Chapter xxx

Critical Thinking

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If there was one life skill everyone on the planet needed, it was the ability to think with critical objectivity (Lanyon, 2011)

Chapter Overview

This chapter will provide an in-depth discussion and analysis of critical thinking in midwifery practice. Initially, the concept of critical thinking will be defined. The distinction between decision-making and critical thinking will then be explored, outlining how critical thinking underpins decision-making. The application of critical thinking and how it aligns with the provision of safe autonomous midwifery practice will be explored, justifying the importance of midwives developing this vital cognitive skill. A conceptual model for critical thinking in midwifery will then be presented utilising a case study approach. Finally, a multi-method approach to the measurement of critical thinking will be discussed.

What is critical thinking?

The importance of developing critical thinking skills has been a well-established priority in tertiary education for many decades. This type of cognitive thinking facilitates deep learning through critical analysis of new ideas, facts and information. Learning is greatly improved when critical thinking is applied, as new knowledge is interpreted, analysed and applied to complex situations (Facione, 2013).

However, the need for well-developed critical thinking skills is not confined to academic study. Critical thinking skills are essential to guide and assist in decision-making in every-day life. Consider the choice of which telephone company you would like to use for your mobile phone. To make this decision you will evaluate the different plans that are on offer, perhaps talk to a few other people to obtain their experience, compare prices and inclusions, and then make a judgement on which company to choose, all of which engage critical thinking skills. In an academic context, critical thinking moves beyond merely retrieving information, critical thinking involves the ability to reason, process and evaluate information, using it to problem solve, reach accurate conclusions, and inform action.

A pioneering Delphi study by the American Philosophical Association (APA) produced an international expert consensus definition of critical thinking. This consensus definition describes

critical thinking as a process of purposeful, self-regulatory thinking using the cognitive skills of interpretation, analysis, evaluation, inference (Facione, 1990). When critical thinking is applied to events or problems, they are considered and deliberated using a controlled, purposeful, focussed and conscious approach (Mong-Chue, 2000). Paul (1993) suggests that critical thinking is the art of thinking about your thinking while you are thinking, in order to make your thinking better. This type of meta-cognition enhances decision-making and judgement. The word 'critical' is a Greek derivative and signifies the ability to discern, to choose, evaluate and make a judgement (Mong-Chue, 2000). In summary, critical thinking is essentially a tool of inquiry that informs professional judgement and decision-making.

What is the relationship between critical thinking and decision-making?

Critical thinking underpins independent and interdependent decision-making. It is considered the 'cognitive engine' informing professional judgement and skilled decision-making (Facione & Facione, 1996). Effective decision-making is not possible without the application of critical thinking to the nature of a problem and potential solutions (Paul et al., 1995). The higher order thinking used in critical thinking facilitates knowledge development informing contextualised decision-making and problem-solving, analysing the situation from different perspectives (Facione & Facione, 1996).

Within the context of healthcare the use of critical thinking is particularly important where regular clinical decision-making occurs and sound judgement is crucial for the provision of safe and effective care. Critical thinking facilitates the careful definition and analysis of problems, promoting inquisitiveness and questioning of information and decisions (Castledine, 2010). This in-depth type of cognitive thinking allows for deep exploration of the situation and possible solutions, which informs decision-making. This is in direct contrast to the rote learning of facts, rules or ritualistic behaviour and routines where tasks are performed with minimal understanding and evaluation. Critical thinking involves the ability to reason, process and evaluate information, using it to problem solve and reach the best possible decisions.

To ensure care is safe, clinical decisions need to be based on the best available evidence. Rather than simply retrieving information, critical thinking is required to reason, process, analyse, critique and evaluate the evidence for the current context and the needs of those in your care. The application of critical thinking ensures evidence is not blindly applied to practice but that a process of critical analysis is utilised to reach conclusions about the quality of evidence and applicability in each clinical situation.

In 2000 Scheffer and Rubenfeld undertook a Delphi study and developed a discipline specific consensus definition of critical thinking for nursing. The study also identified and defined 10 habits of mind (affective elements) and 7 skills (cognitive elements) for critical thinking in nursing which are outlined

in Table 1 (Scheffer & Rubenfeld, 2000).

