Effect of Peer Learning Strategy on the Clinical Performance of Nursing Students

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Abstract. Context: Pear learning considers a successful educational strategy since it enhances students' clinical performance, motivates them to take an active part in the educational system, provides them with the chance to grow as competent learners, reduces the burden on the responsible faculties and makes more effective use of resources. Aim: this study aimed to assess the effect of peer learning strategy on the clinical performance of the nursing students. Design: A quasi experimental design was used to achieve the aim of the study. Setting: The study was conducted in the Nursing Department at Alexandria Technical Health Institute, Damanhur Branch. Subject: A convenient sample of the first year nursing students who enrolled in nursing course at the second semester of the academic year 2019/2020. **Tools:** it includes two tools; "Structured Interview Questionnaire" it consists of three parts, part I: Sociodemographic data, part II: Cardiopulmonary Resuscitation Knowledge Questionnaire & part III: observational checklist and 2nd tool: peer learning strategy experience questionnaire. Results: Regarding total cardiopulmonary resuscitation knowledge 0% of the study group had high total score at the pre peer learning implementation phase which improved at the post phase to be 91.9%. Nursing students' satisfactory level of the total cardiopulmonary resuscitation practices score was improved at the post peer learning implementation phase compared to pre (98.4 % versus 1.6 % respectively). Conclusion: Peer learning is a significantly effective teaching strategy compared with the traditional method in improving nursing students' clinical performance. The study advised implementing the peer learning technique as a formal method in the clinical settings to improve students' knowledge and practice. Recommendations: Develop a structured formal written peer learning strategy guidelines with outlined desired outcomes and annual assessment for modifications by organizing reflective discussions.

Keywords: peer learning strategy, nursing students, clinical performance

Introduction

Nursing education must be effective in order to fulfill its goals, many teaching methods are used in theoretical and clinical education among these methods is pear learning (PL), which allows students to teach and supervise other students, reducing the burden on the responsible faculty members and making more effective use of resources (Cheung, 2021).

Teachers must enhance their own teaching modules in order to make the future of education more student-centric rather than teacher-centric and from a one-size-fits-all style to the multimodal teaching one. Through that every student can gain and subsequently become engaged learner. Due to the students' increasing number and the shortage of the clinical preceptors, PL presented in the nursing education field as an instructional paradigm that is particularly well suited for the clinical placements (Nelwati, 2020& Solheim et al., 2018).

Over the last years, nursing clinical education has received heightened attention with a particular focus on the learning environment. Various learning models, including PL, have been examined by partnering nursing students, teaching and supporting each other, without direct preceptor guidance. Collaborative learning provides a platform for the development of critical thinking, problem-solving, reflection, and independence among students. As a result, PL has been recognized as a valuable approach to enhancing nursing education (Alnajjar et al., 2020).

There is an increasing demand to enhance the nursing students' learning environment, especially in the resources limited settings, to enable them to acquiring clinical skills, enhance their logical reasoning, and grow as professionals. In the clinical placements, students should have the chance to learn the practical nursing skills and get hands-on experience. Even if, in areas where simulation learning is possible, nursing students must be exposed to the real-world experiences to get the necessary experience. Peer learning provides students with an actual environment for active engagement and promotes a deeper understanding of the subject matter through shared learning experiences (Rojo et al., 2020).

Peer learning defined as learning from and with each other, both in formal and informal ways which

requires that students reciprocally exchange knowledge, experiences, and ideas among their peers. Peer learning is commonly referred to "peer teaching", "peer mentoring," "peer instruction", and "peer tutoring". Evaluations of tutoring sessions by tutees suggest that peer tutoring as an adjunctive teaching and learning strategy can positively impact the students' academic performance (Hawkins 2022& Topping, 1996).

Peer learning is used as a general concept for a group of teaching approaches. It reflects the ability to gain knowledge and skill through vibrant support and assistance among students at the same status or level in both formal and informal manners. It includes members of comparable social groups who are not originally teachers to help each other to gain knowledge and skills and in turn they also learn a long with the process. (Núñez-Andrés et al., 2022& Choi et al., 2021).

Significance of the Study

The quality of the clinical learning environment considers an indicator which significantly presents the quality of the curriculums of all nursing associations. The complexity of the learning in the clinical settings has made it necessary for the researchers to study the effect of different variables on the clinical learning because it can be difficult for the nursing educators to develop novel paradigms in nursing pedagogy that foster students' creativity, aptitude, and motivation. Leading to using PL strategy as a successful educational intervention since it motivates students to take an active part in the educational system and provides them with the chance to grow as competent learners (Carey et al., 2018).

