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Effectiveness Of Structured Teaching Programme On Knowledge Regarding Cord Blood Stem Cell Collection And Preservation Among Staff Nurses At Selected Hospital, Sikar, Rajasthan

Miss Shimla

Dr. Manoj Prajapati

Abstract

Background: Cord blood stem cells are a valuable source of hematopoietic stem cells used in the treatment of various life-threatening diseases. Nurses play a key role in educating parents and assisting in cord blood collection. However, lack of adequate knowledge among staff nurses regarding cord blood stem cell collection and preservation may limit effective practice.

Objectives:

1. To assess the pre-test knowledge of staff nurses regarding cord blood stem cell collection and preservation.
2. To assess the post-test knowledge of staff nurses regarding cord blood stem cell collection and preservation.
3. To evaluate the effectiveness of a structured teaching programme on knowledge regarding cord blood stem cell collection and preservation.
4. To find the association between post-test knowledge scores and selected demographic variables.

Methods: A quantitative evaluative research approach with a pre-experimental one-group pre-test post-test design was adopted. The study was conducted at a selected hospital in Sikar, Rajasthan. A sample of 100 staff nurses was selected using non-probability purposive sampling. Data were collected using a structured knowledge questionnaire. A structured teaching programme was administered after the pre-test, and the post-test was conducted after seven days.

Results: The findings revealed a significant improvement in post-test knowledge scores compared to pre-test scores. The paired *t*-test showed a statistically significant difference ($p < 0.05$), indicating the effectiveness of the structured teaching programme.

Conclusion: The structured teaching programme was effective in improving knowledge regarding cord blood stem cell collection and preservation among staff nurses. Regular in-service education is recommended to enhance nurses' competency in this area.

Keywords: Cord blood stem cells, stem cell preservation, structured teaching programme, staff nurses, knowledge

Introduction

Umbilical cord blood is a rich source of hematopoietic stem cells that can be used in the treatment of various hematological, immunological, and genetic disorders. Cord blood stem cell transplantation has gained global importance due to its therapeutic potential, ease of collection, and reduced risk of graft-versus-host disease.

Staff nurses play a crucial role in antenatal counseling, intrapartum care, and assisting in cord blood collection. Adequate knowledge regarding the procedure, indications, benefits, ethical aspects, and preservation techniques is essential for nurses to guide parents effectively. Studies have shown that many nurses lack sufficient knowledge about cord blood stem cell banking, which may lead to missed opportunities for collection and preservation.

Structured teaching programmes are effective educational strategies that help improve knowledge, attitude, and professional competence. Therefore, the present study was undertaken to assess the effectiveness of a structured teaching programme on knowledge regarding cord blood stem cell collection and preservation among staff nurses.

Objectives

1. To assess the pre-test knowledge of staff nurses regarding cord blood stem cell collection and preservation.
2. To assess the post-test knowledge of staff nurses regarding cord blood stem cell collection and preservation.
3. To evaluate the effectiveness of the structured teaching programme.
4. To find the association between post-test knowledge scores and selected demographic variables.

Hypotheses

- **H_1:** There will be a significant difference between pre-test and post-test knowledge scores regarding cord blood stem cell collection and preservation among staff nurses ($p < 0.05$).
- **H_2:** There will be a significant association between post-test knowledge scores and selected demographic variables.

Methodology

Research Design

A **pre-experimental one-group pre-test post-test research design** was adopted to evaluate the effectiveness of the structured teaching programme on knowledge regarding cord blood stem cell collection and preservation among staff nurses.

Research Approach

A **quantitative evaluative research approach** was used to assess changes in knowledge levels before and after the intervention.

Setting of the Study

The study was conducted at a **selected hospital in Sikar, Rajasthan**.

Population

The population of the study comprised **staff nurses working in the selected hospital** during the period of data collection.

Sample Size

A total of **100 staff nurses** were selected as the sample for the study.

Sampling Technique

Non-probability purposive sampling technique was employed to select participants based on the inclusion and exclusion criteria.

