Critical thinking in nursing education: A literature review

Elaine Simpson, MSN, RN,
Manager, Professional Development Program,
Health Affairs Nursing Programs,
King Fahad National Hospital, Riyadh, Saudi Arabia.

Mary Courtney, PhD, RN,
Professor of Nursing,
Director, Centre for Nursing Research,
School of Nursing, Queensland University of Technology

CORRESPONDENCE
Prof. M. Courtney
School of Nursing
Queensland University of Technology
Victoria Park Rd
Kelvin Grove 4059
Queensland, Australia

Phone: (07) 3864 3887
Fax: (07) 3864 3814
Email: m.courtney@qut.edu.au

CRITICAL THINKING IN NURSING EDUCATION: A LITERATURE REVIEW

ABSTRACT

The need for critical thinking in nursing has been accentuated in response to the rapidly changing health care environment. Nurses must think critically to provide effective care whilst coping with the expansion in role associated with the complexities of current health care systems. This literature review will present a history of inquiry into critical thinking and research to support the conclusion that critical thinking is necessary not only in the clinical practice setting, but also as an integral component of nursing education programs to promote the development of nurses' critical thinking abilities. The aims of this paper are: (a) to review the literature on critical thinking, (b) to examine the dimensions of critical thinking, (c) to investigate the various critical thinking strategies for their appropriateness to enhance critical thinking in nurses and (d) to examine issues relating to evaluation of critical thinking skills in nursing.

Key words: critical thinking, nursing education, evaluation instruments, skills and strategies.

INTRODUCTION

Health care organizations have made dramatic advances and transformations during the last few decades, resulting in rapid growth of technology and theory. Some of the changes facing nursing today are an expansion in technology, consumer demand for quality care, pressure for cost containment, decreased length of stay in hospitals, an aging population, complex disease processes and increased patient acuity. These changes have been associated with incumbent ethical and moral dilemmas which are borne out in the daily practice of nurses. More marked changes are predicted in the coming decades, such as the development of technology prolonging an individual's life-span, which compounds the aging population situation and increases the burden of escalating healthcare expenditure[1-9].

If nurses are to deal effectively with complex change, increased demands and greater accountability, they must become skilled in higher level thinking and reasoning abilities. Knowles[10] states that "facts learned in youth have become insufficient and in many instances actually untrue; skills learned in youth have become outmoded by new technologies" (p.28). Nurses are now required to provide skilled, multidimensional care in multiple, often unfamiliar environments or settings[11]. Consequently, nurses should be prepared to function as safe, competent, intuitive and innovative clinicians in an environment where new information and clinical situations are constantly changing[12].

Fowler[13] claims that practicing nurses and nurse educators concur that the increasing complexity of modern healthcare demands critical thinking. Every day, nurses sift through an abundance of data and information to assimilate and adapt knowledge for problem clarification and solution. Moreover, nurses are constantly involved in making decisions within their practice. These decisions are frequently concerned with situations where there is no single or absolutely correct response[14]. Colucciello[15] proclaims the use of critical thinking is vital in examining simple and complex situations in nurses' day-to-day responsibilities. It is an essential means of establishing whether the information or assessment obtained has been accurately captured in order to articulate specifically and distinctly what the information conveys.

Ulsenheimer [16] suggests critical thinking is a process for reasoning which anyone has the capacity to master,

proposing that "such a reasoning process will provide nurses with a capacity to defend their actions" (p.151). Alfaro-LeFevre[17] emphasizes it is imperative that nurses become critical thinkers in order to practice sound clinical judgement. He defines clinical judgement as "critical thinking in a clinical area" (p.46). Nurses must use critical thinking skills to rigorously investigate and reflect on all aspects of a clinical observation or problem[18] in order to decide on an appropriate course of action. Alfaro-LeFevre[17] asserts that critical thinking belongs in nursing because nursing is concerned with purposeful goal-directed thinking, with the primary aim of making judgements grounded on factual evidence rather than conjecture.

One area in which critical thinking has gained particular attention is within Quality Improvement. Nurses are accountable on a daily basis for the quality of care provided to their patients. As such, nurses utilize critical thinking abilities to guide quality improvement initiatives effectively by coaching staff and/or their peers in a variety of ways so as to improve patient care. Case[19] provides examples of these quality initiatives, such as identifying clinical indicators to monitor for the purpose of detecting and reframing problems, and implementing and evaluating actions.

Enhancing patient care is a trademark of the nursing profession and the Joint Commission of Accreditation of Healthcare Organizational standards (JCAHO) in the USA. In 1993, the Joint Commission of Accreditation of Health care Organizational standards announced the need for nurses to be proactive in identifying opportunities for improving care, documenting that care and recommending, implementing and evaluating actions to bring about improvements. Surveyors from JCAHO envision that nurses do more than document passive observations. Nurses need to act on patients' observations in such a way that management of care involves all facets, exemplifies reasoned consideration, constructive thinking and incorporates a particular disposition that leads to favourable outcomes[20,21]. Chase[21] states that not recording this process is providing less than adequate documentation of professional nursing outcomes. Moreover, patients' medical records are potentially beneficial and valuable as evidence in legal cases.