The increase in the number of critical care students without a corresponding increase in the educators' number presents a hinder in training the nursing skills. It becomes challenging for one educators to handle large groups while ensuring that all students acquire practical skills. Being up-to-date, well-prepared, and professionally competent with the life-saving procedures such as cardiac resuscitation (CPR) in the emergency is essential for nurses to quickly and effectively response to cardiac arrest. Therefore, peer learning has been recognized as an effective and valuable approach for delivering undergraduate CPR training, which is fundamental in emergency situations (Kodikara, 2022).

Training nursing students to perform CPR in high-quality promises the increase in the sudden cardiac arrest survival rates by increasing the professionally trained care providers. Moreover, using well skilled students as basic life support trainers can help as an alternative for the public training which can positively enhance the emergency response during the crisis. Over the past two decades, there have been various strategies employed to teach CPR to the nursing students. PL is one of several ways used to teach CPR to nursing students to insure active students' involvement and innovative thinking rather than conventional teaching approaches (Cheung, 2021&Fatima 2018).

During the past few decades, in the nursing associations, PL method has been utilized, however, there have been discrepancies in the academic achievement and students' response. Undoubtedly, tutoring provides an academic support, still there is a gap in the literature about the way tutors may affect their peer tutees' academic performance and skillset improvement (Cofer 2018).

Hence, this study will assess the effect of PL strategy on the clinical performance of the nursing students. Hopefully the findings will enrich the nursing education with an approach which encourages engagement, facilitates interaction during the learning process and also increases the nursing students' personal development for their future roles**.**

Aim of the study
This study aims to evaluate the effect of peer learning strategy on the nursing students' clinical performance.

Research Hypothesis:

The current study hypothesized that:

- The nursing students who experienced peer learning strategy will exhibit better knowledge.
- The nursing students who experienced peer learning strategy will exhibit better practice.

All subjects were divided into two groups as the following; study group including (peer tutors and tutees). Peer tutors: In total six students who were selected to be the peer tutors from the first-year nursing students, had previous experience of the selected procedure (CPR) and performed these procedures with satisfied performance score prior to study and they perceived benefits of having presented their work to their peers. Peer Tutees: the rest of study groups were 62 students divided randomly and assigned into 6 subgroups of about 10 or 11 students in each group.

Control group: were 67 students who exposed to the regular instructors teaching as the routine faculty teaching method.

Inclusion criteria

Peer tutors will be selected from the enrolled students in the study group who have learning, teaching abilities (through recording 3 minutes presentation video about interested topic and evaluated through checklist), good manual skills (according to CPR pretest), previous semester academic achievement, results of CPR pretest and agreed to participate as peer tutors.

Exclusion criteria

Will include students who attended previous adult CPR training courses, repeaters and those who will refuse to participate.

Tools of data collection

Structured Interview Questionnaire

It was developed by the researcher based on the review of the relevant recent related literature (Bogle et al. 2016; American Heart Association 2017, Ghanem et al. 2018 and Panchal A. et al. 2019). This questionnaire consists of three parts as follows:

Part I: concerned with assessment of students' demographic characteristics as age, gender, marital status, residence and previous academic achievement in the first semester.

Part II: "Cardiopulmonary Resuscitation Knowledge Questionnaire" this part concerned assessing the student's knowledge regarding adult CPR which consisted of 20 multiple choice questions regarding basic concepts about adult CPR (arrest recognition, airway management maneuvers, and effective chest compression criteria).

Scoring system; each question was graded as the following; two grades was given for the true answer, one

Subjects & Methods
Research Design

Quasi-experimental design (study & control groups) was used in carrying out this study. Quasi-experiment design is an empirical interventional study used to estimate the causal impact of an intervention on a target population without random assignment (Sidhu, 2019).

Study setting

The study was conducted in the Nursing Department at Alexandria Technical Health Institute, Damanhur Branch. This department comprises four nursing clinical labs located in the third and fifth floors, each lab capacity accommodating 20 students. Equipped with two mannequins for practicing hands-on adult CPR training and a data show projector. The department is supported by a dedicated team of eight experienced teachers. Upon completing a two-year program, students receive a technical nursing certificate. With a capacity ranging from 150 to 200 students per each grade.

Subjects

A convenient sample of first-year nursing students (135) who enrolled in nursing courses at the second semester of the academic year 2019/2020 was selected to participate in the study.

grade for the false answer, and zero if not been answered. A total score was calculated by summing up the grades of the questioner.

