



Using root cause analysis to promote critical thinking in final year Bachelor of Midwifery students

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TITLE: Using root cause analysis to promote critical thinking in final year Bachelor of Midwifery students; An Australian example

ABSTRACT

Background: Midwives require well developed critical thinking to practice autonomously. However, multiple factors impinge on students' deep learning in the clinical context. Analysis of actual case scenarios using root cause analysis may foster students' critical thinking and application of 'best practice' principles in complex clinical situations.

Objective: To examine the effectiveness of an innovative teaching strategy involving root cause analysis to develop students' perceptions of their critical thinking abilities.

Methods: A descriptive, mixed methods design was used. Final 3rd year undergraduate midwifery students (n=22) worked in teams to complete and present an assessment item based on root cause analysis. The cases were adapted from coroners' reports. After graduation, 17 (77%) students evaluated the course using a standard university assessment tool. In addition 12 (54%) students provided specific feedback on the teaching strategy using a 16-item survey tool based on the domain concepts of Educational Acceptability, Educational Impact, and Preparation for Practice. Survey responses were on a 5-point Likert scale and analysed using descriptive statistics. Open-ended responses were analysed using content analysis.

Results: The majority of students perceived the course and this teaching strategy positively. The domain mean scores were high for Educational Acceptability (mean= 4.3, SD= .49) and Educational Impact (mean = 4.19, SD = .75) but slightly lower for Preparation for Practice (mean = 3.7, SD = .77). Overall student responses to each item were positive with no item mean less than 3.42. Students found the root cause analysis challenging and time consuming but reported development of critical thinking skills about the complexity of practice, clinical governance and risk management principles.

Conclusions: Analysing complex real life clinical cases to determine a root cause enhanced midwifery students' perceptions of their critical thinking. Teaching and assessment strategies to promote critical thinking need to be made explicit to students in order to foster ongoing development.

Key words: midwifery students; critical thinking; decision-making; root cause analysis; teamwork, assessment

INTRODUCTION

Although scientific knowledge underpinning evidence-based midwifery practice is rapidly expanding there remains uncertainty regarding 'best practice' in many clinical situations (Scholes et al., 2012). In order to promote safe autonomous practice, midwives are required to possess and enact high levels of professional judgement, critical thinking and decision making skills (Lake and McInnes, 2012; Cioffi et al., 2005; Kitson-Reynolds, 2009). Critical thinking involves higher level thinking and reasoning skills that facilitate thinking in a controlled, purposeful, focussed and conscious way when making decisions (Simpson and Courtney, 2002). "Cognitive competence" of this nature is critical for effective, safe, autonomous practice (Newstead and Hoskins, 2003; Cronenwett et al., 2007), yet there is a dearth of literature about how midwives make decisions and develop the required cognitive skills (Jefford et al., 2010). Midwives often report limited confidence in their clinical judgment and seek validation of their decisions from perceived higher order authorities such as doctors (Jefford et al., 2010).

Best practice midwifery involves continuity of care throughout the perinatal period provided by a known midwife (Hodnett, 2008). Accredited undergraduate midwifery programs therefore need to develop students' cognitive skills to enable them to work as autonomous practitioners (Australian Nursing and Midwifery Council, 2010). These skills are important in promoting safe, evidence-based practice rather than the adoption of ritualistic behaviour and routines (Kramer and Schmalenberg, 2008; Cronenwett et al., 2007). It is often assumed that students develop critical thinking skills during their clinical placement when engaged in the mentor-student relationship. However, the reluctance of some midwives to be autonomous decision makers may limit students' development of critical thinking skills. With escalating clinical workloads and dwindling staffing levels, the preceptor relationship is often not prioritised (Fisher and Webb, 2008) further limiting opportunities for students to observe and learn critical problem-solving skills. Consequently, it is not surprising that students report observing poor care and decision making practices during clinical placement (Licqurish and Seibold, 2008). Students also report being reluctant to challenge practice. They tend to conform to their preceptor's behaviour, and adopt routine practices rather than learning to develop and apply their own critical thinking to their practice (Begley, 2001).

Although development and assessment of critical thinking and decision making can be addressed during on-campus learning this is not consistently achieved. For example, a review of a midwifery curriculum by Lake and McInnes (2012) found limited consideration was given to developing students' cognitive abilities. Regardless of whether students were actually developing these skills, the students were not aware of attempts to do so, and did not recognise explicit teaching strategies. Participating in

focus group discussions as part of the research study encouraged students to reflect on their learning and recognise instances of cognitive skill development not noted previously during their studies (Lake and McInnes, 2012).