Skills in critical thinking can provide the necessary broader outlook, creative solutions and multiple pathways needed for successful quality improvement initiatives. In the current climate of short staffing, cost containment and high expectations for quality nursing care, there is an urgent need for nurses to recognize and act upon

organizational and system problems[22]. Failure to act on these problems may result in inequitable, poor quality or even dangerous nursing care[22]. Snyder[2] states in the past, nursing has not been concerned with administrative aspects of health care. However, the time is ripe for nursing to address consumer-focused care. Nurses comprise the majority of the hospital work force and are responsible for providing most of the care to their patients, "therefore, it is not surprising that the overall satisfaction with a hospital is directly related to satisfaction with nursing care"[2] (p. 206). The process of critical thinking will enhance the ability of nurses to identify clinical indicators, assess their significance and discuss areas for improvement. Like critical thinking, continuous quality improvement is also seen as a never-ending process, hence, a harmonious relationship exists between the use of critical thinking strategies and effective quality improvement initiatives.

Nurses use information from nursing practice, nursing theory and other sciences to apply knowledge to individual situations. Through applying critical thinking abilities to both technical and interpersonal aspects of their practice they are able to promote creative, personalized solutions to unpredictable client circumstances. Nurses need to be prepared for life long learning [23, 24] and the future nursing profession is going to recognize a graduate who can think critically and identify complex clinical phenomena.[25] In order to solve unique and complex problems nurses need to be organized and utilize information innovatively. This is an empowering activity.[10]

Aims of the Paper

The aims of this paper are: (a) to review the literature on critical thinking, (b) to examine the dimensions of critical thinking, (c) to investigate the various critical thinking strategies for their appropriateness to enhance critical thinking in nurses and (d) to examine issues relating to evaluation of critical thinking skills in nursing.

Review Process

Nursing literature in critical thinking in nursing education from January 1989 to 2000 was reviewed by utilizing 'MEDLINE' and 'CINHAL' databases. The key words used were: critical thinking, nursing curriculum, critical thinking evaluation instruments, skills and strategies. There is a paucity of research conducted in the evaluation of critical thinking as was demonstrated by a lack of critical thinking instruments that are specific for nursing to assess critical thinking skills in nursing.

LITERATURE REVIEW: TOWARDS A DEFINITION OF CRITICAL THINKING

Central to this interpretation of critical thinking is a realization that critical thinking is not a method to be learned, but rather a process, an orientation of the mind and so, includes both the cognitive and affective domains of reasoning. There has been considerable confusion about definitions of critical thinking, with several shared terms and conflicting meanings. This confusion led to the formation of the critical thinking Delphi Project[26] in 1990 which is discussed later on. The Delphi Project provided considerable insight and direction about what critical thinking is and is not. This paper will clarify these perspectives.

As a concept, critical thinking has been expressed in several ways. A major influence in critical thinking traces back to the work of John Dewey.[27] From a philosophical perspective Dewey proposes that critical thinking involves suspension of judgement and healthy scepticism. Early writers such as Ennis[28] suggest students should be assisted in the engagement of thinking that is reflective, reasonable and directed on what to believe or do. Ennis views critical thinking as "the correct assessing of statements" (p.83) and notes an individual who is able to think critically, according to this definition, has the skills to evaluate statements.

In recent years some prominent critical thinking theorists include Watson and Glaser; [29] McPeck;[30] Paul;[31-33] Siegel;[34] Brookfield;[35] Kurfiss;[36] Facione;[37, 26] and Boostrum.[38] Watson and Glaser[29] view critical thinking as being more than a specific set of cognitive skills – critical thinking is also a composite of skills, knowledge and attitudes. The authors explain that critical thinking comprises an understanding of the nature of making inferences and generalizations and the skills of being able to consider carefully the logic and accuracy of evidence. These authors also express the notion that having the ability to think critically is a key element to being fully functional in our modern complex society. For them, critical thinking is a fundamental requirement to being able to actively participate in one's social and political circles. Attitude also plays a significant role, for attitude influences the person's ability to question life's complexities or underlying assumptions in a situation or circumstance.

To McPeck,[30] critical thinking involves both a propensity and skill – "one must develop the disposition to use

those skills", hence, teaching someone to be a critical thinker entails both the cognitive and the affective domains of reasoning. McPeck's work revolves around two components of critical thinking as: (i) the 'context of discovery' and (ii) 'the context of justification'. In keeping with McPeck's second aspect of his argument, Kurfiss[36] establishes the notion that critical thinking is associated with the justification of beliefs. Kurfiss points out that argumentation is the process by which this justification is presented. Bell [39] suggests that one way to develop this skill is involvement in debates, because the steps in a debate process comprise all of the argumentation skills essential to critical thinking, such as: analyzing a problem, finding evidence, constructing a case, organizing information in order to deliver a speech, planning refutation, rebuttal and debating. Kurfiss;[36] Watson and Glaser;[29] McPeck;[26] Paul;[33] Brookfield [35] and Facione [40] state that critical thinking is more than a set of skills and view argumentation as a focal point in critical thinking.

