

Original Article

Peer Assessment in Learning of Nursing Process: Critical Thinking and Peer Support

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Abstract

Background: Methods enabling students to learn and use the nursing process more efficiently will also increase their critical thinking and peer support. One of the methods that this can be achieved is the peer assessment.

Objectives: This experimental study was carried out to determine the effects of students' assessment of nursing process through the Peer Assessment Method on critical thinking and peer support in a clinical setting.

Methods: The study sample consisted of 68 nursing students. Data were collected with the sociodemographic questionnaire, California Critical Thinking Disposition Inventory and Peer Support Scale. The participants in the experimental group used the Peer Assessment Method for the assessment of the nursing process. In the control group, for the assessment of the nursing process, the traditional discussion method was used. The aforementioned tools were administered to each group twice: at the beginning and end of the training.

Result: California Critical Thinking Disposition Inventory and Peer Support Scale scores of the experimental group which were low and moderate respectively at the first measurement increased to high and good levels at the second measurement respectively. In the control group, while low California Critical Thinking Disposition Inventory scores obtained at the first measurement became moderate at the second measurement, their Peer Support Scale scores were moderate at both measurements.

Conclusion: In the study, it was concluded that the peer assessment method was more effective in the development of critical thinking and peer support of the nursing students.

Keywords. Critical thinking, peer assessment, peer support, nursing process, nursing student.

Introduction

Clinical practice is a special area in which nursing students put their theoretical knowledge into practice, and learn and develop key skills (Brooks & Moriarty, 2009). Among the skills developed in this area, critical thinking is foremost. Critical thinking is defined as the goal-oriented, organized mental process in which specific thinking skills are used (Lin, Han, Pan & Chen, 2015; Srisawad, Cooper & Cant, 2017). Critical thinking is an important skill which should be developed in order that nurses can solve the problems, detect more complex care needs of patients and provide quality care by working professionally and scientifically (Carter, Creedy & Sidebotham 2016; Srisawad et al., 2017; Ward & Morris 2016; Carvalho et al. 2017). Therefore, in clinical education settings, nursing students should be taught about critical

thinking and should be helped to develop their critical thinking skills with appropriate experiences and methods (Carter et al., 2016; Chan, 2013; Carvalho et al. 2017; Stone, Cooper & Cant, 2013).

In clinical education, of the methods through which students learn and implement the critical thinking process, the nursing process takes the first place. The process is a powerful scientific tool for the development of critical thinking skills of nurses (Alfaro-Lefreve, 2014; Chan, 2013; Lin et al., 2015). By collecting and analyzing the data belonging to the patient, the process makes it possible to consider patient needs and nursing practices through reasoned judgement, and helps nurses gain critical thinking and effective problem-solving skills. The nursing process consists of data collection, diagnosis, planning, implementation and evaluation phases. The

nursing process, a learning tool, is used to increase the professionalism of students, and the placement of critical thinking (Can & Erol 2012; Ballantyne, 2016; Yue, Zhang, Zhang, & Jin, 2017).

The student nurses care, apply and evaluate plans with critical thinking using the nursing process (Alfaro-Lefreve, 2014; Ballantyne, 2016). The nursing process allows students to think critically (Lin et al., 2015; Shoulders, Follet & Eason, 2014; Carvalho et al., 2017). In another study, students stated that they utilized nursing process in the development of critical thinking (Youngshook, David, & Rhonda, 2013). However, the nursing process may also be a factor that prevents the development of critical thinking. Nursing process can not be learned well and the lack of information about it may prevent critical thinking by preventing effective use of the nursing process (Dikmen & Usta, 2013). Thus, several studies conducted on the issue revealed that nursing students had difficulty in using nursing process in the clinical setting (Can & Erol, 2012; Loza, Parra & Narino, 2014), and that their critical thinking levels were not satisfactory (Atay & Karabacak, 2012; Newton & Moore, 2013; Kaya, Şenyuva & Bodur, 2017). Therefore, there is a need for methods to develop the critical thinking of nursing students in clinical education (Carter et al., 2016; Chan, 2013; Youngshook et al., 2013).

