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## Critical Thinking and Clinical Decision Making Skills in Pediatric Nursing Students.

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### ABSTRACT

Nursing educators are aware of the necessity to improve the students' critical thinking ability and clinical decision making skills. However, few studies have been conducted to evaluate efficacy of teaching methodologies on critical thinking or decision making skills among Iranian nursing students and registered nurses. This study aimed at finding the relationship between nursing students' critical thinking ability and clinical decision making in pediatric care. We enrolled 34 female nursing students into this study. They were undergoing their training course at the neonatal ward of Besat hospital in Sanandaj, Iran. The Watson and Glaser Critical Thinking Appraisal Test were used to measure the students' level of critical thinking. Decision making was assessed using the computerized patient management problem (PMP). No significant differences were found between different critical thinking skills and the overall critical thinking scores between the different groups. However, there was a statistical difference in clinical decision making between the two groups. Nursing educators are required to develop their critical thinking, modulate their traditional teaching methods, and try various approaches to improve critical thinking and decision making of their nursing students who become future nurses.

**Keywords:** critical thinking, clinical decision making, pediatric care, nursing student

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## INTRODUCTION

Pediatric nursing as a practice has changed a lot over time. Evolutionary trend of pediatric nursing rely on the role of children in the growth of different societies. In the same way, planning of pediatric nursing had deep theoretical changes such as the parents' increasing involvement in their child's healthcare[1].

Bearing in mind the situation of pediatric nursing in recent years, Taylor quoted "pediatric nursing and nursing performance for infants, teenagers and their families belong to the health-illness continuum which includes health improvement, illness management, and health maintenance"[2].

The first role of a pediatric nurse is to provide direct nursing care for infants and their families using the nursing process. In nursing process, nurses initially assess infants, identify their problems, and after estimating the expected goals, they evaluate appropriate nursing care. This care model is designed to satisfy physical and emotional needs of the infants and is based on their growth and development and their responsibility and participation in the self-care process [3].

Regardless of different care plan, education, protection, and even management conditions, pediatric nurses should attach more importance to the infants and their families' welfare which is not possible without the ability of critical thinking in the application of nursing care [4].

Duchscher et al [5] emphasized the process of nursing as a special method of thinking, performance, problem solving. She claims that care is a type of interpersonal relationship to improve health. If nurses want to benefit from this process, they should have cognitive skills including decision making, problem solving, creative thinking, and critical thinking. A critical thinker is someone who is able to effectively cover the patients' problems through nursing process[6]. Hockenberry et al [7] added "critical thinking is deliberately, goal- directed thinking that helps persons in making judgments based on evidence rather than estimation."

Alfaro [8] argues that, nurses should be able to think critically if they want to succeed in their changing environment and make correct health care decisions. Skillful and precise critical thinking is necessary in an environment with an increased number of patients in serious conditions who need more care and are hard to control. Critical thinking enables nursing students to decide on an appropriate intervention under special conditions [6].

White et al (2003)[9] believes that effective clinical decision making is one of the most important factors that skilled members of a health team, especially nurses, practice in the area of patient care. Furthermore, nurses' ability in clinical decision making is the most effective factor on the quality of care. It is a function which distinguishes expert nurses from others. In this regard, critical thinking and decision making skills would be increasingly necessary in future nursing approaches [10].

In the recent years, many studies have been conducted worldwide to measure the quality of nursing care, critical thinking, and to evaluate nursing care plans regarding the level of critical thinking and ability of clinical decision making. In a study on the relation between the level of critical thinking among respiratory care nursing students in relation to their clinical decision making, Hill et al [11] found higher the level of students' critical thinking was related to their decision making ability. Moreover, teaching people to think critically is a challenge. Thinking critically does not mean "knowing everything"; simply memorizing information will not help a student to become a critical thinker. Students need to recognize different learning processes such as abnormal laboratory tests results and know what specific nursing measures need to be taken without memorizing normal laboratory results [12].

