

Effect of Peyton's Four- steps Approach on Pediatric Nursing Students' Skills Acquisition, Self-efficacy and Satisfaction Regarding Infants' Cardiopulmonary Resuscitation

Amal Abo El-Azm Abd El-Rahman Younis ⁽¹⁾ Heba Ibrahim Mohamed Ali ⁽²⁾ & Amal Ahmed Ali Gamal Eldeen ⁽³⁾

(1,3) (Lecturer of Pediatric Nursing, Faculty of Nursing / Tanta University, Egypt).

(2) (Lecturer of Pediatric Nursing, Faculty of Nursing / Kafr Elsheikh University, Egypt).

Abstract

Background: Cardiopulmonary resuscitation for infants is considered a lifesaving procedure and one of the basic and fundamental pediatric clinical skills. There is a necessity for simple teaching methods accepted by the students and provide a sustainable outcome. Peyton's four- steps approach is a model for instructing practical skills and consisted of: demonstration, deconstruction, comprehension, and execution. **The study aimed** to determine the effect of Peyton's four- steps approach on pediatric nursing students' skills acquisition, self-efficacy and satisfaction regarding infants' cardiopulmonary resuscitation. **A quasi-experimental research design** was used in the study. The study was accomplished at the **Clinical Pediatric Skills Laboratory** for third year students, Faculty of Nursing, Tanta University. A total sample of 100 pediatric nursing students participated in the study. **Four tools** were used to collect the data: sociodemographic characteristics of the studied students, cardiopulmonary resuscitation observational checklist, learning self-efficacy scale and learner Satisfaction in Learning Scale. **Results:** All students in the study group had satisfactory level of skills acquisition, high self-efficacy and high satisfaction level regarding infants' cardiopulmonary resuscitation, **Conclusion:** Peyton's four- steps approach was effective in improving pediatric nursing students' skills acquisition, self-efficacy and satisfaction. **Recommendations:** Incorporating the use of Peyton's four-steps approach as a teaching strategy for all practical skills in clinical pediatric skills lab.

Keywords: Peyton's four-step, cardiopulmonary resuscitation, self-Efficacy, Satisfaction

Introduction

One of the challenges facing nursing education today is the tremendous increase in the number of students pertaining to the number of teachers which decrease the students' ability to acquire new skills. Additionally, students must actively engage in their education, which necessitates time for reflection and peer interaction (**Mohammed et al 2019**). Nursing students can practice clinical skills with actual patients in a clinical setting (**Leal et al 2018**). For nursing students, developing practical skills and learning by interacting with patients can be quite difficult and stressful. They are aware that any error could harm the patient, cause injury or even death (**Abdallah et al 2014**).

Currently, nearly all medical faculties include clinical skills lab training in their training curricula. Skills lab equipment and facilities offer an effective and secure learning environment for undergraduate nursing students to learn and perform clinical skills (**Huixu 2020**). Prior to practising these procedural skills on actual patients, trainees can practise them on mannequins and models in a safe, "mistake-forgiving" training environment provided by skills laboratories (**Hashim et al 2016**). Improved knowledge, abilities, and behaviors are the result of skills lab training, and the general impact on patient-related outcomes is minimal. Nursing students can perform procedural skills on patients more quickly, accurately, and professionally when they get skills lab instruction (**Angadi et al 2019 & Coe et al 2020**).

Effective learner-centered teaching techniques are currently being used to raise student engagement in the classroom, promote original thought, and enhance their problem-solving skills (**Bachiller & Badia 2020**). A plenty of teaching methods had been used in the skills lab to teach students practical skills. The classic instructional method of "see one and do one" which was widely used to teach clinical skills is no longer considered to be the most effective approach (**Ebrahimi et al 2020**).

The "see one, do one" method in which the teacher first demonstrate the skill, and then the skill was re-demonstrated once more by students under teacher's guidance and supervision (**Ahmed et al 2018 & Kim et al 2019**). Only when nursing students acquire strong and high self-efficacy and confidence in their abilities, they will be able to put patients' needs first over their own needs and develop into safe and competent practitioners (**Dorttepe & Arikon 2019**). Learning self-efficacy is essential for accelerating academic development and is positively correlated with effective learning strategies (**El-Mokadem & Ibraheem 2017, Liu & Xiao 2021**).

