



Research Article

Probing Concept of Critical Thinking in Nursing Education in Iran: A Concept Analysis



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SUMMARY

Purpose: Given the wide disagreement over the definition of critical thinking in different disciplines, defining and standardizing the concept according to the discipline of nursing is essential. Moreover, there is limited scientific evidence regarding critical thinking in the context of nursing in Iran. The aim of this study was to analyze and clarify the concept of critical thinking in nursing education in Iran.

Methods: We employed the hybrid model to define the concept of critical thinking. The hybrid model has three interconnected phases—the theoretical phase, the fieldwork phase, and the final analytic phase. In the theoretical phase, we searched the online scientific databases (such as Elsevier, Wiley, CINAHL, Proquest, Ovid, and Springer as well as Iranian databases such as SID, Magiran, and Iranmedex). In the fieldwork phase, a purposive sample of 17 nursing faculties, PhD students, clinical instructors, and clinical nurses was recruited. Participants were interviewed by using an interview guide. In the analytical phase we compared the data from the theoretical and the fieldwork phases.

Results: The concept of critical thinking had many different antecedents, attributes, and consequences. Antecedents, attributes, and consequences of critical thinking concept identified in the theoretical phase were in some ways different and in some way similar to antecedents, attributes, and consequences identified in the fieldwork phase. Finally critical thinking in nursing education in Iran was clarified.

Conclusion: Critical thinking is a logical, situational, purposive, and outcome-oriented thinking process. It is an acquired and evolving ability which develops individually. Such thinking process could lead to the professional accountability, personal development, God's consent, conscience appeasement, and personality development.

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Introduction

Critical thinking (CT) is a fundamental component of management, decision making, clinical judgment, professional achievement, and effective cooperation in the community (Akyuz & Samsa, 2009). The development of CT among nursing graduates is so important that education experts refer to it as the main goal of all educational endeavors. They believe that CT is the main outcome of higher education and a key factor in program accreditation (Staub, 2003). The Essentials of Baccalaureate Education for Professional Nursing Practice have referred to CT as an important competency for nursing students (World Federation for Medical Education, 2009). Despite the consensus between experts and scholars over

the importance of CT, there is considerable disagreement over its nature and definition. Researchers tend to define the concept based on their own disciplines—such as philosophy, psychology and education (Demir, Bacan, Tarhan, & Dombay, 2011).

The same problem exists in nursing. Most nursing educators have consensus over the importance of CT; however, few of them have agreement on a single, comprehensive definition of the concept (Spencer, 2008). Application of CT in nursing has yielded to some degree of confusion and uncertainty. Such confusion and uncertainties happen when nurses, nurse educators, and students use CT interchangeably with other relevant expressions and concepts that have different meanings (Jenkins, 2011). On the other hand, despite the clear consensus over the importance of CT, the effects of cultural beliefs on this concept have still remained unknown (Demir et al., 2011). Jenkins reported that there is inadequate evidence regarding the cross-cultural perspectives on CT. She, therefore, recommended more studies for determining the central components of the concept and also for developing its

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flexible and applicable constructs. Consequently, defining and standardizing the concept according to the discipline of nursing seems essential. Moreover, clarification of the concept and identification of its attributes, antecedents, and consequences would help researchers develop valid instruments for evaluating nurses and nursing students' critical thinking ability. On the other hand, there is limited scientific evidence regarding critical thinking in the context of nursing in Iran. The purpose of this study was to analyze and clarify the concept of critical thinking in nursing education in Iran.