Brookfield [35] proposes that critical thinking entails more than cognitive skills, such as logical reasoning or scrutinizing arguments. Brookfield agrees that emotions are paramount to the critical thinking process, because as one attempts to think critically and assist others to do so, one cannot help but become conscious of the importance of one's emotions to this activity. Brookfield suggests that critical thinkers are typically individuals who engage in productive and positive activity, in that they are actively involved with life and perceive themselves as creative and being re-creative in aspects of their personal, workplace and political lives. Further, critical thinkers view their thinking as a process, rather than an outcome. In this instance, Brookfield explains that a critical thinker is continually questioning assumptions of right and wrong. This is because critical thinking is not static – it does not bring a person to a position of finality or conclusion.

Throughout the literature the multiplicity of definitions of critical thinking proved to be a hindrance. These varying definitions posed to be a catalyst for the American Philosophical Association to recruit Peter Facione in 1987, a prominent philosopher and writer in the field of critical thinking, to head a systematic inquiry into the current state of critical thinking and critical thinking assessment. Facione convened a panel of expert theoreticians representing several academic disciplines throughout the United States and Canada to form the Delphi Project. An outcome of the panel's activities and deliberations was the formation of important consensus in relation to the concept of critical thinking intended to guide curriculum development, instruction and assessment. This consensus was acknowledged by the American Philosophical Association in 1990, and called

the Delphi Report. The final definition of critical thinking within the report follows:

> *We understand critical thinking to be purposeful, self-regulatory judgement which results in interpretation, analysis, evaluation and inference as well as explanation of the evidential conceptual, methodological, criteriological or contextual considerations upon which that judgement was based. Critical thinking is essential as a tool of inquiry. Critical thinking is a pervasive and self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, honest in facing personal biases, prudent in making judgements, willing to consider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in selection of criteria, focused in inquiry and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit (Facione,[26] p.4)*

Prior to the Delphi Report[26] there was no clear definition of critical thinking. However, the concepts advanced by Ennis,[28] McPeck,[30] Paul[41] and others were prominent and influential in the final consensus.

Components of Critical Thinking

Brookfield [35] identifies four components of critical thinking. Firstly, identifying and challenging assumptions is considered a major tenet of critical thinking. Critical thinkers are always mindful of how assimilated assumptions shape their perceptions, understandings and interpretations of themselves and the world around them. Secondly, promoting the importance of context is crucial to critical thinking. The third component described by Brookfield [35] relates to critical thinkers having the capacity to imagine and explore alternatives, that is, they are lateral in thought processes. Lastly, reflective skepticism – this author refers to individuals who recognize alternatives to supposedly fixed belief systems, habitual behaviours and entrenched social structures. Thus, individuals who are critical thinkers become skeptical of claims to universal truths or to ultimate explanations and do not take things for granted or as real. For example, they become suspicious of those who claim to have the solutions to all of life's problems. Therefore, learning to think critically involves expanding a person's thought processes.

Kurfiss [36] perceives critical thinking as an investigation in order to explore a situation, question, problem or

phenomenon. From this inquiry, the person is able to arrive at a reasoned conclusion that can be justified. As Kurfiss [36] states " in critical thinking all assumptions are open to questioning, divergent views are aggressively sought and the inquiry is not biased in favour of a particular outcome" (p.2).

The Dimensions of Critical Thinking

The dimensions of critical thinking comprise of both (a) cognitive skills and (b) affective dispositions. Facione, Facione and Sanchez[42] state that having the requisite cognitive critical thinking skills is essential to being a good critical thinker. The concept of critical thinking is also associated with a set of personal attitudes or dispositions that can be used to describe an individual who is inclined to use critical thinking.

(a) The cognitive critical thinking skills can be understood as:

- Interpretation: accurately interpreting problems as well as objective and subjective data from common information sources, related to the care of the patient;
- Analysis: examining ideas/arguments in problems, objective and subjective data and possible courses of action related to the care of the patient;
- Inference: querying claims, assessing arguments (recognizes faulty reasoning) and reaching conclusions which are appropriate to the care of the patient;
- Explanation: clearly explaining and defending the reasoning in which an individual arrives at specific decisions in the context of the health care of the patient;
- Evaluation: evaluating information to ascertain its probable trustworthiness as well as its relevance to particular patient care situations; and
- Self-Regulation: constantly monitoring one's own thinking using universal criteria. For example, clarity, precision, accuracy, consistency, logicalness, significance etc. and correcting oneself as appropriate in the context of caring for patients.

These skills are employed interactively in the reflective reasoning process of making a judgement of what to believe or do. Therefore, in thinking critically, a person not only tries to determine judiciously what to do or what to believe, a person is also able to apply the core critical thinking skills to one another. In other words, one may analyze one's own inferences, explain one's own interpretation or evaluate one's own analysis.

(b) An individual's disposition is explained as:

- Open-minded: having an appreciation of alternate perspectives and willingness to respect the right of others to hold different opinions. Understanding other cultural traditions in order to gain perspectives on self and for others;
- Inquisitive: curious and enthusiastic in wanting to acquire knowledge, wanting to know how things work, even when the applications are not immediately apparent;
- Truth-Seeking: courageous about asking questions to obtain the best knowledge, even if such knowledge may fail to support one's preconceptions, beliefs or interests;
- Analytical: Thinking analytically and using verifiable information. Demanding the application of reason and evidence and the inclination to anticipate consequences;
- Systematic: valuing organization and a focused and diligent approach to problems of all levels of complexity; and
- Self-Confident: trusting one's own reasoning and inclination to utilize these skills, rather than other strategies, in order to respond to problems. For example, making decisions based on scientific evidence and responding to the values and interests of individuals and society.