The maximum total score was 40; which converted into percentages as the following:

- High level of knowledge if the percent $\geq$ 75% score (30-40)
- Average level of knowledge if the percent = 60%: < 75% score (24 - 29)
- Poor level of knowledge if the percent < 60% score (0 -23)

Part III: Cardiopulmonary Resuscitation Practices Checklist" this part concerned with assess the students' practical skills regarding adult CPR. This tool was written in English language, it consists of 11 subsections (21 Steps) divided into the following sub-statements;

- Assessment and Activation: four Steps.
- High Quality Compression: Six Steps
- Airway Management: Tree Steps
- Application of AED and rescuers switching: Five Steps

- Resume Compressions: two steps
- Post Resuscitation Care: one Step

Total score of practice was (42 marks); on three-point Likert scale ranging from "not performed" equal to 0, "Incompletely performed" equal to 1 and "completely performed" equal to 2. The total score was distributed as the following;

- Satisfactory Level if the percent ≥ 75% score (16-22)
- Unsatisfactory Level if the percent < 75% score (0 < 16).

Procedures

The preparatory phase included reviewing related literature and theoretical knowledge of various aspects of the study using books, articles, internet periodicals, and journals to develop tools for data collection.

Tool's content validity was ascertained by a panel of seven experts from Medical-Surgical and Critical Care Nursing academic staff who reviewed the content of tools for clarity, accuracy, relevance, and comprehensiveness, and the necessary modifications had done accordingly.

Reliability: was applied by the researcher for testing the internal consistency of the tools using Cronbach Alpha for the knowledge questionnaire sheet and the value was 0.92, for the cardiopulmonary resuscitation observational checklist it was 0.95. A pilot study was carried out on 10% of the total sample size.

Official permission was obtained by submission of official letters issued from the dean of the faculty of nursing, Ain Shams University, to the dean of Alexandria Technical Health Institute and the head of Nursing Department, Damanhur Branch at which the study conducted.

Ethical considerations: legal approval obtained from the ethical committee in the faculty of nursing, Ain Shams University before starting the study. The researcher obtained students' consent after clarifying the aim and the objectives of the study. And assured anonymity and confidentiality of subjects' data.

Fieldwork

Assessment phase: data related to students' were obtained. The teaching learning environment and educational content were assessed and prepared. Only 6 teachers will participate in the study according to the teaching plan (cover the traditional method for the control group) and help as researcher assistants for the study group.

Structured Interview Questionnaire was used for the study and control groups as; part I for sociodemographic characteristics, part II and III for pre-test to assess realistic levels of the students' knowledge and practice regarding CPR procedure.

The studied sample (135) was divided by the researcher using stratified random sampling method into study group were 68 students and control group 67 students.

To select the peer tutors, the researcher asked the study group to record a video for 3 minutes presentation about interested topic and evaluated by the researcher according to evaluation checklist. Peer tutors were chosen based on the evaluation of the recorded videos, results of the CPR pre-test (knowledge and practice) and the previous semester academic achievement. The study group was divided into 2 parts; peer tutors (6) and peer tutees (62) students.

Implementation phase: The researcher conducted a meeting with the peer tutors and the teachers to discuss the peer tutoring/ learning process and introduce the tools (adult CPR knowledge test and practice checklist) which supposed to be used by the teachers and peer tutors to evaluate the study and control groups as a pre and post-test for the clinical training.

Clinical adult CPR teaching and demonstration was done for the peer tutors by the researcher in the clinical lab using CPR mannequins and each tutor done re-demonstration and was evaluated by the researcher using the knowledge questioner and checklist under the supervision of the researcher in order to master the skill before assigning the peer tutoring roles. Educational materials as handouts and videos concerning adult CPR procedure were provided for peer tutors and the teachers as well.

The peer tutors group revised the content, prepare the skill labs, formulate the training schedule, students' allocation, design the lesson plan and attached all schedules and tutees' groups on the announcement board under the supervision of the researcher. Study and control groups similarly allocated into the traditional teaching and peer learning strategy.

Evaluation phase: Posttest was conducted for both study and control (knowledge and practice).

Data Analysis

The collected data were organized, categorized, tabulated, and statistically analyzed using the statistical package for social science using SPSS program version 26. The obtained data were organized, analyzed and represented in tables and graphs as required. It were presented using descriptive statistics in the form of

(frequency, Mean score, Standard deviation (SD)). The used tests were;

- Chi-square test: For categorical variables, to compare between different groups.
- Monte Carlo correction: Correction for chi-square when more than 20 of the cells have expected count less than
- One Way ANOVA Test: Used to compare between more than two groups
- Student t-test: Used to compare two groups for normally distributed quantitative variables.
- Paired t-test: Used to comparing between pre and post in each group.
- Pearson correlation: Pearson coefficient was used to correlate between quantitative variables.

