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The Effect of Peer Learning vs. Traditional Learning on Knowledge and Clinical Performance of Critical Care Nursing Students

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Abstract
Background: Clinical practice is a vital part of nursing education, and highly valued by student nurses. From a student perspective, the clinical environment can be perceived as stressful and not welcoming. Therefore, the relationship between the student and the instructor is fundamental to the learning process. Peer learning offers students the opportunity to learn from each other. Moreover, it was suggested that academic involvement and interaction with faculty and fellow students increases the time and physical and psychological energy that students devote to the academic experience. The positive effects of peer learning have been described as increased cognitive skills, self-confidence, autonomy, clinical skills and reasoning are highlighted. Furthermore, and perhaps more difficult to evaluate in other educational models, are increased self-evaluating skills, collaborative- and leadership abilities, critical thinking and the opportunity to share the experiences of a fellow student without the immediate interference of the preceptor. **Aim**: The study aimed to compare the effect of using peer learning versus traditional learning on the clinical performance of critical care nursing students. **Methods:** The study was conducted at the critical and emergency care nursing Department, Faculty of Nursing, Damanhour University using an experimental comparative design. 100 nursing students enrolled in the third year were selected randomly to participate in this study. These were divided into two groups randomly. - Group I (study group): consisted of 50 students who were similarly assigned into 10 subgroups of 5 students each and they were learned by their colleagues. Group II (control group) included the other 50 students who were similarly assigned to 2 skill labs in subgroups of 25 students each.**Results:** The finding of the current study indicates significantly better performance scores among peer learning group. This study revealed that the majority of the study group students were positively satisfied as regarding peer learning. Moreover, the majority of the students in peer group stated that being taught by their peer increases interaction and collaboration with other students, they can communicate more freely with their peer than with their clinical instructor they don't feel freer to approach the instructor for help than their peer**.** However, they agreed that the feedback they received from their peers is more helpful and they learn more from their peer than from their clinical instructor. Furthermore, they expressed their belief that peer learning experience was worth the time spent and students felt more comfortable when the performance is being assessed by their peer.**Conclusion:** The results of this study confirm the results of the previous studies, emphasizing numerous positive effects of peer learning methods in the academic environment. The results of this study also suggest that peer-assisted learning increases the confidence, reduces anxiety and affects the development of students' future responsibilities. Therefore, the study recommends more utilization of this approach in nursing education, with training workshops aimed at changing the attitude of nurse educators towards the use of more innovative models of active learning such as peer learning.
Keywords: Peer learning, peer tutoring, traditional method, nursing students, clinical performance.

Introduction:

Clinical act is a crucial part of nursing education and highly valued by student nurses [1]. From a student perspective, the clinical environment can be perceived as stressful and not welcoming [2, 3]. Therefore, the relationship between the student and the instructor is fundamental to the learning process [4]. Universities are increasingly seeking alternative approaches to education that supplement traditional classroom learning, especially given that budgets have been cut and student populations have raised in many universities (5).

At a time when university resources are stretched and demands upon staff are increasing, peer learning offers students the opportunity to learn from each other. Moreover, Astin A. (2000) (6) suggested that academic involvement and interaction with faculty and fellow students increases the time and physical and psychological energy that students devote to the academic experience.

In Egypt, as well as internationally the expanding number of student nurses subsequently leads to a pressing need for additional instructors and clinical settings [7]. To address these challenges, new educational strategies for learning in clinical practice need to be implemented and evaluated. One way forward might be peer learning, a collaborative educational model, where students from the same social grouping learn each other [8, 9].

Peer learning is a complex process by which students learn from students that are more experienced and

knowledgeable about the subject material. The commonest model of peer learning is when a senior student performs as a teacher for another student. However, it has been suggested that a more favorable approach is to combine students from the same year as this will allow students to alternate the roles of teacher and student, and motivates students to become more involved in their own learning [10]. The model is often referred to as the 2:1 clinical placement model [11]. Students are active and equal partners sharing learning activities and involving in discussions and feedback [12].

The positive effects of peer learning have been described as increased cognitive skills, self-confidence, autonomy, clinical skills and reasoning are highlighted. Furthermore, and perhaps more difficult to evaluate in other educational models, are increased self-evaluating skills, collaborative- and leadership abilities [12], critical thinking [13], and the opportunity to share the experiences of a fellow student without the immediate interference of the instructor [14, 15].