The integration of interactive educational methods is effective to improve undergraduate nursing students' clinical skills, their self-efficacy and satisfaction, and confidence in the clinical setting (**Lubbers & Rossman 2017**). Cardio-Pulmonary Resuscitation (CPR) for infants, which is regarded as one of the core paediatric clinical skills, can be taught

using these interactive teaching techniques. It is a lifesaving procedure that is done when infant's breathing or heartbeat has stopped (**Makinen et al 2016**). It involves a combination of rescue breathing (mouth-to-mouth resuscitation or other artificial ventilation techniques) and chest compressions. There is a need for simple and straightforward teaching strategies that any educator can use, which the students will accept and which will produce long-lasting results. (**Hori et al 2016**).

Peyton's four- steps approach is a widespread methodical approach that is used to teach practical clinical skills. Peyton's four steps approach consisted of four steps: **Demonstration**, in which the teacher accomplishes the skill as usual without comment. **Deconstruction**, the teacher repeats each step gradually adding explanation, dividing the skill into smaller sub-steps, and describing all sub- steps of the procedure. **Comprehension**, the student describes and explains all steps of the procedure and the teacher performs the procedure for the 3rd time following this explanation. **Execution (Performance)**, the student performs the skill step by step while illustrating each sub-step on his own without any help from the teacher (**Dietsch et al 2016 & Radwan et al 2021**).

Peyton's four steps approach includes the combination of several aspects of learning theory. The learning in steps one and two is depending on a social cognitive approach of learning theory. Step three, while the student instructing the teacher, tends to be a key to active student learning, while step four, in which the procedure is actually implemented, is connected with the behaviourist learning theory (**Schroeder et al 2017**).

The third step appears to be very important in Peyton's approach and was valuable for skills acquisition. Before providing guidance and knowledge to the teacher during the procedure, the student must first consider and recall the first two parts of the procedure (**Dietsch et al 2016**). This method might assist students in organising their ideas and promote student- centered learning. Depending upon the information presented in the first two steps, students must adjust the data in their memory. This will assist in the transfer of relevant knowledge to long term memory (**Busebaia & John 2020&Yap et al 2016**). The student first has to think and focus upon the first two steps before sharing and instructing the teacher. Think-Share gives the students some time to arrange their ideas before actively sharing it. Additionally, this cognitive process, known as self-explanation, appears to make it easier for new knowledge to be incorporated into current knowledge (**Franguez et al 2017**).

Peyton's third step also incorporates aspects of mental practise. This mental exercise is beneficial

for learning procedures in the study of nursing and other health professions. (**Sattelmayer et al 2016**). Even in the absence of an active movement, students can create a mental image of it. When a technique is described without being administered simultaneously, a mental image of the procedural motions is created, which improves motor learning and reproduction. (**Giacomino et al 2020& Krautter et al 2015**). As a result, the combination of four steps would be necessary to attain success in learning and a solidly formed self-construction. Finally, with frequent practice, students will have high satisfaction, self-efficacy, and confidence in their abilities and will be able to carry out the procedure in various circumstances (**Muenster et al. 2016 & Yap et al. 2016**).

Significance of the study

Students in the nursing field must be educated and learned with an effective manner as they will be responsible for children's soles in the future. In addition, increase the number of the student in the last few years lead to traditional method become not effective in education and student was not competent or satisfied when they thought with it. Cardiopulmonary resuscitation in children is considered one of lifesaving procedures that need a high professional strategy. So, it is necessary to incorporate an innovative clinical training strategy as Peyton's four steps approach to improve the students' performance and affect their practical skills and confidence. (**Muenster et al. 2016 & Huixu 2020**)

Aim of the Study

The aim of the study was to determine the effect of Peyton's four-steps approach on pediatric nursing students' skills acquisition, self-efficacy, and satisfaction regarding infants' cardiopulmonary resuscitation.

Research Hypothesis:

Students who are taught with Peyton's four-steps approach are expected to have higher skills acquisition, self-efficacy, and satisfaction regarding infants' cardiopulmonary resuscitation than the students who are instructed using the traditional method of teaching.

Subjects& Methods

Research design

A quasi- experimental research design was used in this study.

Setting:

The study was conducted at the Clinical Pediatric Skills Laboratory for the 3rd year students, Faculty of Nursing, Tanta University. The skills lab contains four beds with manikins for different clinical procedures such as cardiopulmonary resuscitation, suction, breathing and heart sounds, ...ect. There are

other multiple devices as incubator, suction device, and nebulizer device.

