Original Article

Effectiveness of Round by Peers on Critical Thinking and Clinical Decision-Making in Nursing Students

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Abstract

Background: Strengthening critical thinking and clinical decision-making skills is important for nursing. Therefore, it is essential to use appropriate educational methods to influence these factors. This study aimed to assess the impact of peers' round on nursing students' clinical decision-making and critical thinking abilities. **Materials and Methods:** In this semi-experimental study, 67 final-year nursing students participated in round meetings at Ganjavian Hospital in Dezful, Iran, from January 2022 to July 2023. They were selected using a census sampling method. After selecting patients from different hospital departments and presenting them in groups of 3–4 individuals, group members collected patient information and used experts' opinions to present rounds with other students. Before and after the initiation of the program, participants completed critical thinking (18 questions) and clinical decision-making (40 questions) questionnaires. Data were analyzed using the independent *t*-test, paired *t*-test, Pearson correlation, and one-way analysis of variance (ANOVA). **Results:** Rounds by peers improved students' critical thinking ($t_{66} = 9.52$; $p < 0.04$) and clinical decision-making ($t_{66} = 2.48$; $p < 0.004$) after the intervention. Systematic analysis and re-evaluation of outcomes had the lowest scores. Searching for alternatives and thinking outside the box obtained the highest scores among the questionnaire subscales. There was a relationship between critical thinking and clinical decision-making ($r = 0.075$; $p < 0.001$). **Conclusions:** Considering the effect of round by peers on critical thinking and clinical decision-making in nursing students, nursing schools should employ new methods for the clinical training of their students.

Keywords: *Critical thinking, decision making, nursing, peer influence, students, teaching round*

Introduction

In the nursing profession, the ability to think critically and make confident decisions is crucial for effective patient care. Nursing education programs are meticulously designed to equip aspiring nurses with the competence and confidence required for successful practice in diverse healthcare settings.[1] Therefore, various studies have sought ways to improve these two basic skills in nursing students. One study showed that the process of nursing training has a positive effect on students' clinical decision-making.[2] The results of another study demonstrated that teaching critical thinking by presenting its basic principles and then presenting the scenario to students improved skills in this field.[3] The results of one study revealed the effect of using conceptual analysis on students' critical thinking.[4] In addition, another study demonstrated the effect of using a portfolio on critical thinking.[5] However, one study showed that online distance learning does not affect the critical thinking or clinical decision-making abilities of first-year nursing students.[6]

Currently, the clinical teaching approach for nursing students does not help them develop critical thinking and effective clinical decision-making. Student conferences are often limited to providing a medical history or an oral conference about the patient's disease, medication, or tests, and the student does not learn how to make connections between different patient data or use the opinions of others to develop appropriate care plans for the patient. Albooghobeish *et al*.[7] revealed a low decision-making capability among nursing students. Shirazi and Heidari revealed that the critical thinking skill level of nursing students is low.[8] The results of another study in Iran showed that 63% of nursing students have a low level of critical thinking.[9] The lack of

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effectiveness of Iran's current teaching methods in fostering critical thinking among students demands reevaluation.[8] Effective methods for teaching specific competencies are a current challenge in education.[10]

Using robust collaborative problem-solving environments and navigating complex scenarios that directly leverage existing knowledge[11] can improve nursing students' skills. In this regard, peer rounds can be helpful. In round presentations, students can learn from each other. Peer learning fosters greater independence and collaboration among students. Through this approach, nurses are empowered with the necessary knowledge and skills to provide patient care.[12] Peer rounds are also an exercise in team collaboration and learning. By communicating effectively with peers and professionals, students foster cooperation.[13] Each student contributed to peer round by collaborating on patient data collection and analysis. These activities can enhance critical thinking and logical decision-making skills by integrating different information, learning in peer groups, and collaborating with other professionals.

To the best of our knowledge, no study has investigated the impact of round by peers on nursing students' critical thinking and decision-making skills. This study aimed to assess the impact of round by peers on nursing students' clinical decision making and critical thinking abilities.