Table 1: Habits of mind and skills in critical thinking in nursing.

	Definition
<i>Habit</i>	
Confidence	Self-assurance of reasoning capabilities
Contextual perspective	Considers the whole situation, including relationships, background and environment, pertinent to a set of circumstances
Creativity	Uses intellectual ingenuity to generate, discover, or restructure ideas, devising alternatives
Flexibility	Able to adapt, accommodate, modify or change thoughts, ideas and behaviours
Inquisitiveness	A zeal to learn, seeking knowledge and understanding through observation and considered questioning to explore possibilities and options
Intellectual Integrity	Seeks the truth through sincere, honest processes, even when the results conflict with own assumptions, values and beliefs
Intuition	Rapid and unconscious sense of knowing and judgement
Open-mindedness	Is receptive differing opinions and interpretation and aware of own biases
Perseverance	Determined to overcome obstacles
Reflection	Uses contemplation of thoughts, feelings and experiences related to a specific event to enhance understanding and self-evaluation
<i>Skill</i>	
Analysing	Separates or breaks an issue into its constituent parts to discover their nature, function and relationships
Applying Standards	Makes judgments according to established personal reasoning, professional or social rules or criteria

Discriminating	Recognises differences and connections in situations and uses careful consideration to categorise or rank
Information Seeking	Searches for evidence, facts and knowledge through identification of relevant sources and gathering objective, subjective, historical, and current data
Logical Reasoning	Draws inferences or conclusions that are supported and validated by evidence
Predicting	Can envisage a plan and its outcomes
Transforming Knowledge	Changes or converts the condition, nature, form, or function of concepts among contexts

Adapted from Scheffer and Rubenfeld (2000, p358)

Reflective Exercise

Choose a recent clinical experience where you were required to make a complex clinical judgement and decision. Using the elements outlined in Table 1 above, rate the thinking processes that you utilised within your midwifery decision-making. According to each of the 17 criteria, give yourself a score out of 5 per criterion assessing how well you utilised each critical habit or skill during the decision-making process (5 being the highest, 1 being the lowest).

Following this exercise consider the following questions:

1. Was this an easy exercise to undertake?
2. What areas have you identified you need to develop further?
3. Did these criteria cover all aspects of thinking undertaken in midwifery decision-making?

Given the unique and complex nature of midwifery practice it is surprising that to date a consensus definition of critical thinking in midwifery has not been developed.

Is critical thinking in midwifery unique?

Midwifery is often characterised as comprising of a combination of both 'science' and 'art'. This presents challenges in midwifery clinical decision-making. In isolation, the 'science' component of midwifery allows for straightforward uncomplicated decision-making. Using an analytical or rational approach, the woman's clinical information could simply be combined with the evidence to inform decision-

making. It is the 'art' of midwifery that makes midwifery practice unique and complex and presents more challenges in decision-making.

The philosophy of midwifery practice views and acknowledges pregnancy and birth as normal physiological events and premise midwifery care within a primary, social healthcare model. Midwifery care utilises holistic decision-making which values diverse ways of knowing including the woman's own knowledge of her body and decision-making abilities (Siddiqui, 2005).

The relationship between the woman and the midwife is unique, being based on a partnership model underpinned by trust, respect, equity and shared decision-making (Pairman & McAra-Couper, 2015). The midwife and the woman base decisions related to the provision of care on the woman's preferences and values in combination with the best available evidence (Noseworthy, Phibbs, & Benn, 2013).

Due to the uniqueness of each woman, their pregnancy and birth, decisions cannot be deduced from the simple application of evidence (Gilkison, Giddings & Smythe, 2016). Providing holistic individualised midwifery care involves a highly developed cognitive ability to critically analyse the individual woman's circumstances in combination with the evidence and her preferences or wishes for care (Gilkison et al., 2016). There is an increasing wealth of literature and clinical practice guidelines in maternity care. However, evidence that is congruent with the woman's unique situation is often absent. An essential skill in contextualised evidence-based decision-making in midwifery is the use of critical thinking skills to evaluate the evidence in terms of quality and applicability to the individual woman's unique circumstances.