Subjects:

A convenience sampling of 100 pediatric nursing students in the third year, Faculty of Nursing, Tanta University, during the first semester of the academic year 2022-2023 throughout three months from October to December 2022, involved in the study. The studied students were separated into two groups:

- a. Group 1 (Study group): consisted of 50 pediatric nursing students studied Cardio-Pulmonary Resuscitation with Peyton's four-steps approach.
- b. Group 2 (Control group): consisted of 50 pediatric nursing students studied Cardio-Pulmonary Resuscitation with traditional teaching method which is demonstration and re-demonstration usually used in the clinical skills laboratory.

Tools of data collection:

Four tools were used to collect the data. These tools are:

Tool I: Sociodemographic characteristics of the studied students: It was designed by the researchers after review of recent literature. It included the characteristics of students such as age, gender, residence, and last certificate.

Tool II: Cardiopulmonary Resuscitation Observational Checklist: This tool was designed by the researchers after review of recent literature and guided by the **Pediatric Nursing clinical book 2021-2022** that was developed by the Pediatric Nursing Staff of the Faculty of Nursing, Tanta University. This tool was used to evaluate the pediatric nursing students' practical skills in carrying out infants' cardiopulmonary resuscitation procedure.

Scoring system:

Students' practice in each step of cardiopulmonary resuscitation was scored as follows: "two for correct and completely done step", "one for correct and incompletely done step", and "zero for not done or incorrect step". The total score of the students' performance was categorised as follows:

- 60% and more of the total score was considered satisfactory skills acquisition level.
- Less than 60% of the total score was considered unsatisfactory skills acquisition level.

Tool III: learning self-efficacy Scale (L-SES): it was developed by (Kang et al 2019) to assess learning self-efficacy for medical students. L-SES was constructed depending on theories of both self-efficacy and Bloom's taxonomy of educational objectives. The researchers used L-SES to evaluate the students' perceived self-efficacy regarding infants' cardiopulmonary resuscitation procedure immediately after the application of Peyton's four-steps approach and traditional teaching method using demonstration and re-demonstration. The scale was

made up of 15 items and three domains cognitive, affective, and psychomotor. The cognitive domain included 6 items, the affective domain included 4 items, and the psychomotor domain included 5 items. The items of the scale were answered using a five-point Likert scale ranged from "strongly disagree" to "strongly agree".

Scoring system:

1= Strongly disagree.

2= Disagree.

3= Undecided- Neither agree nor disagree

4= Agree with the statement.

5= Strongly agree with the statement.

The total score of self-efficacy was classified as

follows:

- 60% and more of the total score was considered high self-efficacy.
- Less than 60% of the total score was considered low self-efficacy.

Tool IV: learner Satisfaction in Learning Scale: This scale was designed by the National League for Nursing (Sherrill 2009) and modified by the researchers. This scale was used to evaluate the students' satisfaction with the Peyton's Four Steps Approach and traditional teaching method immediate after its application. It was formed of five items that were added to measure satisfaction with current learning. The scale items were answered using a five-point Likert-type scale that ranged from "strongly disagree" to "strongly agree".

Scoring system:

1 = Strongly disagree.

2= Disagree.

3= Undecided – neither agree nor disagree.

4= Agree with the statement.

5= Strongly agree with the statement.

The total score of student satisfaction was categorised as follows:

- 75% and more of the total score was considered high satisfaction.
- Less than 75% of the total score was considered low satisfaction.

Method

The study was accomplished through the following

steps:

1. Administrative process:

- Approval from the Ethical Research Committee of the Faculty of Nursing at Tanta University was obtained.
- Official permission for data collection and conducting the study was obtained from the responsible authority (Dean of the Faculty of Nursing, Tanta University) after explaining the aim of the study.

2. Ethical and legal considerations:

Confidentiality and privacy of information was maintained. Meeting with the students who were involved in the study before conducting the study.

Students' consent to participate in the present study was obtained after illustrating the nature and aim of the study. Obtained information was confidential and it was used only for purpose of the study and students have the right to withdraw from the study at any time.

3. **Tools development:** four tools were used to collect data (Tool I, II, III, IV).
4. **Content validity:** The tools of the study were tested for its content validity by five experts in the pediatric nursing and nursing education fields. Necessary modifications were carried out accordingly.
5. **Reliability** of the developed tools was tested through the internal consistency.
6. **Pilot study:** A pilot study was conducted on 10 students (10%) of the study sample to test the applicability and clarity of the study tools. Those students were not included in the study subjects.