Materials and Methods

In this quasi-experimental study through census method, 67 fourth-year undergraduate nursing students were recruited to participate in this study between January 2022 and July 2023. A 2-week absence from the round by peers led to exclusion from the study. However, for ethical reasons, the student was not excluded from participating in the peer round. The work steps in this study include provision of explanations of the work method to the students, selection of the patients according to the internship ward of the students, presentation of the patients to the students to collect the relevant information, collection of the patient information, and presentation of the results to the research group, appointing of experts to provide an opinion on the patient information and interpretation of the results by the research team, referral of students to the relevant experts for their opinions, preparation of the final file, presentation of the round, discussion and exchange of opinions between the interns, and summarization of the materials by the students of the group presenting the round by peers. In other round presentation methods, the instructor/professor is the center of the case presentation, so the student cannot study, think about the problem, or share ideas with other students. The steps are presented in detail in the following. An orientation meeting was held for students in the hospital meeting hall before the start of the round by peers. The students were given the necessary instructions on performing the tasks and had their questions answered. Students in groups 3–4 interned in the departments of internal medicine, neurosurgery, ICU, CCU, orthopedics, etc. Therefore, the researchers selected patients from these departments with conditions such as gastrointestinal bleeding, acid-base disorders, and cerebral hemorrhage, etc. Then, it was provided to students in the same department. Students were required to collect the patient's history, patient file data, laboratory results, CT scan or radiography results, and all their consumed drugs. The students were then expected to present their prepared materials to the research team. Based on the need, the researchers determined which expert opinions, such as radiologists, pharmacologists, and nursing faculty members, etc., be used to complete the data. After the necessary studies, students were required to consult with experts identified by the research team. After completing the file presentation, the students provided the prepared PowerPoint presentation to the research team for final approval.

All students were informed of the time of the round presentations. Presentations were given in PowerPoint format along with patient document attachments in the meeting hall of Ganjavian hospital of Dezful, Iran. The presenting team explained the patient's medical history and medical documents. Then, all the students presenting in the meeting specified the nursing diagnoses for each patient, prioritized the patient's problems, announced the specific care plan for each diagnosis, and exchanged opinions. Subsequently, the members of the peer group presented their opinions and those of experts and summarized the contents. The research team acted as supervisors in the collection, interpretation, and presentation of data and provided corrective comments when necessary. The program lasted for one semester and was conducted twice a week from 11:00 a.m. to 1:00 p.m.

Before the initiation of the round program, Ludin's clinical decision-making and critical thinking questionnaires were provided to all students.[14] The clinical decision-making questionnaire included 40 questions scored on a 5-point Likert scale, ranging from "completely agree" to "completely disagree." A score of 50% of the total score denotes low decision-making. This section has four subscales. The questions for each subscale are as follows: search for alternatives (1–10), search for information and unbiased information (11–20), evaluate and re-evaluate consequences (21–30), and the use values and consequences (31–40). The number of questions in the critical thinking domain was 18. The critical thinking options were scored on a 5-point Likert scale, ranging from "completely agree" to "completely disagree." A total score below 35.75 was considered low. This section has three subscales. The questions for each subscale are as follows: systematic analysis (1–5), thinking within the box (6–13), and thinking outside the box (14–18).

The tool was translated according to Wild *et al.*'s (2005) model.[15] After translating the questionnaire into Farsi, a panel of experts evaluated the clarity, simplicity, and contradictions in the two translators' translations and prepared the Persian version accordingly. This version was then translated into English by two independent translators. The meaning and concepts were assessed by 12 experts in education, including 10 nursing faculty members and two medical education faculty members. Moreover, 10 students were asked to provide their opinions and suggesting improved wording for each item using the given tool. Finally, three members of the research team performed the final tool review.[16] Furthermore, 10 students from various medical science fields assessed the face validity of the tool by rating its sentences based on difficulty level, wording ambiguity, and appropriateness level.[17] The questionnaire's content validity was evaluated. The opinions of 10 experts were presented to categorize each question on a three-point Likert scale, including "necessary," "useful but not necessary," and "not necessary." Then, based on Lawshe's Content Validity Ratio (CVR) formula, items with a CVR < 0.62 were deleted.[18] The questionnaires were completed by 10 specialists using a four-option Likert scale to express opinions on relevance criteria for the Content Validity Index (CVI). Items with scores above 0.79 were kept unchanged, those between 0.70 and 0.79 required modifications, and those below 0.70 were discarded.[19] The CVR of the clinical decision-making and critical thinking questionnaire scores was 0.80 and 0.81, and the CVI scores were 0.83 and 0.84, respectively. Both Ludin questionnaires were supported by Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA). For the decision-making questionnaire, the Minimum Discrepancy Function Divided by Degrees of Freedom (CMIN/DF) = 2.49, Root Mean Square Error of Approximation (RMSEA) = 0.072, Comparative Fit Index (CFI) = 0.955, and Goodness of Fit Index (GFI) = 0.994, and Cronbach's alpha = 0.75. For the critical thinking questionnaire, CMIN/DF = 2.61, RMSEA = 0.052, CFI = 0.985, GFI = 0.974, and Cronbach's alpha = 0.77. The mean, standard deviation, Pearson's correlation coefficient, paired and independent tests, and One-Way Analysis of Variance (ANOVA) were used to analyze the data using SPSS (version 16.00; SPSS Inc., Chicago, IL, USA) at a significance level of < 0.05.