As a curriculum outcome, Iranian Nursing Associations do not require nursing students to be assessed according to their ability of critical thinking. There is growing need for independent and skillful nurses in the future. From the other side, the process of nursing is a special method of thinking and practice that is used together with abilities such as problem solving and decision making to identify, prevent, and treat actual or potential health problems. Therefore this study aimed at investigating the relationship between critical thinking and ability of clinical decision making among pediatric nursing students.

## METHODS

This was a descriptive correlational study in which 34 male and female nursing students, enrolled during the years 2007-2008, underwent training course at the pediatric ward of Besat hospital, Sanandaj, Iran. Among them, 16 students were in their fourth semester with and conducted their training under supervision and 18 students were in their eighth semester, undergoing their training in independently. All of the participants were selected using census method.

In our study, we used written and digital tools. The written tool was Watson-Glaser Critical Thinking Appraisal (WGCTA) test (form A), which consisted of two sections: demographic specifications (age and marital status) and critical thinking items (Watson G, Glaser EM, 1980). In 2003, the questionnaire was translated into Persian and was adapted to the Iranian culture by Eslami Akbar. It includes 80 items for assessing critical thinking skills in five different areas including: inference, recognition of assumptions, deduction, interpretation and evaluation of arguments.

Each section contained 16 multiple choice items. The final score was out of 80 and achieved scores in each section from 0-16. The test respondents could be classified in one of weak (scores of <54), average (scores of 54-59), or strong classes (scores of 60-80) regarding their critical thinking skills[13].

We used a prototype called patient-management problem (PMP) to measure students' clinical decision making skills. Computerized PMP initiates by describing a clinical case involving patient's age, symptoms, and clinical results. Then, some important points for decision making are presented to the student who should choose an appropriate option among a variety of functional options. Later, feedback would be given to the student as she continues her decision making in the PMP. This model precisely reflects the stages of decision making that are necessary in clinical practice, which include patient information (the problem), data analysis (a list of the patient's problems), presenting nursing diagnosis, making decisions about nursing interventions, and recuperation or delivering care services with an emphasis on patients and their families' education. In this study, the students faced six scenarios on making decisions and selecting appropriate pediatric care.

The testing and scoring method for PMP questions was so that the student would see three options at the end of each PMP problem, one of which was correct answer and its selection was beneficial to the patient and necessary for solving the problem (+1 points). The next option was a neutral one regarding its benefit or harm for the patient (null points). The last was harmful for the patient (-1 points). The total score for decision making skills was 0-18. Afterwards, the scores were calculated on the scale of 100. The collected scores that were in the mean range were considered at an average level, those with one standard deviation less than the mean were considered weak, and those with one standard deviation above the mean were considered good.

For data collection, after the training period, the students were asked to participate in a training workshop in spring 2007. Then, WGCTA test was distributed among the students on a specific date. After a brief instruction they were asked to answer critical thinking items in one hour. Then, on another date, students came together in the computer hall of the faculty of medicine to answer computerized PMP questions about clinical decision making. The students were able to monitor the problems on their computers. Each question contained information about sick infant's condition and had three options, which were related to making decisions about priority of nursing diagnosis, consequence of priority, intervention and education.

The feedback was given to each student after choosing an option; the feedback was the answer for the previous question and the student could not return to that question and changed her answer. After this stage, the next question appeared on the computer screen; after answering and receiving feedback, this process continued until the end of the decision making operation. Finally, after determining the scores, critical thinking and clinical decision making were classified in three different categories of weak, average, and good.

Data were analyzed using SPSS software, version 9. Mann-Whitney and *Chi-square tests* and *Spearman's correlation coefficient* were used as appropriated. To determine the validity of the decision making tool we used content validity. Then the validity was also cross checked by academic staff of Nursing and Midwifery school of Shahid Beheshti in Tehran. Before the final approval, and for internal and overall correlation, the answers were evaluated and confirmed by a computer expert. To determine the reliability or

practical reliance, a pilot study was conducted as a retest. The questionnaire was filled out by eligible participants who had the characteristics of the study population. After two weeks the participants were asked to fill out the same computerized questionnaire again. Then the results of these two stages were compared ( $r=0.928$ ).