The observed differences and association were considered as follows:

- Non-significant at $P > 0.05$
- Significant at $P \leq 0.05$

Results

Table1: demonstrates comparison of nursing students' demographic characteristics of the studied students. Regarding group 59.7% of them aged from 17: ≤18 years old, 100% of them were females, 89.6% of them were singles, and 62.7% of them lived in rural area. Concerning the study group; 62.9% of the students' tutees were aged from 17: ≤18 years, 100% of them were females, 95.2% of them were singles and 64.5% of them lived at rural area. Regarding tutors; 66.6% of them were aged from 17: ≤18 years, all of them were females, 100%of them were singles and 83.3% of them lived at rural area. All of the study and control groups (100%) did not attend any previous clinical peer learning sessions. There was no significant difference between the groups.

Table2: shows a statistically significant improvement between the pre and post study phases' among the students' tutors' knowledge subscale's of "assessment and timing", "cardiac arrest & chest compressions", and "airway management& application of AED" as p <0.001 for all subscales.

Also, there was a statistically significant improvement between the pre and post study phases' related to the students' tutors' practice subscale's of "assessment, activation", "high quality compression" "Airway management & Application of AED", "Resume Compressions & Post Resuscitation Care" as p <0.001 for all subscales.

Table 3: presents that regarding CPR knowledge subscales total scores; during the pre-peer learning strategy implementation phase; there was no statistically significant difference between the students' tutees and control groups of mean and standard deviation; "assessment and timing", "cardiac arrest & chest compressions", and "airway management &application of AED"; p=0.094, p=0.435 and p= 0.340 respectively.

While, during the post peer learning strategy implementation phase; there was statistically significant difference regarding subscales total scores for "assessment and timing", "cardiac arrest & chest compressions", and "airway management &application of AED"; p<0.001, p<0.001and p= 0.001 respectively.

Figure 1: Shows that no one (0%) of the students' tutees had high total knowledge score regarding cardiopulmonary resuscitation in the pre peer learning implementation phase which improved at the post phase to be 91.9% of them had high total knowledge score. Furthermore, 1.5 % of the control group had high total knowledge score regarding cardiopulmonary resuscitation that improved at the post phase to be 44.8% of them had high total knowledge score.

Table 4: presents that related to the pre peer learning strategy implementation phase; there was no statistically significant difference between the students' tutees and control groups regarding mean and standard deviation of practice subscales total scores except "Airway management & Application of AED" (p= 0.02).

A statistically significant difference was detected during the post phase between the students' tutees and control group as the mean of the practice subscale's total scores were; p < 0.024 for "Resume Compressions & Post Resuscitation Care".

Figure 2: reveals that only 1.6 % of the students' tutees had satisfactory total practices score regarding cardiopulmonary resuscitation at the pre peer learning strategy implementation phase that improved at the phase to be 98.4% of them had satisfactory total practices score. In addition, no one (0%) of the studied students in the control group had satisfactory total practices score regarding cardiopulmonary resuscitation at the pre peer learning strategy implementation phase that improved in the post study phase to be 98.5% of them had satisfactory total practices score.

Table 5: illustrates a statistically significant difference cardiopulmonary resuscitation knowledge and practice total scores among the students' tutees and control group between the pre and post study phases (p < 0.001).

Table 1. Comparison of nursing students' Socio-Demographic Characteristics; Study (n=68), and Control (n=67) Groups.

Socio-Demographic Characteristics	Study (n=68)				Control (n=67)		χ^2	MCp
	Tutees (n=62)		Tutors (n= 6)					
	No	%			No	%		
Age								
17 : ≤ 18	39	**62.9**	4	**66.6**	40	**59.7**		
>18 : ≤20	21	33.9	2	33.3	25	37.3	0.792	0.970
20 +	2	3.2	0	0	2	3		
M±SD	**17.56 ± 1.21**		**17.96 ± 1.43**		**18.0 1 ± 3.61**		F=0.113	0.893
Sex								
Male	0	0	0	0	0	0		
Female	62	**100**	6	**100**	67	**100**	-	-
Marital status								
Single	59	**95.2**	6	**100**	60	**89.6**	1.431	0.583
Married	3	4.8	0	0	7	10.4		
Residence								
Rural	40	**64.5**	5	**83.3**	42	**62.7**	0.845	0.687
Urban	22	35.5	1	16.6	25	37.3		
Previous Clinical Peer Learning Sessions								
Yes	0	0	0	0	0	0	-	-
No	62	**100**	6	**100**	67	**100**		

