



## Critical thinking evaluation in reflective writing: Development and testing of Carter Assessment of Critical Thinking in Midwifery (Reflection)



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### ARTICLE INFO

**Keywords:**  
Critical thinking  
Pre-registration  
Midwifery  
Students  
Reflection  
Journal writing

### ABSTRACT

**Objective:** develop and test a tool designed for use by academics to evaluate pre-registration midwifery students' critical thinking skills in reflective writing.

**Design:** a descriptive cohort design was used.

**Sample:** a random sample ( $n = 100$ ) of archived student reflective writings based on a clinical event or experience during 2014 and 2015.

**Methods:** a staged model for tool development was used to develop a fifteen item scale involving item generation; mapping of draft items to critical thinking concepts and expert review to test content validity; inter-rater reliability testing; pilot testing of the tool on 100 reflective writings; and psychometric testing. Item scores were analysed for mean, range and standard deviation. Internal reliability, content and construct validity were assessed.

**Findings:** expert review of the tool revealed a high content validity index score of 0.98. Using two independent raters to establish inter-rater reliability, good absolute agreement of 72% was achieved with a Kappa coefficient  $K = 0.43$  ( $p < 0.0001$ ). Construct validity via exploratory factor analysis revealed three factors: analyses context, reasoned inquiry, and self-evaluation. The mean total score for the tool was 50.48 (SD = 12.86). Total and subscale scores correlated significantly. The scale achieved good internal reliability with a Cronbach's alpha coefficient of .93.

**Conclusion:** this study established the reliability and validity of the CACTiM (reflection) for use by academics to evaluate midwifery students' critical thinking in reflective writing. Validation with large diverse samples is warranted.

**Implications for practice:** reflective practice is a key learning and teaching strategy in undergraduate Bachelor of Midwifery programmes and essential for safe, competent practice. There is the potential to enhance critical thinking development by assessing reflective writing with the CACTiM (reflection) tool to provide formative and summative feedback to students and inform teaching strategies.

### Introduction

Teaching critical thinking is an essential component in any academic programme, particularly within health disciplines, such as midwifery, where clinical decision making is paramount. Critical thinking involves a disciplined, self-directed and purposeful thinking process that encompasses 'thinking about your thinking' in an effort to improve decisions and actions (Paul, 1993; Facione, 1990; Scheffer and Rubenfeld, 2000). Critical thinking has also been described as a process of reflective thinking where the focus is to determine action or change

of thought (Ennis, 1987). The action following the thinking process is a crucial component of critical thinking (Paul, 1993) with critical thinking considered as the 'metaphorical bridge' between information and action (Rubenfeld and Scheffer, 2015).

To address the need for a discipline specific definition of critical thinking in nursing, a Delphi study was conducted by Scheffer and Rubenfeld (2000). The consensus definition comprised of ten habits of mind (affective components) and seven skills (cognitive components) (Scheffer and Rubenfeld, 2000). To date there has not been a consensus definition of critical thinking in midwifery.

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Critical thinking is essential in making safe, evidence based and efficient clinical decisions using a process of intentional higher order thinking (Ashcraft, 2010). Best practice midwifery involves working autonomously providing continuity of care to a defined group of women (Hodnett, 2008), and midwives are increasingly taking on such roles. This increased autonomy for midwives coupled with uncertainty regarding 'best practice' in many clinical situations, require well-developed critical thinking skills to facilitate the provision of safe, woman centred and evidenced based midwifery practice (Carter et al., 2014; Lake and McInnes, 2012; Scholes et al., 2012;). Despite the recognition of the importance, teaching and cultivating critical thinking skills remains a significant challenge for nursing and midwifery education programmes (Mun, 2010).

The concept of critical thinking is intrinsically linked to reflection as both processes involve reflective thought and action. Reflective practice is an important component in the development of a self-aware, skilled, engaged autonomous midwifery practitioner (Bass et al., 2016; Gallagher et al., 2017). In his seminal work on reflection, Schön (1995) suggests that reflective practice promotes a heightened consciousness of a practitioner's implicit knowledge and learning from their experience. The act of reflection involves purposeful thinking in the form of contemplation of thoughts, feelings and experiences related to a specific event (Kennison and Misselwitz, 2002). Schön (1995) identified a two-step process of reflection involves 'reflection-in-action' (thinking while doing), and 'reflection-on-action' (after the event thinking).