Ethical considerations

This study was approved by the ethics code (IR.DUMS.REC.1401.059) of the Ethics Committee of Dezful University of Medical Sciences. Informed consent was obtained from the students to participate in the study.

Results

Most students were between 18 and 24 years old (77.61%), were women (56.70%), and had a Grade Point Average (GPA) of 16 to 18 (61.20%).

Regarding critical thinking among nursing students [Table 1], the result showed that the peer round program improved students' critical thinking ($t_{66} = 9.52$; $p < 0.04$). The mean scores (SD) of the essential thinking subscales indicated that systematic analysis had the lowest score [17.80 (4.20)], and thinking outside the box had the highest score [23.43 (6.20)].

The overall clinical decision-making score improved after the intervention ($t_{66} = 2.48$; $p < 0.004$). Search for alternatives [Table 2], canvasing of objectives and values [Table 3], searching for information and unbiased assimilation of the new information [Table 4], and evaluation and re-evaluation of consequences [Table 5], obtained the highest to lowest scores.

Based on the Pearson test, a relationship was found between critical thinking ability and clinical decision-making (r = 0.075; $p < 0.001$). Based on the independent *t*-test and ANOVA, no significant relationship was found between the demographic variables, critical thinking ability, and clinical decision-making scores.

Discussion

This study investigated the effects of peer round on critical thinking and clinical decision-making in nursing students.

The results revealed that the round by peers had a positive effect on critical thinking and clinical decision-making scores. The results of one study revealed that critical thinking scores improved significantly when students led the clinical round compared to when the teaching instructor did so.[12] In addition, the results of another study indicated that the clinical round is a suitable tool to facilitate critical thinking and clinical decision-making. Collaborative dialog among students, professors, and other knowledgeable individuals facilitates clinical judgment, helps students gain independence, and improves the learning process.[20]

The results indicated that the average critical thinking score increased after the intervention, which is consistent with those of studies conducted in Canada[21]; however, in other studies, the level of critical thinking among nursing students was moderate.[22,23] The difference in the results of different studies can be related to the various instruments used to measure students' critical thinking skills, although in this study, the high critical thinking score can be explained by the fact that participation in the peer round program and team collaboration improves students' motivation to solve problems and ultimately strengthens their critical thinking skills.

The results demonstrated that the critical thinking subscales—systematic analysis and thinking outside the box—had the lowest and highest scores after implementing the round by peers. In the study by Sacgaca *et al.*,[24] the analysis skills of nursing students were not manifested. Shirazi and Heidari showed that the minimum score for