A high degree of cognitive skill is required to balance midwifery decision-making that is inclusive of the holistic philosophical foundations of midwifery care, contextualised evidence, and the woman's individual preferences and choices (Carter, Creedy & Sidebotham, 2018a). Due to this distinctive nature of midwifery decision-making, midwives need to utilise unique and deliberate cognitive skills. Given the unique and multidimensional nature of midwifery decision-making and hence, critical thinking skills required, it is surprising that there is little published literature on thinking processes in midwifery.

Conceptual Model of Critical Thinking in Midwifery Practice

To promote greater understanding of the uniqueness and complexity of critical thinking in midwifery practice a conceptual model was developed. Elements and concepts that shape critical thinking in midwifery practice emerged from (1) the review of literature on critical thinking and midwifery, (2) systematic reviews of the literature evaluating current available tools used to measure critical thinking, (3) development of survey items and expert review of these, and (4) testing of tools that aim to measure critical thinking in midwifery practice from different perspectives. The conceptual model of critical thinking in midwifery practice offers new knowledge and a framework about the application of this

vital cognitive skill to practice (Carter et al, 2018a). The conceptual model represents the holistic philosophical underpinnings of midwifery care whilst also incorporating the constructs of critical thinking.

Figure 1 Conceptual model of critical thinking in midwifery practice

Ref: Carter et al., (2018a, p117; reproduced with permission Elsevier)

The conceptual model of critical thinking in midwifery practice is rooted within a framework of woman-centred care. The conceptual model is underpinned by the philosophical beliefs that:

- Pregnancy and birth are normal physiological events;
- Midwifery care and decision-making are based on the best available evidence;

- Midwifery care involves the development of a partnership relationship between the woman and midwife of equal power and mutual respect; and
- Midwifery care is holistic and individualised. (Carter et al., 2018a, p116).

The conceptual model of critical thinking in midwifery comprises of four phases and twelve elements within these four phases. There is no particular sequencing to the conceptual model, dependent on the situation, the phases may be used in any order.

To explain the conceptual model of critical thinking in midwifery practice a case study approach will be utilised. Following a short description of the case, an explanation of how the model could be utilised to apply critical thinking skills to midwifery practice and thereby inform midwifery decision-making is provided. To facilitate understanding of the conceptual model a relatively uncomplicated case study has been chosen, to illustrate application of the model rather than the complexity of the case and decision-making.

Sally's story

Sally is a primigravida and accessing midwifery continuity of care through the local hospital Midwifery Group Practice (MGP). MGP is a publicly-funded maternity service model in which women receive continuity of care from a *known* midwife throughout pregnancy, during birth, and across the early parenting journey (usually to 6 weeks postpartum). Midwives are supported within a multi-disciplinary network of health professionals for consultation and referral (Australian College of Midwives, 2015). Sally is a healthy 31-year-old woman with no medical conditions and is experiencing an uncomplicated pregnancy. Sally's membranes ruptured at term + 2 days with clear liquor present. Sally contacts her midwife Angela and they agree to meet at the local hospital. It is now ten hours since rupture of the membranes and Sally has not yet experienced any contractions. Angela needs to undertake midwifery decision-making related to care.

Phase 1: Explores Context

- *Undertakes self-appraisal*

In accordance with this element Angela would undertake a critical self-assessment of her skills and knowledge in relation to Sally's situation and determine whether she requires additional resources or consultation with another midwife or her obstetric colleagues. Depending on Angela's experience in caring for women with term prelabour rupture of the membranes she may need to access specific information regarding management, for example, local clinical guidelines of the unit where she works. She may seek advice from a more senior midwifery colleague and discuss Sally's care with the obstetric team. This stage of self-appraisal may prompt Angela at a later time to undertake professional development or further learning to address any identified gaps.

