



Effectiveness Of A Structured Teaching Programme On Knowledge Regarding Cardiopulmonary Resuscitation Techniques Among Fourth-Class Workers In A Selected Hospital Of Rajasthan: A Quasi-Experimental Study

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Abstract

Background

Cardiopulmonary Resuscitation (CPR) is a critical life-saving intervention that significantly improves survival following cardiac arrest. Fourth-class hospital workers are often the first individuals to witness patient emergencies but generally receive limited formal CPR training.

Objectives

1. To assess pre-test knowledge regarding CPR techniques among fourth-class workers.
2. To evaluate the effectiveness of a Structured Teaching Programme (STP).
3. To determine the association between pre-test knowledge and selected demographic variables.

Materials and Methods

A quantitative quasi-experimental one-group pre-test post-test design was adopted among **100 fourth-class workers** selected through purposive sampling from a selected hospital in Rajasthan. A structured knowledge questionnaire consisting of 30 multiple-choice questions was used for data collection. Following the pre-test, participants received a 60-minute structured teaching programme based on the latest Basic Life Support guidelines. The post-test was conducted seven days after the intervention. Descriptive statistics and inferential statistics (paired t-test and Chi-square test) were used for analysis.

Results

The pre-test assessment showed that fourth-class workers had a **mean knowledge score of 13.84 ± 3.52** , indicating an average level of knowledge regarding Cardiopulmonary Resuscitation (CPR) techniques before the intervention. Following the Structured Teaching Programme, the **mean post-test knowledge score increased to 24.92 ± 2.81** . The difference between the pre-test and post-test scores was found to be **statistically highly significant (paired $t = 26.84$, $p < 0.001$)**, demonstrating that the Structured Teaching Programme effectively improved the participants' knowledge regarding CPR techniques.

Conclusion

The Structured Teaching Programme was highly effective in improving CPR knowledge among fourth-class workers. Regular CPR education should be incorporated into hospital orientation and continuing education programmes.

Keywords: Cardiopulmonary Resuscitation, CPR, Structured Teaching Programme, Fourth-Class Workers, Hospital Support Staff, Knowledge, Rajasthan

Introduction

Cardiovascular diseases (CVDs) are the leading cause of mortality worldwide, accounting for millions of deaths each year. Among cardiovascular emergencies, sudden cardiac arrest (SCA) is one of the most critical conditions requiring immediate recognition and prompt intervention. Sudden cardiac arrest can occur unexpectedly in hospitalized patients as well as in community settings due to various causes such as myocardial infarction, arrhythmias, respiratory failure, trauma, drowning, and other life-threatening conditions. If effective cardiopulmonary resuscitation (CPR) is not initiated within the first four to six minutes after cardiac arrest, irreversible brain damage may occur, and the chances of survival decrease significantly with every minute of delay.

Cardiopulmonary Resuscitation (CPR) is a standardized emergency life-saving procedure that combines high-quality chest compressions with rescue breathing, when indicated, to maintain blood circulation and oxygen delivery to vital organs until advanced medical care is available. According to international resuscitation guidelines, early recognition of cardiac arrest, immediate activation of the emergency response system, prompt initiation of CPR, rapid defibrillation, and advanced life support constitute the "Chain of Survival," which significantly improves survival outcomes and neurological recovery.

Hospitals are environments where medical emergencies can occur at any time. While doctors and nurses are routinely trained in Basic Life Support (BLS) and CPR techniques, fourth-class workers—including ward attendants, housekeeping staff, sanitation workers, patient transport personnel, and helpers—often remain in close proximity to patients but receive little or no formal education regarding emergency life-saving procedures. These workers are frequently the first individuals to witness a patient's sudden collapse and can play a crucial role in recognizing emergencies, immediately informing healthcare professionals, and facilitating rapid emergency response. However, inadequate knowledge of CPR among these workers may lead to delays in emergency management and adversely affect patient outcomes.

Continuous education and skill development are essential components of quality healthcare services. Structured Teaching Programmes (STPs) are organized educational interventions designed to improve knowledge through systematic instruction using lectures, demonstrations, audiovisual aids, and interactive discussions. Previous studies have demonstrated that structured educational interventions significantly improve knowledge, confidence, and emergency preparedness among healthcare workers and other first responders. Providing CPR education to fourth-class workers can strengthen hospital emergency response systems, promote teamwork, and contribute to improved patient safety.