Table 2. Comparison of students' tutors' knowledge and practice of cardiopulmonary resuscitation at the pre and post study phases (n=6).

|	Tutors (n=6)					
Knowledge Subscales	Pre	Post		t	P- Value	
Assessment and Timing	1.17±0.98	**6.0±0.0**		12.042[*]	**<0.001[*]**	
Cardiac Arrest & Chest Compressions	1.83±1.72	**6.0±0.0**		8.770[*]	**<0.001[*]**	
Airway Management & Application of AED	2.0±1.55	**6.0±0.0**		6.325[*]	**0.001[*]**	
Practice Subscales						
Assessment and Activation	3.33±1.21	**8.0±0.0**		9.439*	**<0.001***	
High Quality Compression	4.833 ± 0.75	**12.0 ± 0.0**		23.320*	**<0.001***	
Airway management & Application of AED	6.50±1.64	**16.0 ± 0.0**		14.162*	**<0.001***	
Resume Compressions & Post Resuscitation Care	3.0 ± 0.0	**6.0 ± 0.0**		-	-	

Table 3. Comparison of Students' Tutees (n=62) and control group's (n=67) cardiopulmonary resuscitation practice at the pre and post phase of peer learning strategy implementation.

| Knowledge Subscales	Pre Phase		T	P- Value
	Study(tutees) (n=62)	Control (n=67)		
Assessment and Timing	0.90±1.04	1.21±1.02	1.686	0.094
Cardiac Arrest & Chest Compressions	2.73±1.33	2.91±1.35	0.782	0.435
Airway Management & Application of AED	1.15±0.97	1.31±1.02	0.958	0.340

	Post Phase			
Assessment and Timing	**5.48±0.92**	3.75±1.81	6.969*	**<0.001***
Cardiac Arrest & Chest Compressions	**7.55±0.90**	5.88±3.36	3.909*	**<0.001***
Airway Management & Application of AED	**5.47±0.86**	4.07±3.12	3.517*	**0.001***

Tutees' and Contol Group Total Knowledge Score
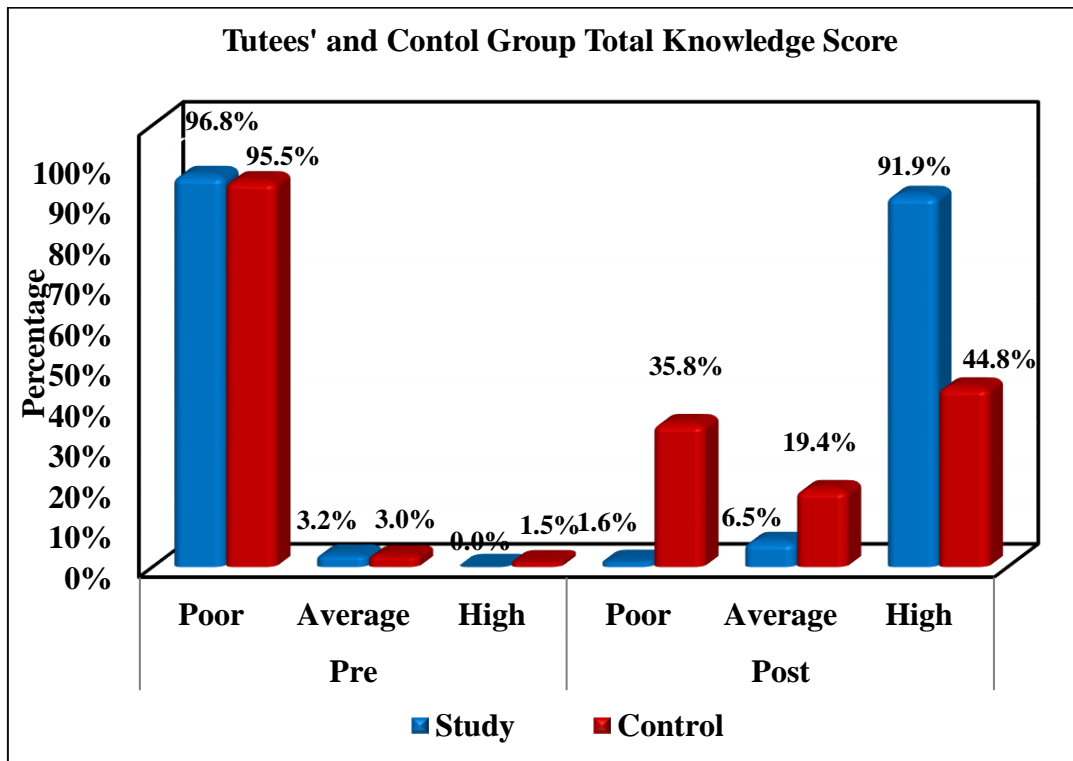
Table 4. Comparison of Students' Tutees (n=62) and control groups (n=67) cardiopulmonary resuscitation practice at the pre and post phase of peer learning strategy implementation.

