

The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

Hanan T. Elbahnasawy¹, Neanaa M. Fayed²,
Sabah A. El Kholy³ and Reda El Feshawy⁴

^{1,2}Professor of Pediatric Nursing,

⁴Assistant Professor of Pediatric Nursing ,

³Teacher in Technical Institute Nursing,

^{1,2,4}Faculty of Nursing, Menoufia University

¹Currently in Galala University

Abstract: Background: Teaching pediatric nursing students about pediatric basic life support is a complex challenge as they are considered the future life savers. Nursing educators need effective teaching strategy as mind mapping that facilitate the visual organization of complex steps. So, the purpose of the current study was to evaluate the effect of applying mind mapping teaching strategy on pediatric nursing students' performance regarding pediatric basic life support. **Design:** A Quasi- experimental design was used. **Setting:** It was conducted at Technical Institute of Nursing, Menoufia University. **Sampling:** A purposive sample of 200 pediatric nursing students were included. **Three instruments** were used for data collection, structured interviewing questionnaire sheet, Mind mapping evaluation questionnaire and an observational checklist for pediatric basic life support. **Results** of this study showed that there were highly statistical significant improvement in students' levels of procedural knowledge (12.47 ± 3.62 VS 6.94 ± 3.21), levels of theoretical knowledge (13.55 ± 3.01 VS 4.82 ± 1.98) and higher levels of practice related to performing pediatric basic life support on post-test 16.06 ± 3.80 compared to 7.00 ± 3.72 on pre-test. **Conclusion:** Pediatric nursing students who received clinical education based on mind mapping had higher knowledge score and higher level of practice regarding pediatric basic life support on post-test than pre-test. **Recommendation:** Integration of mind mapping teaching strategy for nursing students within their field of study enhanced understanding and organizing information in a clear and effective manner.

Keywords: Basic life support, mind mapping teaching, pediatric nursing, students' performance

The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

Introduction:

Pediatric basic life support (PBLS) involves administering cardiopulmonary resuscitation (CPR) to children experiencing cardiac arrest without the use of equipment, relying on bag-mask ventilation or barrier devices until advanced life support (ALS) is available. The aim of Basic Life Support (BLS) is to maintain a distribution of oxygen-rich blood through survival organs, especially the brain and heart, through temporary artificial circulation until normal cardiac activity and breathing are restored. Effective time management is the most critical factor to reduce brain damage and improve outcomes so, it is essential to diagnose and initiate treatment promptly (Muhaisen & Obaid, 2024).

In children, the most frequent causes of cardiac arrest includes respiratory insufficiency, traumatic events, metabolic derangements and drowning. Key cardiac causes includes congenital heart defects, acquired cardiomyopathies and arrhythmias (Bockmuehl et al., 2025).

Nurses, who are frequently the primary responders in healthcare environments, so the proficiency of nurses in delivering CPR is essential, as inadequacies in training can significantly affect outcomes and heighten the likelihood of complications (Hassan et al., 2025). Undergraduate pediatric nursing students must be prepared to competently and confidently perform CPR in caring of critically ill children. Nurse educators are challenged to seek out and conduct innovative teaching

techniques that provide opportunities for nursing students to practice CPR while maintaining child safety (Agm et al., 2024).

Mind mapping is an effective method of graphic thinking and has emerged as an innovative and effective method in enhancing the memory capacity of the medical college students in medical education. Moreover, it is a powerful note-taking tool that was firstly established by Tony Buzan (Soar et al., 2021).

Many studies have shown that the use of mind mapping in the learning process can improve student learning outcomes. By using mind mapping, students can more easily organize information, connect main ideas with sub-ideas, and remember and repeat lesson material more effectively. Apart from that, mind mapping can also increase students' creativity and motivation to learn (Sari et al., 2024). Therefore, the present research purpose was to evaluate the effect of applying mind mapping teaching strategy on pediatric nursing students' performance regarding pediatric basic life support procedure.

Significance of the study:

Globally, bystander-initiated CPR, is administered at rates ranging from 48% to 89%. Return of spontaneous circulation (ROSC) is achieved in 20%–35% of cases and survival to hospital discharge in 5%–10% of instances (Yatimi et al., 2024). In Egypt, there is no way to tell for sure how common out-of-hospital cardiac arrests happen in children, but the

The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

estimated rate is 9 for every 100,000 person/years. Whereas the rate in intensive care units is 0.94 for every 100 admissions (Abd-elrahman et al., 2022). According to our knowledge, there is limited research in Egypt on mind mapping strategy for pediatric basic life support teaching, Thus, this study was conducted to address the gap of knowledge for pediatric nursing students on this topic.

Purpose of the study

To evaluate the effect of applying mind mapping teaching strategy on pediatric nursing students' performance regarding pediatric basic life support.

Research hypotheses

- Pediatric nursing students who receive clinical education based on mind mapping teaching strategy will have higher level of knowledge about pediatric basic life support on post-test than pre-test.
- Pediatric nursing students who receive clinical education based on mind mapping teaching strategy will have higher level of practice about pediatric basic life support on post-test than pre-test.

Methods

Research Design:

A Quasi-experimental design (pre and post-test) was used to fulfill the purpose of the study.

Research Setting:

This study was conducted at Technical Institute of Nursing, Menoufia University.

Sampling: -

A purposive sample of 200 pediatric nursing students were selected from total students at Technical Institute of Nursing.