Third- year student at the faculty of nursing, Damanhour university attend a critical care nursing course aimed at enabling them to apply critical care nursing management in clinical settings. The practical sessions are often taught by assistant learning staff to a group up to 20 students, a situation that makes guidance and supervision of the practical performance of each student not feasible. To overcome this critical care nursing department applying peer learning in its course. The situation provides an opportunity to compare peer learning with the traditional clinical session method.

Aim of the study

The study aimed to compare the effect of using peer learning versus traditional learning on the clinical performance of critical care nursing students.

Hypotheses

1- Students who follow a peer learning strategy acquire better nursing skills in suction than those who follow the traditional method of learning.
2- Students who follow a peer learning strategy obtain a higher score in knowledge test in suction than those who follow the traditional method of learning.

Methods:

Research design:

- An experimental design was used to carry out the study.

Ethical considerations:

- The researchers obtained the official permissions to conduct the study from the head of the Critical care and emergency nursing department, at the Faculty of Nursing, Damanhour University and participation acceptance from nursing students. An individual informed consent was obtained from each student after full explanation of the study objectives and procedure. Students were reassured that participation is totally voluntary, that refusals or withdrawals have no consequences, and that the information would be confidential and does not affect the assessment of their academic achievement.

Setting:

The study was conducted at the critical and emergency care nursing Department, Faculty of Nursing, Damanhour University. The critical and Emergency care nursing is staffed by 2 Lectures and 10 demonstrators. Over 200 undergraduate students were enrolled in the third year nursing program.

Sample:

- The best 10 students with the highest clinical score in the previous academic year (Second year) were invited to participate and all of them agreed to participate in the study.
- 100 nursing students enrolled in the third year were selected randomly to participate in this study. All of them agreed to participate in this study. Those were divided into two groups randomly.
- Group I (study group): consisted of 50 students who were similarly assigned into 10 subgroups of 5 students each and they were learned by their colleagues.

Group II (control group) included the other 50 students who were similarly assigned to 2 skill labs in subgroups of 25 students each and they were learned by 2 demonstrators from the department.

Instruments:

Three tools were used in this study: the tool (I) Student's Clinical Evaluation Checklist, the tool (II) Evaluation of students' knowledge and the tool (III) Peer learning Experience questionnaire.

Tool (I): Student's Clinical Evaluation Checklist: it consisted of 2 parts

1- Part (I): it included student's demographic data as age, sex

2-part (II): it included Clinical evaluation checklist which developed by the researchers based on related literature [16,17] to evaluate the nursing student's performance toward applying steps of suction taught in the practical part of critical care nursing course and applied in the laboratory setting. This tool asked about student's

age, gendered and was consisted of before the procedure (16 steps), during the procedure (16 steps) and after the procedure (18 steps). Each step was to be checked as "done correctly", "done incorrectly" and "not done" and most of these steps were scored o.25and some steps were scored 0.5 and 1. The score of total performance was 20.The point grade system of performance in the Faculty of nursing, Damanhour University was applied to the total score as follows: Excellent (≥17), Very Good (15 – <17), Good (13 – <15), Satisfactory (12 – <13) and Poor (<12).

Tool (II): Evaluation of students' knowledge: it consisted of 20 questions. 10 statements were answered with true or false and other 10 questions were multiple choice questions

Tool (III): it consisted of 12 statements to determine students' opinion about peer learning with a five-point Likert scale ranging from "strongly disagree" to "strongly agree".

