

## Critical thinking dispositions among junior, senior and graduate nursing students in Iran

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**Abstract:** The purpose of this study was to compare the critical thinking skills in junior, senior and graduate nursing students of Zahedan University of Medical Sciences. In this study the clinical skill level of 120 junior and senior nursing students and clinical nurses in 2010 was determined using the random sampling method. Data was collected by Watson questionnaire (WGCTA) and analyzed using t-test, and analysis of variance with Scheffe's test. Result showed significant difference between mean scores of all critical thinking skills in the three groups ( $p = 0.006$ ), so that critical thinking ability of senior students was more than junior students and the ability of critical thinking in clinical nursing students had been lower than the seniors. According to the findings of the study, it can be stated that although critical thinking is important in clinical judgments and decisions but during the training period, have had no significant development therefore the traditional education system needs evolution and revision in order to realize training purposes in line with fostering creative and efficient students.

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### Introduction:

Concern for patient safety has grown worldwide as high rates of error and injury continue to be reported. A recent Commonwealth Fund international survey of six nations showed that between one-quarter and one-third of patients with health problems experienced medical, medication, or testing errors. A number of countries, including the United States of America, Australia, Canada, Germany, New Zealand and the United Kingdom, have identified a need for improvement in the coordination and delivery of care [1] and a reduction in preventable medical errors [2]. Patient safety can be directly affected by the critical thinking ability of a nurse. Nurses must have the ability to recognize changes in patient condition, perform independent nursing interventions, anticipate orders and prioritize [3]. These actions require critical thinking ability, advanced problem-solving skills and the ability to communicate clearly [4]. Using root cause analysis, the Joint Commission on the Accreditation of Healthcare

Organizational Standards (JCAHO) identified orientation, training, and competence assessment as top factors contributing to patient safety errors over the past 10 years. It is expected from nursing graduates to have critical thinking skills, so that, on the basis of which they can make appropriate decision in clinical settings [5]. Therefore, since the researcher have had the inference, during few years of experience and working with nursing students and internship in this field, that higher semester students have failed to reach the basic level of critical thinking in nursing that is a certain learning and giving correct answers in any form and having a reason for every action; therefore, this study was conducted to evaluate this skill so that the results of the study be considered by training managers to address educational deficiencies and to reinforce the strength points.

**Material and Methods:****Study design**

This descriptive cross-sectional study was undertaken to assess the level of critical thinking skills of junior and senior nursing students and clinical nurses of Zahedan University of Medical Sciences in 2010. The survey was conducted from October 25 to December 3, 2010.

**Participants and settings**

In this study, 120 participants, including all junior and senior nursing students (90) and clinical nurses that graduate from Nursing and Midwifery Faculty of Zahedan University of Medical Sciences. (30), which were selected using random stratified approach, were studied.

The criteria for exclusion of subjects in this study in the group of students was determined to be occupation of student with nursing, being transferred or guest for students or guests, and having another university degree and in nurses' group was enjoyment of nurse of nursing experience, the history of nurses participation in the workshop of critical thinking and the working history of less than two years.

**Measurements and variables**

To assess the students' and clinical nurses' critical thinking ability, Watson-Glaser Critical Thinking Appraisal (WGCTA) Form A was used. The first part of the questionnaire is about the demographic characteristics (age, sex, Marital status) and the second part contains 80 questions in five sections including inference, recognition of assumption, deduction, interpretation, and Evaluation of argument. In the inference section, the data is obtained through identifying the correctness or incorrectness of expressions, in the recognition of assumption section, by diagnosis of presence or absence of assumptions in the mentioned expressions, in the deduction section by specifying of extracted or non-extracted results from situations, in the section for ability to interpret and clarify by specifying the extracted or non-extracted interpretations of biographies and finally, in Evaluation of argument' section by detection of strong and weak evidences. WGCTA is scored for only correct answer. Each correct answer receives 1 point, resulting in a total subscale score of 16. The total critical thinking score is a summation of the 5 subscale scores to give a maximum of 80. Duration of responding to the questionnaire was 60 minutes that the samples completed the questionnaire in the presence of the researcher.

Validity and reliability of the tools, conducted inside and outside the country, have been confirmed (Cronbach's  $\alpha$  coefficient of 0.82 in this study).

**Statistical analysis**

Statistical Package for the Social Sciences (SPSS) 19.0 for windows was used for statistical analysis. Frequencies and percentage were used for the analysis

of general characteristics, and the mean score and standard deviation (SDs) were calculated for the analysis of the students' critical thinking skills. The scores of critical thinking skills among 3 group were compared using Analysis of Variance (ANOVA) techniques, Scheffe's multiple comparison for continuous variables. The level of significance was set at  $p < .05$ .