- **Inclusion criteria:** Students should be enrolled in the Pediatric Nursing course for the first time
- **Exclusion criteria:** Students who had received previous education course about mind maps because they had previous knowledge which may affect the results of the study.

Instruments

To achieve the purpose of the study, three instruments were utilized for data collection:

Instrument one: A Structured Interview Questionnaire Sheet

to assess the knowledge of pediatric nursing students regarding pediatric basic life support. It was developed by the researcher after reviewing related literature (Kose et al., 2019). This instrument was divided into three parts as the following:

- **Part one:** Characteristics of studied students to collect data about students as age and gender.
- **Part two:** Self- assessment form to assess procedural knowledge of the students regarding pediatric basic life support. It was developed by Plackett et al., (2022) and adopted by the researcher. It included 7 items regarding pediatric basic life support knowledge in form of yes or no questions. It included questions about if the students know how to assess responsiveness of toddlers and neonate, ...etc.

The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

Scoring system

The scoring system for student's procedural knowledge was as follows; correct response was assigned Yes and was given score 2 while the incorrect response was assigned No and was given score zero. The total score was 14. The procedural knowledge levels were arranged as follow; $\leq 75\%$ for unsatisfactory knowledge and $> 75\%$ for satisfactory student's knowledge.

▪ **Part three:** Pediatric basic life support theoretical knowledge Questionnaire to assess theoretical knowledge of the students regarding pediatric basic life support. It was developed by Chandrasekaran et al., (2010) and adopted by researcher to be more appropriate for pediatrics. It included 15 multiple choice questions such as the abbreviation of "PBLs", the location for chest compression and the way to give rescue breathing to infant and children, ...etc. The answers was marked utilizing key answers based on the recent guidelines of American Heart Association guidelines

▪ **Scoring system for each item:** one correct response was assigned a mark of "1" while the incorrect response was assigned a mark of "0". The total score was 15.

▪ **Total scoring system** $\leq 75\%$ for unsatisfactory knowledge and $> 75\%$ for satisfactory student's knowledge. Reliability of the instrument was tested using Cronbach Co-efficiency Alpha (α). it was 0.85.

Instrument Two: Mind Mapping Evaluation Questionnaire.

It was divided into two parts:

▪ **Part one:** Nursing Student's Knowledge about Mind Maps was used to assess students' knowledge regarding mind maps: It was developed by Mustafa (2022) and adopted by the researcher. It included 10 items in the form of multiple-choice questions such as; definition of mind maps, uses, advantages, disadvantages, types, who can use them,etc

Scoring system:

The scoring system for student's knowledge was as follows; two scores were provided for correct answer and zero for the incorrect. The total score was 20. The knowledge levels were arranged as follow; less than 50% for poor knowledge, from 50% to less than 75% for average knowledge and $\geq 75\%$ for good student's Knowledge.

▪ **Part two:** Mind Mapping Effectiveness Questionnaire to assess students' opinions regarding the use of the mind mapping in education. It was developed by Rosciano, (2015) and adopted by the researcher. It includes 7 statements such as mind mapping assist me in acquiring knowledge about pediatric basic life support, ...etc.

Scoring system:

Scoring system for each item was as follows: agree which denotes 3 points, then not certain which denotes 2 points and disagree denotes 1 point, with total scores 21. The response levels were arranged as follow; Negative response, if the total score was less than 60 %, and Positive response, if the total score was equal or more than 60%.

***The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing
Students Performance Regarding Pediatric Basic Life Support***

Reliability of the instrument was tested using Cronbach Coefficiency Alpha (a). it was 0.79.

Instrument three: Observational Checklist for Pediatric Basic Life Support (PBLS)

to assess student's practices regarding pediatric basic life support procedure. It was developed by Plackett et al., (2022), and adopted by the researcher. It included two parts as the following:

- **Part one:** Adherence to Algorithm Checklist:-It was developed to assess the performed pediatric basic life support for its correct order. It included 9 statements about safe approach, open airway , ...etc.

Scoring system:

Each practice step was scored as follows: Done in the correct algorithmic order was provided 2 points, done in an incorrect algorithmic order was given 1 point and zero point was assigned if the step wasn't done at all. The total score of students' correct performance was 18. The practice levels were arranged as follows; scores less than 85% were considered as incompetent practice and $\geq 85\%$ were considered as competent practice.

- **Part two:** Observational Checklist for Students quality of practice: To assess students' quality of clinical practice related to pediatric basic life support. It included 11 statements about safe approach, initial rescue breaths, ...etc.

Scoring system:

For done one point was provided, Zero was provided for not done. The total score was 11. The quality of practice levels were determined as follows; $\geq 85\%$ was considered as good quality of practice and less than 85% - 60 % was considered as fair quality of practice and less than 60% was considered as poor quality of practice. Reliability of the instrument was tested using Cronbach Coefficiency Alpha (a), it was 0.80.

Validity: Instruments were submitted to a jury of five experts three professors and two assistant professors in pediatric nursing to determine face validity of the instruments. The jury committee adds some modifications to be more specific to children; These modifications were done to ascertain their relevance and completeness.

Ethical considerations

An approval was taken from ethical and research committee of Faculty of Nursing, Menoufia University. A written consent was obtained from the students who agreed to participate in the study. An initial interview was done with students to inform them about the purpose and benefits of the study. Also, they were told that the study is voluntary, harmless and they can withdraw from the study at any time without penalty.

Pilot study

Pilot study was carried out on 10 % of students (20) to test study instruments in terms of its clarity, applicability, feasibility, and time required to fulfill data collection instruments. No

The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

modification were done, therefore the sample of the pilot study was included in the total sample.