Phases of the actual study:

The study was accomplished through three phases; assessment, implementation, and evaluation.

I. Assessment phase:

Initial assessment of students related to their sociodemographic characteristics was done prior to teaching sessions for the two groups using tool I.

II. Implementation phase:

All pediatric nursing students were separated into six groups and each group involved nearly 88 students who attend to lab area for two weeks. Every rotation, ten students were selected randomly, five students for the study and five students for the control groups. A simple random sample was obtained from each group by choosing each fifth student in the attendance list. The students were allocated randomly and equally to control or study groups. The total time was about 3 hours a day, once every two weeks.

Implementation phase included two steps:

1. Orientation of students about each teaching method and setting objectives.
2. Demonstration of infants' cardiopulmonary resuscitation procedure for both groups as follows:
 - **For Control Group:** infants' cardiopulmonary resuscitation procedure was demonstrated using traditional method of teaching practical skills on a manikin (two steps approach: see once and do once). The researcher carried out the resuscitation procedure only one time (demonstration). Then, the students were allowed to perform it by himself for one time (redemonstration) under supervision of the researcher followed by the researcher's feedback.
 - **For Study Group:** The researcher carried out infants' cardiopulmonary resuscitation procedure on a manikin using Peyton's four-steps approach as follows:

1. **Demonstration:** during the first step, the researchers demonstrated infants' cardiopulmonary resuscitation procedure on a manikin silently at normal speed as usual but without any comment.
2. **Deconstruction:** then, the researcher demonstrated infants' cardiopulmonary resuscitation procedure repeats each step slowly adding explanation, dividing the skill into smaller sub-steps, and describing each sub-step of the procedure in details.
3. **Comprehension:** during the third step, the researcher demonstrated infants' cardiopulmonary resuscitation procedure following each student's instruction for each step while other students were observing. The student described and explained each step of the procedure and the researcher performed the procedure for third time following the student's illustration of the procedural sub-steps.
4. **Performance:** finally, each student in the group performed the procedures step by step in details illustrating all sub-steps on his own without any help from the teacher, followed by the researchers' feedback. After the researcher finished the first two steps, each student takes from 15 to 25 minutes in the comprehension and performance steps.

III. Evaluation phase:

The researcher evaluated student' skills acquisition during all steps of the procedure; preparation, assessment, implementation, after care, and documentation using tool II. Evaluation was done immediately after implementation of infants' cardiopulmonary resuscitation procedure to determine the effect of Peyton's four-steps approach versus traditional teaching method on nursing students' clinical skills acquisition, satisfaction, and self-efficacy for both study and control group respectively using tool II, III, and IV.

Statistical analysis:

Data were fed to the computer and analysed using IBM SPSS software package version 20.0 (Armonk, NY: IBM Corp). Qualitative data were described using number and percent. The Shapiro-Wilk test was used to verify the normality of distribution. Quantitative data were described using range (minimum and maximum), mean, standard deviation, and median. Statistical significance of the obtained results was judged at p-value 0.05. Chi-square test was used for categorical variables, to compare between different groups. Student t-test was used for normally distributed quantitative variables, to compare between two studied groups. The Pearson correlation coefficient was used to correlate between two normally distributed quantitative variables (White 2019).

Results

Table (1): shows that nearly three quarters of students (72%- 74%) were between 22 and 23 years old in both study and control group respectively. The table also reveals that 86% and 84% of students were females in both study and control groups respectively. Regarding residence, it was observed that 80% of students in both study and control groups were from rural areas. The majority of students (94% and 84%) had general secondary school education in both study and control groups. There is no statistically significant difference between two groups regarding sociodemographic characteristics of students.

Table (2): indicates that all students (100%) in the study group had satisfactory skills acquisition level regarding infants' cardiopulmonary resuscitation, while more than three quarters of students (80%) in the control group had unsatisfactory level of skills acquisition immediately after teaching. The total mean scores of students' skills acquisition level was 17.34 and 8.52 in study and control groups respectively with statistically significant difference (P value <0.001).