Several teaching strategies aim to enhance critical thinking. Simulated clinical scenarios are a predominant teaching and assessment strategy used in midwifery preparatory programs to develop and assess students' cognitive skills. Cioffi et al. (2005), for example, compared the effects of clinical simulation (n=18) with a standard lecture (n=18) on midwifery students' critical thinking abilities. Students who received the simulation intervention collected more clinical information, re-examined collected clinical information less often, made fewer formative judgements, reported higher confidence, and made final decisions quicker than students in the control condition (Cioffi et al., 2005). However, Scholes et al., (2012) studied responses of midwifery students to a complex simulated postpartum haemorrhage scenario and found that students had difficulty prioritising their actions when more than one response was required to a clinical cue. The students failed to demonstrate any inductive and/or deductive reasoning or thinking. Similar findings were reported by Mitchell et al (2009) in their review of the use of clinical simulation using an OSCE (Objective Structured Clinical Examination). Mitchell et al (2009) concluded that at the undergraduate level, it is the concrete, measurable aspects of clinical performance that are best assessed by the OSCE and that a variety of assessment methods is required to measure critical thinking skills. While simulation activities are useful for clinical skill development, including decision making, simulation activities are limited in developing critical thinking in clinical situations where interpretation of multiple data sources is required (Mitchell et al., 2009). Mong-Chue (2000) argued that critical thinking requires controlled, purposeful, focussed and conscious processes. Development of critical thinking requires a deeper learning approach using analytical skills and judgements above and beyond standard clinical simulation where rapid decision making is paramount. Similarly, Kitson-Reynolds (2009) argued there is limited evidence measuring the effectiveness of simulation on fitness to practice in the complex world of midwifery practice.

Assessment has the capacity to influence students' behaviour more than the actual teaching they receive. Assessment tasks can prompt students to truly engage with teaching content and promote deeper learning (Biggs and Tang, 2007). It is particularly important for students to be proficient in situations they will encounter when they graduate, therefore assessment should be focussed on meaningful tasks that replicate real world challenges (Mueller, 2005). The authenticity of an assessment is measured by the similarity between the cognitive demands of the assessment compared to that of the real life situation on which the assessment is based (Boud and Falchikov, 2006). An

authentic assessment item in midwifery would need to encompass teamwork, communication, and decision making in uncertain and unpredictable circumstances (Homer et al., 2009). Furthermore, such assessment would need to be congruent with the development of critical thinking and decision making and require simultaneous decisions amongst a multitude of variables. Utilising real world assessments that contain multiple complexities for students to problem solve may be effective in developing critical thinking skills.

This study aimed to evaluate the effectiveness of an innovative teaching strategy involving root cause analysis to develop students' critical thinking within a clinical decision-making framework. Root cause analysis is a systematic process used to promote quality and safety by identifying the source of the problem, and preventing the problem from reoccurring (Connelly, 2012). In health care, the problem often has multiple, interrelated root causes in areas such as policies and procedures, human resources, environment of care, information management, and communication. An important aspect of root cause analysis is to focus on the system rather than individuals when analysing the situation. A systems approach examines how a particular system failed to produce the desired outcome and led to the error. Connelly (2012) argues that all factors that lead to errors should be examined in order to identify ways to prevent repetition of the error. There is limited research on the use of root cause analysis in health professional education. Lamberton and Mahlmeister (2010) described the use of a simulated root cause analysis with undergraduate nursing students but its use has not been explored in midwifery education. Although Lamberton and Mahlmeister (2010) suggested this simulation activity could reduce the likelihood of errors as students enter the profession, no measurement of changed thinking or improved safe practices was attempted. There is a need to measure the effectiveness of root cause analysis as a teaching strategy.

METHOD

A descriptive, mixed methods design was used to examine the effectiveness of an innovative assessment process involving root cause analysis designed to develop critical thinking in student midwives.

Context

The Bachelor of Midwifery is an accredited three-year program which commenced in 2010 and offered through the School of Nursing and Midwifery in a publically-funded, research intensive Australian University. The curriculum is designed around a philosophy of woman-centred care and incorporates

reflection and development of critical thinking into teaching, learning, and assessment strategies at each year level. The program is delivered in blended mode, which involves a combination of face-to-face intensive teaching, interactive on-line material including “real time” webinars (web-based discussions), supervised clinical practice, and lecturer-led face-to-face tutorials situated in clinical sites. Students are placed within the same practice organisation for the duration of their degree program. This flexible mode of delivery allows students to focus their learning within clinical practice and the single placement option enables students to develop relationships and consolidate learning within one organisation.

