Brief Report

A Comparative Study on Critical Thinking Skills of Bachelor and Master's Degree Students in Critical Care Nursing

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Abstract

Background: Promoting critical thinking skills is an essential outcome of undergraduate and postgraduate nursing education.
Objectives: The current study aims at comparing critical thinking skills of bachelor students of nursing (BSc) and master's students of critical care nursing (MSc) in the academic year 2014 - 2015.
Methods: The current cross-sectional study was conducted on 79 BSc students of nursing and 44 MSc students of critical care nursing in 3 universities of medical sciences including Semnan, Tehran, and Kashan. The California critical thinking test, form B, was used for data collection. Analysis of variance Mann-Whitney, and Kruskal-Wallis tests were used for statistical analyses.
Results: The mean scores of BS and MSc nursing students were 11.14 ± 3.01 and 10.05 ± 3.33, respectively, which were not significantly different. The mean scores of students in Semnan, Tehran, and Kashan universities of medical sciences were 9.84 ± 3.13, 9.66 ± 3.32, and 11.79 ± 2.92, respectively, and the total mean score was 10.46 ± 3.24. The scores of critical thinking domains showed that students in Kashan University gained higher scores in interference, and deductive and inductive reasoning domains compared with the students in other universities.
Conclusions: The level of critical thinking in BSc students was higher. The overall level of critical thinking skills was low in nursing students. It is suggested that appropriate and effective methods should be employed to create and improve critical thinking in nursing education.

Keywords: Critical Thinking, Nursing Students, Education, Nursing

1. Background

Critical Thinking (CT) is one of the thinking styles that plays a major role in training and education (1, 2).

Although studies highlight the importance of CT as a fundamental tool in learning, the ability of students to use CT skills is low (3-10).

Many studies show improving levels of CT over the academic year (7, 11). However, Hariri and Bagherinezhad reported a low level of all CT domains in BSc and MSc students of the faculty of health sciences, Mazandaran University of Medical Sciences (12). As the students proceed through the academic year and increase their academic knowledge, it is expected that they become more educated critical thinkers. However, in adequate data is available regarding the CT levels in MSc students of nursing, especially in the students of critical care nursing who work in complicated and sensitive settings which require taking right decisions.

2. Objectives

The current study aims at comparing CT skill levels between the students of BSc and MSc in critical care nursing.

3. Methods

The current cross-sectional study was conducted on 123 nursing students, consisting of 79 BSc nursing students and 44 MSc students of critical care nursing, from Semnan, Tehran, and Kashan Universities of Medical Sciences, in the academic year 2014 - 2015. Inclusion criteria were studying in the last semester of nursing course, MSc students of critical care nursing in various semesters, voluntary participation in the study, and not have taken the California critical thinking test before the study. Participation in the CT workshop or test was considered as an exclusion criterion. Census sampling method was used, and a total of 180 questionnaires were distributed among all BSc and MSc students of critical care nursing.

The California critical thinking test, form B (CCTST, FB) was used. This test comprises 34 multiple-choice questions, and a correct answer on 5 domains of critical think-

ing (analysis, inference, evaluation, deduction, and induction) was used to measure the level of CT skills in students. The time required to answer the test was 45 minutes.

The mean score of the CCTST, FB was 15.89. Accordingly, scores less than 15.89 indicate lower levels of CT skill and scores higher than 15.89 represent higher levels of CT skill (13).

The validity and reliability of the test have been confirmed in earlier studies (12, 13). Based on Cronbach's alpha, reliability of the test was 0.87.

Three research assistants from the aforementioned universities were trained on how to fill out the questionnaires. After obtaining permission from the authorities of the universities, the questionnaires were distributed among the selected students during the breaks between classes. All students were asked to respond to the questionnaires in a private environment, and return the filled questionnaires on the same day.

