Integrating quality improvement into pre-registration education


Abstract
Healthcare organisations around the world are adopting new strategies to improve the quality of patient care in response to reports of negative patient outcomes and cuts to public service expenditure. However, many nurses lack the knowledge, skills and attitude to improve the systems within which they work, calling for a radical redesign of nursing education to integrate quality improvement science. This article describes the integration of quality improvement education within undergraduate nursing education programmes in Wales through collaboration between higher education institutions, NHS Wales and the UK Institute for Healthcare Improvement Open School.

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UNDERGRADUATE NURSING EDUCATION programmes in the UK are increasingly covering topics such as quality improvement and patient safety, reflecting the need to produce a workforce that is prepared for the future demands of the NHS (Nursing and Midwifery Council (NMC) 2010, Welsh Government 2012a). This article describes how Cardiff University and Glyndwr University in Wales, in partnership with NHS organisations and the Institute for Healthcare Improvement (IHI) Open School, have since 2011, integrated the topic of quality improvement into undergraduate nursing programmes.

Policy directives and nursing curricula
Governments worldwide have tasked healthcare professionals with delivering high quality and safe patient care that provides the best value for money (Patel et al 2012). The report High Quality Care for All (Department of Health 2008) put quality at the heart of the NHS in England, recognising that everyone should play a part in promoting high quality care for patients. The Quality Delivery Plan for the NHS in Wales (Welsh Government 2012a) set out a vision for health care based on ‘providing services that are safe, effective, accessible, affordable and sustainable – reducing harm, variation and waste’. The document defined excellent quality of care simply in the following terms: doing the right thing, in the right way, at the right time, at the right place and with the right staff. Explaining quality care in this way gives students and educators a clear insight into what can be a complex issue. In addition, all staff, including students working in the NHS and partner institutions such as universities that train healthcare professionals, are identified as having a responsibility for ensuring continual improvement in the quality of care delivered to patients.

As well as government recommendations, the NMC (2010) stated that all nursing students, regardless of specialist field of practice, need to act as ‘change agents’, to enhance people’s wellbeing and experiences of health care through leadership and quality improvement. Therefore,
the NMC (2010) positions students and educators as important allies in an effort to improve health care in the UK. It also indirectly raises the issue of how quality improvement and change should be taught and promoted to students.

These policy directives develop existing insights that recognise healthcare students as being ideally placed to bring new and innovative ideas to the workplace and become a force for positive change. In the United States (US), for example, the Quality and Safety Education for Nurses project encourages nursing students and educators to identify and close gaps between present care and ideal care (Sherwood 2011). Similarly, the NHS Institute for Innovation and Improvement (2009) in England, working with universities and their partner NHS organisations, has shown how the principles of quality improvement can be introduced successfully into pre-registration curricula. As a result of this work, the number of staff with knowledge of basic quality improvement tools, and who have undertaken an improvement project, has increased substantially. Furthermore, quality improvement courses have led to reports of students feeling more empowered and valued (NHS Institute for Innovation and Improvement 2009). However, until recently, the principles of quality improvement have been largely absent from nursing and other undergraduate healthcare courses in Wales.

**Defining quality improvement**

The Institute of Medicine (2001) in the US set out six dimensions of quality in health care (Box 1), which have been accepted universally. Although the definition of quality improvement escapes consensus, it has been defined as ‘the combined and unceasing efforts of everyone – healthcare professionals, patients and their families, researchers, payers, planners and educators – to make the changes that will lead to better patient outcomes (health), better system performance (care) and better professional development (learning)” (Batalden and Davidoff 2007). Viewed in this way, quality improvement and ‘change making’ should become an intrinsic part of everyone’s job, every day in all parts of the healthcare system.

While change management and theories of change have long featured in nursing curricula, quality improvement approaches encourage practitioners to confront the fact that not all change results in improvements. Consequently, one of the main principles of quality improvement is the use of measurement to determine whether a change in practice has led to an improvement in the quality of health care. For example, the Model for Improvement, a quality improvement methodology used in health care throughout the UK and internationally, is based on three questions or ‘thinking components’ (Langley et al 1996):

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What change can we make that will result in the improvements we seek?

These questions establish what the intended aim, measures and outcomes of the improvement project will be. The model is used in conjunction with the ‘Plan Do Study Act’ (PDSA) approach (1000 Lives Plus 2012):

- Plan – what are you going to do?
- Do – carry out the plan and collect information on what worked well and what issues need to be addressed.
- Study – analyse the information gathered and review the aim of the change against what actually happened. Questions that need to be asked include what worked and what did not work or what should be adopted, adapted or abandoned?
- Act – use the results to plan the next PDSA cycle.

In short, each PDSA cycle begins with a plan and ends with an action based on learning gained. Therefore, learning is carried over into successive PDSA cycles. However, it is important to remember that many changes tested in PDSA cycles will not result in improvement. The key is to use learning to amend the change and continue to test and measure for improvement.