Practice Subscales	Pre Phase			
	Study (tutees) (n=62)	Control (n=67)	T	P- Value
Assessment and Activation	2.11 ± 1.44	1.96 ± 1.52	0.604	0.547
High Quality Compression	4.43 ± 0.92	4.52 ± 0.79	0.521	0.604
Airway management & Application of AED	4.08 ± 1.61	5.61 ± 1.02	**4.515**	**0.02***
Resume Compressions & Post Resuscitation Care	1.74 ± 1.50	1.79 ± 2.0	0.159	0.874
Post Phase				
Assessment and Activation	8.0 ± 0.0	7.82 ± 0.64	1.989	0.051
High Quality Compression	11.87 ± 0.64	11.78 ± 0.79	0.743	0.459
Airway management & Application of AED	15.35 ± 2.18	15.79 ± 1.16	1.401	0.164
Resume Compressions & Post Resuscitation Care	6.0 ± 0.0	5.79 ± 0.83	**2.070***	**0.042***
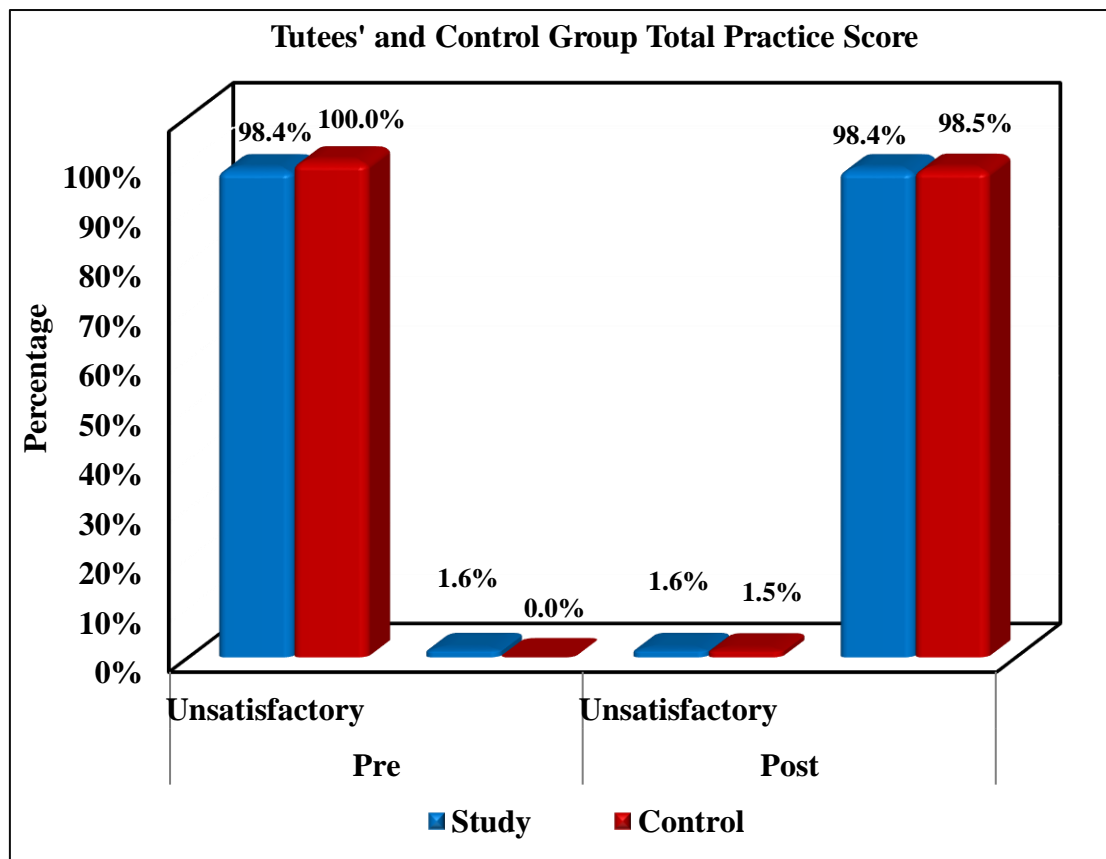
Figure 2. Percentage Distribution of the Students' Tutees (n=62) and Control (n=67) Groups according to their total practices score regarding Cardiopulmonary Resuscitation at the pre and post phases of peer learning strategy implementation.