Procedure

- After allocation of the students to the study (peer-learning) and control (traditional- learning) groups. The researchers conducted a workshop before starting the learning sessions and the attendants were the assistant learning staff assigned to the clinical sessions and the nursing students in the study group. It was for orientation of the participants concerning peer learning benefits, techniques, and tutor role, with a briefing of the studies addressing this issue in the literature.
- The researcher selected one of the most important skills for critically ill patients, it was endotracheal tube suctioning. Each peer student teacher asked to study the suction procedure carefully and was allowed to apply its steps in the Faculty skill lab under the supervision of researchers. This was repeated until the student mastered this skill.
- The 50 students in the study group were assigned to ten groups for 2 skill labs in subgroups of 5 students each for implementation of the peer learning process. The researchers prepared the schedule for the trained students to act as peer teachers for others their colleagues. Each student was given two chances to act as a peer teacher for 2 different subgroups. The clinical sessions started from 9 AM to 1 PM one day/week as each student at each peer group spent about 50 minutes to be taught and evaluated for the procedure by his/her colleague. The evaluation of peer groups students' performance was carried out through the student's clinical evaluation checklist after the end of the clinical session. Additionally, the study group student's opinions regarding the peer learning method were assessed using Peer Learning Experience questionnaire.
- The control group 50 students were assigned to 2 groups for 2 skill labs in subgroups of 25 students. These sub-groups were trained by assistant learning staff in traditional clinical sessions. The evaluation of control groups students' performance was carried out through the student's clinical evaluation checklist after the end of the clinical session.

Data analysis:

- Data entry and statistical analysis were done using SPSS 17.0 statistical package

Results:

Table (I): Distribution of nursing students in control and study groups according to general characteristics

general characteristics	Control group		Study group	
	No.	%	No.	%
Age				
17 - < 20 years	5	10	5	10
20 - < 24 years	45	90	45	90
Sex				
Male	12	24	13	26
Female	38	76	37	74
Previous qualification				
secondary school	37	74	35	70
technical institute of nursing	13	26	15	30
Previous academic achievement grad				
excellent	11	22	9	18
very good	28	56	30	60
good	9	18	9	18
pass	2	4	2	4

Table (1) shows the distribution of nursing students in the control and study groups according to their general characteristics. Regarding students' age, the results revealed that the majority of students in control and study groups (90%) were from age 20 years to below 24 years. Also, this table indicated that the majority of the control and study groups were females (76% and 74%) respectively.

In relation to the previous qualification, the table illustrates that the majority of nursing students in the control and study groups had secondary school education. Finally, it was noticed that the higher percentage of nursing students achieved very good scores in both control and study groups, (56% and 60%) respectively. The lowest percentage got pass score in both the control and study groups (4%).

Table (II): Total score level of knowledge among nursing student in control and study groups

Total Score of knowledge	Traditional (n = 50)		Peer (n = 50)		χ^2	^{MC}p
	No.	%	No.	%		
Excellent (17+)	35	70.0	46	92.0		
Very Good (15 – <17)	3	6.0	3	6.0		
Good (13 – <15)	5	10.0	1	2.0	11.064*	0.009*
Satisfactory (12 – <13)	6	12.0	0	0.0		
Poor (<12)	1	2.0	0	0.0		

χ^2, p: χ^2 and p values for **Chi square test** for comparing between the two groups. ^{MC}p: p value for **Monte Carlo** for Chi square test for comparing between the two groups. *: Statistically significant at $p \leq 0.05$

Table (II) Demonstrates number and percentage distribution of nursing students in the study and control groups according to their total scores level of knowledge concerning suction. The table illustrates that 70% of the control group students had excellent scores. While the majority of the study group students (92%) had excellent scores. The difference between the two groups concerning the level of knowledge in suction procedure was found to be statistically significant (χ^2: 11.064*, P= 0.009*).

Table (III): Total score of skills among nursing student in control and study groups

Total Score of skills	Traditional (n = 50)		Peer (n = 50)		χ^2	^{MC}p
	No.	%	No.	%		
Excellent (17+)	27	54	38	76		
Very Good (15 – <17)	11	22	10	20		
Good (13 – <15)	7	14	2	4	8.811*	0.038*
Satisfactory (12 – <13)	3	6	0	0		
Poor (<12)	2	4	0	0		

χ^2, p: χ^2 and p values for **Chi square test** for comparing between the two groups. ^{MC}p: p value for **Monte Carlo** for Chi square test for comparing between the two groups. *: Statistically significant at $p \leq 0.05$

Table (III) Demonstrates number and percentage distribution of nursing students in the study and control groups according to their total scores level of practice concerning suction. The table illustrates that nearly half of the control group students (54%) had excellent scores. While three-quarters of the study group students (76%) had excellent scores. The difference between the two groups concerning the level of practice in suction procedure was found to be statistically significant (χ^2:8.811*, P= 0.038*).