Once an improvement has been implemented successfully in one setting, changes can then be implemented more widely, for example in another

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**BOX 1**

**Six dimensions of quality in health care**

- **Safe**: avoiding injuries to patients from care that is intended to help.
- **Effective**: providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and overuse).
- **Patient-centred**: providing care that is respectful of and responsive to individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions.
- **Timely**: reducing waiting times and sometimes harmful delays for those who receive and give care.
- **Efficient**: avoiding waste, in particular waste of equipment, supplies, ideas and energy.
- **Equitable**: providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location and socioeconomic status.

(Adapted from Institute of Medicine 2001)
ward or department. However, despite developing a set of changes that result in success in one setting, the context and the people are likely to be different elsewhere – so further multiple PDSA cycles are required for local adaptation.

The national programme for quality improvement in Wales

Nursing students at two Welsh universities participated in quality improvement projects that they devised themselves during 2011/12.

Supported by lecturers at Cardiff University and Glyndwr University, the national programme for quality improvement in Wales – 1000 Lives Plus – and the IHI Open School, students have participated in quality improvement learning events and practical projects. The IHI Open School is an interdisciplinary community of more than 100,000 student and faculty members that aims to advance healthcare improvement competencies in future generations of healthcare professionals worldwide (IHI 2012).

IHI Open School student members have free access to online courses to acquire knowledge and skills in leadership, patient safety and quality improvement, to plan and improve services in their clinical environment. The IHI Open School also encourages setting up student chapters where, supported by teachers, students engage with each other about issues related to quality improvement in health care. For example, chapters show students arranging seminars and discussions featuring esteemed speakers and participating in healthcare campaigns such as promoting hand hygiene or the safe disposal of sharp instruments. There are over 500 chapters around the world and the IHI Open School community supports the sharing and spread of learning within and between chapters.

Students and educators in Wales benefit from the 1000 Lives Plus learning events and opportunities, including awareness raising events, competency-based competitions, social networking and informal teaching sessions. 1000 Lives Plus has also been instrumental in promoting better collaboration between universities through hosting events where educators from across Wales meet to discuss incorporating quality improvement into the curricula. As a result of one such event hosted by 1000 Lives Plus, educators at Cardiff and Glyndwr Universities, working closely with the IHI Open School, started to design and support additional quality improvement teaching and learning opportunities.

During clinical placements, students are frequently exposed to 1000 Lives Plus national improvement programmes, which include projects that examine areas of practice such as reducing healthcare-associated infections or hospital-acquired pressure ulcers. Furthermore, 1000 Lives Plus supports classroom teaching and learning activities, for example through delivering presentations to students about the quality and safety agenda in Wales and co-hosting a conference with the NHS Institute for Innovation and Improvement for all UK-based IHI Open School chapters, to showcase student improvement projects called Small Changes, Big Impact (www.1000livesplus.wales.nhs.uk/small-changes-big-impact).

Because of collaboration between the universities, the IHI Open School and 1000 Lives Plus, students learn that quality improvement has relevance in clinical and academic contexts, providing a useful bridge over the often lamented theory-practice gap (Landers 2000). For example, first-year students are introduced to the principles of quality improvement methodology in the classroom and are supported to undertake more in-depth online learning via IHI Open School quality improvement modules (Table 1). This learning is revisited in the second year, when students have the opportunity to interact with guest speakers from NHS Wales during classroom seminars that focus on improvement projects being undertaken in clinical areas.

Third-year students are then guided by NHS and university staff through practical steps involved with undertaking improvement projects. For example, students learn how to ‘process map’ a recurring clinical procedure such as arranging a patient’s discharge home from hospital to identify areas where the process may be improved.

Throughout the three years of pre-registration training, nursing students develop their existing knowledge and skills. The core learning introduced in the first year is revisited and extended in subsequent years. Learning about quality, quality improvement and associated topics such as patient safety, effectiveness or patient-centredness, also occurs in many areas throughout the curriculum. For example, in learning about patient handover students are taught a handover approach – in this case using the SBAR (Situation, Background, Action and Recommendation) framework, which touches on many aspects of quality.

The quality improvement curriculum displayed in Table 1 should not be seen as exhaustive or standalone, but as providing a series of learning opportunities focusing on a specific set of skills that complement and enhance content existing elsewhere in the curriculum. Students’ learning is formatively assessed in a number of ways.
Quality improvement projects

Students are not required to undertake a quality improvement project during their undergraduate training. Instead they are expected to be able to plan a quality improvement project. Developing students’ capabilities in planning is commensurate with quality improvement programmes of study in pre-registration courses in England (NHS Institute for Innovation and Improvement 2009). The decision to limit course requirements in this way avoids potential impracticalities associated with large cohorts of students undertaking quality improvement in clinical areas, especially in terms of resource and support issues.

Exposure to quality improvement methodology in the curriculum has been reported by students as key to raising their awareness of improvement work being undertaken in clinical practice. For example, students at both universities in Wales have reported seeking out and participating in quality improvement projects under way in clinical placement areas, either as part of national 1000 Lives Plus projects, or more local improvement initiatives undertaken within a ward or community team.