**Ethical consideration**

Approval for the research was obtained from Zahedan University of Medical Science Ethical Committee. All participants were briefed on the purpose of the study and were given a complete guarantee of confidentiality and the option of voluntary withdrawal from the study any time. The privacy of the participants was protected by keeping the questionnaires in confidence and in the possession of the investigator only.

**Results:****Sample Characteristics**

Table 1 shows the demographic characteristics of participants. The mean age was 26.7 years and range of participants was between 18-36 years. 75% of the participants of the study were female and 25 percent were male. 71.6 percent of participants were single and 28.4 percent were married. The respondents were classified by age in to 3 group:  $\leq 23$  years, 24-29, and  $\geq 30$ . Those aged 24-29 constituted the largest portion (47.50%).

**Comparison of Critical Thinking Skill among Nursing student and graduate nurses**

The overall critical thinking skill scores and all subscale scores for 3 group are presented in Table 2.

Regarding the overall goal of studying the critical thinking ability in three groups, the results showed that fourth-year students had the highest average ( $M = 42.80$ ) and first-year students had the lowest average ( $M = 39$ ) that showed a significant difference in the score of the three groups in this section ( $p = 0.006$ ) so that the average score for first-year students to think critically had been so lower compared with the fourth-year students ( $p = 0.004$ ).

The mean score of points of the ability to Inference in first-year nursing students was 4.79 and clinical nurses was 4.16, that were respectively the highest and lowest scores in this section. For comparing the groups' mean in this section, ANOVA test was used that did not reveal any significant difference in this regard.

The average score of the last-year students in part of recognition of assumption had been higher than the two other groups (9.73). Results showed that between the mean of the three groups there is a statistically significant difference does and Scheffe's test, as well, detected the difference between the average of points of the ability to detect Recognition of assumption in the group of clinical nurses and last-year students, so that

the mean and point of nurses ability in the field of detecting the Recognition of assumption had been significantly lower compared with the last-year students ( $p=0.02$ ). regarding the ability to deductive of the studied groups the average score of clinical nurses in this section had been more than the other two groups. However, the results of ANOVA showed no significant differences compared with the other two groups ( $p=0.1$ ). fourth-year and first-year students had respectively allocated the highest (11.4) and the lowest (9.65) average score in section of interpretation and Scheffe's test results showed the difference between fourth-year and first-year students so that the average score of the first year nursing students' ability to interpret had been significantly less compared with the fourth-year students ( $p= 0.006$ ). Another finding of this study was the weakness of first-year students in the evaluation of argument ability compared with the other two groups. Moreover, clinical nurses also gained the highest score in the group (9. 10). According to ANOVA test results between the three groups, in terms of evaluation of argument ability, there was a statistically significant difference and the difference had been between the group of clinical nurses and last-year nursing students, in a way that the mean score of evaluation of argument ability for first-year students had been significantly lower compared with the other groups ( $p= 0.008$ ). Moreover, Average of scores' difference in this section in these two groups, i.e., in the first and fourth year students was also significant ( $p= 0. 009$ ).

#### Discussion:

In this study, the first and fourth year students' and clinical nurses' critical thinking ability was studied. Findings indicated that the critical thinking skill of nursing students and clinical nurses in Zahedan have had a mean scores ranging from 39 to 42 and students obtained nearly 50 percent of the total test score (80 points). Shin, in his study, which had been conducted using Watson - Glaser tool, reported the average score of critical thinking for students studying in nursing associate degree courses to be 41.98 and bachelor students to be 47.22 [6]. Other studies indicate that no difference was observed in critical thinking skills [7] and critical thinking skill of nursing students in different countries had been different [8,9]. Islami et al in their study reported the nursing students' critical thinking scores assessed with these tools to be  $45.6 \pm 5.3$  for the first year and  $46.5 \pm 5.6$  for the last year. Clinical nurses mean scores in this study have been estimated to be  $40.8 \pm 7.8$  [10]. It seems that the scores obtained from this study are lower than those of foreign students and students of Tehran nursing faculties. In a study which was conducted on the bachelor's students using the California B tool, the mean score obtained from the total 34 points of the questionnaire was lower than 14