Facione, Facione and Sanchez [42]and Chenworth [43] state these dispositions or attributes/attitudes or habits of mind could be considered as the elements of a process of reasoning in an individual's character that propels or stimulates an individual towards using critical thinking. Without these dispositions the engagement of critical thinking will not occur. This conceptualization of critical thinking was developed by a panel of experts of the critical thinking Delphi Project from the American Philosophical Association.[44]

Although there are varying definitions for critical thinking, the definitions described above reflect certain unique elements. Critical thinking is associated with elements such as knowledge, active argumentation, reasoning, initiative, intuition, application, analyzing complex meanings, identification of problems, envisioning alternatives and making contingency related value judgements. Critical thinking is substantially larger than the sum of its parts, because it is a process that promotes attitudes to continuously explore, redefine or understand. All these factors contribute to a process of purposeful reasoned interaction between a person and their interaction with a

situation or surrounding circumstances. Bittner and Tobin[7] explain that the critical thinking process is multi-faceted and further state that "it is similar to an umbrella under which many types of thinking flow, depending on the situation" (p. 269).

CRITICAL THINKING IN NURSING LITERATURE

The concept of critical thinking has only been recently addressed in nursing literature (Jones and Brown,[45] and Daly[46]). Daly [46] states the reasons supporting the interest in this construct are related to the following issues:

- the increasing interest in critical thinking in education;
- instructional methods to develop critical thinking in nursing education; and
- a rapidly changing health care arena.

Critical thinking is gaining much popularity in nursing. Critical thinking has come to the forefront in nursing following the mandate by the National League of Nursing (USA),[47] who stated that nursing programs must measure critical thinking as an outcome criteria for accreditation. It is a concept currently being used in nursing education and practice as an essential core skill in professional development.[48] However, nursing's endeavour to capture and utilize this concept has resulted in some confusion and uncertainty. Confusion arises when nurses, teachers and students use the term "critical thinking" interchangeably with other terms that are components of critical thinking, but have different meanings. In order to allay further confusion, it is timely to clarify the difference between and among these similar terms.

Critical Thinking versus Problem Solving

Up to now, this literature review has emphasized an appreciation of critical thinking as a complex process. Historically, nursing theory education has been dominated by terms such as problem solving, decision making, nursing process, creative thinking, all of which are often paralleled with critical thinking. However, there is a crucial difference between critical thinking and problem solving. Problem solving focuses on a problem and finding solutions to resolve the problem (outcomes) for example, patient care problems. In contrast, Meyers [49] states that critical thinking goes beyond problem solving. Rather than seeking a specific solution to a problem,

critical thinking aims to raise questions on all aspects of the situation and critique the solutions. Critical thinking is not centered on seeking an answer, whereas problem solving by its very nature expects an answer.

Perhaps one reason why confusion exists around the differences between problem solving and critical thinking is because, as suggested throughout this literature review, critical thinking needs to be understood as a process. For example, an important step in problem solving and decision making is the need to utilize critical thinking abilities to reframe a problem or situation. Too often problem solving is used in its pure scientific term, as in a recipe – follow the steps and an outcome will be achieved. If utilized by a critical thinking theorist or thinker, assumptions about the outcome do not exist, therefore problem solving travels a different process. Facione and Facione[40] describe critical thinking as ultimately a cognitive engine that drives problem solving and decision making.

Critical Thinking versus Clinical Decision Making

Clinical decision making is concerned with issues of a 'clinical' nature, as distinct from problems pertaining to a broader spectrum of circumstances that may or may not be 'clinical' in character. It is a systematic process of assessment of a repertoire of actions, evaluation and judgment making that will contribute to the achievement of a desired outcome. Therefore, when a decision-maker's knowledge of the situation is embodied with cognitive knowledge and experiential knowledge "the outcome is a clinical decision making process that embraces critical thinking" [7] (p. 269). Incorporating critical thinking skills during the clinical decision making process will provide clarification, a range of potential solutions appropriate to the circumstances or setting and reasoning to support the clinical decision made. Lipman and Deatrick [50] affirm that requisite to clinical decision making is the use of critical thinking.

Critical Thinking and Creative Thinking

Creative thinking is a combination of knowledge and imagination. A creative thinker typically has an attitude of interest in everything, continuously exploring for new ideas, options, alternatives and approaches and then trying to manipulate the understanding into new knowledge or meanings. Creative thinking is ultimately stimulated through posing Socratic questions, such as "what else?" and "why?" or "what if?" Paul[41] emphasizes that critical and creative thinking "have an intimate relationship to figuring things out. There is a natural marriage

between them" (p.102). In order to step outside the everyday reasoning and approaches to problem solving, a person needs to develop an imagination of the possibilities and potentials inherent in a particular circumstance. This often demands a creative leap of faith and a willingness to be 'playful' with future possibilities. Creative thought processes are a motivator, because they make work more interesting. Creative thinking is used in various fields of thought – from philosophy to mechanical to technical endeavours.[42] From these illustrations, it is evident that critical thinking is a broad umbrella under which several forms of thinking occur. Creative thinking is of its greatest value when known solutions have failed and change has not occurred.[51]

Critical Thinking in Nursing Education

Schank [23] points out it is vital for nurses to master the skills of thinking and reasoning in order to constructively critique the value and application of new knowledge. No where is this process of critiquing the applicability of new knowledge more needed than in nursing education curricular design. This implies a necessity "to reevaluate nursing curricula in light of its structure (cohesive/depth), emphasis placed on intellectual skills (analysis/communication) and mastery of basic principles versus specific facts (process/how vs. content/that)."[23] In other words, when evaluating curriculum in terms of its structure, emphasis needs to be placed on the quality of the content, how the content is organized, and how students will be able to process and evaluate the information. Techniques of instruction need to promote active modes of learning in teaching students how to evaluate the depth of information imparted, develop analysis skills, communication and application of information in new and unique ways.

