

A study to assess the effectiveness of structured teaching programme on knowledge regarding placental stem cells banking and its utilization among postnatal mothers of selected hospitals at Bareilly.

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Abstract :

Background of the Study: Placental stem cell banking is the process of collecting, processing, and storing stem cells obtained from the placenta after childbirth for potential future medical use. The placenta, which nourishes and supports the fetus during pregnancy, is a rich source of stem cells that can differentiate into various types of cells and tissues. These stem cells possess regenerative and therapeutic properties, making them valuable for the treatment of several diseases and disorders. Recent advances in regenerative medicine have highlighted the therapeutic potential of stem cells in the treatment of numerous diseases and disorders. Stem cells possess the unique ability to self-renew and differentiate into specialized cell types, making them invaluable for tissue repair, regeneration, and transplantation. Among the various sources of stem cells, the placenta has emerged as an important and ethically acceptable source of multipotent stem cells. The increasing prevalence of chronic diseases, genetic disorders, and cancers has generated interest in stem cell preservation. Consequently, placental stem cell banking has become an important component of modern obstetric and neonatal care. Healthcare professionals, particularly nurses, play a crucial role in educating expectant parents regarding the benefits, limitations, ethical considerations, and future applications of stem cell banking. Cord blood banking is once in a lifetime opportunity to save babies cord blood stem cells for potential medical uses. Saved cord blood of baby can be lifesaving for baby or other family members and ensure that these cells are immediately available if ever needed. Postnatal mothers are the primary decision-makers regarding placental stem cell banking. Their knowledge and perception directly influence the utilization of banking services. Nurses, being the key healthcare professionals involved in maternal and newborn care, have a vital role in educating mothers about stem cell banking and facilitating informed decision-making. **Objectives:** To assess the knowledge regarding Placental stem cells banking and its utilization among postnatal mothers of selected hospitals at Bareilly”. To evaluate the effectiveness of structured teaching programme on knowledge regarding Placental stem cells banking and its utilization among postnatal mothers of selected hospitals at Bareilly”. To find out the association between pretest knowledge scores regarding stem Placental stem cells banking and its utilization among postnatal mothers of selected hospitals at Bareilly with their selected socio demographic variables. **Methodology:** Pre-experimental Pretest post-test only design was used for the study. Sample and Sampling Technique: Purposive sampling technique was used to select 30 Postnatal Mothers from Rohilkhand Medical College and Hospital. Data was collected by means of demographics and questionnaire i.e. Socio demographic data and structured questionnaire. Analysis was done by using descriptive and inferential statistics in terms of frequency, percent, mean, median, mode, standard deviation and chi-square test. **Result:** Most of the subjects in the pre-test 18(60%) had poor knowledge, In post-test, maximum no. of postnatal mothers 24(80%) had good knowledge, 6(20%) had average knowledge scores. the pre-test mean knowledge score was 19.14, median 21, mode 23, standard deviation 2.90, and range 12. Whereas the post-test, mean knowledge score was 36.89, median 39, mode 38, standard deviation 4.60 and range 19. The overall difference in mean knowledge score was 17.72, median 18, mode 15, standard deviation 1.7 and range 07. The findings reveal that the mean knowledge scores of post-test (36.89) is higher than pretest (19.14). There is mean difference of pretest and posttest is 17.72. there was association found between two variables, those were age of subject's & education of subjects. Hence H2 was accepted.

Keyword: Placental Stem Cells, Stem Cell Banking, Postnatal Mothers, Stem Cell Banking Utilization.