One of the methods proposed in the development of critical thinking is the peer assessment (Lin et al., 2015; Stone et al., 2013). Peer assessment is a process in which a person's work is evaluated by his/her peers according to their own perspective using certain guidelines (Casey et al., 2011; Topping, 2009). This process can be implemented among students in the same class with similar experiences, and development levels (Chen & Ku, 2009; Topping, 2009). It is a partnership system in the learning process and helps students to learn by themselves and from each other (Loke & Chow, 2007). This method makes it possible to identify early and correct errors and misconceptions. Students who undertake peer assessment think critically by using metacognitive and thinking processes (Chen & Ku, 2009; Topping, 2009). Peer assessment is considered as an important method that enables students to think critically in order to be a professional nurse with lifelong learning skills (Lin et al., 2015).

Peer assessment not only provides opportunity to learn from peers but also creates a supportive learning environment and thus promotes peer support. Peer support is the way through which a student helps other students by using his/her helping skills. Peer support, an important part of clinical nursing education, is informally used by students in clinics. Peer support is recommended to overcome problems and to facilitate learning in clinical practices (Caliskan & Cinar, 2012). Although peer support and peer assessment are both considered to be useful in nursing education (Caliskan & Cinar, 2012), the number of the pertinent studies are few. It is emphasized that there are shortcomings regarding the use of this method and that further studies should be conducted on it (Chan, 2013; Stone et al., 2013). A literature review (Casey et al., 2011; Stone et al., 2013) shows that there are studies, though not many, on peer assessment. However, there are no studies investigating the effects of students' evaluation of the nursing process through peer assessment during clinical practices on critical thinking and peer support. This experimental study was carried out to determine the effects of students' assessment of nursing process through the peer assessment method on critical thinking and peer support in a clinical setting

Methods

Design and Sample

The study was conducted with the 2nd-year nursing students studying at the Nursing Department of Health Sciences Faculty of a university during their internal medicine clinical practices.

Study population and sample: The study population included 269 2nd-year nursing students studying at the Nursing Department of Health Sciences Faculty of a university who had clinical practices in the Internal Medicine Nursing Course. The study sample comprised 68 students. Of them, 34 were assigned to the experimental group and 34 to the control group. The participants in the study sample were determined using the random sampling method.

The clinical practices of the Internal Medicine Nursing Course are performed in the clinics of the Internal Medicine department of the university hospital during the fall semester of the second year of the education. Therefore, students are divided into 8 groups and each group includes an average of 34 students. During the clinical

practice, the students in each clinic is supervised by different a teacher who accompanies students throughout their clinical practices. Clinical internship practices of the Internal Medicine Nursing Course take ten weeks. At the end of a five-week internship, student groups rotate. Therefore, during the implementation of clinical practices, a teacher in each clinic works with two student groups. This present study was conducted in the neurology clinic with the two student groups performing their clinical practices. One of the two groups was the experimental group, and the other one was the control group.

Data Collection Tools

Sociodemographic questionnaire (SQ): The questionnaire includes questions as to the students' sociodemographic characteristics.

California Critical Thinking Disposition Inventory (CCTDI): The scale is used for the evaluation of educational programs and educational approaches used to develop inclination towards and/or skills of critical thinking. The scale was developed by the Facione and colleague (1994). The validity and reliability of the Turkish version of the scale was conducted by Kokdemir (2003). Its consistency coefficient was determined as 0.88.

The items on the scale are rated on a 6-point Likert scale. The scores obtained from the items are summed and thus raw scores for each subscale are calculated. By dividing the raw scores by the number of the items and multiplying the resulting figure by 10, the lowest and the highest standard scores are calculated. If a score obtained from a sub-scale of the CCTDI is lower than 40, it indicates low disposition towards critical thinking; however, if it is higher than 50, it indicates high inclination towards critical thinking. A total score below 240 indicates a low inclination towards critical thinking, a score between 240 and 300 indicates a moderate inclination and a score above 300 indicates a strong inclination (Kokdemir, 2003).

Peer Support Scale (PSS): The scale was developed to measure peer caring behaviors of nursing students. The scale was developed by Kuo colleague (2007). The validity and reliability study of the Turkish version of the scale was conducted by Caliskan and Cinar (2012).

The scale has 17 items and three subscales: physical, academic and emotional assistance. The overall score of the scale indicates the level of helping behavior displayed by nursing students towards each other. All the items of the scale are rated on a 4-point Likert scale. The lowest and highest scores for the entire scale are 17 and 68 respectively. Scores lower than 34 are considered low while those over 52 are considered high. The Cronbach's alpha reliability coefficient of the scale was 0.93. (Caliskan & Cinar, 2012).

Procedure: In the study, while one of the two groups was assigned as the experimental group, the other one was assigned as the control group.