Reflective writing as a pedagogical strategy promotes 'reflection on action' where students are encouraged to review, analyse and evaluate a situation or experience. Using writing as an instrument to facilitate reflection, reflective writing assists students undertake deep learning from clinical experiences. During the process of reflective writing, students challenge and integrate their thoughts, feelings, assumptions, and experiences with theoretical content and evidence, and develop a deeper understanding of the situation, their actions and thoughts (Kennison and Misselwitz, 2002; McGuire et al., 2009; Schön, 1995; Scheffer and Rubenfeld, 2000). When purposeful reflection occurs on meaningful experiences critical thinking is cultivated (Kennison, 2003).

Reflection is a central element within the consensus definition of critical thinking in nursing (Scheffer and Rubenfeld, 2000). A rich clinical learning environment provides an ideal context to promote critical thinking skills. Students' reflection on their experiences in the clinical placement environment can develop critical thinking skills, foster self-awareness and understanding, and improve clinical practice (Naber et al., 2014; Craft, 2005; Kennison, 2006). Therefore, reflective writing is an ideal medium to evaluate and measure the development of critical thinking skills.

The development of critical thinking and reflection are endorsed and required by midwifery regulatory bodies internationally (NMBA, 2010; NMC, 2015). Yet, the efficacy of teaching strategies to develop critical thinking and the measurement of its' development remains unclear. Carter et al. (2015) found an absence of specific measurement tools used to evaluate critical thinking skill development in midwifery in their recent systematic review.

Another systematic review examining the efficacy of teaching strategies on critical thinking skills found inconsistencies between studies often when the same teaching strategy or measurement tool was utilised (Carter et al., 2015, 2016). One study included in the review utilised nursing students' reflective writing to improve and develop critical thinking skills (Naber and Wyatt, 2014). The reflective writing intervention was conducted over an eight-week period, but was not associated with increases in students' critical thinking scores on the California Critical Thinking Skills Test (CCTST) and California Critical Thinking Disposition Inventory (CCTDI). It could be that eight weeks was not long enough to develop complex levels of thinking. However, it could also be that the use of standardised tools that measure formal logic and general critical thinking skills are unsuitable to measure

improvement in critical thinking in reflection. The use of standardised general critical thinking tools (such as CCTST, CCTDI and the Health Service Reasoning Tool) have produced contradictory results when applied to the context of nursing and midwifery and may be inappropriate (Carter et al., 2015, 2016). Specific tools are required to measure critical thinking applied to midwifery practice.

Recognising that a reliable tool to evaluate reflective writing for evidence of critical thinking was lacking, Kennison (2006) developed the Critical Thinking Scale (CTS). The authors established content validity through expert view of draft items, concurrent validity through positive correlations with the CCTST, and inter-rater reliability (Kennison, 2003, 2006). However, no internal reliability testing or factor analysis was undertaken. The items in this tool were reviewed and found to be not relevant to midwifery practice.

Given the importance of developing critical thinking skills and reflection in midwifery practice, and synergies between the two, the current study reports on the development and psychometric testing of a tool designed to measure critical thinking skills in reflective writing for pre-registration midwifery students.

### Research Questions

1. To what extent is the draft tool reliable and valid in measuring critical thinking in midwifery students' reflective writing?
2. What is the level of midwifery students' critical thinking evident in their reflective writing?

### Methods

#### Design

A staged model was used for tool development, and tested using a descriptive cohort design.

#### Setting

The three-year degree Bachelor of Midwifery, commenced in 2010 using an educational framework of transformational learning. Transformational learning promotes a context of learning where students are inspired to discover their own ways of knowing, and to critically evaluate and reflect on themselves and their practice (McAllister, 2005; McAllister et al. 2007). Within a woman-centered philosophy, the programme focuses on the development of reflective practice and critical thinking, with teaching, learning and assessment strategies scaffolded throughout the three years.

Students undertake approximately 1800 hour of clinical placement in one organisation for the duration of the degree. The integrated clinical placement model requires students to undertake two to three shifts per week, enables them to consolidate learning in one organisation, and develop meaningful relationships with known preceptors and practitioners.

Midwifery students are also required to complete three structured reflections related to their clinical experiences per semester. Reflections are recorded in an online e-portfolio and feedback provided by midwifery lecturers. Feedback concentrates on (1) the development of reflective writing and skills, as evidenced by focussed and deep reflection, (2) challenging students' assumptions, and (3) providing supportive encouragement. Students utilised the Bass Model of Holistic Reflection (Bass et al., 2017), specifically designed to reflect the holistic nature of midwifery practice. The model comprises of six interdependent phases; self-awareness, description, reflection, influences on knowing, evaluation and learning (Bass et al., 2017). Students receive guidelines and prompts for each phase of the model, to encourage the development of reflection and transformational learning (Bass et al., 2017).

The Bass Model of Holistic Reflection assists midwifery students to

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