



Importance of Critical Thinking in Medical Science Students

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Abstract

Critical thinking is the process of searching, obtaining, evaluating, analyzing, synthesizing and conceptualizing information as a guide for developing one's thinking with self-awareness, and the ability to use this information by adding creativity and taking risks. The nursing process has been important to nursing practice for a long time. The nursing process has been used as a problem-solving activity to think about a plan of care as the foundation for professional practice in everyday nursing practice. The nursing process may describe a nursing care plan that provides students with a learning experience that helps them practice critical thinking and decision making skills. The nursing process is seen as a decision making approach that promotes critical thinking in nursing. This process consists of five phases namely: assessment, diagnosis, planning, implementation and evaluation.

Keywords: Critical Thinking, Nursing Process, Critical Thinking, Nursing Process, Medical Science

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1. Introduction

There is no universally accepted definition of critical thinking; however, the Delphi report published by the American Philosophical Association gave us a description of critical thinking in terms of cognitive skills and affective dispositions that was generic with no domain-specific implications. This resulted in a definition of critical thinking "as the process of purposeful, self-regulatory judgment; an interactive, reflective, reasoning process" (Facione 1990). The Delphi report described the ideal critical thinker as one who is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in

inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit.

Critical Thinking in the Profession of Nursing The Delphi definitions are consistent with and supportive of KataokaYahiro and Saylor's (1994) definition of critical thinking in nursing as "the critical thinking process is reflective and reasonable thinking about nursing problems without a single solution and is focused on deciding what to believe and do". This definition broadens the concept of critical thinking in nursing to include reflection of thoughts and recognition that there can be various solutions to problems. The nursing process is a scientific-problem solving model using the steps of assessment, nursing diagnosis or problem identification, planning, implementation, and evaluation in a step-by-step process to plan care for patients. Critical thinking in nursing has long been equated with the nursing process which confines

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critical thinking to a very linear, narrow, single right solution, problem-solving process.

Critical thinking includes creative thinking, open-mindedness, inquisitiveness, and is not bounded by predefined standards and objectives. Critical thinking does include knowledge, skills, and attitudes, and it definitely incorporates the important component of the nursing process and problem-solving approach, but it goes beyond to higher-order thinking and is not a synonymous term with "nursing process." Critical thinking is not a single way of thinking, but is a complex, multidimensional cognitive process dependent on reflective thought and tolerance for ambiguity essential for decision making in nursing practice (Jones, Brown 1991). Nurses are challenged to "think on their feet" in the multiple, complex, fast-moving environments of today's nursing practice. The literature repeatedly stresses that nurse must be able to think critically in order to process complex data and make sound clinical judgments in the planning, managing and evaluating of the health care of their patients (Raines 1996).

The practice of nursing requires "creative, personalized solutions to unpredictable client circumstances" (Miller, Malcolm 1990).

According to Facione and Facione (1996), nursing practice demands fair-mindedness to new evidence and a willingness to reconsider clinical judgments. It values a focused and diligent approach to ill-structured patient problems, and requires tolerance of multiple perspectives and interpretations when such perspective and interpretations can be supported by reasons and evidence. While the nursing process demands linear thinking to problem solve, critical thinking abilities compel nurses to challenge assumptions, question the context, look for new ways of doing and thinking, and consider, sift, and evaluate ideas or solutions for their worth and practicality (Bumard 1989). These abilities are essential for making sound clinical judgments in order to provide safe, effective care to patients.

Kataoka-Yahiro and Saylor (1994) feel that to make good nursing judgments, critical thinking must be used. They have identified five components of critical thinking: (1) specific nursing-based knowledge, (2) practical experience, (3) critical thinking competencies, (4) attitude or Paul's "traits of the mind," and (5) standards (intellectual and professional). Component number 3, critical thinking competencies, is divided into three cognitive types: general, specific in clinical situations, and specific in nursing. General critical thinking competencies are not unique to nursing

but include scientific process, hypothesis generation, problem solving, and decision making. The specific critical thinking competencies in clinical situations, including diagnostic reasoning, clinical inferences, and clinical decision making, are used in nursing and other clinical disciplines. Finally, the specific critical thinking competency in nursing is the nursing process but it is only one of the competencies and not all-encompassing. The attitude component is considered a central aspect of a critical thinker and includes confidence, independence, integrity, risk taking, creativity, and fairness.