**RESULTS**

The age ranges of 86.1% of 4th semester students and 94.5% of 8th semester students were 19 and 21 years old, respectively. 88.9% and 81.6% of the students in respective groups were single.

In the inference section of the critical thinking assessment, participants in both groups were weak. In the recognition of assumptions, 75% of the 4th semester trainees and 94.4% of the 8th semester trainees were weak. This figure was, 81.53% and 88.9% in deduction for both respective groups. In the interpretation section, 87.5% of the 4th semester trainees were weak while 44.4% of 8th semester trainees were in an average or good level. Regarding the evaluation of arguments, 43.8% and 33.3% of the trainees in both groups scored average and good. Finally, considering the overall critical thinking score, most 4th semester trainees (93.8%) and all 8th semester trainees (100%) were weak. Trainees in both groups showed no statistically significant difference between the mean scores of critical thinking skills and overall critical thinking (table 1).

**Table 1: comparison of mean (SD) of different critical thinking skills for 4th semester and 8th semester nursing students using Mann-Whitney test**

Skills	Students	Mean	SD	P Value
Inference	4 <sup>th</sup> Semester	5.56	2.12	0.542
	8 <sup>th</sup> Semester	5.94	2.5	
Recognition of assumptions	4 <sup>th</sup> Semester	8.37	2.55	0.144
	8 <sup>th</sup> Semester	5.94	1.72	
Deduction	4 <sup>th</sup> Semester	8.37	2.02	0.565
	8 <sup>th</sup> Semester	7.16	2.03	
Interpretation	4 <sup>th</sup> Semester	8.87	1.62	0.175
	8 <sup>th</sup> Semester	9.7	1.74	
Evaluation of arguments	4 <sup>th</sup> Semester	9.12	3.2	0.917
	8 <sup>th</sup> Semester	8.8	2.9	
Overall CT	4 <sup>th</sup> Semester	40.56	7.36	0.84
	8 <sup>th</sup> Semester	39.83	5.78	

Considering the ability of clinical decision making, we found that half of the 4th semester trainees (50%) and most of the 8th semester trainees (88.9%) were in the good or average levels. There was a significant difference in clinical decision making between trainees in both groups (Chi-square test,  $P<0.001$ , table 2).

**Table 2: comparison of clinical decision making between 4th semester and 8th semester nursing students**

Trainees	Decision making ability- Number (%)				Test result
	Weak	Average	Good	Total	
4th semester	4(25)	4(25)	8(50)	16(100)	$\chi^2=15.8$ $P<0.0001$
8th semester	2(11.1)	16(88.9)	0(0)	18(100)	
Total	6(17.6)	20(58.8)	8(23.5)	34(100)	

Findings of our study showed no statistically significant relationship between clinical decision making and overall critical thinking skills of the nursing students.

**DISCUSSION**

The overall critical thinking of the most 4th semester trainees (93.8%) and all 8th semester trainees (100%) was weak. This is consistent with findings of the a study conducted by Colucciello et al [14], although the 8th semester trainees had passed a four year period in nursing training, their overall critical thinking ability was not only less than the 4th semester trainees, but also it was less in some skills such as recognition of assumptions, deduction, and evaluation of arguments.

As a result, findings of our study emphasized the need for reviewing current educational strategies and implementation of active learning strategies in theoretical and clinical education of nursing students. It seems that this problem is rooted in the Iranian elementary and secondary educational system, as well as higher level of education in which the emphasis is more on the improvement of content and cognitive knowledge rather than training in the areas of mental and critical thinking.

Concerning the clinical decision making skills, half of the 4th semester (50%) and most of the 8th semester trainees (88.9%) were at a respectively good or average level.

