"Effectiveness of Simulation Based Teaching Programme on Knowledge and Skill on PALS among VIIth Semester BSc. Nursing Students in A Selected Nursing College at Kollam District"

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DOI: https://doi.org/10.51244/IJRSI.2026.1305000098

Received: 04 May 2026; Accepted: 09 May 2026; Published: 01 June 2026

ABSTRACT

Introduction: Pediatric Advanced Life Support (PALS) is a critical component in managing life-threatening emergencies in children. Nursing students often have inadequate knowledge and skills in pediatric resuscitation, which can affect patient outcomes. Simulation based learning programme has been identified as an effective teaching strategy to improve competency in emergency care. The study was aimed to assess the effectiveness of Simulation based teaching programme on knowledge and skill regarding Pediatric Advanced Life Support (PALS) among Seventh semester B.Sc. nursing students.

Methods: A quantitative research approach with a Quasi-experimental one group pre-test and post-test design was adopted. The study was conducted among 50 B.Sc. Nursing students in a selected nursing college using a non-probability purposive sampling technique. Data were collected using a structured knowledge questionnaire and observational checklist to assess the skills and analyzed using descriptive and inferential statistics.

Results and Discussion: The findings revealed that the mean knowledge and skill score increased significantly from pre-test to post-test, indicating improvement in knowledge and skills following the training programme. The results were statistically significant both for knowledge 't' value 22.131 $p<0.01$) and skills't' value 21.277 ($p < 0.01$) confirming the effectiveness of simulation based teaching programme

Conclusion: The study concluded that simulation based teaching programme on PALS was highly effective in improving knowledge and skills among nursing students. Regular reinforcement and periodic training are recommended to sustain competency in pediatric emergency care.

Keywords: Effectiveness, Simulation based teaching programme. Knowledge and Skills, PALS, Nursing students.

INTRODUCTION

Paediatric Advanced Life Support refers to the assessment and support of pulmonary and circulatory function in the period before an arrest and during and after an arrest. Consistent with the Chain of Survival PALS should focus on prevention of the causes of arrest (sudden infant death syndrome, injury, and choking) and on early detection and rapid treatment of cardiopulmonary compromise and arrest in the critically ill or injured child.[1] Nurses of health services who have received professional education and training should be able to practice CPR accurately and offer advanced cardiac life support to the patient who suffered an attack of cardiac arrest. This is considered as the basic requirement and qualification of licensed nurses. In the wider community it is expectation that competence in cardiopulmonary resuscitation (CPR) and Paediatrics Advanced Life Support (PALS) is at a high standard in all hospital medical and nursing staff.[2] In children, cardiac arrest is mostly the terminal event of progressive shock or respiratory failure. Primary cardiac arrest is less common in infants and children than adults but may occasionally in conditions like SIDS {sudden infant death syndrome}, drowning trauma and sepsis.[3]Nurses being in the front line of emergency system, It is necessary to train nurses regarding this new resuscitation guideline. For this purpose, assessing existing knowledge and attitude of nurses will greatly help in planning an effective teaching learning programme for them. Several studies highlight the critical need for

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XIII Issue V May 2026

structured PALS training in undergraduate nursing education. The objectives of the study is to determine the effectiveness of simulation based teaching programme on knowledge and skills on paediatric advanced life support (PALS) among seventh semester BSc nursing students. Therefore giving skill training to the nursing students regarding performance of PALS can make the difference between life and death for a victim. Thus we can reduce the mortality and morbidity rate among infants and children.

NEED AND SIGNIFICANCE OF THE STUDY

Every year number of children are dying due to airway obstruction, choking, cardiac problems, and electric shock. About every 29 seconds a new case is reporting in the globe. The nurse who is trained in pediatric advanced cardiac life support skills, will possess qualities such as goal oriented, self-directed, a capacity to work independently, able to identify and set priorities, assertive with positive attitude and able to work well with the professional staff. Several studies consistently report that nursing students have inadequate baseline knowledge and skills in pediatric resuscitation before training.