Tommie, Nelms and Lane[52] state that according to the American Association of Colleges of Nursing, [44] the diversity and complexity of nursing practice makes it essential to prepare nurses who can think critically and creatively, and who have substantial education in humanities, nursing and other sciences. As summarized by Schank,[23] critical skills for nursing are the ability to think, apply, analyze, synthesize and evaluate situations.

Schank[23] emphasises critical thinking cannot be cultivated by merely providing students with complex and copious amounts of discipline content. Students need to actively practice the component skills, commencing with uncomplicated operations; for instance identifying fundamental issues and key concepts. Having mastered these skills, students progress on to recognizing assumptions and creating and critiquing arguments. To be able to do this, they need to have the essential knowledge of the discipline. Therefore, the National League for

Nursing in the United States announced that all nursing programs must incorporate critical thinking into their curriculum for the purpose of accreditation.[53,54]

The Royal College of Nursing Australia (RCNA)[55] also believes "quality in nursing practice is dependent upon educational preparation of nurses to ensure the capacity of nurses to: critically evaluate and modify nursing interventions" (ACN 004 271 103). It is therefore essential that Schools of Nursing develop in their graduates an investigative attitude. Tommie, Nelms and Lane[52] and others make the point that in the future, nursing is going to recognize a graduate who can think critically and recognize complex clinical phenomena within relationships that have potential solutions. It is evident from the dearth of literature on critical thinking in nursing that there is no universal skill subject called critical thinking – it is a process of effective teaching strategies.[1, 30]

Miller and Malcolm[1] advocate the integration of instructional strategies to foster critical thinking into all levels of nursing curriculum. This is in contrast to the proposition of perceiving critical thinking as an independent unit to be taught as a subject in a curriculum. The authors suggest that the method of integration depends primarily on faculty members' level of discussion and participation, as they consider the necessity to increase teaching strategies that promote critical thinking, re-conceptualize and revise the curriculum. Paul[41] states simply that it is important for nurse educators to "abandon methods that make students passive recipients of information and adopt those that transform them into active participants in their own intellectual growth" (p. 45).

Conger and Mezza [56] point out knowledge is more than just procuring of facts and rules. Instead, knowledge is an active process of deliberation and interpretation until cognitive and affective structures are acquired. Dexter et al.[6] concur with Conger and Mezza and state that "merely teaching the current state of knowledge in the field is insufficient preparation for future nursing practice" (p.160). Therefore, Schank,[24] Dobryzkowski,[57] Case,[54] Elliott,[58] Oermann[59] and Schell[60] assert that there is a variety of strategies or instructional methods that can be utilized and are effective in promoting, attaining and advancing the acquisition of critical thinking. Nursing literature abounds with strategies of how to teach critical thinking skills. This topic is of interest to nurse educators because of the mandate by the National League of Nursing (USA) to implement critical thinking as one of the outcome criteria required for accreditation of nursing programs.

Educational Strategies To Develop Critical Thinking In Nursing

The focus thus far has been on promoting critical thinking in students and critical thinking strategies which teachers can use to enhance critical thinking abilities. Teachers also have to be supported, as they too are 'students' at critical thinking and are of "undeniable importance in setting the stage for critical thinking."[61] "Nursing practice requires creative, personalized solutions to unpredictable client circumstances. This cannot be taught by rote."[1] Rossignol[61] states that strategies utilized by teachers in order to conduct classes could influence students' thinking immensely. Oermann[59] states that "critical thinking is not developed through one lecture, nor one clinical experience, instead, skill in thinking develops over time through varied experiences" (p. 25). "Critical thinking then becomes a daily experience, not an experience saved for the clinical practice setting."[58]

Kurfiss [36] offers a range of strategies to encourage the critical thinking process such as:

- formal/informal writing assignments or brief case studies;
- questions that involve reasoning skills and the ability to organize and articulate knowledge; and finally
- dialoging on complex problems.

What Kurfiss suggests is typically what nurses do on a daily basis. Dealing with questions of quality of life and death, nurses are continually weighing alternatives, looking at reasons for choosing one alternative over another in an open, flexible and attentive manner and considering what actions to follow.

The nursing literature presents various techniques to develop critical thinking. Nurse educators face many challenges when teaching critical thinking. Therefore, success in teaching critical thinking requires creative strategies. Bittner and Tobin[7] provide the view that instructional methods to enhance critical thinking should include creative approaches to open nurses' minds and to broaden and augment their ways of thinking and to facilitate the process of problem solving. The problem solving ability that the nurse is capable of demonstrating at the bedside is invaluable to patient care.