Procedure

- An official permission to carry out the study was obtained from the director of setting after submitting an official letter from the Dean of the Faculty of Nursing explaining the purpose and outcomes of the study and the method of data collection. The Educational sessions for students were developed through four phases as the following:

❖ Assessment phase:

At the beginning of the study, the researcher introduced herself and explained the purpose and nature of the study to the students. Assessment of students' knowledge regarding pediatric BLS was done at the beginning of the study using instrument one (pre-test). The time needed to collect data was 5 minutes. Assessment of student's regarding pediatric BLS practices was done at the beginning of the study using instrument three (pre-test). The time needed to collect data was 5 minutes. Assessment of students' knowledge and opinions about using the mind maps strategy was done using instrument two (pre-test). The time needed to collect data was 10 minutes.

❖ Planning phase

Based on the obtained results from pilot study and assessment phase as well as reviewing the related literature, the educational sessions was developed by the researcher. Detected needs, requirements and knowledge gaps of students regarding pediatric basic life support were translated into aim and

objectives of the educational sessions. The content was selected on the basis of identified needs and organized in five sessions. After that, the researcher prepared the training places, teaching aids and media (papers, colored pens, laptop...etc. This was followed by arranging the teaching and training schedule.

❖ Implementation phase:

After planning phase, the educational sessions were implemented during the first semester of the second academic year 2023-2024. The data was collected in 2 months through five sessions in which students were divided into 10 small groups, each group included 20 student. The length of each session was ranged from 45-60 minutes. According to students' schedule. The researcher conducted educational sessions for each group. First session focused on providing adequate and most important knowledge about mind maps supported with pictures including basic concepts related to mind maps, uses, advantages, disadvantages....etc. Second session focused on how to draw mind maps: The researcher teach and worked with the students to draw mind maps using papers and colored pens, brainstorming, drawings, demonstrations, then the students re-demonstrated it. Third session was about knowledge regarding pediatric basic life support, beginning with definition of cardiac arrest, causes, signs indicated for rescue breathing....etc. Fourth session was about applying mind map teaching strategy. The fifth session was application of the procedure under the

The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

researchers' supervision to validate student's ability to do the procedure.

Each session was started with summary of the previous session and the objectives of the new one. Students were provided the chance to ask any question and were informed to be in connection with the researcher by telephone or what's app for any questions or guidance. Motivation and reinforcement were used in order to enhance student's learning.

❖ **Evaluation phase:**

Process evaluation includes evaluating the educational session's component, methods and material used. Outcome Evaluation: students' knowledge about mind maps strategy was reassessed immediately after implementation of the educational sessions using instrument two (part one). Students' knowledge regarding pediatric BLS was reassessed using instrument one (post-test). Student's practices regarding pediatric BLS was reassessed using instrument three (post-test). Evaluation of students' opinions about using the mind mapping strategy in education was done using instrument two part two (post-test)

Statistical Analysis:

Data was entered and analyzed by SPSS (Statistical Package for Social Science) statistical package version 22. Qualitative data were presented as number and percentage. Quantitative data were presented as mean and standard deviation (SD) and compared utilizing t test. A statistical significant difference was considered if $P < 0.05$.

Results

Table 1 Clarified that the mean age of studied students was 19.38 ± 0.65 and more than two thirds of them were males.

Table 2 Illustrated that the vast majority (90%) of students had confidence to ventilate a toddler or infant correctly without equipment's on post-test compared to 28.5% of them on pre-test. Regarding How to carry out chest compressions on a toddler or infant, the majority (85.5%) of studied students had higher level of procedural knowledge on post-test compared to 18.0% of studied students on pre-test. Therefore, there were highly statistically significance difference at 1% regarding students' procedural knowledge on pre and post-tests.

Figure 1 Showed that the majority (85%) of studied students' had satisfactory level of procedural knowledge regarding pediatric basic life support compared to 10% of them on pre-test.

Table 3 Clarified that the total mean score of students' theoretical knowledge regarding pediatric basic life support on post-test was 13.55 ± 3.01 compared to 4.82 ± 1.98 on pre-test. Therefore, there were highly statistically significance difference at 1% level of significance on post-test than pre-test.

Figure 2 Showed that the majority (80.5 %) of studied students' had satisfactory level of knowledge regarding Mind Maps on post-test than pre-test .

Table 4 Illustrated that the vast majority (89.5% and 88.0% respectively) of students had positive opinion regarding

The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

using mind mapping. Moreover, about two thirds (62.0%) of students had preferred Mind Maps in learning skills. **Figure 3** Showed that the majority (89.50%) of studied students' had good quality level of clinical practice regarding pediatric basic life support on post-test than pre-test.

Figure 4 Reflected that there was a positive highly statistically significant correlation between total theoretical knowledge and total quality of clinical practices on performing correct algorithm regarding pediatric basic life support on post test.

Table (1): Distribution of studied students according to their characteristics (n=200).

Distribution of studied students according to their characteristics		
Items	No.	%
Age by years		
M±SD	19.38±0.65	
Sex		
Female	65	32.5
Male	135	67.5
Total	200	100%

Table (2): Distribution of studied students according to their procedural knowledge about pediatric basic life support on pre and post-tests (n=200).