The final clinical course (or subject) of the program focuses on transition to professional midwifery practice. This capstone course is designed to consolidate knowledge, provide an opportunity to apply critical thinking to plan, deliver, and evaluate care within a reflective framework. In 2012 there were 22 students enrolled in the final year course.

Assessment item and process

The major assessment item for the course incorporated root cause analysis using real coroners’ reports as the basis for the case scenarios. A web search was conducted to identify suitable and available coroners’ reports of cases involving maternal and newborn care from Australia, New Zealand and the United Kingdom. Each selected case was used to create a scenario. The focus of each case study is outlined in Table 1. Topics included post-partum haemorrhage, streptococcus-A septicaemia, amniotic fluid embolism/uterine rupture, and eclampsia.

Measures

The utility framework was used to evaluate the value of the assessment task (van der Vleuten, 1996). Within this framework, the value of an assessment format considers aspects inherently linked to the curriculum such as reliability, validity, educational impact, acceptability, and cost effectiveness (van der Vleuten, 1996).

A 16-item survey tool based on the domain concepts of Educational Acceptability, Educational Impact and Preparation for Practice was developed. Item responses were on a 5-point Likert scale of 1 = strongly disagree to 5 = strongly agree. There were also open-ended questions that asked students what they: (1) enjoy most/least about this assessment item; (2) learned from this assessment item; and

(3) how could it be improved. The survey tool was reviewed by an expert panel (n= 8) consisting of midwifery educators, clinicians, managers and government advisors. Panel members were briefed on the purpose of the tool and commented on the extent to which each item accurately reflected the corresponding domain. Discussion followed, modifications to the wording were made, and consensus reached.

Student Evaluation of the Course (SEC) is a 9-item survey that asks students to rate the quality of the course on a 5-point Likert scale of 1=strongly disagree to 5 = strongly agree (Nulty, 2004). Items include, "My skills in analysis and problem solving increased as a consequence of doing this course", and "Overall I am satisfied with the quality of this course". Students may comment on areas for improvement. The SEC is a standardised measure used routinely throughout the university.

Procedure

Students were introduced to root cause analysis during the intensive teaching period at the beginning of semester. The lecturer described a root cause analysis framework and instructions on how to examine a case from the perspective of midwifery and other maternity disciplines involved in the case. Root cause analysis usually consists of 7 critical steps: define the problem, gather evidence, identify causes, identify root causes, identify potential solutions, implement solutions and assess the impact (US Accountability Office, 2004). There may be several root causes for a particular situation.

Class sessions also aimed to develop a deeper awareness of reflective practice and principles of clinical governance. Clinical governance in Australia refers to processes that ensure high standards of clinical performance including, clinical risk management, clinical audit, ongoing professional development and well developed processes to take action to manage adverse events (ACSQHC, 2010). Students used knowledge of the case review process gained from previous courses as well as their clinical practice. Students formed groups of 3-4 and allocated different case scenarios. Students were encouraged to attend case reviews and mortality / morbidity meetings within their own clinical practice sites to observe multidisciplinary practice-focused discussion in action. To promote teamwork, students worked in small groups. Each group explored and examined their allocated case using risk management and clinical governance principles and reached an agreement about their analysis. To promote communication, the findings of each group including recommendations for future practice were presented using powerpoint to their fellow students via the WIMBA platform within Blackboard 8 over the internet.

After graduation (approximately 6 weeks after completion of the course), all 22 students were contacted through their university email account and invited to complete the evaluation survey. Responses were anonymous. Ethical approval was obtained from the University Human Research Ethics Committee.

Approach to analysis

Survey responses were analysed using descriptive statistics using SPSS Version 21. Mean scores and standard deviations were calculated for each domain as well as responses to each item.

Latent content analysis was applied to the qualitative data (Graenheim and Lundaman, 2004). Responses were typed into a word document table. Hard copies were read and notes made and shared with the team. The survey domains were used as a coding framework. Like-statements or phrases were identified and clustered together. These were then assigned conceptual meaning and grouped. The analysis remained at a descriptive level. Each participating student was allocated a number (such as S1 and S2) for coding and reporting purposes.