- *Seeks root cause of a problem*

Although term prelabour rupture of the membranes is not normally considered a ‘problem’, rather a variance, Angela would still need to consider whether there are any underlying causes for this occurrence, adding additional information to guide decision-making. For example; has a malpresentation or position caused the membranes to rupture? is polyhydramnios present? are there any signs of chorioamnionitis? This element encourages deeper cognitive thinking instead of simply reacting and responding to the symptoms or presentation.

Phase 2: Reasoned Inquiry

- *Sources best available evidence*

Within this element Angela would source the best available evidence relating to term prelabour rupture of the membranes. This would include the prioritisation of high-level evidence and seeking relevant clinical guideline or policies.

- *Critically analyses and contextualises evidence*

Within this element Angela would utilise critical thinking skills to critically analyse literature or evidence pertaining to this situation, making judgements about the quality of the evidence and its’ relevance to Sally’s individual set of circumstances. The contextualisation of the evidence would involve Angela considering Sally’s situation and knowledge of her as a woman and her pregnancy and current clinical cues. For example, Angela would consider whether Sally has previously experienced any other pre-labour signs such as strong Braxton hicks (and consider the likelihood of spontaneous labour commencing). She would also consider whether Sally has any identified factors that would increase her risk of chorioamnionitis e.g. positive Group B Streptococcus. Equally, Angela would need to consider the contextual appropriateness of care recommended, for example, Sally’s home situation and whether her environment is conducive to home monitoring.

During this stage Angela would also critically analyse any available clinical guidelines. Although clinical guidelines generally provide guidance for best practice, not all are based on the best available evidence, and are often out-of-date (Mènage, 2016; Prusova, Churcher, Tyler, & Lokugamage, 2014). An evaluation of the ‘Green top-guidelines’ (produced by the Royal College of Obstetricians and Gynaecologists in the United Kingdom) revealed that only 9-12% were founded on the best quality evidence (Prusova, et al., 2014).

- *Explores options*

This element encourages the explorations of a range of options for Sally’s individual situation. Angela would use a variety of strategies within this type of critical thinking to devise alternatives, including

consideration of the evidence, Sally's preferences and individual circumstances. Angela may also utilise midwifery intuition and creativity to generate options of care. Utilising intuition to guide decision-making relies on an exquisite sensitivity to pattern recognition where unconscious judgements are made based on a variety of cues and past experiences (Steinhauer, 2015; Geraghty, 2015).

- *Examines practices*

Critical thinking within this element involves examination of others' practices. In this specific case study where Angela is the lead carer, it would involve observing others' practices, interventions, recommendations or care provided to Sally, evaluating whether they are evidence based and/or woman-centred and seeking clarification around these. It may also involve recognising and addressing 'unwritten rules' within the organisation. Unwritten rules are based on tradition and institutional etiquette rather than evidence and can quickly become the cultural norm of an organisation (Hunter, 2005). An example of 'unwritten rules' relevant to this case study may be the recommendation of active management approach to term prelabour rupture of membranes, 'because it's what we always do here'.

Phase 3: Facilitates Shared Decision-making

- *Explores woman's preferences*

Within this element Angela would explore Sally's preferences for care. This may include an exploration of Sally's thoughts and knowledge around induction of labour, her perception of risk and her knowledge of her own body and what is right for her. This element of critical thinking acknowledges Sally's right to autonomy in decision-making. As mentioned previously, elements of the model can be used flexibly. In this case, Angela may have had several previous conversations with Sally about her preferences and have an agreed birth plan in place.

- *Incorporates woman-centred care planning*

Once Sally's preferences of care are established, Angela would ensure that any care planning is centred around Sally's needs and preferences. Using critical thinking and judgement, Angela would share with Sally her interpretation and contextualisation of the best available evidence. Individualised planning of care and sequencing of care would then occur.

- *Negotiates care*

Within this element critical thinking skills are utilised in gathering and synthesising information from all of the other elements and discussing these with Sally and other health professionals. In this case study, this would most likely involve discussing with obstetric colleagues an individualised plan of care for Sally and advocating for Sally's choices.