Methods

We employed the hybrid concept analysis model (henceforth, briefly referred to as the hybrid model) to perform an in-depth analysis of the concept of CT. In the hybrid model, theoretical analysis of the literature and the analysis of the empirical data are employed to analyze, refine, and define the concept of interest (Rodgers & Knafl, 1993). Employing both theoretical and empirical data overcomes the limitations of the current definitions and provides a comprehensive context-based definition of the concept. The hybrid model has three interconnected phases—the theoretical phase, the fieldwork phase, and the final analytic phase. The theoretical phase focused mainly on the analysis of the theoretical data retrieved from the literature. This phase leads to an operational definition of the concept. During the fieldwork phase, the theoretical definition is refined through qualitative analysis of the empirical data obtained from key informants. In the final analytic phase, theoretical data are compared with the empirical data to provide a refined definition of the intended concept (Schwartz-Barcott, Patterson, Lusardi, & Farmer, 2002). Consequently, the final definition is supported by both theoretical and empirical data. We went through all the aforementioned phases of the hybrid model to provide a comprehensive literature-derived and context-based definition of CT in the context of Iranian nursing education system.

Theoretical phase: literature review

Schwartz-Barcott and Kim (1993) emphasized the need to search the literature extensively. Once the literature has been gathered, the focus is on identifying the essential nature or the “essence” of the concept in the form of attributes. The attributes are not dictionary definitions, but represent the “real” definition of the concept (Rodgers & Knafl, 1993). Schwartz-Barcott and Kim used the literature to explore the relative strengths and weaknesses of the various definitions to produce a tentative definition.

We conducted an internet-based literature review to retrieve studies published between 1990 and 2013. The search key terms were “critical thinking”, “nursing”, “education”, and “nursing education”. We searched both international databases (e.g., Elsevier, Wiley, CINAHL, Proquest, Ovid, and Springer) as well as national Iranian databases (e.g., SID, Magiran, and Iranmedex). Initially, 829 full-text articles and 771 abstracts were retrieved. However, many of the retrieved documents were the same articles indexed in multiple databases. After removing those repetitive documents, 375 articles remained in our study database. Thereafter, we read the title and abstract of the retrieved articles and selected only those that had defined or analyzed the concept of CT. Finally, 35 articles were included in the final analysis. While reading and examining the retrieved studies, we searched for the definitions, attributes, antecedents, and consequences of CT. We extracted the definitions, attributes, antecedents, and consequences of the concept and inserted them into separate documents. Finally, we compared the retrieved definitions, attributes, antecedents, and consequences and produced a comprehensive list.

Definitions of CT in nursing education

Many scholars have emphasized the importance of CT for nurses (Brooks & Shepherd, 1990; del Bueno, 1992; Ford & Profetto-McGrath, 1994; Miller & Malcolm, 1990). The Watson and Glaser's (1980) definition of CT is very close to the definition of nursing process and hence, is the most common definition of the concept in nursing literature. They referred to critical thinking as the composite of attitude, knowledge, and skills that include “defining a problem, choosing information for solution, recognizing stated and unstated assumptions, formulating and selecting relevant and promising hypotheses, drawing conclusions, and judging the validity of the inferences” (Watson & Glaser).

CT is the rational explanation of ideas, inferences, principles, arguments, and assumptions which yields to consequences, outcomes, statements, opinions, and actions (Bandman & Bandman, 1995). According to Kataoka-Yahiro and Saylor (1994), critical thinkers consider more than one solution for each nursing problem. They are committed to the cognitive process of dialectic thinking. Dialectic thinking, in turn, is focused on a nurse's open-mindedness, mental curiosity, and skepticism which may accordingly lead to the development of conflict-solving and problem-solving abilities (Brookfield, 1987). CT is reflective and rational thinking and decision-making about those nursing problems that have more than one solution (Kataoka-Yahiro & Saylor). It is the process of repeated synthesis of relevant information, examination of assumptions, identification of patterns, prediction of outcomes, generation of options, and selection of actions (Jacobs, Ott, Sullivan, Ulrich, & Short, 1997).