RESULTS

Sample

Seventeen (77%) out of 22 students completed the routine evaluation of the course (SEC). Of these 12 (54%) students provided additional feedback on the root cause analysis activity using the Utility Index. Participants consisted of mature-aged, female students, with around two-thirds aged between 26 and 45 years (See Table 2). There are no males enrolled in the program. A similar proportion of participants had previously completed a technical college or degree qualification prior to commencing the Bachelor of Midwifery program.

Utility Index

The mean scores for each domain were high for Educational Acceptability (mean= 4.3, SD= .49) and Educational Impact (mean = 4.19, SD = .75) but slightly lower for Preparation for Practice (mean = 3.7, SD = .77) as shown in Table 3. Overall student responses to each item were positive with no item mean less than 3.42. Highest scores were obtained in the domain of Educational Acceptability with no mean rating below 4.17. Students enjoyed researching the topic and preparing the report and presentation requirements for this assessment (mean = 4.42). Students recommended that this assessment be retained in the course (mean = 4.42). Students also agreed that the critical incidents were similar to those faced in the clinical environment (mean = 4.17).

Items in the domain of Educational Impact were also rated highly. Students consistently agreed that the assessment developed their critical thinking skills (mean = 4.33), challenged their thinking (mean 4.33) and encouraged them to examine the whole clinical situation rather than the tasks at hand (mean = 4.33). Students also acknowledged that the assessment process developed their decision-making skills (mean = 4.07) but indicated less agreement about its value in consolidating learning from across the program (mean = 3.75).

Responses to items in the domain of Preparation for Practice, were positive but ranked less favourably than responses on other subscales. Students perceived that undertaking the root cause analysis improved their sense of accountability as a midwife (mean = 4.0) and decreased their likelihood of making clinical errors (mean = 4.0). Students reported being more aware of the causes of critical incidents (mean = 3.83), but reported less agreement about the impact of this assessment activity on their preparedness as a midwife (mean = 3.58) and confidence in managing complex cases (mean = 3.42).

Qualitative responses

Using content analysis the majority of students' open ended comments could be clustered under the survey domains of Educational Acceptability and Educational Impact.

Educational acceptability

Overall students viewed the assessment process favourably. Students valued learning about how errors occur. One student (S6) noted that "The errors in the case seemed extreme, backing these errors with research was really good". Another student (S12) noted "how easy it can be to miss critical information when other outside factors are involved." Students noted that the assessment process helped them by: "Promoting awareness about error prone situations" (S2), and "Realising it was a series of events that enables the holes in the cheese to line up" (S3).

Students also valued learning more about clinical governance and risk management issues. Examples of learning included "not to attribute blame to any one team member" (S3), developing "an understanding of risk management principles" (S4) and looking for "evidence around protocols & guidelines" (S10).

Educational Impact

Students perceived the assessment task had an educational impact on their understanding of (1) critical thinking pathways; and (2) awareness of clinical governance principles and safety. In regards to critical thinking, students stated that they learned to think in different ways, and be aware that multiple factors contribute to errors. For example, one student (S6) noted that “incomplete documentation created significant risk as other staff had to make assumptions”. Another student (S3) learned to “PRIME [incident reporting system] incidents when needed as a way of contributing to clinical governance and patient safety (focus on the issue and not attack any one person). Following a process may highlight a pattern of errors.”

A third impact identified by students was increased awareness of communication. Students identified new knowledge around “working in a multidisciplinary team and being accountable for your actions” (S8). Several students (S2, S4, S5, S8, S5) referred to incidents being the result of multiple communication errors or omissions. The root cause analysis enabled students to understand the importance of communication and risk management (S2, S3, S4, S5, S10, S11). Another student (S5) stated that: “It prompted discussion and information sharing around the topic and this developed our understanding”.

Students also learned that multiple factors contribute to critical events (S4, S5, S7, S8). S2 identified that “Individual, institutional and system based factors are causes for error and compromise safety.” Similarly, S8 noted: “there are many indicators leading up to the “main event” that can be missed”. The importance of “continued professional development”, and “being woman-centred, and reflecting on practice” were also highlighted.

Student Evaluation of the Course

According to SEC results, students ranked the course highly (mean = 4.2 out of 5, SD = .62). In particular, students agreed that, “My skills in analysis and problem solving increased as a consequence of doing this course (mean 4.6, SD = .81); and “I received helpful feedback on my assessment work” (mean = 4.6, SD =.66). Open response comments tended to highlight positive aspects of the course. One student (S6) wrote, “the assessment on root cause analysis, examining systems of governance was particularly useful. I see the processes and information covered in this assessment as being fundamental to good midwifery practice, and promoting professional autonomy, and collaborative practice.” Another (S9) wrote that the most positive aspects of the course were, “working through our critical event from the perspective of not attributing blame but actually discerning what went wrong and

how so many small failings accumulated to a woman dying; and looking at the case from a governance perspective and forming our own recommendations. I loved researching the evidence.”