The fifth component, standards, includes universal intellectual standards such as clarity, specificity, accuracy, relevancy, and significance as well as professional standards such as ethical criteria for nursing judgments and criteria for evaluation and professional responsibility. The authors also feel there are levels of critical thinking in nursing and have identified them as basic, complex, and commitment. The basic level is an early step and looks for right or wrong or one right answer to complex problems. Realizing that there are alternative solutions moves the nurse to the complex level, and choosing an action or belief based on an alternative puts the nurse at the highest level of commitment. Education needs to provide a learning environment that is conducive to critical thinking, giving the students opportunity for flexibility, creativity, support for change, and risk taking. According to Yildirim (2011), critical thinking is "the process of searching, obtaining, evaluating, analyzing, synthesizing and conceptualizing information as a guide for developing one's thinking with self-awareness, and the ability to use this information by adding creativity and taking risks".

2. Critical Thinking in Nursing Process

One technique for understanding a concept with an unclear definition in nursing is to review the literature for examples. When looking for examples of critical thinking, descriptions of nursing process were found. This is incongruent with the treatment in the nursing literature of critical thinking as an outcome. Nursing process, while it has been given many different meanings is generally described as a linear process using the four steps of assessment, planning, intervention, and evaluation (Yildirim 2010b). Nursing process is a problem-oriented model that breaks down symptoms into nursing problems utilizing nursing diagnosis. The format is logistic with a series of discrete components in unvaried sequence and inflexible. Nursing process

is congruent with the perspective of measuring outcomes by benchmarking and prototyping and is useful because it encourages uniformity in practice. The focus is on looking for similarities between the patient and the expected benchmark for that day. Stevens-Barnum (1994) notes that when comparing nursing process to holistic methods, they are at opposite ends of the spectrum with regard to principle, method, and interpretation. This is a concern for those with a holistic perspective.

Abdellah (1969) is credited with initializing the essence of nursing process with her twenty-one nursing problems typology. Her goal was to develop a strong knowledge base for nurses and promote autonomy. It was to be a guide for identifying and solving patient problems. The problem was defined as a condition faced by the patient and family, which the nurse can help with through her professional functions. There is consistency even in this initial attempt at typology due to her labeling of the problems as nursing problems and not patient problems. Abdellah's (1969) assertion is that patients cannot receive adequate care without first addressing patient care with a focus on 'problem'. The focus on the problem hence illness aspect of the patient is a weakness that Abdellah (Abdellah, Levine 1986) acknowledges herself. Flaws within nursing process have been documented by Benner (1984) in her work within the development of her Novice to Expert model. Her work revealed that those nurses with little experience used nursing process better than those who were expert. Stevens-Barnum (1994) adds that the expert nurse may simply ignore the nursing process to practice at their level. The nursing process has been important to nursing practice for a long time. The nursing process described as divided into three stages. The first stage (1950-1970), which they called "problem and process," was a four-step process involving assessment, planning, intervention, and evaluation. It was embedded in the process of solving patient problems. The second stage (1970-1990) consisted of diagnosis and reasoning in a five-step nursing process including assessing, diagnosing, planning, implementing, and evaluating. It emphasized diagnosis and reasoning by using theories or nursing knowledge. At this time, the nursing process was not seen as a linear, step-wise, problem-solving process but rather as a dynamic, reflective process. The nursing process at the current stage (1990-present) is related to outcome specification and testing. It has become a more sophisticated, system-based reasoning

process because of an outcome orientation in the current health care system.

Pesut and Herman (1998) assert that the nursing process should connect to nursing practice. Due to increased technology and information, changes in the health care system, and a shift to a learning-centered focus, nurse educators need to enhance the thinking strategies of students. Using critical and reflective thinking skills in the nursing process is thought to improve contemporary nursing practice. The nursing process has been used as a problem-solving activity to think about a plan of care as the foundation for professional practice in everyday nursing practice (Pond, Bradshaw, Turner 1991; Taner 1986; White et al., 1990). In addition, Pardue (1987) emphasized the mental processes required for successful implementation, which are similar to critical thinking. Sedlak and Ludwick (1996) stated that the nursing process and critical thinking should not be seen as separate from each other. Students' cognitive development can be facilitated using critical thinking in the nursing process. Tucker and Flannery (1996) also described a nursing care plan that provides students with a learning experience that helps them practice critical thinking and decision making skills. It is an important responsibility of nurse educators to integrate high level critical thinking skills into the nursing process in the clinical setting.