Table 5. Comparison between Students' Tutees' (n=62) and Control Groups (n=67) Total Knowledge and Practices Scores of Regarding Cardiopulmonary Resuscitation at Pre and Post peer learning implementation phases.

Total Scores	Study (Tutees) (n=62)				Control (n=67)			
	Pre	Post	t	p-value	Pre	Post	t	p-value
Knowledge	4.77±2.37	18.50±2.25	29.912*	**<0.001****	5.43±2.52	13.06±5.31	8.928*	**<0.001****
Practices	12.37±3.24	41.23±2.49	49.997*	**<0.001****	13.43±2.67	41.18±2.17	27.001*	**<0.001****

Discussion

Nurses are often the first healthcare professionals who notice a patient during the cardiopulmonary arrest. Accurate performance of CPR which is based on updated guidelines is essential to optimize the patient survival. Therefore, preparing nursing students for their future roles by educating them the CPR skills is very important and can be challenging. Moreover, nursing students should be educated with the most recent and accurate knowledge regarding CPR to apply the theoretical knowledge into practice (Demirtas, 2021).

Research in teaching CPR skills has pointed out that self-instruction is an effective method to improve CPR competence. One approach is to encourage reinforcement and revision of learning, provision of prompts and personal feedback, and the promotion of responsibility. These and other benefits have been subscribed as peer learning which is presently one of the most broadly adopted teaching strategies for providing education because it is much effective to improve self-esteem, competence, and anxiety reduction in learning. It allows students to actively engage in the courses and develop a variety of skills through the contact with their colleagues who are almost at the same age and educational level (Shaaban & Mohamed, 2020 &Lin et al., 2022).

Therefore, this study aimed to evaluate the effect of the peer learning strategy on the nursing students' clinical performance through; Design a peer learning strategy for nursing students, Implement the peer learning strategy for nursing students and Assess the effect of peer learning strategy on the nursing students' clinical performance (knowledge and practice).

Regarding the socio-demographic characteristics of the studied students the current study revealed that more than two thirds of the students' tutees and tutors groups were aged from seventeen to less than eighteen years, all of them were females, most of them were single and two thirds of them lived at the rural area.

Concerning the control group, nearly half of them aged from seventeen to less than eighteen years old, all of them were females, majority of them were singles, more than two thirds of them lived in the rural area and all of the study and control groups did not attend any previous clinical peer learning sessions. From the researcher point of view this might be because females are more interested in nursing education than males according to the region culture and all of study participants were at the first year nursing therefore, all of them are in the same age group.

This result was on the same line with Choi et al., (2015), who studied "Peer-assisted learning to train high-school students to perform basic life-support", and

revealed that all participants were females and were in the same age group. But this was in contrast with Abouzied et al., (2021), they reported that the age of the studied students' ranged from eighteen to twenty two years and the majority of them were males.

Of great concern, the current study found a statistically significant improvement between the pre and post peer learning strategy implementation phases regarding all cardiopulmonary resuscitation knowledge related questions among the studied tutees and control groups. This may reflect the effectiveness of the peer learning strategy and tutees' readiness to learn from their peer tutors.

This result was supported by Sabeghi et al., (2021), their study showed that the mean knowledge score significantly increased immediately after the training. Also this result was in the same line with Abouzied et al., (2021), they revealed that after the application of peer education method there were statistically significant changes in the mean scores of all questions as well as the overall score of knowledge.

Concerning cardiopulmonary resuscitation knowledge; the recent study showed that minority of the studied tutees had high level regarding CPR knowledge total score at the pre peer learning strategy implementation phase which improved in the post phase to be most of them had high level of CPR knowledge. Furthermore, less than one fifth of the studied students in the control group had high level regarding CPR knowledge total score at the pre study phase that improved in the post phase to be nearly two thirds of them had high level of CPR knowledge total score. This may be due to that tutees could easily interact and discuss with their peers more than the teachers in the traditional method, so information absorption became easier for tutees resulting in improvement of total knowledge.

This result was compatible with Abbas et al., (2018), who studied "Peers versus professional training of basic life support in Syria" and stated that there was an increase in total knowledge level after being used a peer-based education method. This is also in accordance with a study by Prasetyawan & Fitri, (2019) who reports that there were a significant differences in cognitive scores after being given education through the peer teaching method.