Students made recommendations for improvement. One student (S8) wrote, “the professional governance of midwifery practice has not been covered well in the program overall, and this course should ensure that all students graduate with a comprehensive understanding of the legal and professional governance framework for midwifery practice.” Several students suggested that better preparation was required especially in relation to expectations, marking criteria and negotiating group work (S2, S6, S7, S9, S10, S11). Some students struggled with the requirement to consider the root cause analysis from different professional perspectives. Several students also noted that the assessment and associated group work were time consuming (S2, S3, S4, S5, S6).

DISCUSSION

This study aimed to evaluate a novel teaching strategy designed to develop student’s cognitive capacities in preparation for autonomous midwifery practice. Students perceived that undertaking the root cause analysis of actual coroners’ cases promoted critical thinking, and encouraged them to examine the whole clinical situation rather than the immediate task at hand. The validity of the teaching strategy was endorsed with “educational acceptability” and “educational impact” being rated highly, but with slightly less agreement on the effect of the assessment process to “prepare students for practice”. Understanding and conducting root cause analysis as part of their coursework will better prepare students to engage in quality improvement as part of their daily practice after graduation (Cronenwett et al., 2007).

The use of root cause analysis of coroner’s cases offers several advantages over traditional case studies. First, coroner’s reports provide a high level of accurate clinical information to allow for case studies to be easily constructed as well as enabling students to learn about clinically rare events. Second, this type of assessment item provides a ‘safe’ environment in which students can explore critical adverse situations with peers, teaching and clinical staff. Third, a large number of clinical scenarios can be constructed to meet the educational goals of each cohort without repeating a scenario in subsequent years. Finally, there are minimal direct costs related to acquisition of the reports, construction of case studies, and implementation of the assessment process. Students’ evaluation ratings and comments indicated that the assessment process contributed to their critical thinking skills by promoting deep learning (Biggs and Tang, 2007). Furthermore, the assessment was authentic in requiring students to think and problem-solve as they would when practicing, as well as encompass

teamwork, communication, and decision making in uncertain and unpredictable circumstances (Mueller, 2005; Homer et al., 2009).

Human interaction and subjective decision making are critical components of midwifery practice. However, even highly trained and well-intentioned individuals will make mistakes. It is important to expose students to the possibility of clinical errors, teach them how to analyse and learn from these, and to implement continuous quality improvement efforts to persistently refine existing systems in which they will practice in order to promote safe practice (Cronenwett et al., 2007). In addition to the use of coroner cases, other teaching strategies to actively engage students include a “mock root cause analysis” after an error in the clinical setting, as well as embedding error and root cause analysis when using simulation (Lamberton and Mahlmeister, 2010). Quraishi et al (2011) evaluated the effect of teaching root cause analysis using high-fidelity simulation in conjunction with a short lecture. Participating graduate medical students (n = 30) who received a ten minute lecture on root cause analysis and high-fidelity simulation activity involving medical errors had greater knowledge and positive attitudes toward systems improvement compared to students who only received the lecture.

Although our findings are positive, they need to be considered in light of the limitations. Generalizability of results is limited by the use of a single site and small sample of female midwifery students. However, the majority of students (77%) participated, there was a high level of agreement amongst respondents, and consistent findings across measures were found, lending some confidence to the conclusions. On the other hand, it could be that students who favoured the course and the root cause analysis completed the survey and that their views differed from students who did not. The sample size also limited the extent of statistical analysis. Furthermore, the survey tool needs to be examined with a larger sample and tested for reliability.

RECOMMENDATIONS AND IMPLICATIONS

Although the results indicated a high level of overall student satisfaction with this teaching strategy, some changes were recommended. Students identified that the assessment task was time consuming, requiring considerable research. The multifaceted nature of the assessment – research, group work, write up and preparation for the group presentation may have contributed to this perception. Students also identified that governance standards, quality, and safety regulations need to be addressed in more detail. Students also identified the need for better preparation to undertake the root cause analysis process. Several improvements to the instructions have now been made to provide explicit details about the nature of the assessment, and some useful tips on how to prioritise work and manage time.

In response to the need for explicit marking criteria, the marking guide has been modified and provides exemplars.

