

Original article

Validly and Reliability of California Critical Thinking Disposition Inventory (CCTDI) in Kermanshah University of Medical Sciences

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Abstract

Introduction: Students with appropriate Critical Thinking Disposition can facilitate the countries of scientific development, at the first step of endeavor toward the development is to have a valid and reliable instrument. This study carried out to determine validity and reliability of California Critical Thinking Disposition Inventory (CCTDI) and critical thinking disposition of nursing and midwifery students of Kermanshah University of Medical Sciences.

Methods: A Descriptive- Analytical study was carried out on nursing and midwifery students. The CCTDI instrument which includes 75 items. It determined total of Critical Thinking Disposition and 7 sub-scales (Open-Mindedness, Truth-Seeking, Maturity, Systematicity, Analyticity, Inquisitiveness and CT-confidence) among students. Content validity and internal consistency reliability were applied.

Findings: 82.8% and 49% of students were females and midwifery students respectively. Cronbach's Alpha coefficient of total Critical Thinking Disposition was 0.8 and sub-scales obtained the followings coefficients: CT-Confidence 0.7, Systematicity 0.6, Truth-Seeking 0.56, Analyticity 0.55, Inquisitiveness 0.4 and Open-Mindedness 0.43. The best scores of sub-scales belonged to CT-confidence among students and the most scales of Critical Thinking Disposition of students were ambivalence.

Conclusion: It seems that the CCTDI is a proper instrument for nursing and midwifery students in Kermanshah University of Medical Sciences. It is recommended to standardize the instrument for Iranian students.

Key words: Critical Thinking, Critical Thinking Disposition, California Critical Thinking Disposition, Nursing and midwifery students and Kermanshah.

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Introduction

Critical thinking has now been accepted as the fundamental component of every education system (1). Currently health care is facing rapid changes and overwhelming increase in the information. It is mandatory for

nurses and other health care providers to use critical thinking for making decision in clinical settings (2). Definition of critical thinking has long been subjected to controversy. As such we have been left with a collection of definitions

from extremely simple to extremely complicated definitions (3). John Dewey (1933) stated that reflective thinking, the careful collection and evaluation of evidence leading to a conclusion, should be a central aim of education (4). Critical thinking is a self-regulatory process of judgment that help one decide to how to deal with (and solve) problems (5). Critical thinking is the process of thinking that questions assumptions. It is a way of deciding whether a claim is true, false; sometimes true, or partly true. The origins of critical thinking can be traced in Western thought to the Socratic method of Ancient Greece and in the East, to the Buddhist kalamasutta and Abhidharma. Critical thinking is an important component of most professions. It is a part of the education process and is increasingly significant as students' progress through university to graduate education, although there is debate among educators about its precise meaning and scope (6). Dewey argued that having knowledge could not necessarily be translated to having competent thinking ability rather one would be interested in thinking (4). There is no agreement on defining and measuring critical thinking. In its early development, critical thinking was perceived as primarily involving cognitive skills and affective dispositions were inconsistently recognized as an important part of critical thinking. To gain a better conceptualization of critical thinking, Facione (1990) conducted a cross-discipline Delphi study with 46 critical thinking experts. This study yielded a conceptual consensus of critical thinking that included cognitive skills and affective dispositions. According to the Statement of Expert Consensus for Purposes of Educational Assessment and Instruction, critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. Critical thinking is essential as a tool of inquiry. As such, critical thinking is a liberating force in education and a powerful resource in one's personal and civic life. While not synonymous with good thinking, critical thinking is a pervasive and self-rectifying human phenomenon. The ideal critical thinker 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. Thus, educating good critical thinkers means working toward this ideal. It combines developing critical thinking skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society (7). Critical thinking is the basis of professional nursing practice and is essential in the current complex health care delivery system. 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 while coping with the expansion in role associated with the complexities of current health-care systems (8). On the other it has been shown that having critical thinking skills could not directly be translated to professional competence (9). To the best of our knowledge critical thinking ability has never been studied in relation with nursing professional competence in Iran. To do so the first step would be to find a tool to measure critical thinking ability. We, therefore, have studied the reliability and validity of the currently available measures. Using a valid tool we have, then examined the critical thinking disposition nursing and midwifery students.