At the first meeting, the students in the experimental group were administered the SQ, CCTDI, and PSS before they performed any practices. How a care plan should be made was described to the students by the researcher on a sample case. On another sample care plan, the students were demonstrated how they should assess and a care plan and to what they should pay attention. To assess the care plan, the students were asked to use the care plan evaluation form routinely used in clinical practices. It is reported that since inappropriate grouping may lead to problems (Secomb, 2008), peer assessment should be conducted on a one-on-one basis or in small groups (Stone et al., 2013).

Therefore, each student in the experimental group was paired with a peer he/she chose. Then each student started to perform his/her task by implementing the care plan on the patient under his/her responsibility in the clinic. When a student fulfilled the care plan and wanted to present it to the supervisor, he/she was asked to exchange it with that of the student he/she was paired.

Then, they were asked to assess each other's care plan. During this assessment, the students were asked to write down their views about their partner's care plan as positive/negative, incomplete/superfluous or correct/wrong using a red pencil. Each student assessed the care plan made by his/her partner this way and then discussed it with him/her.

In order to provide accurate and timely exchange of knowledge, observation and supervision are essential in peer education and unsupervised

learning is reported to be ineffective (Brooks & Moriarty, 2009; Stone et al., 2013). Therefore, after the peers assessed each other's care plan and discussed it with each other, the pairs and their supervisor discussed and re-evaluated the care plans all together. Even if talks between the students and supervisors continue, partners should work together for at least one week (Brooks & Moriarty, 2009). In this study, pairs worked together for five weeks. By the end of the five-week clinical practices, each student had made four care plans and assessed the four care plans made by his/her partner. Thus, a student had the opportunity to reflect on the eight-care plans. At the end of the clinical practices, the scales were administered to students once more.

At the first meeting, the students in the control group were administered the SQ, CCTDI, and PSS before they performed any practices as were the students in the experimental group. How a care plan should be made was described to the students by the researcher on a sample case. On another care plan, the students were demonstrated how they should evaluate and appraise a care plan and what they should pay attention to.

To assess the care plan, the students were asked to use the care plan evaluation form routinely used in clinical practices. During the five-week routine clinical assessment program, the supervisor talked to the students on a one-on-one basis, and discussed the care plan with the students after examining it. By the end of the five-week clinical practices, each student had made four care plans and discussed them with the supervisor. At the end of the clinical practices, the scales were administered to students once more. It took about 25-30 minutes to fill in the SQ, CCTDI, and PSS.

Ethical considerations

Before the study was conducted, institutional and ethical permissions were obtained from the relevant institutions. The study was carried out appropriate by the Declaration of Helsinki in 1995 (as revised in Edinburgh 2000). This research was accepted by the ethical committee of Cumhuriyet University Clinical Research Ethics Committee, ethical code: 2016-05/01

Data Analysis: The study data were analyzed with the SPSS (Version 10.0, SPSS Inc., Chicago, IL, USA) package program. For the analysis of the data, frequency, percentage calculation, the chi-square test and the

significance of the difference between the two means were used.

Results

The mean age of the students in the experimental group was 19.97 ± 0.64 . Of them, 97.1% were in the 17-20 age group, 91.2% were female, 94.1% were high school graduates, and 70.6% preferred the profession of their own free will (Table 1).

The mean age of the students in the control group was 19.91 ± 0.90 . Of them, 94.1% were in the 17-20 age group, 88.2% were female, 88.2% were high school graduates, and 67.6% chose the profession by their own preference. The analysis made to determine the similarities and differences between the experimental and control groups in terms of variables such as age, gender, education level, and whether they preferred the profession of their own free will revealed no statistically significant difference ($p > 0.05$) (Table 1).

In Table 2, intergroup comparisons of the mean CCTDI and PSS scores the students obtained at the first and second measurements are presented. At the first measurement, the experimental and control groups obtained low scores from the CCTDI (229.18 ± 12.37 and 227.97 ± 14.03 respectively) and moderate scores from the PSS (34.18 ± 8.65 , 34.59 ± 8.92 respectively), and the differences between the two groups were not significant ($p > 0.05$).

At the second measurement, while the experimental group's CCTDI scores increased from low to high (301.79 ± 4.96) and their PSS scores from moderate to good (52.21 ± 10.28), the control group's CCTDI scores increased from low to moderate (250.94 ± 14.66) and their PSS scores remained the same (36.91 ± 8.79). The differences between the two groups were significant ($p < 0.05$) (Table 2).