Some students identified that the group work was challenging. There is increasing recognition that team work is a useful transferable skill highly valued by employers, and a cooperative vehicle for effective learning (Corby, 2013). However, teamwork may be hampered by students' lack of understanding of group processes. Students often complain of being inadequately prepared for group work exercises, and academic staff may have little or no experience of developing or assessing the process of teamwork as opposed to its outputs (Corby, 2013). Our experience also suggests that students may become aware that they have a problem when working in a team, but remain unable to pinpoint how to modify their behaviour to improve the situation. Across the curriculum, it may be useful to implement formative assessment in relation to team work so that issues can be identified and possible solutions discussed in a timely way. The principles of group work have now been introduced early in the program and experiential activities are planned so that students are better prepared to work with others, have good process problem-solving skills and improved negotiation and conflict resolution skills.

CONCLUSIONS

Analysing complex clinical cases to determine a root cause contributed to students' perceptions of their critical thinking abilities. Coroner's cases can provide a high level of clinical information and expose students to the multitude of factors contributing to adverse clinical outcomes. Midwifery students perceived this teaching strategy and assessment as educationally useful and one that fostered deep learning.

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Table 1: Root Cause Analysis Cases

Number	Case	Description
1	Post-partum haemorrhage	Caesarean Section, thrombocytopenia, untreated and unrecognised post-partum haemorrhage, maternal death
2	Streptococcus A septicaemia	Spontaneous vaginal birth, pyrexia not investigated, maternal death
3	Neonatal asphyxia	Vaginal group B Streptococcus. Baby found deceased in bed with mother, autopsy consistent with asphyxia
4	Fetal distress	Post-date induction, persistent fetal distress, Caesarean Section, early neonatal death, perinatal asphyxia
5	Amniotic fluid embolism/uterine rupture	VBAC, intravenous syntocinon augmentation, maternal collapse and cardiac arrest, maternal resuscitation, Caesarean Section, hysterectomy, maternal death.
6	Eclampsia	Primigravida, vomiting and epigastric pain at 24 weeks, seizure, Magnesium Sulphate, further seizure, Caesarean Section, baby stillborn, severe hypertension, disseminated intravascular coagulation, maternal death.
7	Post-partum haemorrhage	Multigravida, Induction with Prostin - small recurrent antepartum haemorrhages. Spontaneous vaginal birth, uncontrolled post-partum haemorrhage, hysterectomy, severe coagulopathy, cardiac arrest, maternal death
8	Shoulder Dystocia	Primigravida, spontaneous rupture of membranes 40+10 weeks, intravenous syntocinon augmentation, fetal distress, difficult vacuum performed, shoulder dystocia. Baby born 15 minutes following birth of the head, ventilated, neonatal death 8 days, weight over 5kgs.

Table 2: Characteristics of students completing the Utility Index

Characteristic	n (%)
Gender	
Female	12 (100)
Male	0
Age in years	
22-25	2 (16.4)
26-35	4 (33.3)
36-45	4 (33.3)
46-55	1 (8.3)
Previous educational Qualifications	
Senior High School or equivalent	4 (33.3)
Technical College (TAFE)	3 (25.0)
Degree	5 (41.7)

Table 3: Student responses: Utility Index Survey

Domain – Educational Acceptability	Mean (standard deviation)
1. This assessment item engaged me in learning	4.33 (.49)
2. I enjoyed researching and preparing this assessment item	4.42 (.67)
3. The critical incident was similar to those faced in the clinical environment	4.17 (.94)
4. This is an appropriate assessment for this course	4.25 (.72)
5. I would recommend this assessment item continue within this course	4.42 (.79)
Domain – Educational Impact	
1. This assessment item was beneficial to my learning	4.27 (.65)
2. Developed my critical thinking skills	4.33 (.65)
3. Developed my decision making skills	4.08 (.99)
4. Consolidated my learning in this course and within the Bachelor of Midwifery Program	3.75 (.96)
5. Challenged my thinking	4.33 (.89)
6. Encouraged me to examine the whole clinical situation rather than the tasks at hand	4.33 (.98)
Domain – Preparation as a Midwife	
1. Improved my confidence in managing complex cases	3.42 (1.08)
2. Encouraged me to be more accountable in my practice as a midwife	4.00 (.95)
3. I am more aware of the causes of critical incidents following the completion of this assessment item	3.83 (.72)
4. I believe I am less likely to make clinical errors following completion of this assessment item	4.00 (1.13)
5. I feel more prepared as a midwife following completion of this assessment	3.58 (.99)