Items	Pre-test		Post-test		X ²	P- value
	No.	%	No.	%		
I am confident to know, How to assess responsiveness of toddlers and infants.						
No	55	27.5%	3	1.5%	54.52 ^{HS}	.000
Yes	145	72.5%	197	98.5%		
I am confident to know, How to assess breathing of toddlers and infants.						
No	68	34.0%	30	15.0%	19.51 ^{HS}	.000
Yes	132	66.0%	170	85.0%		
I am confident to know, How to open the airway of toddlers and infants according to the age with the correct technique.						
No	30	15.0%	17	8.5%	4.07 ^S	.044
Yes	170	85.0%	183	91.5%		
I am confident to know, How to ventilate a toddler or infant correctly without equipment.						
No	143	71.5%	20	10.0%	156.65 ^{HS}	.000
Yes	57	28.5%	180	90.0%		
I am confident to know, When to start chest compressions on a toddler.						
No	102	51.0%	30	15.0%	58.61 ^{HS}	.000
Yes	98	49.0%	170	85.0%		
I am confident to know, How to carry out chest compressions on a toddler or infant.						
No	164	82.0%	29	14.5%	182.47 ^{HS}	.000
Yes	36	18.0%	171	85.5%		
I am confident to know, The correct steps when locating an unresponsive toddler or infant according to current guidelines.						
No	144	72.0%	24	12.0%	147.78 ^{HS}	.000
Yes	56	28.0%	176	88.0%		

Note: (HS): High significant (p<0.001)

S: Significant (p value<0.05)

The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

Figure (1): Levels of procedural knowledge of studied students regarding pediatric basic life support on pre and post-tests.

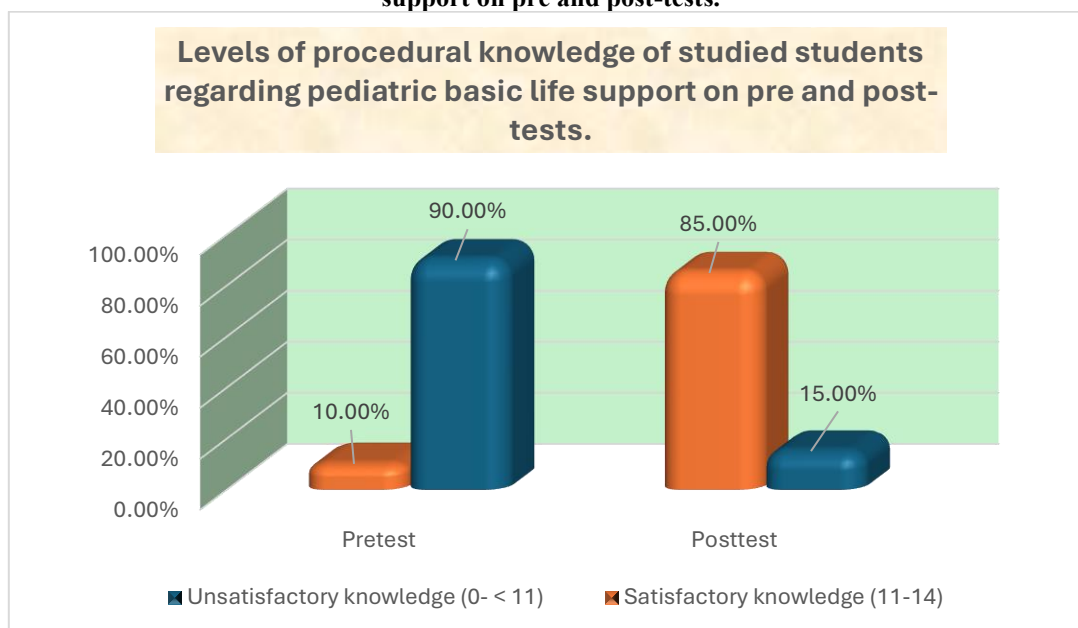
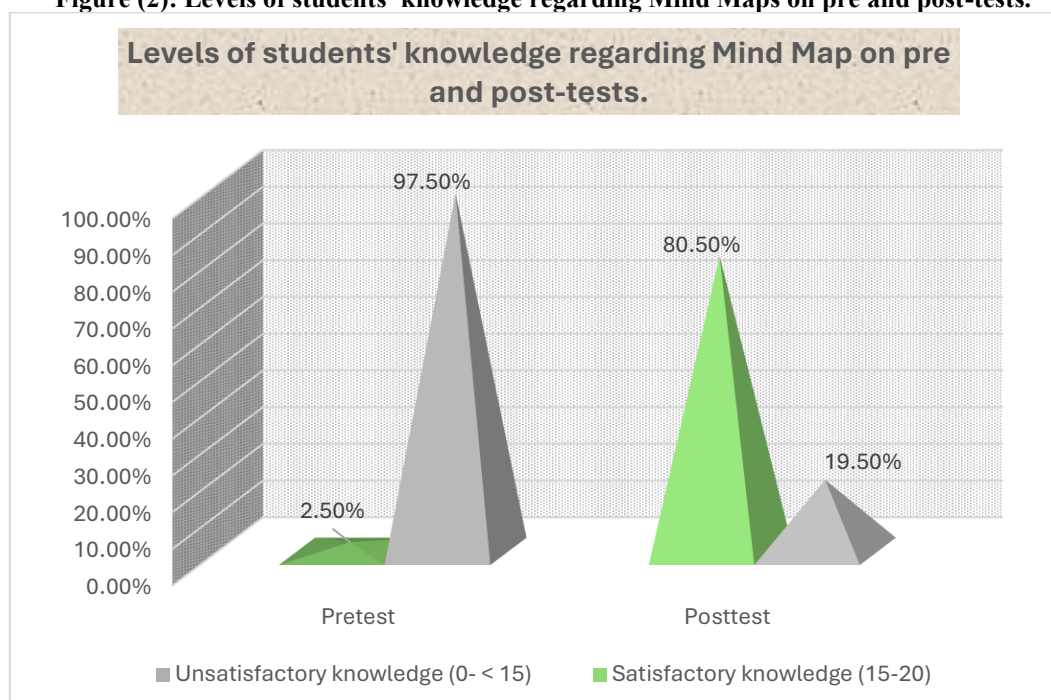


Table (3) Total mean score of students' theoretical knowledge regarding pediatric basic life support on pre and post-tests.