Oermann (1997) considered CT as a thinking process which leads to effective problem solving and decision making (Bethune & Jackling, 1997; Simpson & Courtney, 2002; Tanner, 1993). The process of CT encompasses critical, creative thinking and embodies the re-arrangement of ideas and concepts in an unprecedented way, which finally leads to the formation of innovative ideas and concepts (Gendrop & Eisenhauer, 1996). Scheffer and Rubenfeld (2000) referred to CT as an essential component of the professional accountability and quality nursing care. According to Alfaro-LeFevre (2004) and Daly (1998), CT is a key feature of nursing knowledge, education, and practice and a purposeful outcome-oriented thinking that is derived from patients' needs and is guided by professional standards. Moreover, it is a regularly re-evaluated and self-corrected process that aims at constant improvement (Alfaro-LeFevre; Daly).

Landis and Michael (1981) and Ennis and Milleman (1985), (as cited in Fero et al., 2010) noted that CT is reflective and rational thinking that focuses on decision making about our beliefs and actions. They also noted that CT encompasses the ability to compare and contrast alternative decisions. Based on this definition, the key elements of CT include the ability to search and comprehend the relevant information. Moreover, it is associated with “knowledge, reasoning, cognitive skills, identification, and exploration of alternative frames of reference” (Fero et al.). Simpson and Courtney (2002) defined CT as the basic cognitive process for the development and the application of knowledge which can be applied to problem solving and decision making in different social, ethical, managerial, or political situations.

Bartol (2008) examined the definitions of CT in the nursing literature and found that CT “requires knowledge”, “assumes maturity”, “is more than a set of skills”, “involves deductive and inductive reasoning, analysis and synthesis”, “includes feelings and reflection”, and “challenges the status quo”. Özdemir (2005) reported that CT consists of mental and rational abilities of an individual. These abilities include but are not limited to the ability to identify knowledge, apply different criteria to decision making, provide relevant evidence before accepting others' ideas and claims

about the intended phenomenon, challenge others' ideas and claims, and have confidence, veracity, consistency, and integrity.

Facione and Facione (1996) mentioned that CT is an intentional self-regulated decision-making mechanism associated with evidence-based and criterion-based conceptual, methodological, and contextual explanations, recommendations, analyses, evaluations, and inferences. CT is considered as thinking about your thinking when you think about making your thinking clearer, more systematic, more rational, and more defensible (Loving & Wilson, 2000; Paul, 2005; Turner, 2005). Other scholars have defined CT as a unique cognitive thinking process or reflective and rational thinking that focus on decision making about what we believe or do (Adams, 1999; Daly, 1998; Turner).

CT is beyond nursing process and problem solving. It is both a philosophical orientation toward thinking and a cognitive process recognized by rational judgment and reflective thinking (Glen, 1995; Tanner, 1993). In terms of nursing professionalism, CT is a powerful knowledge base, which enables nurses to analyze nursing interventions and the potential outcomes and effects of their interventions (Petrini, 2001). In a precise contextual definition, Wilkinson (1992) defined CT as the basic knowledge, attitudes and skills applied to all nursing situations.

Attributes of CT in nursing education

The attributes of the concept of interest are determined in the theoretical phase of the hybrid model. Attributes are the dimensions of the concept appearing so much repeatedly in the definitions of the concept that the concept cannot survive without them. Scheffer and Rubinfeld (2000) categorized the attributes of the concept of CT in the following 17 dimensions: analyzing, applying the standards, confidence, contextual perspective, creativity, discriminating, flexibility, information seeking, inquisitiveness, intellectual integrity, intuition, logical reasoning, open-mindedness, perseverance, predicting, self-reflection, and transforming knowledge.

Operational definition of CT in nursing education based on literature review

According to the reviewed literature, CT can be defined as a logical, purposive, and outcome-oriented process driven by patients' needs and guided by professional standards, policies, and procedures as well as ethical codes and rules. It is a key component of nursing education, knowledge, and practice and is rooted in nurse's knowledge, attitudes, skills, and experiences. CT employs logic, intuition, and creativity to evaluate the evidence of certain claims and to determine whether the findings have derived from evidence or not. It also considers alternative explanations. CT enables nurses to adopt creative and unique solutions under unforeseen circumstances to make rational decisions about what they believe or do. Finally, CT entails professional accountability and also quality nursing care.