As related to cardiopulmonary resuscitation practices level; the recent study showed that regarding to "assessment and activation" the present study illustrated that there were a statistically significant improvement in the studied tutees and the control groups practice level between the pre and post phases. This may be related to that CPR taught by the peer learning technique as well as

the regular teaching method encouraged the students' engagement and communication and increased confidence that enhanced the capacity of them to prioritize and execute the "scene safety" step effectively for sustaining lives.

This result was in concurrence with Beck et al (2015) who revealed that the peer learning-based education has a positive impact on the ability to provide first aid and basic life support. This outcome was also consistent with Prasetyawan & Fitri (2019), they showed that there was a significant improvement in the group used the peer education and the other group to provide first aid for traffic accidents.

According to practice of "high quality compression" the present study displayed that there were a statistically significant improvement in the practice level of the studied tutees and the control groups between the pre and the post phases. This can be attributed to that the tutors could be able to follow the standardized curriculum and the instructional plan as same as the regular teachers which were consistent across both studied tutees and control groups. This consistency ensured that both groups receive similar information and guidance, regardless of whether it taught by the teachers or the tutors.

The recent study results were in compatible with Souza et al., (2022) who reported that students in all studied groups were confident in performing chest compressions correctly. This result was in the same line with Abd El-Hay et al., (2015) who stated that there was a highly statistically considerable increase in the mean score of their practice

According to their practice level regarding "airway management & application of AED during CPR" the current study revealed that there was a statistically significant improvement in the practice level in both of the studied tutees and the control groups between pre and post phases. It showed that more than three quarters of the studied tutees and control groups did not perform "Clear the victim & deliver shock" at the pre phase that improved to be most of them completely performed the step at the post phase. This may be explained as the tutors can identify misconceptions, address specific areas of difficulty and provide their tutees personalized strategies or techniques to overcome challenges.

This result was in compatible with Santomauro et al., (2018), they studied "Future perspective in BLS training: The importance of peer-to peer education in high school students", and revealed that more than half of the peer-led group students used the automated external defibrillator correctly and the students who were trained by peer-instructors showed comparable skills in adult CPR to those who were trained by professional instructors. This result was in the same line with Abd El-Hay et al., (2015), they studied "Effect of training program regarding first aid and basic life support on the management of educational risk injuries among students in industrial secondary schools", who reported that there was a highly statistically considerable increase in the mean score of the total practice between the two groups.

Regarding "resume compressions & post resuscitation care" the present study illustrated that there was a statistically significant improvement in the practice level at the studied tutees and control groups between the pre and post phases. It demonstrated that slightly more than half of the studied tutees partially done "recovery position" at the pre phase that improved to be all of them completely done it at the post phase. This may be due to that all the studied students (the control group taught by regular teachers and the studied tutees group who taught by the tutors) developed enough awareness of the importance of the chest compression continuity and post resuscitation care in the management of the victim with cardiac arrest which confirm the effectiveness of the peer learning method comparing with the traditional method.

The current result was in agreement with Sok et al., (2020) they found that the simulation-based CPR training program significantly improved the nurses' CPR practice level. Also this result was compatible with Binkhorst et al., (2020), they studied "Peer-led pediatric resuscitation training: effects on self-efficacy and skill performance", and concluded that near-peer-trained medical students developed a higher level of pediatric basic life support-related self-efficacy than the expert-trained students, with comparable pediatric basic life support skills in both groups.

Conclusion

The results of this study concluded that:
The peer learning strategy is a significantly effective teaching method compared with the traditional method in improving nursing students' clinical performance. The study advised implementing the peer learning technique as a formal method in the clinical settings to improve students' knowledge and practice.

Based on the current study findings, the following recommendations are suggested:
Education:

- Develop structured written formal peer learning strategy guidelines with outlined desired outcomes for annual assessment and modifications.
- Assign one or more senior individuals across the nursing institution to act as a facilitator to inform

the junior students about the advantages of peer learning and assist/ train them in groups.

- Organize peer learning workshops which include senior, junior students and teachers as well where they can exchange the rules through informal ways as a preparation phase for the actual application of the strategy.

Research

Future research aimed to:
- Apply studies on large number of senior and junior students from various nursing educational institutions over a longer period of time.
- Investigate the effectiveness of the peer learning implementation on the students' overall the academic and clinical achievement not only one course.
- Assess the clinical instructors' and clinical staff feedback about the application of the peer learning strategy in the clinical environment.
- Study the acquisition and mastery of the clinical skills, self-reflection, critical thinking, and interprofessional team work of the students who were thought by peer learning strategy in the clinical work after graduation comparing with those who thought by traditional methods.
- Search the factors influencing the successful peer learning in nursing education.
- Conduct qualitative research to explore nursing students' perception toward peer learning.

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