Table 1: Critical thinking of nursing students before and after round by peers

Questions	Pretest	Posttest	Results of test	
	Mean (SD)	Mean (SD)	*t* (df=66)	*p*
Systematic Analysis	16.58 (3.80)	17.80 (4.20)	2.44	0.04
I am a person with logical thinking.				
I am good at solving problems.				
I can easily organize my thoughts.				
I appreciate myself as a person who has comprehensive and precise thoughts.				
While facing a problem, my colleagues/peers are used to asking for my opinion in their decision-making because I can objectively analyze the problem.				
Thinking Within the Box	17.08 (3.96)	19.43 (3.50)	3.88	0.004
I only look for the truths that would support my opinions				
rather than those that would reject my opinions.				
I am afraid of discovering the truth in many issues.				
During a team discussion, if someone's argument had been denied by others, the person would not have a right to express their argument.				
Everyone has the right to address their opinions, but I do not bother with what they say.				
I pretend to be a logical person, although I am not.				
Continuing education activities are a waste of time.				
If possible, I try to avoid reading.				
Decisions made by authority are always right.				
Thinking Outside the Box	19.62 (5.00)	23.43 (6.20)	5.68	0.005
I have a strong desire for knowledge.	52.28 (8.80)	60.66 (8.20)		
I am satisfied that I can understand others' ideas.				
I expect to face the challenge of patient care.				
It is interesting to solve tough problems.				
I like to know how things work out.			9.52	0.04
Total Score				

Table 2: Search for alternatives or options of decision-making before and after round by peers

Questions	Pretest	Posttest	Results of Test	
	Mean (SD)	Mean (SD)	*t* (df=66)	*p*
Search for alternatives or options	31.52 (6.93)	33.09 (4.01)	2.33	0.001
If the clinical decision-making is vital and there is time, I conduct a thorough search for alternatives.				
When a person is ill, his or her cultural values and beliefs are secondary to the implementation of health services.				
Situational factors at the time determine the number of options I explore before making a decision.				
Looking for new information in decision-making is more trouble than it is worth.				
I use books or professional literature to look up things I do not understand.				
A random approach for looking at options works best for me.				
Brainstorming is a method I use when thinking of ideas for options.				
I go out of my way to get as much information as possible to make decisions.				
I assist clients to exercise their rights to make decisions about their own care.				
When my values conflict with those of my client, I am objective enough to handle the decision-making required for the situation.				

critical thinking in nursing students was in the analysis domain.[8] Tajvidi and Moghimi Hanjani attributed this problem to the prevalence of traditional teaching methods, which prevented students from expressing their analysis of cases.[25] This problem can also be observed in the present study because a teacher-centered teaching method was prominent in the faculty, and the peer program was implemented for the first time. Divergent thinking is usually defined as the ability to create different ideas or think in different directions.[26] The round by peers' method, case studies, brainstorming, small group activities, and group discussion were used. Dividing students into small groups based on the internship section improved interaction between group members. However, by involving all group

Table 3: Canvassing of Objectives and Values of decision-making before and after round by peers

Question	Pretest	Posttest	Results of Test	
	Mean (SD)	Mean (SD)	*t* (df=66)	*p*
Canvassing of Objectives and Values	28.40 (3.66)	30.19 (2.27)	4.85	0.027
My professional values are inconsistent with my personal values.				
My finding of alternatives seems to be largely a matter of luck.				
In the clinical setting I keep in mind the course objectives for the day's experience.				
The risks and benefits are the farthest thing from my mind when I have to make a decision.				
When I have a clinical decision to make, I consider the institutional priorities and standards.				
I involve others in my decision-making only if the situation calls for it.				
In my search for options, I include even those that might be thought of as "far out" or not feasible.				
Finding out about the client's objectives is a regular part of my clinical decision-making.				
I examine the risks and benefits only for consequences that have serious implications.				
The client's values have to be consistent with my own in order for me to make a good decision.				

Table 4: Search for information and unbiased assimilation of new information for decision-making before and after round by peers

Question	Pretest	Posttest	Results of Test	
	Mean (SD)	Mean (SD)	*t* (df=66)	*p*
Search for information and unbiased assimilation of new information	26.70 (5.42)	27.30 (2.86)	1.29	0.024
I listen to, or consider expert advice or judgment, even though it may not be the choice I would make.				
I solve a problem or decide without consulting anyone, using information available to me at the time.				
I do not always take time to examine all the possible consequences of a decision I must make.				
I consider the future welfare of the family when I make the clinical decision which involves the individual.				
I have little time or energy available to search for information.				
I mentally list options before deciding.				
When examining the consequences of options I might choose, I generally think through, "If I did this, then…".				
I consider even the remotest consequences before making a choice.				
Consensus among my peer group is important to me in making decisions.				
I include clients as sources of information.				

members in self-learning, they learn to use cognitive processes such as analysis, reasoning, evaluation, and criticism.[26] Furthermore, these things can help people have creative and free thinking.