Nurse educators realize the importance of teaching critical thinking skills to students and are aware that these skills can be developed by devising teaching methods that stimulate higher-level thinking in theory and

practice.[62] Therefore how can nurse educators stimulate these skills or abilities in themselves and in their students?

In reviewing the literature, various strategies are offered to enhance critical thinking abilities by authors such as Elliott;[58] Abegglen, O'Neill and Conger;[63] Morin[64] Oermann;[59] Whiteside;[65] Lipman and Dietrick;[50] Lenburg;[48] Walsh;[66] Daly;[46] Schell; [60] Sellappah et al.[67] Fowler;[13] and Billings and Halstead.[68] These authors support the use of questioning, small group activity, role-play, debate, use of case studies, journaling, simulations, jigsaws, problem solving and writing assignments. By and large, questioning, small group activities, role-play, and journaling are well supported by the majority of these authors.

Problem based learning (PBL) has been introduced into the curriculum of a number of nursing and medical education schools as a method of promoting the development of critical thinking skills, knowledge acquisition and understanding, deductive reasoning, independent learning, interpersonal skills and clinical problem solving skills[69,70]. Evaluations of PBL programs have generally been positive, with reports of higher levels of critical thinking skills,[14, 71, 72] autonomous learning and problem solving skills,[14,71] decision-making skills,[71,72] communication skills, reflection and motivation for continued learning[14].

More frequently, in the last decade nursing education throughout the world has integrated these strategies into higher education. The academic status of nursing curricular has been raised to degree level, with the integration of critical thinking as an educational outcome.

Evaluation of Critical Thinking Skills

There are several standardised tests used to measure critical thinking skills for college/university students, nursing education settings and curriculum development. In reviewing the literature, it is clear that the evaluation of critical thinking skills in nursing is a major difficulty, because commercial critical thinking instruments are not specific to nursing. In a pilot test with a group of Middle Eastern nurses in a large Middle Eastern hospital, authors Simpson, Mulvill and Courtney[73] found that a commercial instrument, although translated into the Arabia language, was inappropriate to assess critical thinking skills. Nurse researchers have expressed doubts about the adequacy of instruments such as the Watson-Glasser Critical Thinking Assessment tool, California Critical

Thinking Test and UNCG Critical Thinking Skills Evaluation Instrument to assess critical thinking outcomes in nursing education and/or practice.[74-76] Alternative forms of evaluation have been suggested, such as the use of concept maps in nursing education,[74] analysis of writing portfolios based on writing assignments which have been carefully designed to foster critical thinking skills,[76] or asking nurses to provide documentation of a situation analysis, potential solutions, and sound rationale for the decisions made.[11]

CONCLUSION

This literature review has demonstrated that critical thinking is necessary not only in the clinical practice setting but also as a daily experience in nursing education programs to develop nurses' critical thinking abilities. Nursing education today places much emphasis on developing techniques and designing learning experiences that foster the development of students' critical thinking abilities in the clinical field.[77] The challenge for future research on critical thinking is the need to concentrate on development of an evaluation instrument that is specific to the discipline of nursing.

RECOMMENDATIONS

1. Teach nurses critical thinking skills by integrating critical thinking strategies into curricula.

2. Construct a commercial critical thinking instrument specific for nursing to evaluate critical thinking skills in nurses.

3. Utilize critical thinking evaluation instruments to assess nurse educators' teaching techniques for instructional effectiveness.

REFERENCES

1. Miller M, Malcolm N. Critical thinking in the nursing curriculum. *Nursing and Health Care* 1990; **11**(12): 67-73.

2. Snyder M. Critical thinking: A foundation for consumer-focused care. *Journal of Continuing Education in Nursing* 1993; **24**(5): 206-210.

3. Shaughnessy C. Critical thinking. *Journal of Continuing Education Nursing* 1994; **25**(3): 100.

4. Howenstein MA, Bilodeau K, Brogna MJ, Good G. Factors associated with critical thinking among nurses. *Journal of Continuing Education in Nursing* 1996; **27**(3): 100-103.

5. Arangie PAR. Critical thinking: The path to the future. *Tennessee Nurse* 1997; Oct: 15-17.

6. Dexter P, Applegate M, Backer J, Clayton K, Keffer J, Norton B, Ross B. A proposed framework for teaching and evaluating critical thinking in nursing. *Journal of Professional Nursing* 1997; **13**(30): 160-167.

7. Bittner NP, Tobin D. Critical thinking: strategies of clinical practice. *Journal for Nurses in Staff Development* 1998; **14**(6): 267-272.

8. Kuhar MB. Critical thinking: A framework for problem solving in the occupational setting. *AAOHN Journal* 1998; **46**(2): 80-81.

9. Boychuck Duchscher JE. Catching the wave: understanding the concept of critical thinking. *Journal of Advanced Nursing* 1999; **29**(3): 577-583.

10. Knowles M. *The modern practice of adult education*. (Rev. Ed.). Chicago: Follett, 1980.

11. Oermann M, Truesdell S, Ziolkowski L. Strategy to assess, develop, and evaluate critical thinking. *Journal of continuing Education in Nursing* 2000; **31**(4): 155-160.

12. Thornhill SK, Wafer MS. Clinical process learning to improve critical thinking. *Nursing Connection* 1997; **10**(3): 51-59.