Phase 4: Evaluation

- *Identifies improvements*

This component of critical thinking would involve Angela taking a proactive stance and addressing any deficits in policies/guidelines, practices or the environment that hinder care (Carter et al., 2018a). In this case it may involve updating current policies or guidelines related to term prelabour rupture of membranes or information brochures/literature provided to women.

- *Evaluates own practice*

In recognition that critical thinking and reflection are intrinsically linked (Carter et al, 2017b), this phase of self-evaluation is a vital element of critical thinking. To assist in this self-evaluation Angela would seek feedback on the care provided from Sally, her family and others involved in her care. This type of reflection informed by critical thinking may identify parts of Angela's practice that could be improved.

- *Initiates professional dialogue*

This element of critical thinking is motivated by the generation of new knowledge (Carter, et al., 2018a). This would involve Angela discussing options and care related to Sally's situation with colleagues, this discussion may occur during or following the care provided. It also may involve debriefing with colleagues following Sally's care if complexities or unexpected events arose.

Reflective Exercise

It's now time to revisit the reflective exercise you undertook earlier in this chapter. Using the same clinical experience you chose previously, use the 12 elements of the Conceptual Model of Critical Thinking in Midwifery Practice to rate the thinking processes that you used during this decision-making. For each criterion give yourself a score out of 5 assessing how well you utilised each of the elements during the decision-making process (5 being the highest, 1 being the lowest).

Following this exercise consider the following questions:

1. Was this an easy exercise to undertake?
2. What areas have you identified you need to develop further?
3. Did these criteria cover all aspects of thinking undertaken in midwifery decision-making?
4. How did this exercise and your results compare to the one you completed earlier using the habits of mind and skills in critical thinking in nursing?

Although the Conceptual Model of Critical Thinking in Midwifery Practice aims to provide a greater understanding of the elements and concepts that encompass critical thinking in midwifery practice, tools

and processes to measure these elements are necessary to further improve practice. Until recently there was no discipline-specific tool to measure critical thinking and a dearth of published studies on the measurement of critical thinking in midwifery (Carter, Creedy & Sidebotham, 2015). The following section describes three tools developed to measure explicit cues of critical thinking in midwifery practice. The tools were originally developed to assess critical thinking in midwifery students, however they are also relevant for use to assess critical thinking of newly qualified midwives and experienced midwives.

Measuring and developing critical thinking skills in midwifery

Midwives require highly developed critical thinking skills to inform safe, evidence-based and woman-centred midwifery decision-making. To assist midwives and midwifery students foster these cognitive skills, measurement tools were required to evaluate the development of critical thinking and provide enhanced knowledge of the practical application of critical thinking to midwifery practice. Due to the unique and complex nature of critical thinking in midwifery and the lack of specific discipline measurement tools available, three tools were developed to measure the application of critical thinking to midwifery practice.

Three tools were piloted and psychometrically tested with undergraduate midwifery students, their clinical preceptors, and faculty. The three tools were specially designed to measure the application of critical thinking in midwifery practice, through preceptor rating, student self-assessment, and evaluation of reflective writing on midwifery practice by faculty. The tools were called the Carter Assessment of Critical Thinking in Midwifery (CACTiM) - (Preceptor/Mentor, Student, and Reflection versions). Through psychometric testing of each individual tool, all three were found to be reliable and valid measures of critical thinking skills in midwifery practice (Carter, Creedy & Sidebotham, 2016a, 2017a, 2017b). A longitudinal study using another cohort of midwifery students further established concurrent validity and reliability. Positive associations were found between the three scales and student characteristics, including Grade Point Average, year level and previous qualifications (Carter et al., 2018b).