Items	Pre-test (M±SD)	Post-test (M±SD)	T-test	P- value
Total mean score of students' theoretical knowledge	4.82 ± 1.98	13.55 ± 3.01	-34.149- ^{HS}	0.000

Note: (HS): High significant ($p < 0.001$).

Figure (2): Levels of students' knowledge regarding Mind Maps on pre and post-tests.

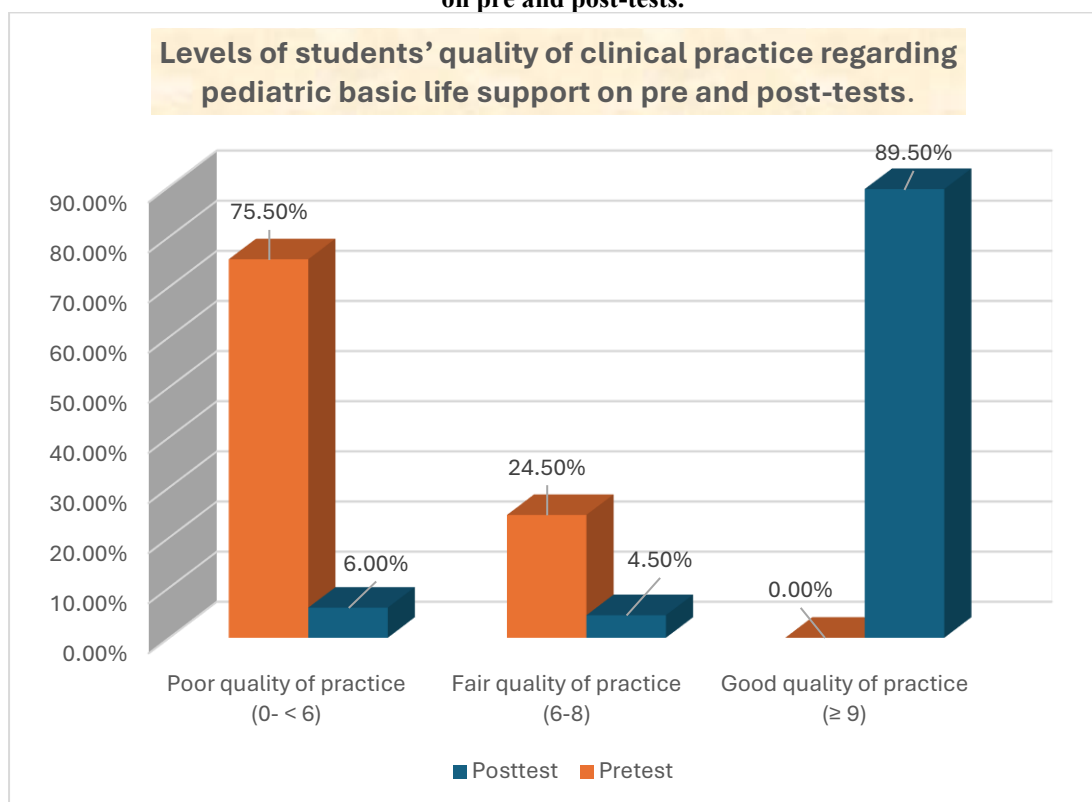


The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

Table (4): Distribution of studied students opinions regarding the use of mind mapping in education and training program on post-test (n=200).