13. Fowler LP. Improving critical thinking in nursing practice. *Journal of Nurses Staff Development* 1998; **14**(4): 183-7.

14. Morales-Mann ET, Kaitell CA. Problem-based learning in anew Canadian curriculum. *Journal of Advanced Nursing* 2001; **33**(1): 13-19.

15. Colucciello M. Critical thinking skills and dispositions of baccalaureate nursing students – a conceptual model for evaluation. *Journal of Professional Nursing* 1997; **13**(4): 236-245.

16. Ulsenheimer JH, Bailey DW, McCullough E, Thornton S, Warden EW. Thinking about thinking. *The Journal of Continuing Education in Nursing* 1997; **28**(4): 150-156.

17. Alfaro-LeFevre R. *Critical thinking in nursing: A practical approach.* Philadelphia, PA: W.B. Saunders, 1995.

18. Bowles K. The relationship of critical-thinking skills and the clinical-judgment skills of baccalaureate nursing students. *Journal of Nursing Education* 2000; **39**(8): 373-376.

19. Case B. Walking around the elephant: A critical thinking strategy for decision making. *The Journal of Continuing Education in Nursing* 1994; **25**(3): 101-109.

20. Tanner CA. Thinking about critical thinking. *Journal of Nursing Education* 1993; **32**(2): 99-100.

21. Chase SK. Charting critical thinking: Nursing judgements and patient outcomes. *Dimensions of Critical Care Nursing* 1997; **16**(2): 100-111.

22. Tanner CA. Critical thinking: Beyond nursing process. *Journal of Nursing Education* 2000; **39**(8): 338-339.

23. Schank M. Wanted: nurses with critical thinking skills. *Journal of Continuing Education* 1990; **21**(2): 86-89.

24. Meyers ST, Stolte KM, Baker L, Nashedawa H, Sohier R. A process-driven curriculum in nursing education. *Nursing and Health Care* 1991; **9:** 460-463.

25. Brock A, Butts JB. On target: a model to each baccalaureate nursing students to apply critical thinking. *Nursing Forum* 1990; **33**(3): 5-10.

26. Facione PA. *Executive summary – critical thinking: A statement of expert consensus for purposes of educational assessment and instruction*. Millbrae, CA: The California Academic Press, 1990. (The complete Delphi report, including appendices, is available from The California Academic Press and as ERIC Doc. No. ED 315-423, P. Facione, Principal Investigator).

27. Dewey J. *Democracy and education: An introduction to the philosophy of education*. New York: Macmillan, 1916.

28. Ennis RH. A concept of critical thinking. *Havard Educational Review* 1962; **22**(1): 81-111.

29. Watson G, Glaser EM. *Watson-Glaser critical thinking appraisal*. San Antonio, TX: The Psychological Corporation, 1980.

30. McPeck J. *Critical thinking in education*. New York: St. Martin's Press, 1981.

31. Paul R. Teaching critical thinking in the 'strong' sense: A focus on self-deception, coordinating views and a dialectical mode of analysis. *Informed Logic Newsletter* 1982; **4**(2): 2-7.

32. Paul R. An agenda item of the informal logic/critical thinking movement. *Informed Logic Newsletter* 1983; **5**(2): 23-4.

33. Paul R. The critical thinking movement. *National Forum* 1985; **65**(1): 32.

34. Siegel H. The generalizability of critical thinking. *Educational Philosophy and Theory* 1991; **23**(1): 18-30.

35. Brookfield SD. *Developing critical thinkers*. Open University Press: Milton Keynes, 1987.

36. Kurfiss JG. *Critical thinking theory, research, practice and possibilities. (ASHE-ERIC Higher Education Report No.2).* Washington DC: Association for Study for Higher Education, 1988.

37. Facione PA. *The California critical thinking skills test*. Millbrae, CA: The California Academic Press, 1990.

38. Boostrum R. *Developing creative and critical thinking: An integrated approach.* Linclonwood, IL: National Textbook Company, 1994.

39. Bell EA. Debate: a strategy for teaching critical thinking. *Nurse Educator* 1991; **16**(2): 6-7.

40. Facione PA, Facione NC. *Test Manual: The California critical thinking skills test, form A and Form B*. Millbrae, CA: The California Academic Press, 1993.

41. Paul R. *Critical thinking*. Rohnert Park, California: Sonoma State University, 1990.

42. Facione NC, Facione PA, Sanchez CA. Critical thinking disposition as a measure of competent clinical judgement: The development of the California Thinking Disposition Inventory. *Journal of Nursing Education* 1994; **33**: 345-350.

43. Chenworth L. Facilitating the process of critical thinking for nursing. *Nurse Education Today* 1998; **18**(4): 281-92.

44. American Philosophical Association. Critical thinking: A statement of expert consensus for purposes of educational assessment and instrument. *The Delphi Report: Research findings and recommendations prepared for the committee on pre-college philosophy.* (ERIC Document Reproduction Service No. ED 315-412.), 1990.

45. Jones SY, Brown L. Critical thinking: Impact on nursing education. *Journal of Advanced Nursing* 1991; **16**(5): 529-533.

46. Daly WM. Critical thinking as an outcome of nursing education. What is it? Why is it important to nursing practice? *Journal of Advanced Nursing* 1998; **28**(20): 323-331.