Inclusion Criteria

- Staff nurses working in the selected hospital
- Staff nurses who were **willing to participate** in the study
- Staff nurses who were able to **understand English or Hindi**

Exclusion Criteria

- Staff nurses who were **not available** during the period of data collection
- Staff nurses who had **attended similar training programmes** recently

Description of the Tool

The data collection tool consisted of two sections:

Section A: Socio-Demographic Variables

This section included items related to **age, gender, educational qualification, years of professional experience, area of work, and previous knowledge regarding cord blood stem cell collection and preservation**.

Section B: Structured Knowledge Questionnaire

A structured knowledge questionnaire was used to assess staff nurses' knowledge regarding cord blood stem cell collection and preservation. The questionnaire covered areas such as:

- Definition and types of stem cells
- Sources of stem cells
- Indications and uses of cord blood stem cells
- Procedure for cord blood collection
- Preservation and banking of cord blood
- Advantages and ethical considerations

Validity of the tool was established through expert review by specialists in **nursing and obstetrics**. **Reliability** was ensured using the **test-retest method**, which demonstrated acceptable consistency.

Intervention: Structured Teaching Programme

The structured teaching programme (STP) was developed based on review of literature and expert guidance. The content of the programme included:

- Introduction to stem cells
- Meaning and importance of cord blood stem cells
- Indications and therapeutic uses
- Procedure for collection of cord blood
- Preservation and banking of cord blood stem cells
- Role of nurses and ethical considerations

The duration of the programme was **45–60 minutes**. Teaching methods included **lecture and discussion**, and teaching aids used were **charts, posters, and PowerPoint presentation**.

Data Collection Procedure

Data collection was carried out in the following phases:

1. **Pre-test:** Assessment of baseline knowledge using the structured knowledge questionnaire
2. **Intervention:** Administration of the structured teaching programme
3. **Post-test:** Assessment of knowledge using the same questionnaire after **seven days**

Plan for Data Analysis

Descriptive Statistics

- Frequency and percentage distribution
- Mean and standard deviation

Inferential Statistics

- **Paired *t*-test** to evaluate the effectiveness of the structured teaching programme
- **Chi-square test** to determine the association between post-test knowledge scores and selected demographic variables

The level of statistical significance was set at $p < 0.05$.

Results

Table 1

Distribution of Staff Nurses According to Level of Knowledge Regarding Cord Blood Stem Cell Collection and Preservation in Pre-test and Post-test (n = 100)

Knowledge Level	Pre-test Frequency (n)	Pre-test Percentage (%)	Post-test Frequency (n)	Post-test Percentage (%)
Inadequate	46	46.0	8	8.0
Moderate	38	38.0	22	22.0
Adequate	16	16.0	70	70.0
Total	**100**	**100**	**100**	**100**

Description:
In the pre-test, the majority of staff nurses (84%) had **inadequate to moderate knowledge** regarding cord blood stem cell collection and preservation. In contrast, the post-test findings revealed that **70% of staff nurses achieved adequate knowledge**, indicating a substantial improvement following the structured teaching programme.