The mean scores the students obtained from the subscales of the CCTDI and PSS are shown in Table 2. At the first measurement, the mean scores the experimental group obtained from the truth-seeking, open-mindedness, self-confidence subscales of the CCTDI were low while their mean scores obtained from the analyticity, systematicity and inquisitiveness subscales were moderate. At the second measurement, while their truth-seeking and self-confidence scores increased to the moderate level, open-mindedness, analyticity and systematicity scores

increased to the high level, but inquisitiveness scores remained at the same level. On the other hand, the mean scores the control group obtained from the truth-seeking, open-mindedness, self-confidence and inquisitiveness subscales of the

CCTDI were low while their mean scores obtained from the analyticity, systematicity subscales were moderate at the first measurement.

Table 1. Distribution of sociodemographic characteristics of the students in the experimental and control groups

	Experimental group (n=35)		Control group (n= 35)		X ^{2a}	p
	n	%	n	%		
Sociodemographic characteristics						
Mean age	(Mean \pm SD=19.97 \pm 0.64)		(Mean \pm SD=19.91 \pm 0.90)			
Age						
17-20 age group	33	97.1	32	94.1	0.349	0.555
21-24 age group	1	2.9	2	5.9		
Sex						
Female	31	91.2	30	88.2	0.159	0.690
Men	3	8.8	4	11.8		
Educational status						
High school	32	94.1	30	88.2	0.731	0.393
Health vocational high school	2	5.9	4	11.8		
Selection status of the profession willingly						
The profession willingly prefer	24	70.6	23	67.6	0.069	
The profession willingly don't prefer	10	29.4	11	32.4		0.793

SD, standard deviation; ^a Chi-square test for independence; *p<.05.

Table 2. Intergroup comparisons of the mean CCTDI and PSS scores the students obtained at the first and second measurements

Scales and sub-dimensions	First measurement			Last measurement		
	Experimental group Mean±SD	Control group Mean ±SD	t ^a , p	Experimental group Mean ±SD	Control group Mean ±SD	t ^a , p
CCTDI						
Truth-seeking	31.76±5.88	34.02±6.14	0.125 t=1.55	46.76±6.35	37.50±6.59	0.000* t=5.89
Open-mindedness	38.58±7.12	38.11±6.14	0.772 t=0.21	51.00±5.38	42.55±5.17	0.000* t=6.58
Analyticity	46.23±5.72	44.85±6.05	0.337 t=0.96	57.35±5.38	49.47±6.16	0.000* t=5.82
Systematicity	40.82±4.08	43.05±4.68	0.040* t=2.09	51.73±4.48	46.14±3.83	0.000* t=5.52
Self-confidence	31.91±3.16	30.79±3.3.47	0.017 t=1.38	47.00±5.22	35.85±4.81	0.000* t=9.14
Inquisitiveness	40.05±3.62	37.11±3.73	0.002* t=3.29	46.94±3.68	39.41±3.42	0.000* t=8.72
Total score	229.18±12.37	227.97±14.03	0.708 t=0.37	301.79±4.96	250.94±14.66	0.000* t=18.79
PSS						
Physical assistance	18.29±5.76	19.26±6.47	0.516 t=0.65	28.73±7.26	19.44±7.14	0.000* t=4.74
Academic assistance	8.14±2.77	8.32±2.42	0.781 t=0.27	10.50±2.78	9.02±2.44	0.024* t=2.31
Emotional assistance	8.02±2.72	7.82±1.58	0.705 t=0.38	10.6.7±2.47	8.44±2.04	0.000* t=4.06
Total score	34.18±8.65	34.59±8.92	0.847 t=0.19	52.21±10.28	36.91±8.79	0.000* t=5.17

^a Independent t test; SD, standard deviation; CCTDI, California Critical Thinking Disposition Inventory; PSS, Peer Support Scale; *p<.05.

At the second measurement, while their open-mindedness scores increased to the moderate level, their scores from the other subscales remained at the same level. While there were no significant differences between the groups in terms of their subscale scores (except for the systematicity and inquisitiveness subscales) at the first measurements ($p > 0.05$), the differences between the groups were significant in all subscales at the second measurement ($p < 0.05$) (Table 2).