Table (IV): Relation between total score levels of practice for study group students and their general characteristics

General characteristic's	Total Score Level						χ^2	^{MC}p
	Excellent (17+)(n = 38)		Very Good (15 – <17) (n = 10)		Good (13 – <15) (n = 2)			
	No.	%	No.	%	No.	%		
Age								
17 – ≤ 20	5	100	0	0	0	0	1.30	0.66
21– ≤ 25	33	73.3	10	22.2	2	4.4		
Sex								
Male	6	46.2	6	46.2	1	7.7	8.35*	0.01*
Female	32	86.5	4	10.8	1	2.7		
Previous qualification								
Secondary school	24	68.6	9	25.7	2	5.7	3.02	0.21
Technical institute of nursing	14	93.3	1	6.7	0	0.0		
Previous academic achievement grad								
Excellent	9	100	0	0	0	0	26.14*	<0.00*
Very good	26	86.7	2	6.7	2	6.7		
Good	1	11.1	8	88.9	0	0		
Pass	0	0	0	0	2	100		

χ^2, p: χ^2 and p values for **Chi square test.** ^{MC}p: p value for **Monte Carlo** for Chi square test. *: Statistically significant at p ≤ 0.05

Table (IV) Illustrate relation between total score levels of practice for study group students and their general characteristics. As regards age and previous educational qualification the table reveals no significant difference between age or previous educational qualification and level of practice among the students in the study group.

On the other hand, it was noticed that excellent level of practice was more observed among female students (86.5%) compared with 46.2% of male students. The difference between the two groups was found to be statistically significant ($\chi 2$ =8.347*, p= 0.007*). The table also reveals that excellent level of practice was more observed among students who achieved excellent and very good in previous academic grade (100% and 86.7%) respectively. A previous academic achievement grade was found to significantly affect the level of practice among the students of the study group ($\chi 2$ =26.137*, p= 0.001*).

Table (V): Students' satisfaction regarding peer learning for study group:

statement	Satisfaction			
	Satisfied		Dissatisfied	
	No.	%	No.	%
1- The feedback I receive from my peer is from students view point, therefore more helpful than from my instructor.	45	90	5	10
2- I am more self-confident and able to perform the procedure independently because of being taught by my peer, more than my instructor.	44	88	6	12
3- I learn more from my peer than my instructor	37	74	13	26
4- I can communicate more freely with my peer than with my instructor.	45	90	5	10
5- I don't feel freer to approach my instructor for help than I do my peer.	44	88	6	12
6- Being taught by my peers increases my interaction and collaboration with other students more than when being taught by my instructor.	44	88	6	12
7- Being taught clinical skills by my peer increases my sense of responsibility more than being taught by my instructor	45	90	5	10
8- My peer is more supportive to me when I am performing nursing skills than my instructor.	45	90	5	10
9- I am less anxious when performing nursing skills in the presence of my peer than my instructor.	45	90	5	10
10- I felt more comfortable when my performance being assessed by my peer	43	86	7	14
11- Peer learning experience was time well spent	43	86	7	14
12- There should be more opportunities of peer teaching in the curriculum.	44	88	6	12
Total	524	87.3	76	12.7
Chi Square and P	Chi Square=167.25		P=0.00	

Table (V) shows students' satisfaction regarding peer learning for the study group. The table illustrated that

the majority of the study group students (90%) were agreed that the feedback they received from their peers is more helpful than from their instructor, they can communicate more freely with their peer than with instructor and peer learning increases the sense of responsibility.

The table also revealed that the majority of the study group students (90%) felt that they were less anxious when performing nursing skills in the presence of their peer and more supportive than their instructor. Also 88% of the study group students were satisfied with being taught by peers increases interaction and collaboration with other students, they don't feel freer to approach instructor for help than their peer, they are more self-confident and able to perform the procedure independently and there should be more opportunities of peer learning in the curriculum.

Moreover 86% of study group students agreed that beer learning experience was time well spent and students felt more comfortable when the performance was being assessed by their peer. About three-quarters of the study group (74%) were satisfied with that they learn more from their peer than their instructor. The difference between total satisfied and dissatisfied level of the study group was found to be statistically significant (Chi Square=167.253, P= 0.000).

Discussion

This study hypothesized that students who follow a peer learning strategy obtain a higher score in knowledge test and acquire better nursing skills in suction than those who follow the traditional method of learning.

