), 28. Doi.org/10.1016/S1553-7250-7250(10)36005-3

Coles, E., Wells, M., Maxwell, M., Harris, F., Anderson, J., Gray, N. M., ... MacGillivray, S. (2017). The influence of contextual factors on healthcare quality improvement initiatives: what works, for whom and in what setting? Protocol for a realist review. *Systematic Reviews, 6,* 1-10. DOI: 10.1186/s13643-017-0566

Djukic, M., Kovner, C., Brewer, C., Fatehi, F., & Seltzer, J. (2013). A Multi-State Assessment of Employer-Sponsored Quality Improvement Education for Early-Career Registered Nurses. *The Journal of Continuing Education in Nursing, 44*, (1,) 12-19

Health Quality and Safety Commission (2017) *A window on the quality of New Zealand Health care.* Health Quality and Safety Commission. Wellington.

Huber, D. (2018*). Leadership and nursing care management* (6th ed.). Sydney, Australia: Elsevier.

James, B., Beattie, M., Shepherd, A., Armstrong, L., & Wilkinson, J. (2016) Time fear and Transformation: Student nurses' experiences of *doing* a practicum(quality improvement project) in practice. *Nurse Education in practice, 19*. 70-78

Kovner, C., Brewer, C., Yingrengreung, S., & Fairchild, S. (2010). New Nurses' view of Quality Improvement Education. *The joint Commission Journal on Quality and Patient Safety*, *36*(1), 29-35.

Kyrkjebø, J., Hanssen, T. & Haugland, B. (2001). Introducing quality improvement to pre-qualification nursing students: Evaluation of an experiential programme. *Quality in Healthcare,* 10, 204-210.

Langley, G., Moen, R., Nolan, K., Nolan, T., Norman, C., & Provost, L. (2009). *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance (2nd edition)*. San Francisco, USA: Jossey-Bass Publishers.

Levett-Jones, T., Fahy, K., Parsons, K., & Mitchell, A. (2006). Enhancing nursing students' clinical placement experiences: A quality improvement project. *Contemporary Nurse, 23* (1) 58-71.

Mery, G., Dobrow, M., Baker, R., Im, J., & Brown, A. (2017). Evaluating investment in quality improvement capacity building: A systematic review. *British Medical Journal, Open*. Doi; doi.org/10.1136/bmjqopen-2016-012431.

Ministry of Health (2016) *The New Zealand Health strategy: Future directions*. Wellington, New Zealand. Ministry of Health. Retrieved from http://www.health.govt.nz/system/files/documents/publications/new-zealand-health-strategy-roadmapofactions-2016-apr16.pdf

Ministry of Health (2012). Improving together. Wellington, NZ: Ministry of Health.

Nightingale, F. (1863). *Notes on Hospitals* (3rd ed). London: Longman, Green, Longman, Roberts and Green.

Nursing Council of New Zealand. (2016*) Competencies for registered nurses*. Wellington. Author.

Reed, J., & Card, A. (2015). The problem with Plan-Do-Study-Act cycles*. British Medical Journal Quality & Safety, 25* (3), 1-15 dx.doi.org/10.1136/bmjqs-005076.

Robb, G., Stolarek, I., Wells, S. & Bohm, G. (2017). The state of quality improvement and patient safety teaching in health professional education in New Zealand. *NZ Medical Journal,* 130 (1464) 13-24.

Sherwood, G., & Barnsteiner, J.(2012) *Quality and Safety in Nursing: A competence approach to improving outcomes.* Chichester, UK: Wiley-Blackwell. http://dx.doi.org/10.1016/j.nepr.2016.05.004

Sherwood, G., & Drenkard, K. (2007). Quality and safety curricular in nursing education: Matching practice realities. *Nursing Outlook, 55,* 151-155. Doi:10.1016/j.outlook.2007.02.004

Taylor, M., McNicholas, C. Nicolay, C., Darzi, A., Bell, D., & Reed, J. (2013). Systematic review of the application of the plan-do-study-act method to improve quality in healthcare. *British Medical Journal, Quality and Safety*., 1-9. doi:10.1136/bmjqs-2013-001862