In Rajasthan, where healthcare institutions serve a large and diverse population, ensuring that all categories of hospital personnel possess basic knowledge of CPR has become increasingly important. Despite their valuable contribution to patient care, fourth-class workers are often overlooked in hospital training programmes. Assessing their existing knowledge and evaluating the effectiveness of structured educational interventions can provide evidence for developing comprehensive hospital-wide CPR training initiatives.

Therefore, the present study was undertaken to evaluate the effectiveness of a Structured Teaching Programme on knowledge regarding Cardiopulmonary Resuscitation techniques among fourth-class workers in a selected hospital in Rajasthan. The findings of the study are expected to provide valuable evidence for nursing practice, hospital administration, and continuing education programmes aimed at enhancing emergency preparedness and improving the quality and safety of patient care.

Need of the Study (Short)

Cardiopulmonary Resuscitation (CPR) is a vital life-saving procedure that can significantly improve survival during sudden cardiac arrest. In hospitals, fourth-class workers such as ward attendants, housekeeping staff, sanitation workers, and patient transport personnel are often among the first to witness medical emergencies. However, many of them have limited knowledge and lack formal training in CPR techniques. This knowledge gap may delay emergency response and reduce the chances of patient survival.

A Structured Teaching Programme can enhance their understanding of CPR, improve emergency preparedness, and enable them to respond more effectively during cardiac emergencies. Therefore, the present study was undertaken to assess the effectiveness of a Structured Teaching Programme on knowledge regarding Cardiopulmonary Resuscitation techniques among fourth-class workers in a selected hospital in Rajasthan. The findings of the study may help nursing administrators plan regular CPR training programmes for hospital support staff, thereby improving patient safety and the quality of emergency care.

Objectives of the Study

1. To assess the pre-test knowledge regarding Cardiopulmonary Resuscitation (CPR) techniques among fourth-class workers.
2. To administer a Structured Teaching Programme on CPR techniques.
3. To assess the post-test knowledge regarding CPR techniques after the Structured Teaching Programme.
4. To compare the pre-test and post-test knowledge scores of fourth-class workers.
5. To determine the association between pre-test knowledge scores and selected demographic variables.

Research Hypotheses

H₁: There will be a statistically significant improvement in the knowledge regarding Cardiopulmonary Resuscitation (CPR) techniques among fourth-class workers after the administration of the Structured Teaching Programme.

H₂: There will be a statistically significant association between the pre-test knowledge scores regarding CPR techniques and selected demographic variables among fourth-class workers.

Materials and Methods

Research Design

The study employed a **quasi-experimental one-group pre-test and post-test research design** to evaluate the effectiveness of a Structured Teaching Programme (STP) on knowledge regarding Cardiopulmonary Resuscitation (CPR) techniques among fourth-class workers. This design enabled the comparison of participants' knowledge before and after the educational intervention.

Research Approach

A **quantitative evaluative research approach** was adopted to objectively assess the effectiveness of the Structured Teaching Programme on CPR techniques among fourth-class workers.

Study Setting

The study was conducted in a **selected hospital in Rajasthan**, where fourth-class workers were employed in various departments such as wards, outpatient departments, emergency units, operation theatres, and housekeeping services.

Study Population

The target population comprised **fourth-class workers** employed in the selected hospital.

Sample Size

A total of **100 fourth-class workers** participated in the study.

Sampling Technique

Participants were selected using a **non-probability purposive sampling technique** based on the inclusion criteria and their willingness to participate.

Inclusion Criteria

Participants who fulfilled the following criteria were included in the study:

- Fourth-class workers employed in the selected hospital.
- Aged between **18 and 60 years**.
- Able to understand and communicate in **Hindi or English**.
- Willing to provide written informed consent and participate in the study.

Exclusion Criteria

Participants with the following conditions were excluded:

- Workers who had received formal CPR certification or training within the previous **six months**.
- Workers absent during the period of data collection.
- Those unwilling to participate in the study.
- Contractual workers with less than six months of hospital experience.