Materials and Methods

A convenient sample of 198 students of nursing and midwifery of was obtained from the Kermanshah University of Medical Sciences for the current study. We used the California Critical Thinking Disposition Inventory (CCTDI). The CCTDI was designed to measure critical thinking dispositions of truth-seeking (12 items), open-mindedness (10 items), analyticity (11 items), systematicity (12 items), inquisitiveness (11 items), self-confidence (9 items) and maturity (10 items), which has been approved with a

significant difference from prior conceptualizations of critical thinking dispositions(7). It is the only measurement that has been validated to measure critical thinking disposition and is appropriate for use in nursing (10).The CCTDI uses a 6-point Likert scale in which 1 = strongly agree and 6 = strongly disagree. Based on a respondent's answers, each item is given a score from 1 to 6. Total CCTDI score of 280 or less indicates serious overall deficiency in critical thinking disposition, total CCTDI score between 280 and 350 indicates ambivalent attitude, and total CCTDI above 350 is consistent with a solid indication of strength in the disposition toward critical thinking. For each dimension, total score less than 30 indicates negative attitude; 30-40, ambivalence; and above 40, positive attitude. Two bilingual persons, competent in both English and Persian language translated the CCTDI into a Persian version; it was back translated and was approved by California press. Content validity and internal consistency reliability were examined. For content validity in addition to experts in the field, students were also asked to offer their suggestions. The Kermanshah University of Medical Sciences approved the design of the study.

Findings

Among 198 participants 82.8% were female and 49% were studying midwifery. Cornerback's alpha for total CCTDI was 0.80. The corresponding figures were 0.70 for self-confidence, 0.60 for systematicity, 0.56 for inquisitiveness, 0.55for analyticity, 0.43 for maturity, and 0.41 for open-mindedness. No difference was observed between male and female participants with respect to the total CCTDI score or scores of each dimension. Table 1 and 2 represent the distribution of different disposition estates across sexes and majors, respectively. The most percentage of participants (female and male, nursing and midwifery) obtained 210-350 score of Critical thinking disposition. Table 3 demonstrates sub-scales of critical thinking disposition, the lowest percentage obtained for truth-

seeking. Figure 1 depicts the mean scores for each dimension of the CCTDI. The highest mean score obtained for self-confidence followed by analyticity.

Table 1. The distribution of critical thinking disposition score across sexes

Sex Score	Female N (%)	Male N (%)	Total N (%)
<210	3(1.8)	0(0)	3(1.8)
210-350	161(98.2)	34(100)	195(98.2)
Total	164(100)	34(100)	198(100)

Table 2. The distribution of critical thinking disposition score across majors

Major Score	Midwifery N (%)	Nursing N (%)	Total N (%)
<210	1(1.1)	2(1.9)	4(1.5)
210-350	90(98.9)	105(98.1)	195(98.5)
Total	91(100)	107(100)	198(100)



Figure 1: the mean scores of Sub-scales of the Critical Thinking Disposition

Table 3. The distribution of Sub-scales of the Critical Thinking Disposition

Sub-scales	Truth-seeking	Open-mid	Analyticity	Systematicity	Confidence	Inquisitiveness	Maturity
frequency	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Negative	107(54)	11(5.6)	2(1)	18(9.1)	5(2.5)	9(4.5)	35(17.7)
Equivalence	84(42.4)	136(68.7)	34(17.2)	69(34.8)	26(13.1)	61(30.8)	96(48.5)
Positive	7(3.5)	51(25.8)	162(81.8)	111(56.1)	167(84.3)	128(64.6)	67(33.8)
Total	198(100)	198(100)	198(100)	198(100)	198(100)	198(100)	198(100)

Discussion

Our findings indicated that CCTDI is a valid and reliable tool for examining critical thinking disposition. It was the first time to determine the validity and reliability the CCTDI with California Press Corporation in Iran. Although, Khalili et al examined the validity and reliability of the CCTST (from B). They found CCTST to be valid and reliable with Cornerback's alpha of 0.62(11). We also documented a weak critical thinking disposition among nursing and midwifery students with inquisitiveness and open-mindedness being most conspicuously weak. Passive traditional education systems are possibly involved in hindering the development or promotion of critical thinking process among students (7). Considering the importance of the critical thinking in clinical decision making any improvement in critical thinking can potentially affect the health care outcomes (12). It is therefore mandatory to modify the education programs so that to allow for critical thinking and thus improve critical thinking of the students.

While we found no difference between men and women as well as majors in respect of CCTDI score, the reports from previously conducted studies have not been conclusive (13, 14, and 15). Reed et al found women to be stronger than

men in open-mindedness and maturity (16). It is recommended to carry out an exclusive study to find out the effective of gender on Critical Thinking Disposition.

Conclusion

In conclusion we demonstrated the CCTDI to have good validity and reliability among

students of Kermanshah. Using the CCTDI we found that nursing and midwifery students if Kermanshah were not skilled in critical thinking. Before widely being adopted, the validity of the CCTDI needs to be examined in different setting. Future studies will also be needed to investigate factor contributing to critical thinking Disposition.

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