Fieldwork phase

Concurrent with the theoretical phase, we conducted the fieldwork phase aimed at exploring the concept using empirical data. The aim of this phase was to refine the findings of the first phase. In this phase, we employed the semi-structured interview method for qualitative data collection to enrich and contextualize the concept. Each interview session started with an open-ended question and continued using the probing questions and the interview guide. Interviews lasted 30–60 minutes. The interview guide consisted of questions such as, “Can you tell me what you understand about the concept of critical thinking?” “How do you

judge that a student is thinking critically?” “What do you consider in the clinical area that you think the student is thinking critically?”

We recruited a purposive sample of 17 key informants—including seven assistant and associate nursing professors with more than 10 years of teaching experience, 3 PhD students, 2 clinical instructors with more than 4 years of clinical teaching experiences, and 5 licensed clinical nurses with more than 5 years of clinical experience. The participants were selected from three universities in Tehran and Esfahan, Iran and also from a teaching hospital located in Karaj, Iran. The study sample consisted of 5 male and 12 female participants. Interviews were recorded by using a digital sound recorder and were then transcribed verbatim. Data collection was continued until reaching data saturation. We started the data analysis process immediately after the first interview. We employed the directed qualitative content analysis approach for analyzing the data. In this approach, primary coding categories are generated and operationally defined by using the available theories and literature (Hsieh & Shannon, 2005). Thereafter, in the data analysis process, we started using three inter-related phases including open coding, categorization, and abstraction (Elo & Kyngäs, 2008). We went through all these phases for data analysis. The MAXQDA 10 software was employed for data management. It has been developed and distributed by VERBI Software based in Berlin, Germany.

In qualitative research, criteria such as credibility, dependability and transferability are usually used for addressing various aspects of trustworthiness (Berg & Welander Hansson, 2000; Guba, 1981; Lincoln & Guba, 1985; Patton, 1987; Polit & Hungler, 1999). First endeavors for establishing credibility are made when researchers think about the focus, the context, the participants, and the data collection method of the study (Adler & Adler, 1988; Patton). To establish credibility, we selected participants with different levels of clinical and teaching experiences. This strategy helped increase the possibility of shedding light on the research question from a variety of aspects. We also provided verbatim quotations from participants to increase credibility. Another way for establishing credibility is to seek agreement among co-researchers, experts, and participants. In this study, the same researcher conducted all the interviews and analyzed the data. Other researchers helped the first researcher identify and minimize her biases. They also examined the accuracy and the appropriateness of the generated codes and categories. The study findings were also checked with the participants. Accordingly, a summary of the authors' interpretation of the key points and the generated codes were given to the participant. We asked them to determine whether the generated codes reflect their views or not. To establish dependability of the study findings, we documented a kept a record of all of our research activities so as to make it possible for others to audit the study. Finally, to increase the transferability of the findings, we provided a clear and comprehensive description of the study context, the participants' characteristics, as well as the data collection and the data analysis processes.

A university-affiliated ethics committee approved the study. We explained the aim and the process of the study for the participants and assured them that they would be able to access the study findings. They were free to participate or reject participation in the study. Interviews were arranged according to the participants' preferences and convenience. Finally, we asked the participants to read and sign the informed consent form of the study.

Final analytic phase

The third phase of the hybrid model consists of combining the findings of the first and the second phases. In this phase, we compared the categories and subcategories generated in the empirical phase with those generated in the theoretical phase. Accordingly, we compared antecedents, attributes, and

consequences of the CT concept generated in the first and the second phases and recognized the similarities and differences. Finally commonalities of the two phases were identified.

Results

Antecedents of critical thinking

Antecedents of CT included (a) teachers' personal characteristics and abilities, (b) students' personal characteristics and abilities, (c) factors related to the nursing discipline and (d) factors related to the nursing system of education.

