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DEVELOPING
CRITICAL THINKING SKILLS
THROUGH ACTIVE TEACHING AND
LEARNING STRATEGIES:
A LITERATURE REVIEW

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Abstract
Clinical decision-making is an integral part of nursing practice. Critical thinking skills are required by nurses to make effective clinical decisions that have positive outcomes. This paper is a review of literature related to critical thinking and decision making and identifies the teaching and learning strategies that are most likely to encourage these abilities in nurses.

Key Words: Clinical decision making, critical thinking, teaching strategies
INTRODUCTION

Rapid changes in the use of technology and continued scientific advancement require nurses to make a myriad of complex clinical decisions to ensure safe, quality patient care and effective clinical outcomes. On a day-to-day basis, nurses are faced with clients experiencing complex health problems and uncertain outcomes. Critical thinking skills are thought to enhance problem-solving skills and enable nurses to make independent, sound and rational decisions for their clients.

In developed countries such as the North America and Australia, there has been an emphasis on critical thinking in nursing curricula at university level. Likewise in Singapore, critical thinking has been identified as of paramount importance for all nurses (Singapore Nursing Board, 1999). It is therefore imperative that the teaching and learning strategies used in nursing courses assist the development of critical thinking skills.

Lectures are the most common teaching mode in Singapore. This didactic style does not meet the learning needs and learning styles of many students (Zapp, 2001). However, staff constraints make the use of lecturers effective for teaching theory-based content to a large group of students (Bastable, 2003). Nevertheless, according to Freire (1970), in lectures students become passive learners. Therefore, as a learning modality lectures do not facilitate the development of critical thinking skills.

In this paper, the literature related to the development of critical thinking skills and the teaching/learning modalities that are said to enhance this process is critically examined.

DEFINITIONS OF CRITICAL THINKING

While definitions of critical thinking differ amongst authors (Maynard, 1996), it is generally accepted that critical thinking is a process that requires the use of cognitive skills. Facione and Facione (1996) contend that the cognitive skills of analysis, interpretation, inference, explanation, evaluation and self-regulation are used to form judgments and to monitor and improve their quality. Paul (1993) presents the context of critical thinking more simply as "... thinking about your own thinking while you are thinking so as to make your thinking better, more clear, more accurate and more defensible" (p. 91). Ennis (1996) defines critical thinking as "... reasonable reflective thinking which helps the thinker to decide what to believe and what to do" (p. 396). The cognitive skills of analysis, interpretation, inference, explanation, evaluation and self-regulation are used to form decisions, and to monitor and improve the quality of judgments (Facione & Facione, 1996).

Based on these definitions, critical thinking can be said to be the process of sorting and questioning the data presented, and select only those that are appropriate to support the rationale for making the decision. There is however, no agreed definition of critical thinking amongst nurse educators though some believe it to be closely associated with the concept of problem-solving (Alfaro-LeFevre, 1995) and the nursing process (Rane-Szostak & Robertson, 1996). Nevertheless, there is consensus that an agreed definition is required for nursing that is discipline specific (Bittner & Tobin, 1998; Kataoka-Yahiro & Saylor 1994; Pless & Clayton, 1993). This level of agreement would provide direction for how critical thinking is taught and evaluated in all nursing programmes (Gaberson & Oermann, 1999). Nurses could then use the same language and follow the same interpretations of the concept of critical thinking and avoid confusion.

CRITICAL THINKING IN NURSING AND CLINICAL MAKING SKILLS

Critical thinking skills are considered to be vital if nurses are to communicate effectively, understand nursing concepts, conduct nursing research, make clinical decisions that guide the delivery of nursing care (Thompson & Rebeschi, 1999; Wilkinson, 2001). Advances in technology and clients with complex clinical conditions indicate the need for nurses to possess critical thinking skills in order to be safe and competent. Jones (1988) states that nurses have to select relevant data from large amounts of data. Critical thinking is a skill that must be practised in a non-judgmental atmosphere and when it is used with nursing knowledge, it develops creative solutions for actual client problems (Cox, 1998).
Experience with similar patients is also required to assist nurses in making effective clinical decisions (Carnaveli & Thomas, 1993). With repeated patient experience, information is stored in the memory system allowing nurses to retrieve the information quickly when faced with a similar scenario. However, Fowler (1998) asserts that it is critical thinking ability that leads to improvement in nursing practice and not just length of experience. A nurse who has years of experience but does not think critically to analyse problems and reflect on past experience will not develop as many alternatives or options as one who does.