The finding of the current study indicates significantly better performance scores among peer learning group. Moreover, the majority of the students in the study group got excellent score in knowledge and skills. The finding indicates the success of the peer learning approach. The finding is consistent with other previous research study done by Tai et al (2014) [18] found that interaction with peers helped them comprehend the task or skill required of them, also gaining information about their own performance in comparison to the required standard. Moreover, Pålsson et al (2017) [19] in his study, reported that learning in peers improved learning and development. Also, Okilwa (2010) [20] and Kroesbergen (2003) [21] stated that Peer learning was an overall useful strategy to promote active engagement in the learning process and increase academic achievement among students.

This finding may be due to the fact that students are able to explain the concepts to another student in a unique way not used by their clinical instructor. Moreover, the most important source of influence for a student is the reference group. Peers have considerable influence on one another and certainly more influential than the clinical instructor. Moreover, they had better resources such as the small numbers of students in their groups. In such environment, each student had the opportunity to perform the practical skill more than once, which enhances his/her performance. Peer learning can develop and strengthen a positive influence among students and increase their own understand of the subject matter [18].

This study revealed that the majority of the study group students were positively satisfied as regarding peer learning. This finding is in the same line with Yuen Loke & Chow (2007) [22] who found that peer learning students reported positive feedback on their experience of peer learning. On the other hand, the majority of the study group students stated that peer learning increases their sense of responsibility for learning. Moreover, this finding is congruent with Mitchem (2001) [23] reported in his study that training students in peer learning strategies can help students take responsibility for their learning, and their ability to recognize and accept responsibility for academic failures.

Furthermore, the present study indicates that the majority of the students in peer group stated that being taught by peers increases interaction and collaboration with other students, they can communicate more freely with their peer than with their clinical instructor they don't feel freer to approach instructor for help than their peer, This is against the finding of previous study found that a few of nursing students taught by peer learning were feel less communicate and interact with other students [24]. These results are in congruence with the previously reported positive effects of peer learning on students, abilities of interactions, transferable personal skills as communication and problem - solving. [4, 23, 5]

In fact, the students taught by peer learning are more self-confident and able to perform the procedure independently and there should be more opportunities of peer learning in the curriculum. In agreement with this, Dennis et al (2007) [23] reported in his study that social, self-confidence and behavioral outcomes were affected positively with the use of peer-assisted learning strategies, including peer learning.

However, the results of the current study showed that the majority of students in peer group agreed that the feedback they received from their peers is more helpful and they learn more from their peer than from their clinical instructor. Additionally, the students in peer group feel less anxious when performing nursing skills in the presence of their peer and they were more supportive than their clinical instructor. In agreement with this Chojecki et al (2010) [25] and Stenberg (2015) [26] reported in their studies that peer learning reduces student anxiety and increases self-efficacy. Our finding against what has been reported in another previous study [27] found that a few of nursing students taught by peer learning were feel less anxious when performing a skill.

The present study revealed that students in peer group expressed their belief that peer learning experience was worth the time spent and students felt more comfortable when their performance was being assessed by their peer. This is congruent with Sevenhuysen et al (2013) [29] who found that peer-assisted learning has the potential to increase the value of hours spent on clinical placements by providing students with supplementary observation and feedback on their performance.

Conclusion:

From the present study, it can be concluded that peer learning strategy is a more effective strategy in the improvement of nursing students' knowledge and practice than traditional learning method. There was a statistically significant difference in the level of knowledge and practice scores related to suction procedure between study and control group after implementing of peer learning and traditional learning. Moreover, the majority of the study group nursing students were satisfied with peer learning.

Recommendations

Based on the findings of the present study, the following recommendations are suggested.

1. Implementation of peer learning strategy in both classrooms and clinical setting to increase the level of students' knowledge and clinical performance.
2. Peer learning should be accepted as an effective strategy to learning nursing skills.
3. Seminars and training workshops should be conducted for nurse educators to increase their proficiencies in applying peer learning as a learning strategy in the clinical learning.

Further studies

1. Replication with a larger sample to further confirm the results.
2. Conduct peer learning strategy in other clinical learning situations
3. A comparative study to determine the effect of traditional learning versus peer learning on students' social interactions.

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