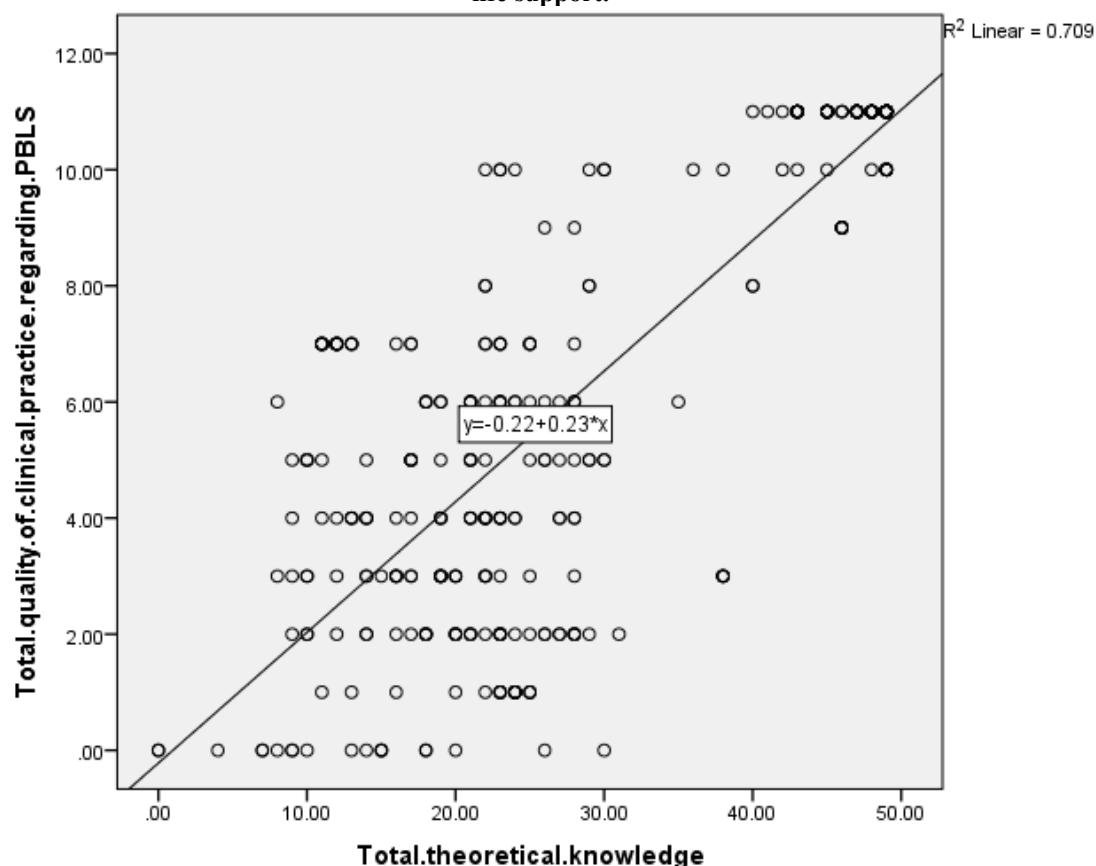
Items	Disagree		Uncertain		Agree	
	No.	%	No.	%	No.	%
Mind mapping assists me in acquiring knowledge about pediatric basic life support.	12	6.0%	9	4.5%	179	89.5%
Mind mapping assists me in practicing pediatric basic life support steps.	15	7.5%	9	4.5%	176	88.0%
Mind mapping helps me put my ideas in some type of order.	13	6.5%	74	37.0%	113	56.5%
I prefer Mind Maps in learning skills.	12	6.0%	64	32.0%	124	62.0%
I enjoy using Mind Maps.	13	6.5%	26	13.0%	161	80.5%
Mind mapping allows me to retain knowledge.	12	6.0%	18	9.0%	170	85.0%
It is easy to create Mind Maps	69	34.5%	3	1.5%	128	64.0%

Figure (3): Levels of students' quality of clinical practice regarding pediatric basic life support on pre and post-tests.



The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

Figure (4): Pearson correlation between students' total theoretical knowledge about basic life support, knowledge about mind maps and quality of clinical practice regarding pediatric basic life support.



Discussion: -

Pediatric Cardiopulmonary Resuscitation is a life-saving skill that requires competence in unpredictable situations. Because of this, it is typically a requirement that pediatric nursing students must be prepared to take on the role of rescuer when the situation arises. Therefore, it is imperative that students retain their knowledge and skills to respond to cardiopulmonary emergencies despite their student status. Traditional teaching methods of cardiopulmonary resuscitation (CPR) are not effective for most learners today. They may lead to lack of retention of survival skills

and poor outcomes (Abdulzahra & Shawq, 2024).

In recent years nursing educators attempted to implement various teaching methods, to improve nursing students' skills. Mind mapping not only aids in the consolidation of fundamental memorized knowledge but also enhances clinical thinking skills and improving the effectiveness of their training (Hu et al., 2025). for this reason the purpose of this study was to evaluate the effect of applying mind mapping teaching strategy on pediatric nursing students' regarding basic life support procedure.

The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

Concerning distribution of studied students according to their procedural knowledge about pediatric basic life support on pre and post-tests. The findings of the current study showed that the lowest percentages of students were confident to ventilate a toddler or infant correctly without equipment's on pre-test. This result was consistent with Otero et al., (2020) who conducted a study about "Assessing ventilation skills by nursing students in pediatric and adult basic life support" and found that, nursing students had unacceptable results when performing mouth to mouth ventilation on an infant before practical CPR training session. From the researcher point of view this might be due to that the students in the present study didn't engage in any practical sessions regarding pediatric CPR. Therefore, educational and practical sessions are needed in order to improve student's practices. In the same context Bahaidarah et al., (2025) who conducted a study about "Knowledge and Right Practice of Pediatric Cardiopulmonary Resuscitation among Childhood Studies Students in Makkah Region" and concluded that most studied students at three major universities did not have adequate knowledge or practices about pediatric CPR.

The present study illustrated that, there was significant improvement in the overall theoretical knowledge regarding pediatric basic life support on post-test. This result came in line with Hendiya et al., (2023) Who conducted a study about 'Effect of Mind Mapping Strategy on Nurses' Performance and Maternal Satisfaction Regarding Intra-

partum Nursing Management" and they illustrated that after the intervention, nurses' knowledge scores of mind mapping-based nursing management were statistically higher than they were before the intervention.

Also, this result came in line with Elasrag & Elsabagh (2020) who conducted a study about "The effect of mind mapping on critical thinking skills of undergraduate nursing students" and they illustrated that a highly significant variation among pre and post-test regarding student knowledge. This, in the opinion of the researcher, demonstrated the advantages of utilizing mind mapping strategy in nursing education as it enable the student to acquire and integrate information.