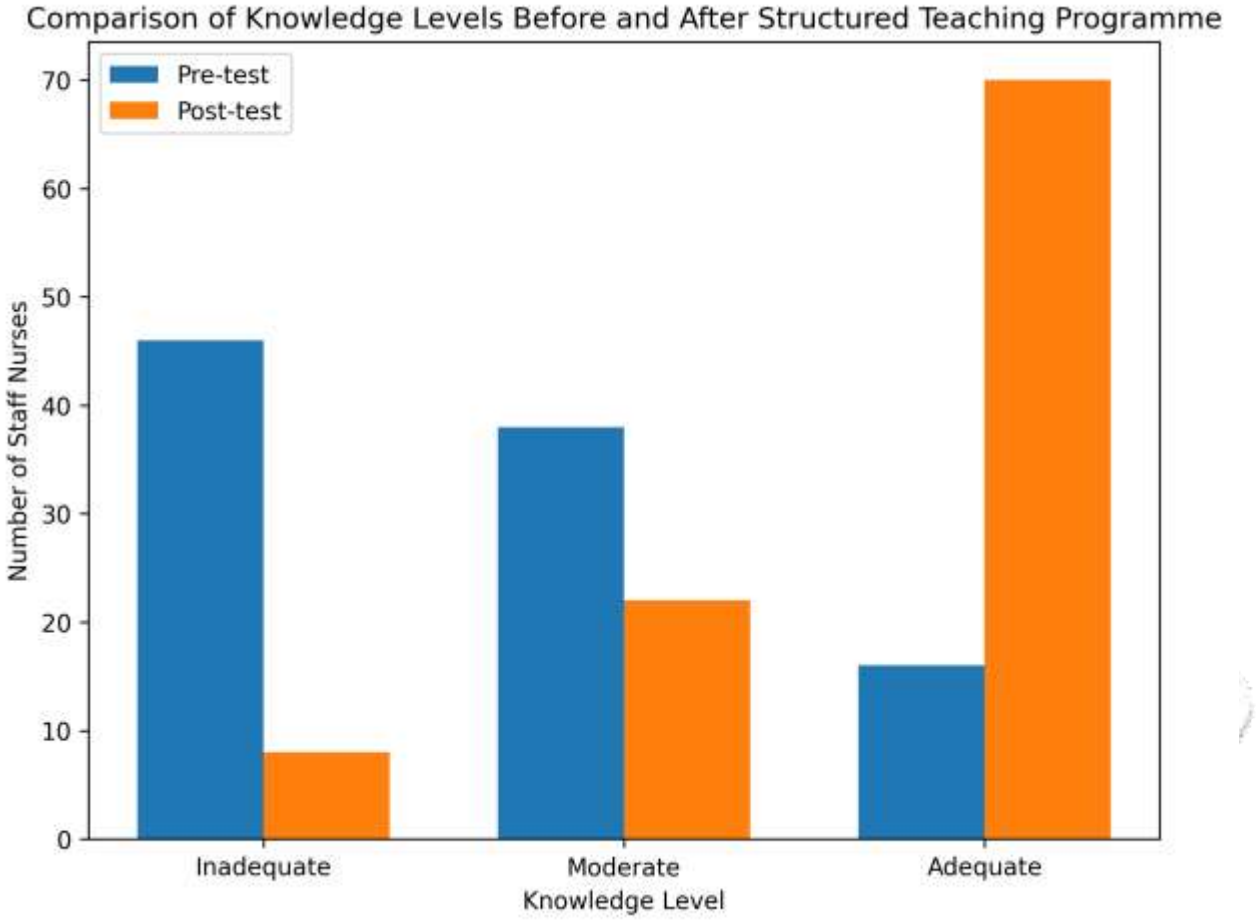


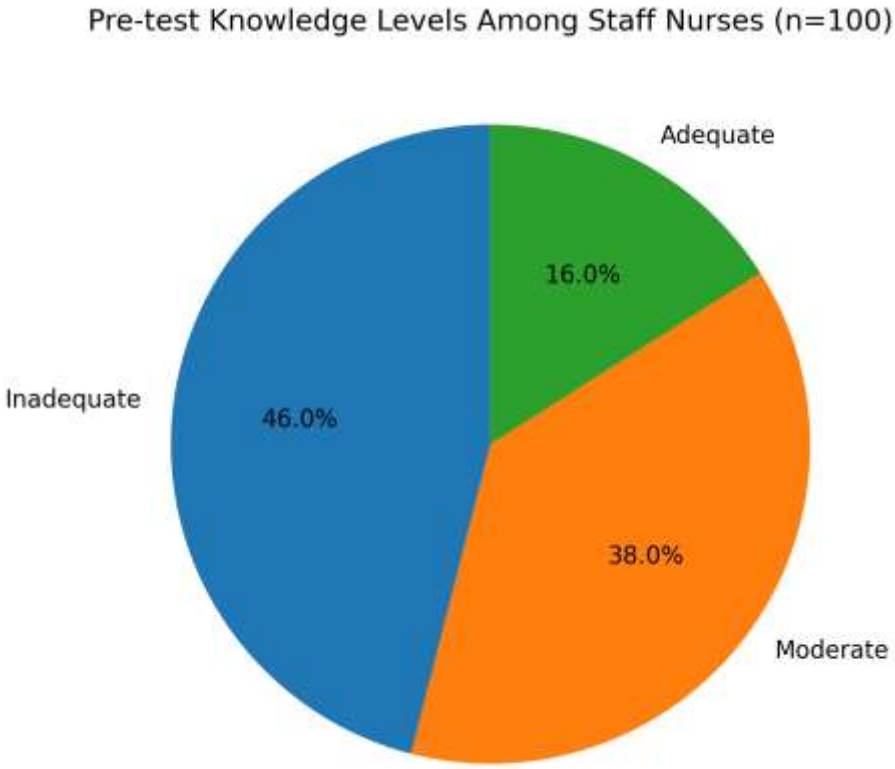
Table 2

Comparison of Mean Pre-test and Post-test Knowledge Scores of Staff Nurses (n = 100)