The mean scores obtained from all the PSS subscales at the first measurement were poor in both groups except for the experimental group's physical assistance subscale score and there was no significant difference between the groups ($p > 0.05$). At the second measurement, the experimental group increased their physical assistance scores to the high level, and academic and emotional assistance scores to the moderate level. The control group increased their academic assistance scores to the moderate level, but their scores for the physical assistance and emotional assistance subscales remained at the same level. A significant difference was determined between the groups in all the subscales of the PSS at the last measurement ($p < 0.05$) (Table 2).

Discussion

In the study, no significant differences were determined between the experimental and control groups in terms of variables related to their sociodemographic characteristics ($p > 0.05$). At the first measurement, the mean scores the two groups obtained from the CCTDI and PSS and their subscales (except for systematicity and inquisitiveness subscales of the CCTDI) were close to each other and the differences were not significant. These results are of importance because they indicate that the students in both groups had similar scores and characteristics at the first measurement.

The comparison of the total mean scores obtained from the CCTDI revealed that the critical thinking skills scores of the students in both groups were low at the first measurement. In several other studies conducted with nursing students, similar results were obtained (Bulut, Ertem, Sevil, 2009; Ozturk et al., 2008). That the students in both groups had low critical thinking scores suggests that the students' critical thinking skills should be developed. At the second

measurement, while the critical thinking scores of the students in the experimental group were high, those of the students in the control group were moderate, and the difference between the groups was significant. The analysis of the results suggests that standard methods used in clinical practices developed the students' critical thinking skills. However, the PAM was more effective in the development of critical thinking skills; thus, their critical thinking skills improved more. In a similar study, the students in the reciprocal peer questioning group achieved higher critical thinking scores than did the students in the control group (Vaghar Vanaki, Taghi & Molazem, 2008). In different studies investigating peer teaching, similar results were found (Loke & Chow, 2008; Ozturk et al., 2008). In a qualitative study, the students stated that they considered peer assessment as an effective method in the development of critical thinking skills (Tomayess, 2012).

Interestingly enough, in several studies investigating nursing students' critical thinking levels, their scores were found to be either moderate or low (Bulut et al., 2009; Kantek, Ozturk & Gezer, 2010; Ozturk et al., 2008; Kaya et al., 2017), and in none of the studies accessed, participants did not achieve high critical thinking scores. As in other studies, in this study, the students' critical thinking scores were low at the first measurement. However, unlike other studies, the students' critical thinking scores increased to high levels after peer assessment. This increase in scores is thought to stem from the fact that the peer assessment urged the students to review their study topics more while assessing each other's nursing process, to establish a cause-effect relationship by analyzing what they read and to use their intellectual abilities more. As a result, it can be said that the peer assessment contributed to the development of the students' critical thinking skills, and that this method could be used in clinical education. This result is similar to the results of the study by Wuryanto et al., (2017).

Another topic investigated in the study was peer support. Peer support is important for learning. Students contribute to and cooperate with each other in a clinic setting informally (Roberts, 2008; Russell, Ryder, Burton, Daly, & Quinn, 2017). In another study, the level of peer support

among nursing students was found to be moderate (Caliskan & Cinar, 2008). Similar results were found at the first measurement of this present study. At the second measurement, peer support scores of the students in the experimental group increased more compared to that of the control group, and the difference between the groups was significant. This result indicates that the peer assessment promoted the cooperation between the students.

In a study investigating peer learning, the participants stated that they perceived an improvement in their patient care capabilities (Secomb, 2008).

In a qualitative study, it was determined that the students utilized peer support in their clinical practices, that peer support encouraged them to help each other to cope with their shortages in clinical practices, that the students found the answers to the questions more easily and that and they considered peer support valuable in this respect (Roberts, 2008).

Based on the results of this study, it can be said that peer assessment promotes peer support by improving peer relationships between students. Surely peer support could have been the most important thing that improved scores. Perhaps using a theory such as Vygotsky would help.

Conclusion

In conclusion, the use of methods contributing to the development of critical thinking in clinical education is of importance. The most commonly used tool in the development of critical thinking and clinical patient care is the nursing process. Methods enabling students to learn and use the nursing process more efficiently will also increase their critical thinking and cooperation skills.

This study found that the peer assessment method used by the students to assess each other's nursing process during clinical setting enhanced their critical thinking and peer support skills. Based on these results, it is recommended that supervisors should utilize the peer assessment rather than traditional training methods, that educational programs should include the peer assessment, that educational institutions should make arrangements to implement such programs, and that further studies should be conducted with larger sample groups.

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