A quasi experimental study on effectiveness of PALS Training Programme on knowledge and retention was done among 60 BSc. Nursing students. The findings of the study showed significant improvement in knowledge after PALS training (mean score increased from 11.13 to 28.47).and Knowledge retention declined after 28 days (mean 19.67).which Indicates need for periodic reinforcement training.[4] A randomized controlled trial on effectiveness of simulated PALS Training on Knowledge and Skills took place among 168 B.Sc. nursing students. The Findings showed Simulation significantly improved both knowledge and psychomotor skills. Post-test scores in experimental group were higher than control group. Simulation-based learning enhanced competency in paediatric emergencies. Simulation is highly effective for teaching PALS.[5] An experimental study on simulation-based PALS training and competency development among nursing students found that nursing students initially had poor baseline knowledge and skills. Post-training, there was a statistically significant improvement. So the study emphasizes the need of integrating the PALS into undergraduate curriculum. The simulation-based PALS training improves both knowledge and skill levels effectively.[6]An Experimental study on Inter professional simulation training in paediatric resuscitation was conducted among Nursing and medical students. The findings revealed that clinical skills, teamwork communication and confidence improved. The training enhanced performance in paediatric cardiac arrest scenarios and Inter professional simulation improves overall PALS-related competencies.[7]An Experimental study on effect of Simulated PALS Training among Nursing Students found that Simulation improved critical thinking, emergency response, and confidence. The Students demonstrated better performance in paediatric emergency scenarios. Simulated PALS training enhances both cognitive and practical competencies among nursing students.[8]A quasi-experimental study was conducted to assess the effectiveness of hands-on skill training programme on PALS among adolescents in selected schools in Bangalore. A high significant difference was found between the pre- and post-test knowledge scores about15.40 and the pre and post-test skill difference was 12.80. The study concluded that hands on skill training was effective improving the level of knowledge adolescents.[9]

In reference to the above-mentioned literatures, the investigator realized the need for enhancement of knowledge and skill of nursing students in PALS through an interventional program to control negative effects of children being ill-treated. The research gap is found that there is inadequate research on structured, repeated simulation-based interventions rather than one-time training. Few studies are conducted in the Indian context, particularly among undergraduate nursing students in Kerala. Hence, the investigator felt the need to explore the knowledge and skill regarding paediatric advanced life support among seventh semester BSc nursing students.

Statement of the Problem

A study to assess the effectiveness of simulation based teaching programme on knowledge and skills on pediatric advanced life support (PALS) among seventh semester BSc nursing students in a selected nursing college at Kollam District.

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Objectives of the Study

1. To assess the pre-test level of knowledge and skill regarding PALS among seventh semester B.Sc. Nursing students in a selected nursing college

2. To determine the effectiveness of Simulation based Teaching Programme on knowledge and skill regarding PALS among seventh semester B.Sc. Nursing students in a selected nursing college.

3. To find out the association between pre-test knowledge and skill regarding PALS among seventh semester B.Sc. Nursing students with selected socio demographic variables.

Hypotheses

H_1: There is significant difference in pre-test and post-test knowledge scores on PALS among nursing students after Simulation based Teaching Programme.

H_2: There is significant difference in pre-test and post-test skill scores on PALS among nursing students after Simulation based Teaching Programme.

H_3: There is significant association between pre-test scores of knowledge and skills on PALS with selected socio demographic variables.

Conceptual Frame Work:

The conceptual model selected for this study is based on "Imogene Kings Goal Attainment theory" (2001).

RESEARCH METHODOLOGY

Research Approach: Quantitative research approach.

Research design: Quasi-experimental – one group pre- test post-test design.