Concerning distribution of studied students according to their knowledge about Mind Maps. The findings of the current study showed that the majority of studied students' have satisfactory level of knowledge regarding mind mapping on post-test than pre-test. This result was consistent with El-Sayed et al., (2023) who conducted a study about "The Effect of Mind Mapping on Cognitive Achievement and Critical Thinking skills of Nursing Students" and they illustrated that the majority of nursing students had a satisfactory level of knowledge about mind mapping following applying it.

In the same context, Mustafa et al.,(2022) conducted a study about "Nursing Students' Perception about Mind Mapping as an Innovative Learning Approach and its Relation to Teaching Effectiveness" and they concluded that majority of the studied

The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

nursing students had satisfactory level of knowledge regarding mind maps. From the researcher point of view, this could be attributed to receiving comprehensive, concise knowledge in an attractive way.

Regarding distribution of student's opinions regarding the use of mind mapping in education and training program on post-tests. The findings of the current study showed that the vast majority of students had positive opinion regarding using mind mapping, As it assists them in acquiring knowledge and skills regarding pediatric basic life support. This result came in line with Hafez et al., (2025) who conduct a study about "Impact of Mind Mapping on Pediatric Nurses' Performance regarding Peripherally Inserted Central Catheters at Neonatal Intensive Care Units" and they concluded that the majority of studied nurses favored using mind maps during training.

Concerning distribution of studied students according to their quality of clinical practice regarding pediatric basic life support on pre and post-tests. The findings of the current study showed that the majority of students' have good quality level of clinical practice regarding pediatric basic life support on post-test than pre-test. In the same context, Pereira & Silva (2024) conducted a study about "Interdisciplinary training program for pediatric cardiorespiratory arrest using rapid cycle deliberate practice" and they concluded that the overall quality of pediatric CPR measured pre-intervention was inadequate whereas it had adequate technique of proficiency

post-intervention. From the researcher point of view, participant's good quality of clinical practice depend on the effectiveness of the teaching strategy. Moreover, mind maps also organize the relationships, and link between ideas and information. This makes it easier for studied students to remember information and ideas that leading to better achievements.

Regarding the correlation between total theoretical knowledge and total score of quality of clinical practice, the result of the current study reflected that there was a positive highly statistically significant correlation between total theoretical knowledge and total score of quality of clinical practice. This result came in line with Ayed et al., (2022) who conducted a study about "Effect of using mind mapping about infection control on pediatric nurses' performance at neonatal intensive care units" and concluded that there was a significant positive correlation between the knowledge and practice post applying mind mapping. Furthermore, Elgendy et al., (2025) concluded that the total score of students' knowledge and practices before and after the mind mapping application is correlated, there was a substantial positive connection with statically significant differences. This correlation can be interpreted and described how more information can leads to good practice. Furthermore, when the students in the current study gained adequate knowledge, they were able to practice effectively. It was discovered that the usage of mind mapping appears to be successfully effective teaching method. As it facilitates all aspects of the brain

***The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing
Students Performance Regarding Pediatric Basic Life Support***

working in synergy, with the use of keywords and branches with varying colors for each step of pediatric basic life support procedure thus improving recall and memorization which reflected on students' performance .

Conclusion

Pediatric nursing students who received the clinical education based on mind mapping teaching strategy had higher level of knowledge and practice regarding pediatric basic life support on post-test than pre-test.

Recommendations

Mind mapping should be a teaching strategy for nursing students within their field of study to enhance understanding and organization of information in a clear and effective manner. Resources and materials that facilitate applying mind mapping teaching strategy during educational process should be followed. Further researches are required about using different teaching strategies to determine the most effective methods in clinical education of nursing students.

References:

- Abdelrahman, D. A., Karam, N. A., & Ezz El-Din, A. M. (2022). An Overview of Survival Rate in Pediatric ICU Following Cardiac Arrest. *The Egyptian Journal of Hospital Medicine*, 87(1), 1483-1485.
- Abdulzahra, F. A., & Shawq, A. H. (2024). Mobile Application to Develop Nurses' Knowledge of Pediatric Cardiopulmonary Resuscitation: A quasi-experimental study. *Journal of Emergency Medicine, Trauma & Acute Care*, 2024(6), 7.
- Agm, S., Gharib Sabaq, A., & Mohamed Abdullah, R. (2024). Effect of Virtual Reality as a Teaching Strategy on Pediatric Nursing Students' Performance Regarding Cardiopulmonary Resuscitation. *Journal of Nursing Science Benha University*, 5(2), 199-218.)
- Ayed, M. M. A., Ismail, M. S. M., Hegazy, A. E. S. A., & Magor, N. R. E. (2022). Effect of Using Mind Mapping About Infection Control on Pediatric Nurses' Performance at Neonatal Intensive Care Units. *Tanta Scientific Nursing Journal*, 27(4), 251-270.
- Bahaidarah, S. A., Alabbad, Z. H., Alali, R. K., Abu-Sadi, R. K., Alharthi, N. M., Alharbi, R. Y., ... & Saeedi, A. A. (2025). Knowledge and Right Practice of Pediatric Cardiopulmonary Resuscitation among Childhood Studies Students in Makkah Region. *Journal of Pioneering Medical Sciences*, 13, 25-28.
- Bockemuehl, D., Fuchs, A., Albrecht, R., Greif, R., Mueller, M., & Pietsch, U. (2025). Age-Specific Considerations in Etiology of Pediatric Out-Of-Hospital Cardiac Arrest. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 33(1), 70.