The results revealed that the students' clinical decision-making scores improved after using the round by peers' program. Different studies have shown different results. Some studies reported an average level of clinical decision-making,[28] one study reported a high level,[29] and some a low level.[30,31] High clinical decision-making scores among students may not reflect reality because they have not yet faced situations requiring clinical decision-making.[6] This discussion is valid to a large extent because hospital students spend their internship under the supervision of nurses and with their cooperation, and they cannot make clinical decisions alone. Therefore, the high score on clinical decision-making can be attributed to the fact that in round by peers, students made clinical decisions only theoretically and not practically.

In this study, the search for alternatives or options subscale of clinical decision-making had the highest score. Another study obtained a high score[32]; however, in the study by Arkan *et al.*,[33] the score was at the medium level. The appropriate score for this subscale can be attributed to brainstorming because the student learns that a problem can be examined from different perspectives. Brainstorming is a creative, friendly space that creates an environment for appreciating ideas (or new thoughts) and a motivation to explore them.[34]

Table 5: Evaluation and re-evaluation of consequences of decision-making before and after round by peers

Question	Pretest	Posttest	Results of Test	
	Mean (SD)	Mean (SD)	*t* (df=66)	*p*
Evaluation and re-evaluation of consequences	27.29 (4.97)	27.04 (2.27)	-0.50	0.045
I consider what my peers will say when I think about possible choices I could make.	113.91 (14.96)	117.62 (7.75)	2.48	0.004
If a colleague recommends an option in a clinical decision-making situation, I adopt it rather than searching for options.				
If a benefit is really great, I will favor it without looking at all the risks.				
I search for new information randomly.				
My past experiences have little to do with how actively I look at risks and benefits for decisions about clients.				
When examining consequences of options I might choose, I am aware of the positive outcome for my clients.				
I select options that I have used successfully in similar circumstances in the past.				
If the risks are serious enough to cause problems, I reject the option.				
I write out a list of positive and negative consequences when I am evaluating an important clinical decision.				
I do not ask my peers to suggest options for my clinical decisions.				
Total Score				

In addition, demonstrated evaluation and re-evaluation of consequences had the lowest score in the subscales of clinical decision-making after implementing the round by peers. The results of one study indicated that the search for alternatives obtained low scores.[32] Beighi and Abedini showed that providing training in the form of a case method did not affect the evaluation and re-evaluation scores of students after the intervention.[35] The reason for this result was that the students spent every day of their internship period under the supervision of a nurse in the department. Therefore, students might not feel the need to evaluate or re-evaluate the outcome of the care because the ward nurse is responsible for the care program and should be accountable in this regard.

The results revealed a weak relationship between critical thinking ability and clinical decision-making. One study revealed a strong relationship between critical thinking ability and clinical decision-making.[14] The results of another study found a positive and significant relationship between clinical decision-making and critical thinking.[36] Teaching critical thinking skills can promote critical thinking and the application of rational decision-making styles by nurses.[27]

There were no significant relationships between critical thinking scores and clinical decision-making according to age, gender, or GPA. The results of some studies were in line with the results of the present study,[23,37] whereas in the study by Mousazadeh *et al*.,[38] this relationship was significant. Considering that the results of the studies were from different provinces of Iran, this difference in the results can be attributed to the clinical training model of nursing students in the relevant hospitals.

A limitation of the present study is the small size of the studied population. In addition, the census method used may limit the generalizability of the study results. In addition, we did not compare round by peers with another educational method, and only compared the pretest and posttest scores in this study, which should be considered in other studies.

Conclusion

The study results showed that a clinical round by a peer can positively affect the clinical decision-making and critical thinking of students. The weak relationship between critical thinking and clinical decision-making may indicate that there may not necessarily be a relationship between these two aspects, although there is a need for more studies in this field. Considering the effect of round by peers on the critical thinking and clinical decision-making of nursing students, nursing schools should use new methods for clinical training. In addition, the implementation of round by peers in larger groups at different levels of nursing education is recommended.

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Conflicts of interest

Nothing to declare.

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