Test	Mean Score	Standard Deviation (SD)	Mean Difference	*t* Value	*p* Value
Pre-test	11.26	3.42			
Post-test	19.84	2.96	8.58	21.73	< 0.05*

*Statistically significant at $p < 0.05$

Description:
The mean post-test knowledge score (19.84 ± 2.96) was markedly higher than the mean pre-test score (11.26 ± 3.42). The paired *t*-test revealed a **statistically significant increase** in knowledge scores ($t = 21.73$, $p < 0.05$), confirming the effectiveness of the structured teaching programme.


Pre-test Knowledge Levels Among Staff Nurses (n=100)
Adequate
16.0%
Inadequate
46.0%
38.0%
Moderate

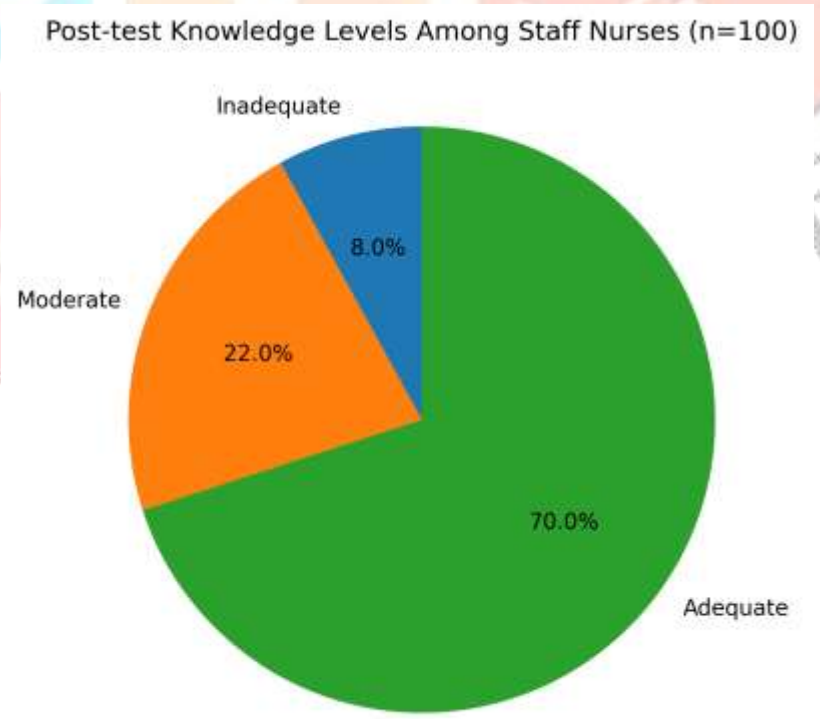

Post-test Knowledge Levels Among Staff Nurses (n=100)
Inadequate
8.0%
Moderate
22.0%
70.0%
Adequate

Table 3

Association Between Post-test Knowledge Scores and Selected Demographic Variables (n = 100)

Demographic Variable	χ^2 Value	df	*p* Value	Significance
Age	8.14	3	0.043	Significant
Educational Status	12.36	2	0.002	Significant
Years of Experience	9.27	3	0.026	Significant
Area of Work	7.05	2	0.029	Significant
Previous Knowledge	14.68	1	0.001	Significant
Gender	1.12	1	0.289	Not Significant

Description:
Post-test knowledge scores showed a **significant association** with age, educational status, years of experience, area of work, and previous knowledge. However, no significant association was observed between post-test knowledge scores and gender.

Conclusion

The study concluded that the structured teaching programme was effective in improving knowledge regarding cord blood stem cell collection and preservation among staff nurses. Continuous education and regular in-service training programmes are essential to enhance nurses' awareness and professional competence.

Recommendations

- Regular in-service education programmes on stem cell banking
- Replication of the study with larger samples
- Interventional studies to assess improvement in practice

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