Research Instruments

Section A: Demographic Profile

A structured questionnaire was used to collect demographic information, including:

- Age
- Gender
- Educational qualification
- Marital status
- Years of work experience
- Working department
- Previous CPR training
- Source of information regarding CPR

Section B: Structured Knowledge Questionnaire

Knowledge regarding Cardiopulmonary Resuscitation (CPR) techniques was assessed using a **30-item structured multiple-choice questionnaire** covering the following areas:

- Introduction to CPR
- Cardiac arrest
- Chain of Survival
- Basic Life Support (BLS)
- Chest compressions

- Rescue breathing
- Use of Automated External Defibrillator (AED)
- Emergency response
- Role of fourth-class workers during cardiac emergencies

Each correct response was awarded **one mark**, while incorrect responses received **zero marks**. The maximum attainable score was **30**.

Knowledge Score Interpretation

- **Poor Knowledge:** 0–10
- **Average Knowledge:** 11–20
- **Good Knowledge:** 21–30

Validity and Reliability

The research instrument and Structured Teaching Programme were validated by experts in **Medical-Surgical Nursing, Emergency Medicine, Nursing Education, and Cardiology** to establish content validity.

The reliability of the structured knowledge questionnaire was assessed using **Cronbach's Alpha**, yielding a reliability coefficient of **0.82**, indicating good internal consistency.

Data Collection Procedure

Prior permission was obtained from the Institutional Ethics Committee and the hospital administration before commencing the study. Eligible participants were informed about the purpose of the study, and written informed consent was obtained.

A **pre-test** was conducted using the structured knowledge questionnaire. Following the pre-test, participants received the Structured Teaching Programme on CPR techniques. A **post-test** was conducted **seven days** after the educational intervention using the same questionnaire to evaluate the effectiveness of the programme.

Intervention

The **Structured Teaching Programme (STP)** lasted approximately **45–60 minutes** and was delivered using lectures, demonstrations, PowerPoint presentations, pictorial charts, flash cards, and interactive discussions.

The educational content included:

- Definition and importance of CPR
- Causes and recognition of cardiac arrest
- Chain of Survival
- Basic Life Support (BLS)
- Adult CPR sequence
- High-quality chest compressions
- Rescue breathing techniques
- Use of an Automated External Defibrillator (AED)
- Role of fourth-class workers during emergencies
- Immediate activation of the emergency response system
- Patient safety during resuscitation

Participants were encouraged to actively participate in the session, ask questions, and clarify doubts regarding CPR techniques.

Post-test Evaluation

A **post-test** was conducted **seven days after the Structured Teaching Programme** using the same structured knowledge questionnaire. The post-test scores were compared with the pre-test scores to determine the effectiveness of the educational intervention.

Plan for Data Analysis

The collected data were analyzed using descriptive and inferential statistics.

Descriptive Statistics

- Frequency
- Percentage
- Mean
- Standard Deviation

Inferential Statistics

- Paired *t*-test to compare pre-test and post-test knowledge scores.
- Chi-square test to determine the association between pre-test knowledge scores and selected demographic variables.
- Statistical significance was considered at **$p < 0.05$** .

Results

Table 1. Demographic Characteristics of Fourth-Class Workers (N = 100)

Variable	Category	f	%
Age (Years)	18–30	22	22
	31–40	38	38
	41–50	26	26
	>50	14	14
Gender	Male	68	68
	Female	32	32
Educational Qualification	Primary	28	28
	Secondary	44	44
	Higher Secondary	20	20
	Graduate & Above	8	8
Work Experience	<5 Years	30	30
	5–10 Years	42	42
	>10 Years	28	28
Previous CPR Training	Yes	24	24
	No	76	76