Table (3): reveals that all students (100%) in the study group have high self-efficacy, while the majority of students (96%) in the control group have low self-efficacy in the cognitive domain with statistically significant difference (X^2 value 92.308 and P value <0.001). The mean total scores of the cognitive domain were 28.10 and 13.24 for both study and control groups respectively with statistically significant difference (P value <0.001). In relation to affective and psychomotor domains of self-efficacy, all students (100%) in the study group have high self-efficacy with total mean scores

19.40 and 24.60. On the other hand, 90% of students in the control group have low self-efficacy in affective and psychomotor domains with total mean scores 9.28 and 7.96 respectively. There are statistically significant difference total scores and mean total scores in both groups regarding affective and psychomotor domains (X^2 value 81.818 and P value <0.001).

Table (4): shows that all students (100%) in the study group have high self-efficacy compared to 90% of them in the control group have low self-efficacy regarding infants' cardiopulmonary resuscitation procedure immediately after teaching with mean total scores 72.10 and 30.48 respectively (P value <0.001 and X^2 value 81.818). The mean percentage scores of the total self-efficacy of students were 95.17 and 25.80 for study and control groups respectively (P value <0.001).

Table (5): represents that all students (100%) in the study group have high satisfaction level and all of them in the control group have low satisfaction level regarding infants' cardiopulmonary resuscitation procedure immediately after teaching with mean total scores 24.40 and 8.78 respectively (P value <0.001 and X^2 value 100.00). The mean percentage scores of the total satisfaction of students were 97.0 and 18.90 for study and control groups respectively (P value <0.001).

Table (6): shows statistically significant positive correlation between total scores of skills acquisition, self-efficacy, and satisfaction of students in the study group related to infants' cardiopulmonary resuscitation immediately after teaching as (P value 0.001). There is negative non-significant correlation between total scores of skills acquisition, self-efficacy, and satisfaction of students in the control group.

Table (1): Percentage distribution of the students according to their socio-demographic characteristics:

Socio-demographic characteristics	Study group (n = 50)		Control group (n = 50)		χ^2	P
	No.	%	No.	%		
Age						
20-21	8	16.0	5	10.0	0.992	0.609
22-23	36	72.0	37	74.0		
> 23	6	12.0	8	16.0		
Gender						
Male	7	14.0	8	16.0	0.078	0.779
Female	43	86.0	42	84.0		
Residence						
Rural	40	80.0	40	80.0	0.000	1.000
Urban	10	20.0	10	20.0		
Last certificate						
Secondary Education	47	94.0	42	84.0	2.554	0.110
Technical Institute of Nursing	3	6.0	8	16.0		

χ^2 : Chi square test

Table (2): Mean total scores of the students' skills acquisition regarding infants' cardio- pulmonary resuscitation:

Total skills acquisition	Study group (n = 50)		Control group (n = 50)		Test of Sig.	P
	No.	%	No.	%		
Unsatisfactory (<60%)	0	0.0	40	80.0	$\chi^2= 66.667^*$	<0.001*
Satisfactory ($\geq 60\%$)	50	100.0	10	20.0		
Total score (0 – 18)						
Min. – Max.	15.0 – 18.0		5.0 – 12.0		t = 29.588*	<0.001*
Mean \pm SD.	17.34 \pm 0.72		8.52 \pm 1.98			

SD: Standard deviation

t: Student t-test

χ^2 : Chi square test

*: Statistically significant at $p \leq 0.05$

Table (3): Total scores of the students' self-efficacy regarding infants' cardio- pulmonary resuscitation:

Total self-efficacy	Study group (n = 50)		Control group (n = 50)		Test of Sig.	p
	No.	%	No.	%		
I. Cognitive						
Low (<60%)	0	0.0	48	96.0	$\chi^2=$ 92.308*	<0.001*
High (\geq 60%)	50	100.0	2	4.0		
Total score (6 – 30)					t= 34.843*	<0.001*
Min. – Max.	25.0 – 30.0		8.0 – 24.0			
Mean \pm SD.	28.10 \pm 1.30		13.24 \pm 2.72			
II. Affective						
Low (<60%)	0	0.0	45	90.0	$\chi^2=$ 81.818*	<0.001*
High (\geq 60%)	50	100.0	5	10.0		
Total score (4 – 20)					t= 23.507*	<0.001*
Min. – Max.	18.0 – 20.0		7.0 – 10.0			
Mean \pm SD.	19.40 \pm 0.76		9.28 \pm 2.95			
III. Psychomotor						
Low (<60%)	0	0.0	45	90.0	$\chi^2=$ 81.818*	<0.001*
High (\geq 60%)	50	100.0	5	10.0		
Total score (5 – 25)					t= 25.323*	<0.001*
Min	21.0 – 25.0		5.0 – 23.0			
Mean \pm SD.	24.60 \pm 0.76		7.96 \pm 4.58			