Clinical decision-making is a complex process (del Bueno, 1990; Jenks, 1993) that when applied by nurses requires them to collect and analyse data, formulate hypothesis and select the most appropriate action for the care of their clients (Lauri, Salanteran, Ekmam, Kim, Kappel & Macleod, 2001). In order to make effective clinical decisions, nurses require critical thinking skills to make accurate assessments, make inferences and decide on the best course of action (Bucknall & Thomas, 1996). There is a strong relationship between critical thinking skills and clinical decision-making in that nurses are required to identify and define problems, sort and organise information, as well as generate, examine and evaluate alternatives in order to make clinical decisions (Robinson, 1998).

**KNOWLEDGE REQUIRED FOR CLINICAL DECISION-MAKING**

The knowledge required for clinical decision-making involves theoretical, practical, and intuitive knowledge. Benner (1984) identified theoretical knowledge, practical knowledge and intuitive knowledge as guiding decision-making in nursing. Theoretical knowledge refers to principles and rules, while practical knowledge is derived from experience. A theoretical knowledge base provides the data for the critical thinking process, and allows the identification of the cues or symptoms presented by the client while practical knowledge in the form of experience assists the nurse to make clinical decisions (Kataoka-Yahiro & Taylor, 1994). Intuitive knowledge also develops through experience of similar situations and allows the nurse to recognise similarities in the patterns presented by the client and use prior knowledge accordingly.

**CRITICAL THINKING SKILLS AND NEW GRADUATE RNS**

Benner (1984) discovered that novice nurses struggle with the application of critical thinking skills as they are initially governed by rules and hence tend not to question practice. One of the subscales on the California Critical Thinking Disposition Inventory is inquisitiveness (Facione, Facione & Sanchez, 1994). A demonstration of inquisitiveness is used as a measure of intellectual curiosity and desire for learning (Facione et al., 1994). Nurses who demonstrate critical thinking are inquisitive, eager to acquire knowledge and willing to search for answers (Oermann, 1997).

Similarly, truth seeking measures the disposition of one who is eager to seek the best knowledge and is courageous about asking questions (Facione et al., 1994). Paul (1993) asserts that one of the intellectual standards required for critical thinking is intellectual humility where the individual admits what he/she does not know.

Therefore, for nurses to develop critical thinking and clinical decision-making abilities it is important that they develop theoretical knowledge. Furthermore, they should be encouraged to develop a sense of inquisitiveness, curiosity and truth seeking behaviours throughout their educational experiences.

### TEACHING/LEARNING STRATEGIES THAT DEVELOP CRITICAL THINKING

Critical thinking skills can be taught (Robinson, 1998; Rapps et al., 2001). Active teaching/learning strategies such as case studies, nursing rounds, computer assisted instruction, written assignments, role-play, effective practical debriefing sessions, and case study exercises are useful in developing these abilities (Hiller & Hingruber, 1996; Marshall, Jones & Synder-Scott, 1997). Critical thinking is a process (Robinson, 1998).

### WRITTEN ASSIGNMENTS

Written assignments are an effective teaching/learning strategy that can be used both in the classroom and clinical area (Bowes & McAdams, 1989; Bowles & Brigham, 1998). Written work can be given as individual or group assignments. Writing engages the student in a dialogue with the audience and a complex cognitive process is used to search for connections and relationships. As a result, students develop
the ability to think universally by understanding the perspectives of those whose ideas are different from their own (Allen, Bowers & Diekelmann, 1989). Further, Rowles and Brightman (1996) assert that this active involvement with the current research literature requires students to judge its quality, organise it into a logical sequence, justify its logic and construct, and support an argument. These activities assist the student to develop and build critical thinking skills.

Similarly, written assignments that are drawn from clinical practice are said to assist students to link concepts and theories and develop problem-solving skills (Bowers & McCarthy, 1993; Gaberson & Oermann, 1999). Similarly, Allen et al. (1989), and Gaberson and Oermann (1989) assert that the written process encourages students to think critically by compelling them to critique their interventions, evaluate their effectiveness, pose new interventions and provide a rationale to support their arguments. The collaborative learning that occurs in group written assignments develops decision making skills by encouraging students to express their ideas to others and act as a team to communicate the results of their thinking (Gaberson & Oermann, 1999).

NURSING ROUNDS

Nursing rounds are an interactive, patient-centred strategy in which students engage in learning at the bedside (Sedlak & Doheny, 1998). The patient problem or a concept related to it forms the basis of learning that is specific to the patient (Stokes, 1998). During the discussion of the client problems and nursing care, nurses are required to link theory to practice and reflect upon their interventions. Anderson-Loflin (1995) assert that this process facilitates critical thinking and so develops the clinical reasoning and clinical decision-making process.

CLINICAL CONFERENCE AND DEBRIEFING

The clinical conference that is held in the clinical setting is another effective technique in developing critical thinking skills. Clinical conference is used mostly to assist undergraduate students to link theory and practice and reflect critically upon their practice. According to Horsfall (1990), opportunities to share thoughts and feelings in group discussions assist students to express themselves verbally, improve their reporting skills and problem-solve difficulties encountered during clinical placements. Oermann (1997) reports that some clinical conferences involve the other disciplines that are involved in planning and evaluating patient care. This multidisciplinary approach enables students to develop problem-solving, decision-making and critical thinking skills (Gaberson & Oermann, 1999).