47. National League for Nursing. *Criteria and guidelines for the education of baccalaureate and higher degree programs in nursing*. New York: National League for Nursing, 1992. Publ. No. 15-2472.

48. Lenburg CB. Confusing facets of critical thinking. *Tennessee Nurse* 1997; October: 13-14.

49. Meyers C. *Teaching students to think critically*. San Francisco: Jossey-Bass Publishers, 1991.

50. Lipman TH, Deatrick JA. Preparing advanced practice nurses for clinical decision making in speciality practice. *Nurse Educator* 1997; **22**(2): 47-50.

51. Miller M, Babcock D. *Critical thinking applied to nursing*. St Louis, Baltimore: Mosby, 1996.

52. Tommie P, Nelms T, Lane EB. Women's ways of knowing in nursing and critical thinking. *Journal of Professional Nursing* 1999; **15**(3): 179-186.

53. O'Sullivan PS, Belvins-Stephens W, Smith F, Vaughan-Wrobel B. Addressing the National League for Nursing critical thinking outcomes. *Nurse Educator* 1997; **22**(1): 23-29.

54. Case B. Critical thinking: Challenging assumptions and imagining alternatives. *Dimensions of Critical care Nursing* 1995; **14**(5): 275-279.

55. Royal College of Nursing, Australia (Foley E.) *Position statements: Quality in nursing practice*. Royal College of Nursing (RCNA), February, 1997.

56. Conger M, Mezza I. Fostering critical thinking in nursing students in the clinical setting. Nurse Educator 1996; **21**(3): 11-15.

57. Dobrzykowski TM. Teaching strategies to promote critical thinking skills in nursing staff. *The Journal of Continuing Education in Nursing* 1994; **25**(60): 272-276.

58. Elliott D. Promoting critical thinking in the classroom. *Nurse Educator* 1996; **21**(2): 49-52.

59. Oermann MH. Evaluating critical thinking in clinical practice. *Nurse Education* 1997; **22**(5): 25-28.

60. Schell K. Promoting student questioning. *Nurse Education* 1998; **23**(5): 8-12.

61. Rossignol M. Relationship between selected discourse strategies and student critical thinking. *Journal of Nursing Education* 1997; **36**(10): 467-475.

62. Weis PA, Guyton-Simmons J. A computer simulation for teaching critical thinking skills. *Nurse Educator* 1998; **23**(2): 30-33.

63. Abegglen J. Critical thinking in nursing: classroom tactics that work. *Journal of Nursing Education* 1997; **36**(10): 452-458.

64. Morin KH. Guest editorial. Critical thinking –say what? *Journal of Nursing Education* 1989; **36**(10): 450-1.

65. Whiteside C. A model for teaching critical thinking in the clinical setting. *Dimensions of Critical Care Nursing* 1997; **16**(3): 152-162.

66. Walsh K. Teaching tools: What if? What else? What then? A critical thinking game. *Nurse Educator* 1997; **22**(5): 9-12.

67. Sellappah S, Hussey T, Blackmore AM, McMurray A. The use of questioning strategies by clinical teachers. *Journal of Advanced Nursing* 1998; **18**(1): 142-148.

68. Billings DM, Halstead JA. *Teaching in nursing: A faculty guide*. Philadelphia: W.B. Saunders, 1998.

69. Maudsley G, Stivens J. Promoting professional knowledge, experiential learning and critical thinking for medical students. *Medical Education* 2000; **34**:535-544.

70. Minasian-Batmanian LC, Asmar C, Clark S, Bayly J, Lovell-Simons A. *An interactive, problem-based, fully online ultrasonography course: design and development.* In Cornerstones: What do we value in higher education? Proceedings, HERDSA Annual International Conference: Melbourne, 12-15 July, 1999, Retrieved 20/8/01 from http://www.herdsa.org.au/vic/cornerstones/pdf/Batmania.PDF

71. Birgegard G, Lindquist U. change in student attitudes to medical school after the introduction of

problem-based learning: in spite of low ratings. *Medical Education* 1998; **32**(1): 46-49.

72. Sandor MK, Clark M, Campbell D, Rains AP, Cascio R. Evaluating critical thinking skills in a scenario-based community health course. *Journal of Community Health Nursing* 1998; **15**(1): 21-29.

73. Simpson E, Mulvill G, Courtney M. The development and use of criteria-based critical thinking tool to enhance instructional effectiveness in nurse educators. *Journal of Advanced Nursing* 2001; (under review).

74. Daley BJ, Shaw CR, Balistrieri T, Glasenapp K, Piacentine L. Concept maps: A strategy to teach and evaluate critical thinking. *Journal of Nursing Education* 1999; **38**(1): 42-47.

75. Magnussen L, Ishida D, Itano J. The impact of the use of inquiry-based learning as a teaching methodology on the development of critical thinking. *Journal of Nursing Education* 2000; **39**(8): 360-364.

76. Sorrell JM, Brown HN, Silva MC, Kohlenberg EM. Use of writing portfolios for interdisciplinary assessment of critical thinking outcomes of nursing students. *Nursing Forum* 1997; **32**(4): 12-24.

77. Howell MA, Whitlow J, Stover LM, Williams Johnson K. Critical thinking as an educational outcome. *Nurse Educator* 1996; **21**(30): 23-28.