SD: Standard deviation

 χ^2 : Chi square test

t: Student t-test

*: Statistically significant at $p \leq 0.05$

Table (4): Total scores of the students' self-efficacy regarding infants' cardio- pulmonary resuscitation:

Total self-efficacy	Study group (n = 50)		Control group (n = 50)		Test of Sig.	p
	No.	%	No.	%		
Low (<60%)	0	0.0	45	90.0	$\chi^2=$ 81.818*	<0.001*
High (\geq 60%)	50	100.0	5	10.0		
Total score (15 – 75)					t= 32.367*	<0.001*
Min. – Max.	70.0 – 75.0		22.0 – 65.0			
Mean \pm SD.	72.10 \pm 1.42		30.48 \pm 8.98			

Table (5): Total scores of the students' satisfaction regarding infants' cardio- pulmonary resuscitation:

Total Satisfaction	Study group (n = 50)		Control group (n = 50)		Test of Sig.	p
	No.	%	No.	%		
Low (<75%)	0	0.0	50	100.0	$\chi^2 = 100.00^*$	<0.001*
High ($\geq 75\%$)	50	100.0	0	0.0		
Total score (5 – 25)					t = 59.197*	<0.001*
Min. – Max.	22.0 – 25.0		6.0 – 12.0			
Mean \pm SD.	24.40 \pm 0.78		8.78 \pm 1.69			

SD: Standard deviation

 χ^2 : Chi square test

t: Student t-test

*: Statistically significant at $p \leq 0.05$

Table (6): Correlation between total scores of the students' skills acquisition, self-efficacy and satisfaction related to infants' cardio-pulmonary resuscitation in study and control groups.

Total skills acquisition, self-efficacy, and satisfaction	Study group (n = 50)		Control group (n = 50)	
	r	P	R	p
Skills acquisition & Self-Efficacy	0.728*	<0.001*	-0.115	0.426
Skills acquisition & Satisfaction	0.589*	<0.001*	-0.117	0.418
Self-Efficacy & Satisfaction	0.515*	<0.001*	0.000	0.998

r: Pearson coefficient

*: Statistically significant at $p \leq 0.05$

Discussion

Teaching clinical skills can be done through using frameworks, observation, demonstration and re-demonstration, and giving feedback. It is necessary to give opportunities for repeated practice that assist in increasing skills acquisition and retention of clinical skills' acquisition which is an important element in education especially nursing. It is important to use a new and multiple teaching methods instead of the classic teaching method of see one and do one (Burgess et al 2020).

Peyton's four-steps approach is effective in skills lab training. Infants' cardiopulmonary resuscitation as a life-saving procedure is crucial part in nursing education. Therefore, pediatric nursing students need to have high level of skill acquisition,

competence, self-efficacy, and satisfaction to be able to perform the procedure perfectly in emergency situations without mistakes or complications (Giacomino et al 2020 & Ghasemi 2020).

There is no statistically significant difference between study and control group regarding sociodemographic characteristics of pediatric nursing students. This may be due to two groups selected with the same characteristics to maintain reliability. This was congruent with the results of Ahmed et al (2018). The present study showed that the majority of pediatric nursing students were females in both study and control groups as females still represent a large number than males in the faculty of nursing. This result was supported by the result of Mohamed & Awad (2019) who found that the majority of students were females.

In relation to skills acquisition, all pediatric nursing students in the study group reached a satisfactory skills acquisition level regarding infants' cardiopulmonary resuscitation and more than three quarters of them in the control group had unsatisfactory level of skills acquisition immediately after teaching. This might be due to the positive effect of the new strategy in their learning. This result was in line with **Mohamed & Awad (2019)** who stated that the students' performance scores had increased in the study group more than the control group and using Peyton's four- steps approach as a model for teaching clinical skills was beneficial for the students and improved their clinical skills. This result was also consistent with **Romero et al (2018)** who found that Peyton's group surpassed the Halsted's group in their procedural scoring.