3.1. Ethical Considerations

The study was approved by the ethics committee of Semnan University of Medical Sciences (ethic code: 92/358995, 2013/10/23). The objectives of the study were explained to the respondents and the informed consent was obtained from all of them before distributing the questionnaires. The questionnaires were anonymous and the respondents were assured of data confidentiality.

3.2. Data Analysis

After checking the normality using the Kolmogorov–Smirnov test, the data were summarized by descriptive and analytic statistical methods (ANOVA and the Mann-Whitney test to compare means; the Kruskal-Wallis test for non-normal data). Data analysis was performed by SPSS software version 13.

4. Results

Out of 180 students, 123 ones completed and returned the questionnaires, 43 of them were from Semnan University (24 BSc and 19 MSc students), 41 from Tehran University (30 BSc and 11 MSc students) and 39 from Kashan University (25 BSc and 14 MSc students); 59.3% of the participants were 20 - 24 years old, 65.9% were female, 68.3% were single, and grade point average of 53.7% of the participants ranged 17 - 18.99.

The mean ± standard deviation (SD) of CT scores for BSc and MSc students were 11.14 ± 3.01 and 10.05 ± 3.33, respectively. The Mann-Whitney test did not show a significant difference between mean scores of the 2 groups (P = 0.086) (Table 1).

Table 1. Comparison of Critical Thinking Scores Based on the Level of Education

Critical Thinking Domains	Degree[a]		P-Value
	Bachelor of Nursing Mean ± SD	Master of Nursing Mean ± SD	
Analytic	3.25 ± 1.33	2.70 ± 1.46	0.064[b]
Inference	3.59 ± 1.60	3.25 ± 1.37	0.312[b]
Evaluation	4.27 ± 1.63	4.03 ± 1.83	0.485
Deductive reasoning	4.54 ± 1.67	4.10 ± 1.92	0.214[b]
Inductive reasoning	5.45 ± 1.76	5.10 ± 1.92	0.552
Total	11.14 ± 3.01	10.05 ± 3.33	0.086

[a]All data are presented as mean ± SD
[b]The Mann-Whitney test (P < 0.05)

The mean ± SD of overall CT scores of Semnan, Tehran, and Kashan universities were 9.84 ± 3.13, 9.66 ± 3.32, and 11.79 ± 2.92, respectively; the total score was 10.46 ± 3.24. Comparison of mean scores of CT domains showed that the students of Kashan University got higher scores in domains of inference, deduction, and induction; their overall score was higher than those of the two other universities. The Kruskal-Wallis test showed a significant difference among the overall scores of the universities (P < 0.05) (Table 2).

5. Discussion

More than two-thirds of the participants obtained scores lower than the average level of CT, which indicated poor CT skills. Other studies have also confirmed that students obtained low scores in one of the CT domains (8, 12). It is believed that Iranian educational system is mostly focused on enhancing and strengthening the mind and knowledge domains rather than developing thinking skills, criticism, and scrutiny. Although nurses are trained to think critically, they do not apply it in solving problems; however, nursing schools have not succeeded in training the problem-solving process and the right decision-making skills (14).

The findings of the present study showed that BSc students of nursing scored higher compared to MSc students, although the difference was not significant. It confirmed that CT should be taught both in the formal university education and the implicit curriculum. In other words, hidden curriculum, which plays a critical role in universities, might help to expand and develop CT skills in BSc students (10).