The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

- Chandrasekaran S, Kumar S, Bhat SA, Shabbir PM, and Chandrasekaran VP (2010): Awareness of Basic Life Support Among Medical, Dental, Nursing Students and Doctors. *Indian J Anaesth*; 54 (2):121
- Elasrag, G. A. A., & Elsabagh, N. E. (2020). The effect of Mind Mapping on Critical Thinking Skills of Undergraduate Nursing Students. *Pharmacophore*, 11(1 -2020), 73-84.
- Elgendy, N., Shawky Mahamud, H., Mohamed Ahmed Ayed, M., Abo Elsoud Ahmed, H., Mohamed Samir, M., & Erian Shehata, M. (2025). Effect of Mind Mapping Application on Nurses' Performance regarding Colostomy at Pediatric Surgical Units. *Egyptian Journal of Health Care*, 16(1), 47-64.
- El-Sayed, N., Mahmoud Abdel-Azeem, A., & Khaled Abd El-Aziz Zaki, A. (2023). The Effect of Mind Mapping on Cognitive Achievement and Critical Thinking Skills of Nursing Students. *International Egyptian Journal of Nursing Sciences and Research*, 3(2), 685-703.
- Falahan, S. N., Habibi, E., Kamyari, N., & Yousofvand, V. (2024). Impact of Virtual Problem-Based Learning of Cardiopulmonary Resuscitation on Fourth-Year Nursing Students' Satisfaction and Performance: a quasi-experimental study. *BMC Medical Education*, 24(1), 425.
- Hassan, S. M., Patil, S. K., Pattabi, A., & Singh, K. (2025). Enhancing Pediatric CPR Competence: A Study in Qatar's Tertiary Healthcare System. In *Nursing Forum* (Vol. 2025, No. 1, p. 4975262). Wiley.
- Hendiya, R., Fawzi El-boudy, D., Hassan Abd El Mageed, H., A Abdel Latif, A., & Bekhatroh Rashed, A. (2023). Effect of Mind Mapping Strategy on Nurses' Performance and Maternal Satisfaction Regarding Intra partum Nursing Management. *Egyptian Journal of Health Care*, 14(2), 860-877.
- Hu, Y., Xiang, Y., Lei, M., Wu, Y., & Sun, M. (2025). The Application of Mind Mapping in The Standardized Education of Inpatient Physicians in Nephrology. *Scientific Reports*, 15(1), 2890.
- Kose, S., Akin, S., Mendi, O., & S. (2019). The Effectiveness of Basic Life Support Training on Nursing Students' Knowledge and Basic Life Support Practices: A Non-Randomized Quasi-Experimental Study. *African Health Sciences*, 19 (2), 2252- 2262.DOI: 10. 4314/ ahs. v19i2. 51.
- Muhaisen, K. S., & Obaid, K. B. (2024). Effectiveness of Simulation Based Education on Nurses Knowledge Regarding Pediatric Basic Life Support. *Kufa Journal for Nursing Sciences*, 14(01), 175-182.

The Effect of Applying Mind Mapping Teaching Strategy on Pediatric Nursing Students Performance Regarding Pediatric Basic Life Support

- Mustafa, A., Keshk, L., & Helal, W. (2022). Nursing Students' Perception about Mind Mapping as an Innovative Learning Approach and its Relation to Teaching Effectiveness. *International Journal of Novel Research in Healthcare and Nursing*, 9(1).
- Otero Agra, M., Hermo Gonzalo, M., Santos Folgar, M., Fernández Méndez, F., & Barcala Furelos, R. J. (2020). Assessing Ventilation Skills by Nursing Students in Pediatric and Adult Basic Life Support: a crossover randomized simulation study using bag-valve-mask (BMV) vs mouth-to-mouth ventilation (MMV). *Signa Vitae*.
- Pereira, R., & Silva, E. M. K. D. (2024). Interdisciplinary Training Program for Pediatric Cardiorespiratory Arrest Using Rapid Cycle Deliberate Practice: A descriptive cross-sectional study. *Sao Paulo Medical Journal*, 142(5), e2023271.
- Plackett, R., Kassianos, A. P., Mylan, S., Kambouri, M., Raine, R., & Sheringham, J. (2022). The Effectiveness of Using Virtual Patient Educational Tools to Improve Medical Students' Clinical Reasoning Skills: a systematic review. *BMC medical education*, 22(1), 1-18.
- Rosciano, A. (2015). The Effectiveness of Mind Mapping as An Active Learning Strategy among Associate Degree Nursing Students. *Teaching and Learning in Nursing*, 10(2), 93-99.
- Sari, J. P., Sukandar, W., Yumna, Y., Nurhasanah, N., Dahliana, D., Yolanda, S. A., & Cahyani, R. I. (2024). Mind Mapping Solutions to Improve Learning Outcomes in Islamic Education and Natural Sciences. *UKAZ: International Journal of Islamic Studies*, 1(1), 9-17.
- Soar, J., Böttiger, B. W., Carli, P., Couper, K., Deakin, C. D., Djärv, T., ... & Nolan, J. P. (2021). European resuscitation council guidelines 2021: adult advanced life support. *Resuscitation*, 161, 115-151.
- Yatimi, A. A., Alsayed, M. A., Alomar, A. H., Khedrawi, A. A., Wasili, M. A., Muafa, K. A., & Alhamoud, A. H. (2024). Enhancing Global Pediatric Cardiac Arrest Outcomes through Bystander Cardiopulmonary Resuscitation: A comprehensive systematic review. *Saudi Journal for Health Sciences*, 13(1), 6-13.