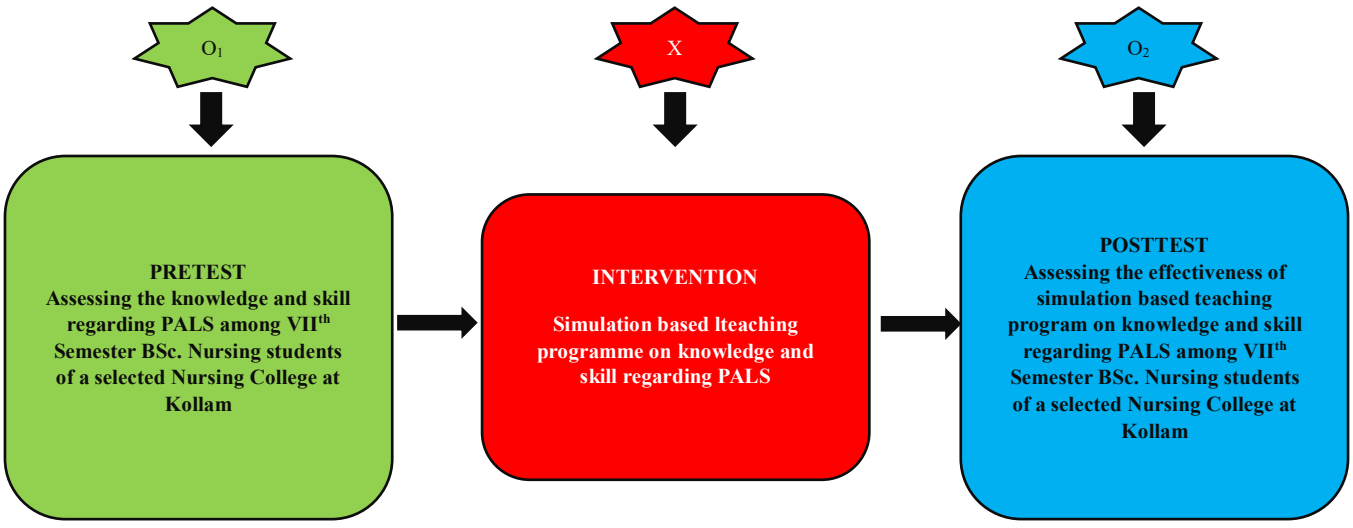
Sample size: 50 Seventh semester nursing students.

Sampling technique: Simple random sampling

Settings of the study: Selected nursing college at Kollam district.

Population: Seventh semester BSc nursing students.

Schematic representation of Research Design



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Variables:

Independent variable: Simulation based teaching programme on PALS.

Dependent variable: knowledge and skill on PALS.

Demographic variable: Age, Educational qualification, previous information on PALS, Source of information

Criteria For Sample Selection

Inclusion Criteria

- Seventh semester BSc. Nursing students.
- Students who are willing to participate.
- Students available during data collection.

Exclusion Criteria

- Students who have undergone any seminar or attended PALS training
- Students absent during the study period

Tools

Section A: Sociodemographic Variables:

Socio-demographic variables consist of Age, Education, Previous information regarding PALS, Source of information

Section B: Knowledge Questionnaire on PALS:

Knowledge questionnaire consist of 25 multiple choice questions on PALSE and each questions carries one mark. Total score is classified as **Good knowledge 18-25, Average knowledge 10-17, Poor knowledge <10.**

Section C: Observation checklist on PALS:

Observational checklist consist of 10 steps and each step carries one mark and incorrect response carrying zero mark. Total score is classified as **Good 8-10, Average 5-7, Poor<5.**

The tool was validated by experts in paediatric nursing, emergency medicine, and research methodology.

Reliability of the Tool:

Knowledge: Split-half method (Spearman-Brown formula)

Observation checklist: Inter-rater reliability

Pilot Study:

Pilot study was conducted among 10% of sample (5 students) to test feasibility, clarity, and reliability.

Ethical Considerations:

- Approval from Institutional Ethics Committee
- Permission from college authority

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- Informed consent from participants
- Confidentiality maintained
- Right to withdraw ensured

Data Collection Process

After obtaining permission from the management, principal, Institutional ethical committee and informed consent from the participants the data were collected from the seventh semester BSc nursing students based on the inclusion and exclusion criteria. Administered tool 1-Socio demographic Performa followed by pretest knowledge and skill assessment. Then researcher given intervention regarding simulation based teaching programme on PALS. After seven days posttest done regarding knowledge and skill on PALS among seventh semester BSc nursing students.