Table 2. Comparison of Critical Thinking Scores Based on the University

Target University (Mean $\pm$ SD)	Comparative Universities (Mean $\pm$ SD)	P-Value
Analytic[a]		
Tehran (2.57 $\pm$ 1.53)	Semnan (2.92 $\pm$ 1.24)	0.264
	Kashan (3.23 $\pm$ 1.47)	0.059
Kashan (3.23 $\pm$ 1.47)	Semnan (2.92 $\pm$ 1.24)	0.337
	Tehran (2.57 $\pm$ 1.53)	0.059
Inference[a]		
Semnan (3.14 $\pm$ 1.55)	Kashan (4.05 $\pm$ 1.33)	0.014
	Tehran (2.92 $\pm$ 1.26)	0.470
Tehran (2.92 $\pm$ 1.26)	Semnan (3.14 $\pm$ 1.55)	0.47
	Kashan (4.05 $\pm$ 1.33)	< 0.001
Kashan (4.05 $\pm$ 1.33)	Semnan (3.14 $\pm$ 1.55)	0.014
	Tehran (2.92 $\pm$ 1.26)	< 0.001
Evaluation		
Semnan (3.76 $\pm$ 1.97)	Kashan (4.51 $\pm$ 1.44)	0.057
	Tehran (2.57 $\pm$ 1.53)	0.353
Tehran (2.57 $\pm$ 1.53)	Semnan (3.76 $\pm$ 1.97)	0.353
	Kashan (4.51 $\pm$ 1.44)	0.334
Kashan (4.51 $\pm$ 1.44)	Semnan (3.76 $\pm$ 1.97)	0.057
	Tehran (2.57 $\pm$ 1.53)	0.334
Deductive reasoning[a]		
Semnan (3.85 $\pm$ 1.79)	Kashan (4.89 $\pm$ 1.81)	0.011
	Tehran (4.07 $\pm$ 1.79)	0.580
Tehran (4.07 $\pm$ 1.79)	Semnan (3.85 $\pm$ 1.79)	0.580
	Kashan (4.89 $\pm$ 1.81)	0.049
Kashan (4.89 $\pm$ 1.81)	Semnan (3.85 $\pm$ 1.79)	0.011
	Tehran (4.07 $\pm$ 1.79)	0.049
Inductive reasoning		
Semnan (5.05 $\pm$ 1.70)	Kashan (5.89 $\pm$ 1.69)	0.041
	Tehran (4.73 $\pm$ 2.03)	0.434
Tehran (4.73 $\pm$ 2.03)	Semnan (5.05 $\pm$ 1.70)	0.343
	Kashan (5.89 $\pm$ 1.69)	0.013
Kashan (5.89 $\pm$ 1.69)	Semnan (5.05 $\pm$ 1.70)	0.041
	Tehran (4.73 $\pm$ 2.03)	0.013
Total		
Semnan (9.84 $\pm$ 3.13)	Kashan (11.79 $\pm$ 2.92)	0.007
	Tehran (9.66 $\pm$ 3.32)	0.810
Tehran (9.66 $\pm$ 3.32)	Semnan (9.84 $\pm$ 3.13)	0.81
	Kashan (11.79 $\pm$ 2.92)	0.004
Kashan (11.79 $\pm$ 2.92)	Semnan (9.84 $\pm$ 3.13)	0.007
	Tehran (9.66 $\pm$ 3.32)	0.004

[a] Kruskal-Wallis test ($P < 0.05$)

Comparison of CT mean scores, in the three universities, showed that the scores of Kashan University students in the domains of inference, deduction, induction, and the overall CT scores were significantly higher than those of the students of Tehran and Semnan Universities. This difference could be attributed to the educational system and teaching process. It is likely that teachers in Kashan University of Medical Sciences use debate, discussions, questioning, and problem-based learning methods more than the two other Universities. Martin et al. reported that traditional educational strategies such as lecture methods cannot improve CT abilities and cognitive skills in nursing stu-

dents (3).

Overall, the current study showed that the CT mean scores were low in five domains of the test among the BSc and MSc students, and the lowest levels were observed in analytic and inference domains. It is believed that various interrelated factors can affect the scores, included the failure of educational system, on memorization of the materials in the classrooms, lack of conceptual learning, and lack of deep and thoughtful questioning.

The study had several limitations. First, the study was performed in three universities and had a small sample size. Second, there may have been a nonresponse bias due to the 30% dropout. Hence, further studies are needed to investigate the CT skills in large populations with different education levels.

Acknowledgments

Footnotes

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