Teachers' personal characteristics and abilities

Teachers' personal characteristics as evident from the reviewed literature included work experience, knowledge, teaching style, authority, readiness, desire to apply critical thinking, awareness of his role-modeling role, impartiality and fairness, insight, foresight, reasoning, application of standards, knowledge transformation, and claim supporting. Our participants also pointed out these characteristics—either directly or indirectly—as well as other characteristics such as striving for motivating and nurturing students, recognizing the individuality and uniqueness of each student, and considering other colleagues as effective role models.

I try to motivate my students; I always remind them 'You can.' We need to attempt to revivify their experiences. (Participant 2)

I have recognized one or two of my colleagues as my role-models. (Participant 5)

On the other hand, teacher's abilities, as evident from the literature, were setting the goals of CT clearly and contextually, providing opportunities for practicing it, encountering students with different situations, and creating an empowering and supporting environment. In addition to these abilities, our participants pointed out abilities such as having an educational philosophy, developing a friendly relationship with students, adopting a collaborative teaching strategy, relating the educational materials to the religious beliefs, considering students' abilities when assigning responsibilities and tasks to them, combining teaching with nurturing, providing cognitive examples, asking students to think about God as the creator, creation, and creatures, teaching ethical principles to students, and arousing students' conscience.

My dominant teaching style has been collaborative, [that is,] I pace myself with my students; sometimes, I even offer them an indirect answer or strategy and ask them to guess other possible answers or strategies. (Participant 2)

Sometimes, I ask students to clarify their meaning with examples drawn from the poetry of Hafez [a famous Persian poet] or Hadith [religious aphorism]. Remember, you [as a teacher] not only are teaching but also are nurturing. Sometimes, you can give them cognitive theological hints. I mean, God is not merely in the mosques; rather, you can also feel him in the classroom, especially in the Medical-Surgical classes where you can see how elaborately God has created human beings. Sometimes, you have to attract students' attention towards God, creation, truth, and existence. Classroom is a good place for highlighting these points. (Participant 5)

We, as teachers, need to define learning, good student, etc., based on a predetermined philosophy... One of the teachers'

characteristics is effective communication; we have to be able to communicate effectively. (Participant 3)

Students' personal characteristics and abilities

Student's personal characteristics, as retrieved from the literature, were "being interested in listening, questioning, and truth discovering", "having confidence, creativity, flexibility, curiosity, intellectuality, intuition, insight, contextual comprehension, logical skepticism, reflection, and perseverance", and "avoiding passiveness, indifference, and prejudice". Our participants also added to this list other characteristics such as having conscience, self respect, independence, and freedom.

Each individual student should feel responsibility towards and committed to his society. He should think whether he has added any useful thing to the body of knowledge related to his discipline or not. (Participant 3)

I should assess students' level of significance, independence, and freedom in presenting themselves in their families and communities. These are the characteristics of critics. (Participant 7)

[A student] need to attempt, spend time, and value himself and his work. (Participant 5)

Regarding student's abilities, our literature review in the theoretical phase yielded no result. However, our participants pointed to abilities such as sympathizing with patients, being courageous to disclose and report personal errors, being interested in care, research, and statistics, and being stylish and well-organized.

Eligible students for CT are those who are interested in research; students who know the research language know that this language is remarkably similar to the language of CT. Our epidemiologists and methodologists are critical thinkers. (Participant 8)

Sometimes, [students] come and disclose their committed medication or documentation errors. (Participant 5)

Factors related to nursing discipline

Other antecedent of CT was factors related to the nursing discipline and nursing system of education. In the theoretical phase, we found only one antecedent—making CT an interdisciplinary activity. However, our participants also added factors such as developing a contextual body of knowledge for nursing and introducing the course of philosophy into the nursing curriculum.