scores, indeed, students obtained 32.40% of the scores [11]. To the researchers, learning in the educational system of the country, at the primary and higher education levels, takes place at the initial cognitive levels and higher levels such as analysis or synthesis, and evaluation are less addressed. In fact, less attention is paid to the growth of the critical thinking power. Sullivan et al state that only 20 percent of the bachelor's degree nursing programs meet the needs of critical thinking [12], other studies also indicate that general skills of critical thinking are taught to nursing students, but they do not use the skills to solve problems and nursing faculties had not been successful in terms of the training of problem solving and decision-making process [13]. Lwitez's results also showed that the one third of students is lacking the critical thinking skills [14]. However, in the present study, fourth-year students revealed higher rate of utilization of critical thinking compared with the first year students and clinical nurses and their mean score had been significantly higher than the other two groups, which is consistent with the results obtained by Baba Mohammadi in Semnan, and Hosseini in Isfahan that conducted their study on the first and last year nursing students [15, 16] The results of similar conducted studies show the lack of difference and changing of the bachelor-degree nursing students' critical thinking despite passing the training units [11, 14 – 17]. Considering that the test of critical thinking is based on the problem-solving process and the nursing process in the defined problem solving stages the use of which is emphasized in nursing education programs. So, it is expected that the scores of students' critical thinking test to be different in the beginning of their arrival to the learning environment up to the end of it that the results of the study are in line with the above reasoning, although this change is not acceptable in comparison with other students inside and outside the country. Experts proposes main and serious obstacle in the development of critical thinking, one of which is the predominant use of traditional teaching methods in the current education system which is preventing from the development of decision making and troubleshooting (or problem solving) skills in the learners and as a result limits the opportunities for students' critical thinking [2]. by an optimistic view of the results of the research regarding the differences seen in the first and fourth year students, one can attribute it to the positive effects of professional training of bachelor-courses in fostering the critical thinking as well as implicit training and records and troubleshooting (or problem solving) skills and decision making of students. It must be acknowledged that the transfer of knowledge and skills of mental – motor skills from the environment of the classroom to the clinical environment and its application need critical thinking skill and clinical judgment. But,

how can the nursing faculties design the nursing education programs to promote critical thinking, needs further research. In this study, the ability of critical thinking in clinical nursing who were enjoying the professional experience was significantly less than the fourth-year students. Skills of nursing students in Japan have been reported to be higher than the graduates [18]. In Islami' s study, as well, the ability of critical thinking in clinical nurses reported to be significantly less than students [11]. Likewise, the results of Sullivan studies revealed the lack of sufficient competency in critical thinking, judgment and decision making of nurses [12], but the other studies' results show that the critical thinking and decision making of nurses increases with clinical expertise and clinical skill [19, 20 and 21].

among the possible causes which are worth mentioning regarding the weakness in the ability of critical thinking in nurses, one can point out such factors as the lack of professional autonomy of nurses, the lack of explicitness of professional position of the class in the health care system, taking course of actions based on the superiors' decision, and the lack of use of the nursing process in taking care of the patient. Experts believe that the ability to foster the critical thinking ability and its application by nurses requires professional autonomy so that the nurses would be able to independently make decisions and solve problems and thus find the opportunity to improve their intellectual ability and cognitive skills [11]. The results of the present study can be a reflection of the current situation of the ability of critical thinking of students and clinical nurses. It seems that employing the active and creative teaching methods of designing the questions that evaluate students' high levels of cognitive domain, using the nursing process in clinical environment and creating an educational setting that provide the psychological security and intellectual freedom of students is one of the issues that should be considered by educational planners.

#### Conclusion:

The results of this study showed that fourth-year nursing students' critical thinking ability had been significantly higher than first- year nursing students, but the level of this skill had been lower in comparison with other studies inside and outside the country and has had no considerable growth. It seems that the effective strategies to improve critical thinking skills, as expected, are not used in training programs and traditional system of education needs evolution and revision for realizing the educational purposes in order to foster students efficient students.

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**Table 1:** General Characteristic (n=120)

Characteristics	Junior(n=30)	Senior(n=60)	graduate(n=30)	Total (N=120)
	n(%)	n(%)	n(%)	n(%)
Age (yr)				
18-23	90.0	3.30	3.30	25.0
24-29	6.70	88.40	6.70	47.50
30-36	3.30	8.30	90.0	27.50
Gender				
Female	62.1	78.7	80.0	75.0
Male	37.9	21.3	20.0	25.0
Materials status				
Single	100.0	86.9	10	71.6
Married	0	13.1	90	28.4

**Table2:** Critical Thinking Ability Among the Junior , senior Nursing student and graduated nurses (N=120)

Subscales	Junior	Senior	Graduated	p
	(n=30)	(n=30)	(n=30)	
	Mean (SD)	Mean (SD)	Mean (SD)	
Inference	4.79(1.31)	4.40(1.94)	4.16(1.94)	<b>0.4</b>
Recognition of assumption	8.68(2.97)	9.73(2.27)	8.46(1.69)	<b>0.02</b>
Deduction	8.13(1.40)	8.50(2.56)	9.23(1.50)	<b>0.1</b>
Interpretation	9.65(1.87)	11.04(2.04)	10.33(1.72)	<b>0.006</b>
Evaluation of argument	7.72(2.06)	9.09(2.11)	9.10(2.12)	<b>0.008</b>
Total	39(5.54)	42.80(5.37)	41.30(4.21)	<b>0.006</b>
<b>Significant at the &lt; 0.05 level</b>				