RESULTS

Section 1: Frequency and percentage distribution of VII Semester B.Sc. Nursing student's knowledge and skills regarding PALS:

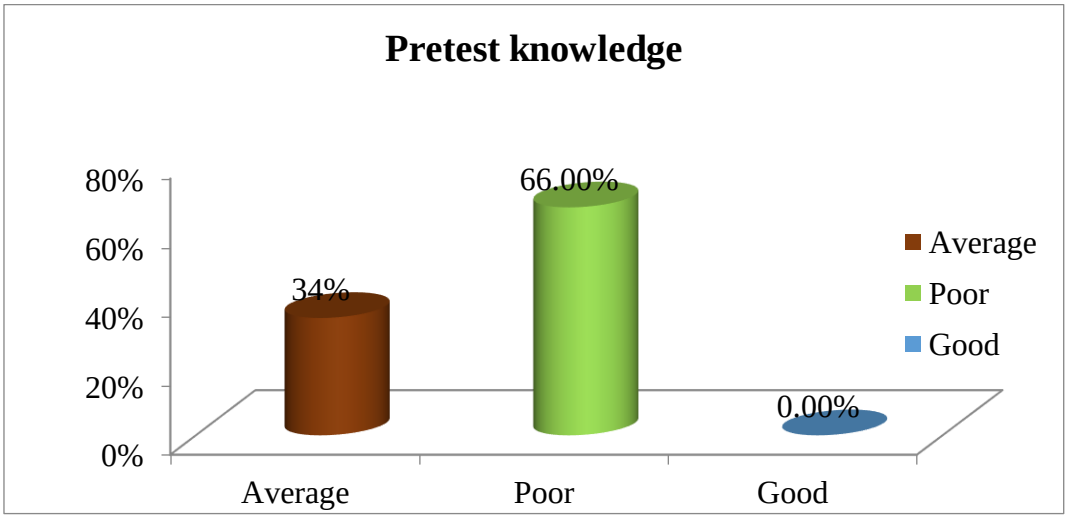

Figure 1: Cylindrical diagram showing the distribution of sample based on pre-test level of knowledge regarding CPR

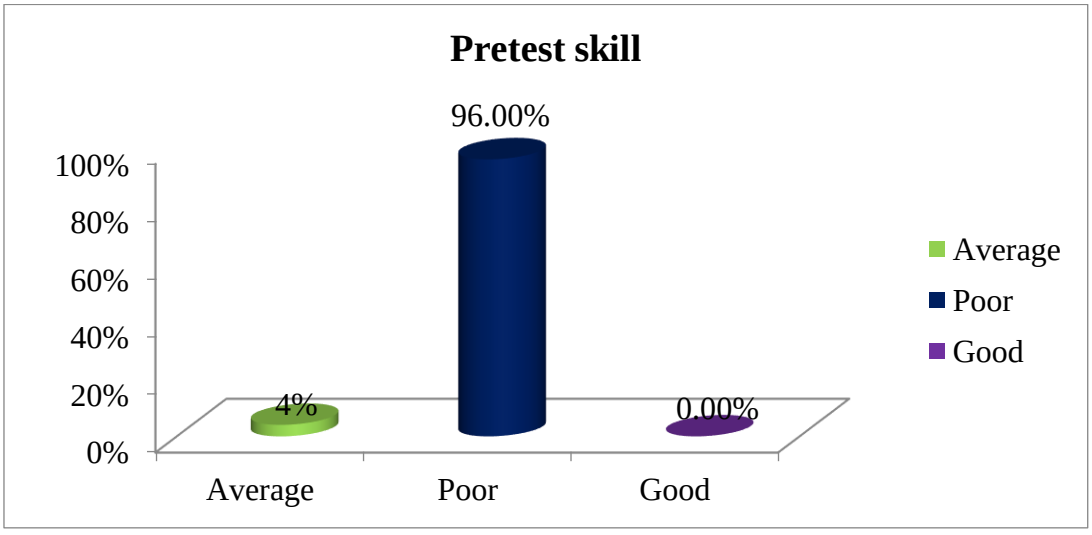

Figure 2: Cylindrical diagram showing frequency and percentage distribution of sample based on pre-test level of skill regarding PALS.

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Section 2: Frequency and percentage distribution of sample based on post-test knowledge and skill regarding PALS.