We need to develop a nursing knowledge that is unique to our country. I mean we need to make use of the knowledge generated by our students. Therefore, we need a basic contextual knowledge for nursing. (Participant 9)

Of course, one way [to develop CT] is to introduce the course of philosophy [into the curriculum] or at least our teachers need to have a philosophical background. (Participant 8).

Factors related to nursing system of education

Factors related to the nursing system of education were another antecedent of CT. In terms of theoretical education system, previous studies had addressed antecedents such as appraisal of all the components of teaching-learning process, nonteacher-centered education, application of effective teaching-learning strategies, and appropriate procedures and criteria for student evaluation. Our participants mentioned other antecedents such as considering the CT ability as a prerequisite for entering nursing, employing qualified human resources, familiarizing

freshman students with the concept of CT, and writing the course syllabi based on the philosophy and underpinnings of each course.

A really interested student certainly [has more CT ability]; therefore, we must consider the CT ability as a prerequisite for entering nursing. We should allow only those interested students who have CT ability to enter nursing...I believe that the use of students' thoughts can produce a considerable change [in nursing]. The mutual learning teaching process happens only when I [as a teacher] use students' thoughts. Therefore, we need to employ qualified human resources. (Participant 11)

On the other hand, regarding clinical nursing education, the only antecedent of CT addressed in the reviewed literature was evidence-based nursing practice. Our participants also added antecedents such as giving more latitude to clinical nurses, developing CT ability in collaboration with head nurses and staff nurses, asking clinical instructors to closely supervise nursing students when they are providing nursing care, requiring students to assess patients before implementing each nursing procedure, providing students with the opportunity for attending physicians' clinical discussions, adopting and promoting evidence-based nursing practice, and optimizing the caring approaches.

Head-nurses and staff nurses go through their old routines. They are reluctant to make changes. Therefore, we, initially, need to unfreeze them. (Participant 7)

We [as teachers] should teach students to assess patients prior to drug administration. (Participant 5)

Attributes of critical thinking

Attributes of CT that had been addressed in the literature were as follows: CT has an applied and complex nature and hence, is not teachable through mere theoretical education; it includes innovative thinking about and reflecting on problems; it is beyond the nursing process and is learned through independently practicing nursing and performing professional roles; and finally, it emphasizes on paradoxical and complex situations and the assessment of the assumptions, opinions, propositions, meanings, and functions of words, expressions, and arguments. Our participants also mentioned the above attributes and added that CT is an individual, situational and acquired ability, which is applicable to higher levels of education. They also noted that CT is an interdisciplinary concept. Participants stated the following:

We need the [CT] process for specific situations where we have different alternatives, when we are located among several propositions and need to make deductions and decisions about them, and when there is some degrees of uncertainty. However, it is less applicable to and less important for routine situations ... because in routine situations, we have clear predetermined guidelines developed by critical thinkers and decision makers. (Participant 8).

[CT] should be taught and practiced individually. Of course, I do not mean that it is not subject to team work and group discussion. Rather, I mean that CT is developed individually because thinking is naturally an individual activity... you think and conclude individually and then evaluate and critique your thoughts individually. (Participant 3)

Consequences of critical thinking

Consequences of CT included personal, systemic, and professional consequences. We explain these consequences below.

Personal consequences

Personal consequences, as mentioned by our participants, included personality development, holism, self-confidence, self-correction, multidimensional growth, situational analysis before implementing the nursing process, clinical judgment, and independent decision making and problem solving. Moreover, our participants believed that CT improves students' caring ability, appeases the conscience, and brings about God's consent. All of these consequences except for personality development, God's consent, and conscience appeasement were also reported in the literature.