Several nursing students from Cardiff University and Glyndwr University have taken their learning a step further by completing their own PDSA cycles (Box 2). These students negotiated the support of clinical staff and university staff before commencing beyond the planning stage, while the area of practice identified for improvement has coincided with existing ward priorities. Although the projects undertaken were in addition to the students’ usual pre-registration workload, this did not hinder their successful progression with coursework and clinical placements. Nursing students did not perceive the extra work as an additional burden, but felt that undertaking quality improvement further enhanced their learning.

Such encouraging feedback has led educators at both sites to consider ways of supporting students to get involved in practical quality improvement. For example, consideration is being given to organising short placements for students with teams that regularly undertake or interface with quality improvement initiatives such as clinical audit, quality improvement or patient safety and clinical governance teams.

An example of how a nursing student used the Model for Improvement and PDSA cycles to improve an area of patient care appears in Box 3. Particularly noteworthy is how the initial plan of

TABLE 1

<table>
<thead>
<tr>
<th>Example of Cardiff University pre-registration nursing and midwifery quality improvement curriculum</th>
<th>Quality improvement topic area</th>
<th>Mode of delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>What is quality?</td>
<td>Lessons one to four delivered during ‘introduction to quality and patient safety’ study day in module 2. Sessions delivered by NHS and university staff with IHI Open School representatives. Online learning via IHI Open School.</td>
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<tr>
<td></td>
<td>What is patient safety?</td>
<td>Two half-day study sessions: the first covering lessons one and two, the other covering three and four. University and NHS staff teaching in collaboration. IHI Open School patient stories module to be completed.</td>
</tr>
<tr>
<td></td>
<td>What are human factors and system factors? Why are they important to patient safety and quality?</td>
<td>Three half-day study sessions: the first covering lessons one and two, the second covering three and four, and the last on planning a PDSA cycle. University and NHS staff teaching in collaboration.</td>
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<td></td>
<td>Introduction to quality improvement (QI) methods: the Model for Improvement.</td>
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<td></td>
<td>Online learning: complete three Institute for Healthcare Improvement (IHI) Open School modules.</td>
<td></td>
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<tr>
<td>Year 2</td>
<td>Understanding systems and the effect of complexity on patient care.</td>
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<td></td>
<td>Understanding and learning from errors and variation.</td>
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<td></td>
<td>The role of patient stories in QI.</td>
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<td></td>
<td>IHI Open School online module.</td>
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<td></td>
<td>Revisit the model for improvement and practical exercises, for example fishbone and driver diagrams, process mapping activity, and how they fit in a Plan Do Study Act (PDSA) cycle.</td>
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<tr>
<td>Year 3</td>
<td>Choosing a QI project – raising awareness of planning and organisation issues, such as obtaining clinical support and time management.</td>
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<td></td>
<td>Measurement of improvement – run charts, outcome measures and audit.</td>
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<tr>
<td></td>
<td>Ethics and QI.</td>
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<td></td>
<td>Planning a PDSA cycle.</td>
<td></td>
</tr>
<tr>
<td>BOX 2</td>
<td>Examples of nursing students’ quality improvement projects 2011/12</td>
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<td></td>
<td>Implementation of a new checklist for patients with mouth care needs.</td>
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<td></td>
<td>Compliance of staff with the SKIN bundle to reduce the incidence of pressure ulcers.</td>
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<td></td>
<td>Implementation of the All Wales Food Record Chart as part of a standard assessment on admission for all patients.</td>
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<tr>
<td></td>
<td>Alleviation of pain during subcutaneous injections.</td>
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</table>
**Example of one nursing student’s quality improvement project**

During clinical practice a nursing student realised that mouth care was sometimes overlooked on the ward. The student designed a chart to encourage nursing staff to assess, document and provide mouth care to patients at risk of developing problems or needing assistance with oral hygiene. The aim of the project was to improve mouth care. Ward staff were asked to provide feedback about the chart.

The project was evaluated using a ‘Plan Do Study Act’ (PDSA) cycle. The original plan was for staff to complete a checklist. However, during the Do and Study stages of the PDSA cycle, it was identified that staff did not wish to complete a separate assessment. The student worked with ward staff to adapt the documentation so that it could be incorporated into the main patient assessment.

Once these changes had been made, the student noted that compliance with completing the documentation increased and patients were receiving better mouth care.

The project is ongoing. The new documentation will track whether mouth care and 12-hourly tooth brushing are being undertaken, as well as ensuring any further oral healthcare treatment is provided as required. While the student was undertaking the PDSA cycles, the All Wales Fundamentals of Care Audit (Welsh Government 2012b) reported the need for further improvement with oral health and hygiene, adding further momentum to the project.

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**Conclusion**

The requirement to integrate quality improvement into the undergraduate nursing curriculum in Wales has resulted in an innovative partnership between universities, the NHS and the IHI Open School. Since undergraduate students’ learning is being delivered by a variety of healthcare practitioners and educators, quality improvement education and practice in Wales have been presented as co-existing naturally, rather than being a separate activity.

The solid foundations on which the partnership is based, allied to the students’ willingness to undertake practical projects mean that future developments to further enhance quality improvement education and practice within undergraduate programmes are much anticipated.