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# Assess The Effectiveness Of Planned Teaching Program On Knowledge Regarding Stem Cell Collection And Preservation Among Antenatal Mothers

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***Abstract***
***Aims and objectives:***
*This study was planned to evaluate the knowledge and sources of information regarding stem cell collection and preservation among antenatal mothers, aiding them in safeguarding their baby and family from life-threatening diseases.*
***Design:***
*A quasi-experimental research design was utilized, employing a one-group pre-test and post-test approach, to assess the effectiveness of a teaching program on stem cell collection and preservation among antenatal mothers at a government maternity hospital in tirupati. A non-probability convenient sampling technique was employed to select a sample of 50 antenatal mothers. Data analysis involved the utilization of descriptive and inferential statistics.*
*Among the 50 antenatal mothers surveyed, 18 (36%) exhibited inadequate knowledge, 23 (46%) had moderate knowledge, and 9 (18%) demonstrated adequate knowledge regarding the collection and preservation of stem cells in the pre-test.*
*Following a scheduled teaching program conducted with 50 antenatal mothers, a post-test was administered after 7 days to the same sample group. Out of the 50 antenatal mothers, 11 (22%) displayed inadequate knowledge, 23 (46%) showed moderate knowledge, and 16 (32%) exhibited adequate knowledge regarding the collection and preservation of stem cells in the post-test.*
*In the pre-test, the mean scores regarding stem cell collection and preservation were 3.34, with a standard deviation of 1.733. In the post-test, the mean scores significantly increased to 13.66, with a standard deviation of 1.624. The corresponding t-value was 35.344, indicating a significant improvement in knowledge from pre-test to post-test.*
*Furthermore, there is a significant association between the pre-test knowledge scores and selected socio-demographic variables such as the type of family, age, and family income, significant at $p < 0.01$. Specifically variables such as the area of living, age, occupation of the father, family income, and religion were significant at $p < 0.05$ in the post-test.*
***Conclusion:*** *the study findings indicate that the planned teaching programme effectively enhanced knowledge concerning umbilical cord stem cell collection and preservation among antenatal mothers. The results reveal a significant difference between pre-test and post-test knowledge levels regarding stem cell collection and preservation among antenatal mothers, with a significance level of p=0.001.*
***Keywords:*** *stem cell collection and preservation, antenatal mothers.*

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## I. Introduction

Stem cell transplantation (sct) stands as a life-saving procedure, utilizing hematopoietic stem cells for bone marrow transplantation in the treatment of both malignant and nonmalignant diseases. Umbilical cord blood (ucb), once considered waste material, is now recognized as a valuable resource, serving as an important source of hematopoietic stem cells. Stem cell transplantation involves the infusion of healthy cells to replace diseased or damaged ones. Stem cells derived from umbilical cord blood have demonstrated efficacy in treating nearly 80 diseases and have been utilized in over 20,000 transplants worldwide[1].

The umbilical cord blood contains all the typical components of blood, including red blood cells, white blood cells, platelets, and plasma. However, it also contains hematopoietic (blood-forming) stem cells comparable to those found in the bone marrow. This is why cord blood can substitute for bone marrow in transplantation procedures. The process of collecting and storing umbilical cord blood in the days following a baby's birth is known as umbilical cord blood banking (ucb). It harbors potent stem cells along with hematopoietic cells [2].

## II. Need For The Study:

Stem cells, despite their unspecialized and immature nature, hold the potential to differentiate into various cell lineages. Their remarkable ability for self-renewal and differentiation plays a crucial role in tissue and organ repair [5].

A pre-experimental study was conducted to evaluate the effectiveness of a teaching program on knowledge regarding umbilical cord stem cell banking among antenatal mothers in rajkot. Employing a quantitative research approach and a pre-experimental research design with a one-group pre-test post-test setup, a non-probability purposive sampling technique was used to select 60 antenatal mothers.

The study results revealed that the mean score of the pretest was 14.35, which increased to 24.96 in the post-test. The observed mean difference was 10.61, with a corresponding p-value of 28.71, indicating high significance at $p < 0.05$ level. Consequently, the findings suggest that the structured teaching programme effectively enhanced knowledge regarding umbilical cord stem cell banking among antenatal mothers, potentially improving the lives of critically ill children [6].

Stem cell therapy represents one of the most challenging frontiers in medical research. The objective of stem cell therapy studies is to improve human health and address medical conditions and diseases by harnessing stem cells as a treatment modality. Stem cells exhibit remarkable abilities to regenerate and repair all tissues in the human body, highlighting their vast potential for future therapeutic interventions in tissue regeneration and repair[7].

Despite the various therapeutic applications of stem cells derived from the umbilical cord, research indicates that between 70 to 80% of women lack adequate knowledge about stem cells and require detailed education and counseling on this topic. This essential education and counseling should primarily be provided by nurses. Many pregnant women are unaware of the existence of banks for storing stem cells[8]

## III. Methods

**Research approach**: the study employed a quantitative research approach, was adopted for the study.

**Setting of the study**: the study was conducted in government maternity hospital at tirupati.

**Population:** the study population consisted of antenatal mothers.

**Sample size:** the sample consisted of 50 ante natal mothers.

**Sampling technique**: non probability convenient sampling technique was employed.

- Those who are not willing participate in the study.
- Not available during the time of data collection.

**Inclusive criteria:**

- Antenatal mothers who understand and can read telugu.
- Those who are willing to participate in the study.

**Development and description tool**:a self-structured questionnaire was created for the collection and preservation of stem cells. The tool was organized into the following sections:

**Section i:** this section includes socio-demographic data such as age, mother's education, family type, lifestyle habits, and father's occupation, family income per year, religion, residence, and number of members in the family.

**Section ii:** it consists of 20 multiple-choice questions related to knowledge on stem cell collection and preservation. The instructional guidelines cover knowledge regarding umbilical cord stem cell collection and preservation as follows:

- definition of umbilical cord blood
- definition of stem cells from umbilical blood
- umbilical cord components
- who can provide cord blood for banking?
- contraindications for collection
- suitable timing of collection
- duration of banking for the cord blood
- conditions managed by stem cells
- sources of stem cells other than umbilical cord blood.

**Score interpretation**: the knowledge assessment for the planned teaching program comprises 20 questions. Each correct answer earns one mark, while incorrect answers are scored as zero. The total score indicates the knowledge level of antenatal mothers. The scoring system is as follows:

**Table i: level of knowledge score**

| Level of knowledge | | Score |
|---|---|---|
| <50% | Inadequate | 1-10 |
| 51-75% | Moderate | 11-20 |
| 76%-100 | Adequate | 21-30 |

## IV. Summary And Conclusion

The researchers developed and applied educational guidelines for umbilical cord stem cell collection and preservation, which included a theoretical component. The theoretical portion integrated the knowledge of umbilical cord stem cell banking among antenatal mothers. Additionally, antenatal mothers received an educational booklet written in telugu about umbilical cord stem cell banking.

According to the study results, the findings underscored that the majority of participants had insufficient knowledge about stem cells collection and preservation before receiving instructional guidelines. However, after receiving the instructional guidelines, there was a noticeable improvement in knowledge regarding umbilical cord stem cell banking among antenatal mothers.

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