[When they use their CT ability] they feel comfortable about their work and God's consent; they feel that their income is legitimate. CT leads to patient satisfaction and nurses' job satisfaction. It soothes nurses' conscience. (Participant 15) We critique and modify each other [through CT]. When I'm at home, I sit down and think and revise my opinions and [decide to] modify my behaviors. (Participant 8)

Systematic consequences

According to the study participants, Systematic consequences of CT were teachers and students' academic development and achievement, better job prospect for nurses, and the improvement of the quality of nursing education and research. All these consequences, except for better job prospect, have also been referred to in the literature. Participants stated the following:

I believe that individuals must have opportunities for presenting themselves, for showing their abilities, and for knowing their strengths and weaknesses. They must be able to evaluate the nursing curriculum as well as educational strategies and policies. These would strengthen the system of nursing education and also would empower teachers and learners. (Participant 10)

CT in nursing must result in effective problem solving and improve the quality of [nursing] practice, education, and research. (Participant 9)

Professional consequences

Our participants believed that CT has professional consequences such as professional achievement, effective problem solving and decision making, and effective time management, the improvement of the social status of nursing, the improvement of physicians' image of nursing, and the introduction of new thoughts and ideas into nursing. In the literature review phase, we also found the same consequences except for the improvement of the physicians' image of nursing. Moreover, we found, in the literature, that CT reduces nurses' anxiety when facing new situations, decreases the incidence of nursing and medical errors, improves the professional status of nurses from order-followers to independent decision-makers, and helps nurses identify patients' needs and choose the best interventions and procedures. Participants stated the following:

CT, if taught, learned, and applied properly, will improve the status of nursing as well as the quality of education and develop teachers and students' personality; therefore, it will lead to the promotion of both teachers and students... there will be no more outdated dialogues and activities and new thoughts will emerge. Consequently, the nursing status will get improved. (Participant 10)

If we perform our roles properly, physicians' image of nursing will also improve. (Participant 15)

Discussion

This study aimed at analyzing and clarifying the concept of CT in nursing education. According to the findings of the literature review phase, CT is the composite of attitude, knowledge, and skills (Brooks & Shepherd, 1990; Paul, 2005; Scriven & Paul, 2004). The findings of the fieldwork phase also showed that for promoting CT in nursing education, both teachers and students needed to possess professional attitude, knowledge, and skills. Based on our literature review and operational definition of CT in nursing education from the literature, for defining the concept of CT, we must determine its antecedents, attributes and consequents (Scheffer, & Rubenfeld, 2000; Schwartz-Barcott et al., 2002). The findings of the fieldwork phase showed that antecedents of CT in nursing education must be considered in personal, systemic, and disciplinary levels. However, according to our participants, the antecedents of CT consisted of contextual factors such as being interested in the Persian literary works and poems, relating educational materials to religious beliefs, asking students to think about creation and existence, developing a contextual body of knowledge for nursing, integrating the course of philosophy into the nursing curriculum, considering the CT ability as a prerequisite for entering nursing, employing qualified human resources, introducing the concept of CT to the freshman students, and writing the course syllabi based on the philosophy and underpinnings of each course. None of these antecedents have been addressed in the literature.

In addition to the attributes cited in the literature, the study findings show that CT is an individual, situational, and acquired ability. On the other hand, in addition to the CT consequences that were found in the literature review phase of the study, our findings revealed that CT could have other consequents such as God's consent, conscience appeasement, better job prospect, and the improvement of the physicians' image of nursing. Finally, our findings highlighted the importance of and the necessity for defining the concept of CT contextually.

Conclusions

The concept of CT in nursing education is still changing due to diversity of contextual issues. Based on the results of the theoretical and fieldwork phases of the current study, the definition of CT in nursing education is as follows: CT is a logical, situational, purposive, and outcome-oriented thinking process. It is an acquired and evolving ability, which develops individually. Its prerequisites are teachers' and students' attitudes and skills, a systematic body of knowledge derived from patients' needs, and some changes in the nursing discipline—such as integrating the course of philosophy into the nursing curriculum, practicing nursing based on the professional standards and ethical codes. Such thinking process could lead to professional accountability, personal development, God's consent, conscience appeasement, and personality development.

Conflict of interest

The authors declared no conflict of interest.

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