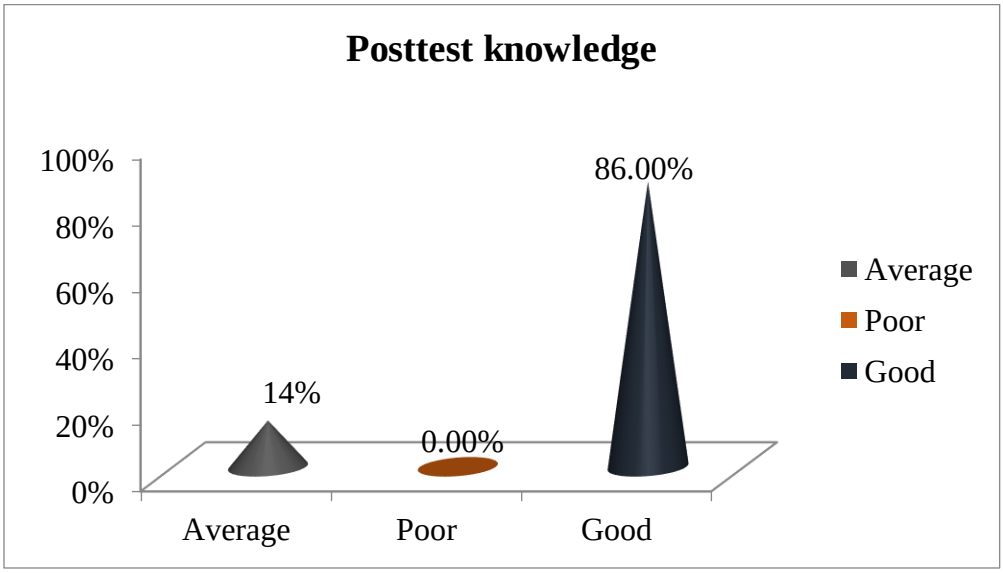

Figure 3: Cone diagram showing frequency and percentage distribution of sample based on post-test level of knowledge regarding PALS.

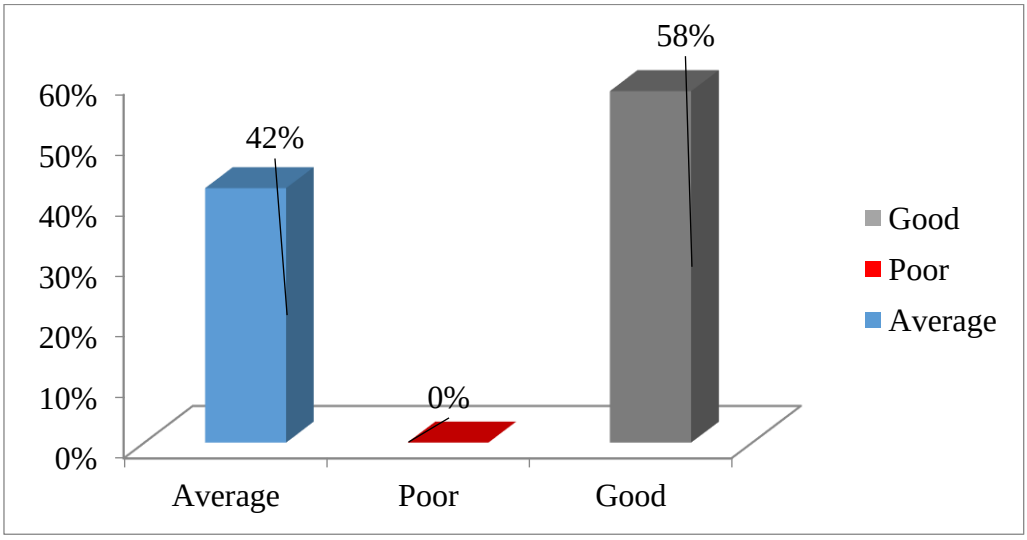

Figure4: The bar diagram showing frequency and percentage distribution of sample based on post-test level of skill regarding PALS.