The finding of the current study was supported the result of **Radwan et al (2021)** who found that the majority of students in the study group had satisfactory level of skills in performing the procedure. **Raghunath et al (2020)** who reported that Peyton's four-steps approach was an acceptable method that could be used to improve students' performance, in addition, the study result of **Shehata (2018)** who mentioned that there was highly statistically significant difference between the study and control group in relation to their clinical performance scores of neonatal cardiopulmonary resuscitation were also congruent with the present study. **Moran et al. (2012)** also stated that Peyton's four-step approach improved students' practical performance.

The finding of the current study was inconsistent with **Ahmed et al (2018)** who illustrated that no statistically significant difference between nursing students' skills acquisition and retention in study or control groups. The study result was also in contrast to the result of **Muenster et al (2016)** who showed that there was no essential difference in external chest compression during resuscitation done by students with both teaching methods.

Regarding self-efficacy, all pediatric nursing students in the study group had a high self-efficacy while the majority of them in the control group had low self-efficacy regarding infants' cardiopulmonary resuscitation procedure immediately after teaching. This result reflects the positive impact of Peyton's four-step approach on pediatric nursing students 'self-efficacy. This result was in agreement with **Babenko (2015)** who revealed the students acquired a high level of self-efficacy after teaching.

In addition, **Cardoza & Hood (2012)** who examined senior nursing students' self-efficacy in providing patient care using simulation; they found that the students' self-efficacy increased after teaching, which is consistent with the use of

simulation. There is relation between simulation and Peyton's four-step approach, as manikins used in Peyton's four- steps approach for demonstration are one type of simulation.

It is a fact that success in any clinical skill requires not only knowledge of the technique and skills in conducting the steps, but also satisfaction of students that can be achieved through practice. In relation to total satisfaction of pediatric nursing students with Peyton's four-steps approach and traditional teaching methods, all students in the study group had high satisfaction level and all of them in the control group have low satisfaction level regarding infants' cardiopulmonary resuscitation procedure immediately after teaching This result can be explained in the light of the benefit of Peyton's four-step approach that leads to developing clinical skills, self-efficacy, and satisfaction of nursing students in practice.

The current study result was supported the results of **Abouelfettoh & Al Mumtin (2015) & Tan et al (2017)** who reported that students' exposure to positive learning experience affects their performance and increase their satisfaction with the teaching method as well. In addition, the study of **Khan (2015)** reported that most of students were satisfied that teaching methods, improved their skills and provided a conducive learning environment

The finding of the present study was in the same line with **Windle (2020)** who reported that nursing students were satisfied with the teaching experience using guided Imagery. The current study result was consistent with **Ahmed et al (2018)** who showed that there was a statistically significant difference between the two groups concerning their satisfaction level and they noticed that most of the students in the study group were highly satisfied with Peyton's four-step approach in teaching of cardiopulmonary resuscitation procedure. According to **Al Sebaee et al (2017)**, students expressed more satisfactions with clinical rotations of Pediatric nursing course. The study of **Herzog et al (2014)** revealed that modified Peyton's approach to instruct small groups of students in skills lab was practicable and well accepted by the trainees which was in agreement with the present study results. **Hung et al (2020)** also found that there were statistically significant improvements in nursing competence, self-efficacy, and learning satisfaction scores after repeated exposures to simulation and this was also in consistent with the present study.

The present study results revealed that there is statistically significant positive correlation between total scores of skills acquisition, self-efficacy, and satisfaction of students in the study group related to infants' cardiopulmonary resuscitation immediately after teaching. The current study result may be

interpreted as students' skills acquisition level affects their satisfaction and self-efficacy level. This result was in agreement with the results of **Al Sebaee et al (2017)** who found that there were positive correlations between students' satisfactions, levels of performance, and their last semester nursing course achievements. This result supported the results of **Hwang et al (2016)** who found that there was high effect of students' academic performance on self-efficacy levels. A recent study conducted by **Aung, J. and Ye, Y. (2016)** who reported that there was a positive relation between the levels of students' satisfaction and their achievement.

Conclusion:

Based on the findings of the present study, it can be concluded that Peyton's four-steps approach was effective in improving pediatric nursing students' skills acquisition, self-efficacy and satisfaction regarding cardiopulmonary resuscitation.

Recommendations:

Based on the findings of the current study, it was recommended that:

- Incorporating the use of Peyton's four-steps approach as a teaching strategy for all practical skills in clinical pediatric skills lab.
- Application of Peyton's four-steps approach in all clinical nursing departments for undergraduate students.

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