We also found a significant difference in clinical decision making skills between the two groups. Our findings were different from Shin et al study [15] which was conducted on nursing students in associate's and bachelor's programs. Total obtained clinical decision making score among bachelor students in that study was higher than associate students, while in our study half of the 4<sup>th</sup>-semester students had a good ability of clinical decision making compared with 8<sup>th</sup>-semester students. However, Colucciello et al <sup>14</sup> study showed no significant differences between the two groups.

From the other side, Brooks and Shepherd [16] stated that level of clinical decision making in a group of bachelor's students was less than students with a nursing diploma which is consistent with our findings. They believed that educational programs of the faculty were probably defective or that there was a general idea in clinical environments that bachelor's degree students had higher level. Meanwhile, most of the 8th semester trainees (88.9%) were at good or average level, respectively.

Our study showed a significant difference in clinical decision making skills between the two groups as well. Our findings were different from Shin et al study [17] which was conducted on nursing students in associate's and bachelor's programs. The total obtained clinical decision making score among bachelor students in that study was higher than associate's students, while in our study half of the 4<sup>th</sup>-semester students had a good ability of clinical decision making compared with 8<sup>th</sup>-semester students.

Consistent with our findings, Brooks and Shepherd [16] stated that level of clinical decision making in a group of bachelor's students was less than students with a nursing diploma. They believed that educational programs of the faculty were probably substandard or that there was a general idea in clinical environments that bachelor's students had a higher level of clinical decision making skills.

Nursing process is used only when the students are under the supervision of nursing educators (as trainees). However, when they work independently, for some specific reasons such as disproportion between the number of patients and nurses, care diversity, etc., care services do not follow the nursing process and merely pursued the physicians' orders.

On the other hand, Taitz et al [18] believe that clinical decision making about a pediatric patient is ability to make independent, confident, meaningful, and appropriate decision for the existing condition of the patients. Therefore, experience, understanding, and future planning are needed. This is possible only after constant decision making in clinics and under supervision of educational supervisors.

In developing clinical decision making skills in nurses, Haj Bagheri et al. [19] believed that different nursing studies confirmed positive role of educators and educational institutes which is consistent with the findings of our study. They added that content of nursing education involves a large amount of theoretical material which is mainly based on models. Therefore, nursing educators are under pressure transferring this huge theoretical content. As a result, they do not find enough opportunity to use student-oriented educational methods practically which leads to the development of critical thinking and clinical decision making skills. Another setback is that the educational approaches are typically teacher-oriented ending in passive learning, dependence, and passivity of the students.

Findings about relationship between the students' critical thinking and clinical decision making skills in pediatric care indicated that although students' critical thinking was weak in all skills, they had average or good decision making skills. Therefore, relationship between the different skills of critical thinking and clinical decision making was not statistically significant. As a final point, we found no statistically significant relationship between overall critical thinking and clinical decision making.

Our findings were inconsistent with Girot's study [20], in which no statistically significant relationship was found between nurses' critical thinking and clinical decision making and academic education with and without experience. These results are consistent with Hicks et al [21] study, in which they found no statistically significant relationship between critical thinking and decision making of special wards nurses.

Although many studies have been conducted on the importance of critical thinking and clinical decision making of nurses, there should still be more studies on transferring this critical thinking ability to nurses' performance in clinical situations. There should also be more studies on the manner of using critical thinking and clinical decision making in clinics as well. In this regard, Kawashima et al [22] believed that critical thinking is not formed in students unless theoretical knowledge is linked with clinical performance, which is consistent with the results of our study.

### CONCLUSION

In Iran Nursing educators need to use various approaches to develop student's critical thinking. They should be more flexible, and unbiased to reflect their habitual and traditional teaching methods, and do routine practices to improve critical thinking and decision making of nursing students who become future nurses. Furthermore, nursing educators must provide students with learning opportunities in which theoretical and practical content be reflected in the actual healthcare environments. After better understanding of these students, it is possible that teaching strategies, methods, and techniques could be used to assist in the development of critical thinking and decision making.

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