Section3: Effectiveness of simulation based teaching programme on knowledge and skill regarding PALS among VII Semester B.Sc. Nursing students

Table 1: Effect of simulation based educational programme on knowledge regarding PALS among VII Semester B.Sc. Nursing students N = 50

Knowledge	Mean	SD	Paired 't' test	df	P value
Pretest posttest	7.8 21.5	4.73 2.42	22.131	13.7	0.0001*

*** Significant at <0.01 level**

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Table2: Effect of simulation based teaching programme on skill regarding PALS among VII Semester B.Sc. Nursing students N= 50

Skill	Mean	SD	Paired 't' test	df	P value
Pretest	2.06	0.78	21.277	5.64	0.001*
posttest	7.7	1.47			

***Significant at < 0.01 level**

DISCUSSION

To assess the pre-test knowledge and skill score on paediatric advanced life support (PALS) among Seventh semester BSc nursing students.

The finding of the present study shows that 66 % of the VII th semester BSc nursing students had average knowledge and 34% of the sample had poor knowledge and with regard to skill 96%of the sample had poor skill and 4% had average skill score regarding paediatric advanced life support (PALS) before simulation based teaching programme, indicating inadequate baseline knowledge and skill regarding PALS. Similar study findings was reported by a quantitative study by Biju (2024) found that nursing students had low pre-test knowledge scores (mean = 11.13), indicating poor understanding of PALS concepts.[4] Similarly, a study by Sharma et al. (2024) reported insufficient baseline competency in both knowledge and psychomotor skills among B.Sc. nursing students[5]. These findings highlight the critical need for structured PALS training in undergraduate nursing education.

To determine the effectiveness of Simulation based Teaching Programme on knowledge and skill regarding PALS among seventh semester B.Sc. Nursing students in a selected nursing college.

The findings of the present study showed that 86 % of the VII th BSc nursing students gained good knowledge, and 14% showed average knowledge and 't' value 22.131($p<0.01$) is significant. Hence the research hypothesis H_1 accepted. similarly with regard to skill score 58 % of the samples gained good skill score and 42% of the samples gained average skill score and 't' value 21.277 ($p < 0.01$) is significant after simulation based teaching programme. Hence the research hypothesis H_2 was accepted. There is no significant association between pre-test scores of knowledge and skills on PALS with selected socio demographic variables. Hence the research hypothesis H_3 was not accepted.

The present is study supported by Sharma et al. (2024) conducted a randomized controlled trial and found that simulation significantly improved both knowledge and skills compared to traditional teaching methods.[6] Likewise, studies by Sharma and Devi (2024) demonstrated that simulation enhances clinical decision-making, psychomotor performance, and critical thinking[8]. High-fidelity simulation allows students to practice real-life scenarios in a safe environment, leading to improved confidence and competence. The chi-square value revealed that there was no significant association between the pre-test levels of knowledge with selected demographic variables. Hence research hypothesis was not accepted.

CONCLUSION

The result of the study shows that I semester BSc nursing students gained good knowledge and skill regarding Paediatric Advanced Life Support. The study findings emphasized the effectiveness of structured teaching programme in improving the knowledge of I semester BSc nursing students. Most studies focus on immediate effectiveness of PALS training, with limited emphasis on long-term retention of knowledge and skills. Therefore, there is a need for a comprehensive study evaluating the effectiveness of simulation-based PALS training with follow-up assessments among nursing students.

Implications:

Nursing Education

- Simulation-based PALS training should be integrated into the nursing curriculum.
- Regular skill-based training sessions and workshops should be conducted.
- Emphasis should be given to hands-on practice rather than theory alone.

Nursing Practice

- Nurses should be trained regularly to maintain competency in paediatric emergency care.
- Hospitals should conduct periodic mock drills and simulation sessions.

Nursing Administration

- Administrators should provide simulation labs and necessary equipment.
- Policies should be implemented for mandatory PALS certification and retraining.

Nursing Research

- Further studies can be conducted with larger sample sizes and different settings.
- Comparative studies can be done between: Simulation vs lecture method, Online vs offline training

Limitations of the Study:

- The study was limited to a small sample size.
- Conducted in a single nursing college, limiting generalizability.
- Short duration for follow-up.

RECOMMENDATIONS

- A similar study can be conducted with a larger sample size.
- A true experimental design with control group can be used.
- Long-term retention studies (3–6 months) should be conducted.
- Studies can be conducted among Staff nurses, Nursing interns and healthcare professionals.

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