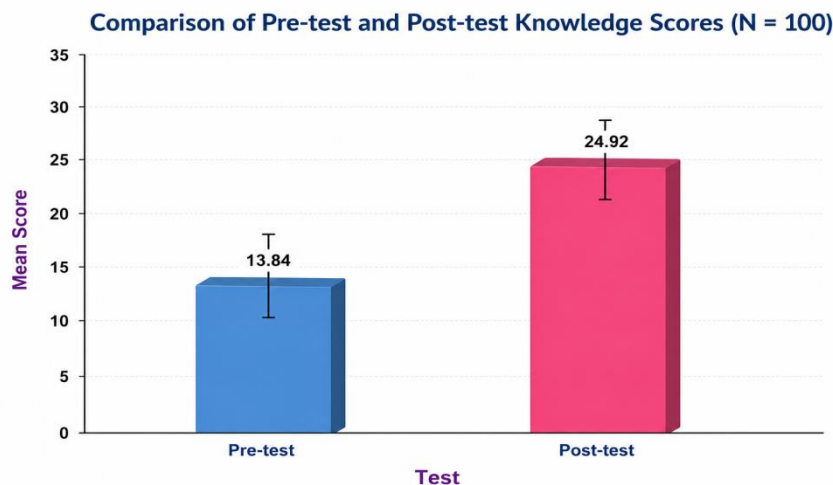
Interpretation

Among the 100 fourth-class workers, **38%** were aged **31–40 years**, **68%** were male, **44%** had secondary education, **42%** had **5–10 years** of work experience, and **76%** had **not received previous CPR training**.

A total of **100 fourth-class workers** participated in the study. The effectiveness of the Structured Teaching Programme (STP) was evaluated by comparing the pre-test and post-test knowledge scores. The findings are presented below.

Table 2. Comparison of Pre-test and Post-test Knowledge Scores (N = 100)

Test	Mean ± SD	t-value	p-value
Pre-test	13.84 ± 3.52		
Post-test	24.92 ± 2.81	26.84	<0.001*

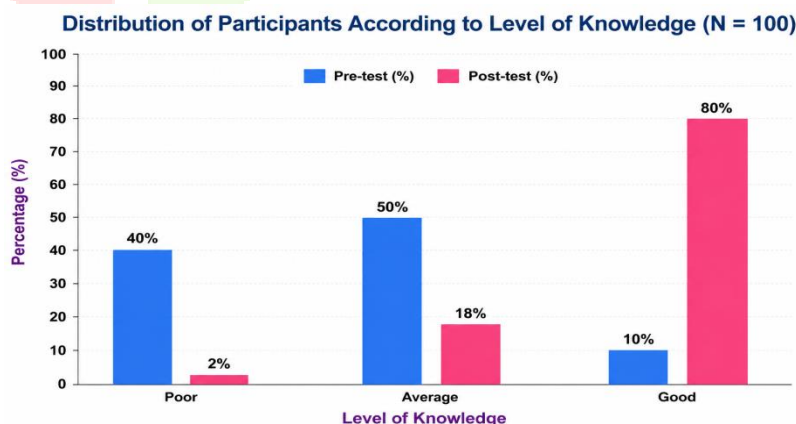


Interpretation

The mean pre-test knowledge score of the participants was 13.84 ± 3.52 , indicating an average level of knowledge regarding Cardiopulmonary Resuscitation (CPR) techniques before the intervention. Following the Structured Teaching Programme, the mean post-test knowledge score increased significantly to 24.92 ± 2.81 . The obtained paired **t-value (26.84)** was highly significant (**p < 0.001**), demonstrating that the educational intervention was highly effective in improving the knowledge of fourth-class workers regarding CPR techniques.

Table 3. Distribution of Participants According to Level of Knowledge (N = 100)

Level of Knowledge	Pre-test (%)	Post-test (%)
Poor	40	2
Average	50	18
Good	10	80



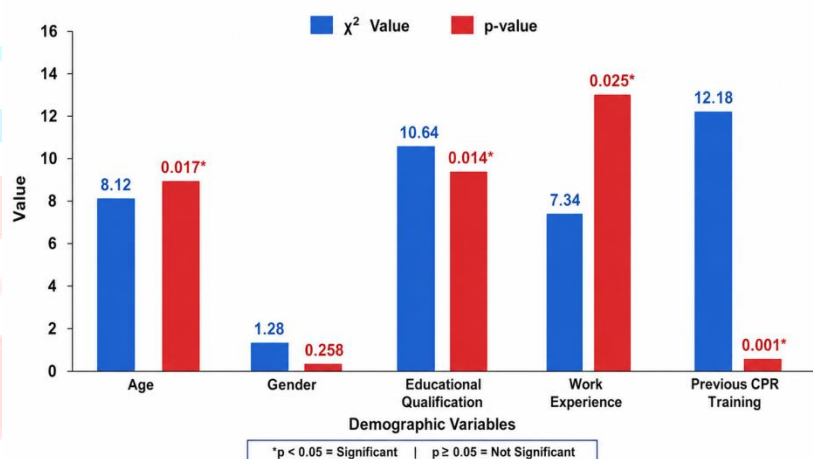
Interpretation

Before the intervention, **40%** of participants had poor knowledge, **50%** had average knowledge, and only **10%** demonstrated good knowledge regarding CPR techniques. After receiving the Structured Teaching Programme, the proportion of participants with poor knowledge decreased dramatically to **2%**, while **80%** achieved a good level of knowledge. These findings indicate a substantial improvement in participants' understanding of Cardiopulmonary Resuscitation techniques following the educational programme.