Debriefing consists of three stages: a description of what occurred, sharing of participants’ feelings and examination of implications of the activity for future work (Horstall, 1990). It can be used in a variety of situations such as after role-play or debate and before the end of a clinical shift (Gossett et al., 1998). In debriefing session, discussions and application of insights gained can be shared (Quinn, 2000). It also provides opportunities for students to report on their clinical activities, describe and analyse the care provided to patients and share their feelings and perceptions about their clinical experience. This active participation and dialogue encourages critical thinking (Gaberson & Oermann, 1999).

CASE STUDIES

Another educational and learning strategy that has been found to encourage critical thinking skills is the use of case studies. Gaberson and Oermann (1999) assert that case studies provide opportunities for nurses to develop cognitive skills in processing and analysing data, deciding on problems and interventions, and evaluating their effectiveness. In the classroom, case scenarios or simulated case studies are used, whilst in the clinical setting the use of real life situations provides a more complete account (Fuszard, 1995). According to Rowles and Brigham (1998), the advantage of case studies is that they stimulate critical thinking by associating the practical with the theoretical. Quinn (2000) asserts that case studies entail making decisions about a particular course of actions. During the decision-making process, students are required to link theory to practice, identify actual and potential health problems, and weigh different decisions to arrive at a clinical judgment (Gaberson & Oermann, 1999). This process requires students and nurses to apply critical thinking skills when considering alternatives, critiquing different approaches, and arriving at judgments. In the classroom, case studies allow nursing students to practise problem-solving and decision-making skills within a safe environment (Fuszard, 1995; Rowles & Brigham, 1998).
In a study by Cascio, et al. (1995), practice based scenarios were used in response to negative student feedback about the existing community health-nursing course. The scenarios reflected cultural, environmental and developmental life span details and specific questions were developed to assist students to analyse them. Students' critical thinking skills were said to be enhanced by this strategy and they were reported to have demonstrated improved communication and problem-solving abilities.

QUESTIONING

Questioning is the final teaching/learning strategy examined in this review. In both classrooms and clinical settings, questioning has been found to prompt students and nurses to link data with relevant content knowledge (Rowles & Brigham, 1998). As an active teaching/learning modality it has the potential to develop critical thinking skills (Schell, 1996; Selappah, et al., 1998). Questioning helps students to think beyond the facts and promotes discussion from multiple perspectives (Rowles & Brigham, 1998). As a technique, it assists the learner to follow and link sequences or sets of circumstances, establish relationships, compare and contrast concepts and principles, make inferences, and see cause and effect (deTornyay & Thompson, 1987). It has been identified that in order to achieve all of the above and facilitate the development of critical thinking skills, Socratic questioning or higher order questions are required (House, et al., 1990; Philips & Duke, 2001; Selappah et al., 1998).

The use of systematic questioning and the drawing of comparisons that occurs in Socratic questioning can help learners to clarify their doubts. Systematic questioning leads students to rational thinking, and questions focused on making comparisons increases the understanding of difficult concepts (Gaberson & Oermann, 1999; Oermann, 1997). Another form of questioning technique is the use of higher-level questions based on Bloom's taxonomy (Bloom, 1956). These questions involve application, analysis, synthesis and evaluation of fact and knowledge. Questions that involve these elements require the type of higher order thinking skills that facilitate the development of critical thinking skills (Philips & Duke, 2001; Selappah et al., 1998; Wink, 1993). However, the study conducted by Philips and Duke (2001) found that the majority of clinical teachers asked low level questions that required memory recall only.

Overt modeling of questioning by lecturers, preceptors, clinicians and nurse educators is said to influence and encourage learners to raise their own questions (Cholowski & Chan, 1995; Schell, 1998; Selappah et al., 1998). Furthermore, such modeling demonstrates the acceptability of questioning and encourages learners to generate and ask their own questions (Haffer & Raingruer, 1998).

CONCLUSION

There are varying definitions of critical-thinking evident in the literature and there are differing nuances of meaning surrounding the concepts of clinical decision-making, clinical judgment, diagnostic reasoning and clinical reasoning. At times these concepts appear to be used interchangeably to describe clinical decision-making.

Clearly critical thinking skills are important if nurses are to make effective clinical decisions. The research that has investigated the development of these skills has confirmed that active rather than passive teaching/learning modalities are the most effective.

However, most of these studies were conducted in developed countries like the North America and Australia. It is therefore important that further studies be conducted to explore any differences that may occur in the Asian context, particularly in Singapore, where the nursing working force is multicultural and nurses come from different educational backgrounds.

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