Marshall's (1995) study supported the use of problem solving methods for teaching critical thinking in connection with the nursing process. In addition, this study supported the usefulness of the nursing process for increasing knowledge and understanding, application, and integration of nursing concepts. Moreover, it was suggested that faculty need to examine their own perceptions about the nursing process, define educational objectives in relation to critical thinking, and identify the best strategies for promoting critical thinking in view of changing methods in clinical practice. Nurse educators must focus on how to use critical thinking in the nursing process in clinical settings to promote students' critical-thinking. Toth (1996) examined various instructional strategies for developing critical thinking abilities in 75 freshman nursing students using the California Critical Thinking Skills Test as the pretest instrument in the first week and the posttest instrument in the tenth week. Teaching strategies included case studies, large group discussion, small group interaction, role playing, and questioning. The results showed that using a variety of strategies can assist students in developing critical thinking

skills and that teaching methods may affect critical thinking abilities in nursing students. A number of authors analyzed critical thinking strategies in clinical practice, such as case studies, nursing process, decision analysis, high-level thinking skills, debate, and questions (Beeken, et. all., 1997; Chubinski, 1996; Garrett, Schoener, Hood, 1996; Giurgevich, 1996; Oermann, 1997). According to Paul and Heaslip (1995), critical thinking includes elements of reasoning (questions, problems, assumptions, inferences, implications, consequences, and points of view), abilities of reasoning (questioning, clarifying issues, generating solutions, assessing solutions, comparing analogous situations, evaluating actions), and traits of reasoning (affective attitudes such as humility, courage, confidence, curiosity, fair-mindedness, thoughts, and underlying feelings). These elements can be applied to nursing practice. Traditional use of the nursing process as a routine activity may have limitations regarding the development of critical thinking skills. Jones and Brown (1991) defined critical thinking as reflective of the nursing process. The nursing process, which consists of five steps, namely, assessment, diagnosis, planning, implementation, and evaluation, provides the basis for critical thinking skills in nursing. For each phase of the nursing process, the instructor engages the student in a critically reflective dialogue.

In the assessment phase, the instructor's role is to review the data with the student through categorization, analysis, and interpretation to determine its completeness (Conger, Mezza 1996). In addition, educators must make reliable observations and distinguish relevant from irrelevant and important from unimportant data (Wilkinson 1996). For example, instructors can ask students to explain why certain data are significant while others are not. The next step is to identify nursing diagnoses. The instructor urges the student to justify and clarify her/his assumptions. Through this dialogue, the instructor provides an environment that helps the student achieve a higher level of data analysis and arrive at a more explicit hypothesis. For example, the instructor may ask the student which data support the diagnosis. Development of a plan of action is the next step. It is important to foster an awareness of multiple solutions to address the nursing diagnoses (Conger, Mezza 1996). Implementation, the fourth step in the nursing process, involves carrying out the plan of care. Finally, the effectiveness of interventions is evaluated. The student is guided to assess outcomes and revise her/his plan to account for

unsolved problems. Educators must encourage students to rethink and carry out the nursing process. Through this process, students can improve their thinking skills and enhance their problem solving abilities.

Beginning nursing students often have difficulties with the data collection, the organization, and the analysis as part of the nursing process. Without help, students cannot apply the process effectively. Nurse educators are responsible for teaching the thinking process to students. Role modeling of this thinking process by the faculty is essential. According to Koehler (1995), the educator's role in the nursing process is to have the student develop critical thinking skills, that is, assess the patient, gather information from the literature, select relevant points, relate all of this information to the care of the patient, and illustrate the information graphically. This helps the student establish priorities, seek relationships among information, and build on previous knowledge. The nursing process provides a systematic guide or method to assist students and novices in developing a style of thinking that leads to appropriate clinical judgments (Christensen, Kenney 1995). Jeffrey (1993) offered a Guided Visual Metaphor for teaching nursing diagnosis. The Guided Visual Metaphor includes a guided series of six instructional steps. In step one (drawing and labeling), the student compares the healthy person to the clinical experience with the assigned patient. In step two (reflection), the student evaluates or reflects on what all these representations mean to the patient. Actual or potential strengths and problems are identified during step three. Problems are then translated into nursing diagnoses in step four. Prioritization, in step five, encourages students to review and weigh selected nursing diagnoses. Discussion is the sixth and final step of the Guided Visual Metaphor process. Another method, described by Iyer et al., (1995) offers a guide to logical thinking which includes seven questions.

These questions are in sequence:

- What is the issue?
- What information do I need and how do I get it?
- Are my data valid?
- What do the data mean, based on the facts?
- What should I do?
- Are there other questions I should ask?
- Is this the best way to deal with the issue?