A comprehensive process was undertaken to develop items for the three CACTiM tools guided by an eight-stage developed approach advocated by DeVellis (2017). Steps undertaken included (1) systematic reviews of the literature and examination of items within other critical thinking measurement tools (Carter, Creedy & Sidebotham 2015, 2016b). (2) A review of Australian National Competency Standards for the Midwife (Nursing and Midwifery Board of Australia, 2010) to ensure congruency with the core competencies and conceptual framework of midwifery practice. (3) Draft items were generated that represented the skills and habits of mind of critical thinking but also assimilated holistic philosophical foundations of midwifery care. Draft items reflected elements of the conceptual model

where woman-centred care, the midwifery-woman partnership and the promotion of informed choice were signified. (4) Mapping of draft items to the consensus definition of critical thinking in nursing (Scheffer & Rubenfeld, 2000) was conducted to ensure conceptual congruence between items and critical thinking attributes. (5) The draft items were then reviewed by a panel of expert midwifery lecturers and clinicians. (6) Each draft tool was then completed by samples of students, clinical preceptors and midwifery lecturers. (7) Items were then statistically assessed for performance, dimensionality (factor analysis) and reliability. (8) Finally, the length of each tool was considered and any poor performing items were removed.

The items of each tool require respondents to evaluate the student's, or midwife's application of critical thinking to midwifery practice on a Likert Scale (such as 1 = strongly disagree to 5 = strongly agree). To ascertain a comprehensive evaluation of the application of this complex cognitive skill, it is recommended that the student or midwife completes the CACTiM self-assessment tool, their preceptor or mentor completes the CACTiM preceptor/mentor tool and a piece of reflective writing on midwifery practice is also assessed (usually by faculty). Although the tools were initially piloted and tested with undergraduate midwifery students, they are also relevant for use with newly qualified midwives and experienced midwives. The qualified midwife could still seek feedback from a mentor and seek feedback on their reflective writing from a midwifery colleague, educator or manager. Such reflections could be added to the midwife's professional portfolio which, in Australia, is submitted to the regulatory authority when being audited for an annual license to practice. Using the three tools to evaluate critical thinking skills provides the student or midwife with useful and objective feedback from multiple sources and provides holistic real-world assessment on the application of critical thinking skills in practice. This multimethod approach also provides the student or midwife with opportunities to explore and compare their perceptions of their own practice with others' perceptions. Development and testing of each tool have been published in journals and are accessible through your institutional library or by request from the author. Examples of items from each of the tools are provided below.

Table 2: Examples of items from CACTiM tools

Name of Tool	Item
CACTiM – Student (self-assessment)	I choose relevant literature and education strategies to facilitate the woman's decision-making
	I often instinctively know what type of care is right for the woman
	If problems arise when caring for the woman I try to seek the root cause
	I can provide the rationale for following (or departing

	from) established guidelines and policies
CACTiM – preceptor/mentor	The student... effectively explores multiple solutions to a given situation
	identifies organisational/service improvement opportunities
	questions the ‘unwritten rules’ in midwifery practice that are not evidence- based
	initiates professional dialogue around midwifery practice
CACTiM – reflection	The student... demonstrates insight into the need to provide individualised care to the woman
	critically analyses the quality of the literature and its’ relevance to the individual woman’s situation
	identifies and examines appropriateness of clinical procedures and practice
	evaluates own practice and its effect on the woman and others

Summary

Key Learning Points

1. Critical thinking is essentially a tool of inquiry.
2. Critical thinking is the ‘cognitive engine’ informing decision-making.
3. Midwives require highly developed critical thinking skills to inform safe, evidence based and woman-centred midwifery decision-making.
4. The newly developed conceptual model for critical thinking in midwifery practice provides new understanding of this important cognitive skill and application to practice.
5. Critical thinking in midwifery practice is distinct and multifaceted, requiring discipline-specific measurement tools.

6. Measuring critical thinking in midwifery practice, can provide feedback on practice, identifying strengths and weaknesses and areas in need of development.

Conclusion

The provision of autonomous, safe, evidence based, woman-centred midwifery care requires technical expertise and highly developed critical thinking skills that inform midwifery decision-making. Due to the distinct nature of midwifery decision-making, midwives need to utilise unique and deliberate cognitive skills to balance philosophical underpinnings of midwifery care with contextualised evidence, whilst honouring the woman's individual preferences and choices. A greater understanding of how critical thinking informs midwifery decision-making and measurement of this vital skill to promote continual development will ultimately result in improvements in practice and midwifery care provided to women and their families.

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