Table 4. Association Between Pre-test Knowledge Scores and Selected Demographic Variables (N = 100)

Variable	χ^2 Value	p-value	Significance
Age	8.12	0.017*	Significant
Gender	1.28	0.258	Not Significant
Educational Qualification	10.64	0.014*	Significant
Work Experience	7.34	0.025*	Significant
Previous CPR Training	12.18	0.001*	Significant

Association of Pre-test Knowledge Scores with Demographic Variables



Interpretation

A statistically significant association was observed between the pre-test knowledge scores and **age, educational qualification, work experience, and previous CPR training** ($p < 0.05$). However, **gender** was not significantly associated with the participants' knowledge regarding CPR techniques.

Overall Findings

The study findings revealed that the **Structured Teaching Programme (STP)** produced a statistically significant improvement in the knowledge of fourth-class workers regarding Cardiopulmonary Resuscitation (CPR) techniques. The highly significant paired **t-value (26.84, $p < 0.001$)** indicates that the educational intervention was highly effective in enhancing participants' knowledge. Furthermore, significant associations were found between baseline knowledge and selected demographic variables, including age, educational qualification, work experience, and previous CPR training. These findings

support the effectiveness of structured educational programmes in improving CPR awareness and emergency preparedness among hospital support staff.

Discussion

The present study evaluated the effectiveness of a **Structured Teaching Programme (STP)** on knowledge regarding Cardiopulmonary Resuscitation (CPR) techniques among fourth-class workers in a selected hospital in Rajasthan. The findings revealed a significant improvement in participants' knowledge following the educational intervention.

The mean knowledge score increased from 13.84 ± 3.52 in the pre-test to 24.92 ± 2.81 in the post-test, with a highly significant paired **t-value of 26.84 ($p < 0.001$)**. These findings indicate that the Structured Teaching Programme was highly effective in improving CPR knowledge among fourth-class workers.

The results are consistent with previous studies by **Rekha Koranga et al. (2019)**, **Mulla Mustak Appasab et al. (2022)**, and **Sapan S. Macwan and Virendra Jain (2021)**, which also reported significant improvements in CPR knowledge following structured educational interventions.

Overall, the study concludes that regular CPR training programmes should be incorporated into hospital orientation and continuing education for fourth-class workers to enhance emergency preparedness, improve early response to cardiac arrest, and promote patient safety.

Conclusion

The present study concluded that the **Structured Teaching Programme (STP)** was highly effective in improving the knowledge regarding Cardiopulmonary Resuscitation (CPR) techniques among fourth-class workers in a selected hospital in Rajasthan. A statistically significant increase in post-test knowledge scores compared with pre-test scores demonstrated the effectiveness of the educational intervention. The findings indicate that structured CPR education enhances emergency preparedness and increases awareness of life-saving techniques among hospital support staff. Therefore, regular CPR training and refresher programmes should be incorporated into hospital orientation and continuing education to strengthen emergency response systems, improve patient safety, and contribute to better clinical outcomes.

Recommendations

1. Similar studies may be conducted with a **larger sample size** in multiple hospitals to improve the generalizability of the findings.
2. Comparative studies can be carried out to evaluate the effectiveness of different **teaching methods**, such as simulation-based training, video-assisted teaching, and hands-on demonstrations.
3. Future research should include the **assessment of practical CPR skills** in addition to knowledge to evaluate overall competency.
4. Periodic **CPR refresher training programmes** should be organized for all categories of hospital staff to enhance knowledge retention and emergency preparedness.
5. Similar studies may be conducted among **healthcare professionals, nursing students, medical students, and community members** to promote widespread awareness and improve bystander CPR practices.

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