The nursing process is generally viewed as a tool for planning and providing patient care. Nurse educators teach how to use critical thinking skills in the nursing process to students, which facilitates

the development of nursing students' thinking abilities. It is the responsibility of nurse educators to ensure that nursing graduates have developed the critical thinking abilities necessary to practice professional nursing. Yıldırım (2010a).skill based critical thinking education program were conducted 14 week (two credit), 11 units, every unit theoretical knowledge, scenario studies, exercises and homework in the content of the elective course. Topics covered were committed to the nursing process. Skill based critical thinking education program were conducted firstly. There was not statically significant difference between students' pretest California Critical Thinking Disposition Inventory scores ($p>0.05$) and there was statically significant difference between posttest California Critical Thinking Disposition Inventory scores ($p<0.05$); it is seen that the discussing group had moderate level and control group had lower level scores. This difference originated from discussing group that had higher academic success scores from control group. It is observed that discussing group students had explicit increase on final grade success through the first unit to last unit in the course period.

2.1 Nursing Process

The nursing process is synonymous within the discipline of nursing. It is an organized, systematic approach used by nurses to meet the individualized health care needs of their patients. Alfaró-LeFevre (1999) states that: The nursing process is a systematic method of giving humanistic care that focuses on achieving desired outcomes in a cost-effective fashion. It's systematic in that it consists of five steps. It's humanistic in that it's based on the belief that as we plan and deliver care, we must consider the unique interests, ideals, and desires of the health care consumer (person, family, community). The nursing process is used by nurses worldwide to describe the delivery of nursing care. Its origin can be traced back to 1955 when Hall a nursing theorist described nursing care as a process. According to Wilkinson (1996), the term nursing process was used to describe a series of steps describing the process of nursing by several nursing authors such as Dorothy Johnson, Ida Jean Orlando, and Ernestine Wiedenbach. The characteristics of the nursing process as defined by Wilkinson (1996) are: dynamic and cyclic; client centered; planned and goal-directed; universally applicable; problem-oriented; and a cognitive process. It is recognized as the foundation for professional nursing practice, and provides the professional nurse with a

framework for decision making and problem solving in everyday practice and situations. This process consists of five phases namely: assessment, diagnosis, planning, implementation and evaluation. Alfaró-LeFevre (1999) provides a brief description of the steps of the nursing process as follows:

2.1.1 Assessment

You collect and examine information about health status, looking for evidence of abnormal function or risk factors that may contribute to health problems such as smoking. You also look for evidence of client strengths.

2.2 Diagnosis (Problem Identification)

You analyze the data (information) and identify actual and potential problems, which are the basis for the plan of care. You also identify strengths, which are essential to developing an efficient plan.

2.3 Planning

Here, you do four key things:

Determine immediate priorities: Which problems need immediate attention? Which ones can wait? Which ones will nursing focus on? Which ones will you delegate or refer to someone else? Which ones required a multidisciplinary approach?

2.4 Establish expected outcomes (goals)

Exactly what do you expect the patient or client to accomplish, and in what time frame?

2.5 Determine interventions

What interventions (nursing actions) will you prescribe to achieve the outcomes?

Record or individualize the plan of care. Will you write your own plan, or will you adapt a standard plan to meet your patient's specific situation?

Implementation: You put the plan into action-but you don't just act. You act thoughtfully:

Assess the person's current status before acting. Are there any new problems? Has anything happened that requires an immediate change in the plan?

Perform the interventions, monitoring the person carefully and making changes as needed. What's the response? Do you need to change something? You don't wait until the "formal" evaluation period to make changes if something needs changing today.

Report and record. Are there any signs you must report immediately? What are you going to chart, and where and how are you going to chart it?

2.6 Evaluation

You determine whether the desired outcomes have been achieved, whether the interventions were effective, and whether changes need to be made; then you change or terminate the plan as indicated. How does the person's health status compare with the expected outcomes? Is your patient able to do what you planned? If not, why? Are there new care priorities? If you achieved the outcomes, is the person ready to manage his care on his own? Do you need to make referrals for health promotion? What made the plan work? What could have been done to make things easier? The last step evaluation is related to all of the preceding steps and involves reassessment of the total nursing plan of care to determine whether the expected outcomes were accurate and effective. The nursing process is seen as a decision making approach that promotes critical thinking in nursing. It is compared with the scientific method of solving problems. The steps are similar in the two approaches, as they proceed from identification of the problem to evaluation of the solution. One difference though is that the scientist identifies the problem first and then collects the data.

By contrast, the nurse collects the data and then determines the problem. Wilkinson (1996) equated the cognitive skills required by nurses to the intellectual skills used in the nursing process namely: creative thinking, critical thinking, problem solving and decision making. The critical thinking concepts, described by authors identifying the problem, gathering pertinent data, identifying and challenging assumptions, beliefs, ideas and issues and imagining and exploring alternatives creatively can be paralleled with the steps of the nursing process as described earlier.

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