INTRODUCTION

Placental stem cell banking is the process of collecting, processing, and storing stem cells obtained from the placenta after childbirth for potential future medical use. The placenta, which nourishes and supports the fetus during pregnancy, is a rich source of stem cells that can differentiate into various types of cells and tissues. These stem cells possess regenerative and therapeutic properties, making them valuable for the

treatment of several diseases and disorders. The field of modern medicine has undergone rapid transformation with the advent of advanced biotechnological innovations, among which stem cell research stands out as one of the most promising developments. Stem cells are undifferentiated cells characterized by their ability to self-renew and differentiate into specialized cell types, thereby playing a crucial role in tissue repair and regeneration.¹

Recent advances in regenerative medicine have highlighted the therapeutic potential of stem cells in the treatment of numerous diseases and disorders. Stem cells possess the unique ability to self-renew and differentiate into specialized cell types, making them invaluable for tissue repair, regeneration, and transplantation. Among the various sources of stem cells, the placenta has emerged as an important and ethically acceptable source of multipotent stem cells. Placental stem cells are particularly valuable because they offer several advantages over other sources of stem cells. Unlike embryonic stem cells, their collection does not involve ethical controversies, as they are derived from tissues that are normally discarded after delivery.²

NEED OF THE STUDY

Cord blood banking is once in a lifetime opportunity to save babies cord blood stem cells for potential medical uses. Saved cord blood of baby can be lifesaving for baby or other family members and insure that these cells are immediately available if ever needed.⁶ Cord blood preservation is still a new concept in India and a lot of people are unaware about this concept. Due to unawareness many people loss once in a life time opportunity to bio-insure their child's future. In India, there are approximately 72000 births daily, which results in discarding 72000 umbilical cords a day.³

Postnatal mothers are the primary decision-makers regarding placental stem cell banking. Their knowledge and perception directly influence the utilization of banking services. Nurses, being the key healthcare professionals involved in maternal and newborn care, have a vital role in educating mothers about stem cell banking and facilitating informed decision-making.

Therefore, the investigator felt the need to conduct a study on placental stem cell banking and its utilization among postnatal mothers to assess their knowledge, determine utilization patterns, and provide evidence for nursing interventions that can enhance awareness and informed decision-making.

STATEMENT OF THE PROBLEM

“A study to assess the effectiveness of Structured Teaching Programme on knowledge regarding Placental stem cells banking and its utilization among postnatal mothers of selected hospitals at Bareilly”.

OBJECTIVES OF THE STUDY

1. To assess the knowledge regarding Placental stem cells banking and its utilization among postnatal mothers of selected hospitals at Bareilly”.
2. To evaluate the effectiveness of structured teaching programme on knowledge regarding Placental stem cells banking and its utilization among postnatal mothers of selected hospitals at Bareilly”.
3. To find out the association between pretest knowledge scores regarding stem Placental stem cells banking and its utilization among postnatal mothers of selected hospitals at Bareilly” with their selected socio demographic variables.

HYPOTHESIS

1. **H1:** The mean post - test knowledge scores of postnatal mothers who have been exposed to structured teaching programme will be significantly higher than the mean pre-test knowledge scores at 0.05 level of significance.
2. **H2:** There will be statistical association between pre-test knowledge scores of postnatal mothers with their selected socio-demographic variables at 0.05 level of significance.

OPERATIONAL DEFINITION

1. **Effectiveness:** It refers to the extent to which the structured teaching programme has achieved the desired effect in improving the knowledge of postnatal mothers regarding Placental cell banking and its utilization.
2. **Structured teaching Programme:** It refers to a systematically organized teaching programme prepared by the investigator on placental cell banking and its utilization, with the use of A.V. Aids to enhance mothers awareness about placental stem cell banking and its utilization and its prevention.
3. **Knowledge:** In this study, knowledge refers to awareness of postnatal mothers regarding placental cell banking and its utilization.
4. **Placental stem cell banking:** In the present study, placental stem cell banking refers to the process of collecting, processing, cryopreserving, and storing stem cells obtained from the placenta and placental blood after childbirth for future therapeutic use.
5. **Utilization:** In this study, utilization refers to the actual use or acceptance of placental stem cell banking services by postnatal mothers for preserving stem cells after childbirth.
6. **Postnatal Mothers:** In this study Mothers who have delivered a live newborn and are within six weeks after childbirth and admitted to the selected hospital during the period of data collection.

CONCEPTUAL FRAMEWORK

The conceptual framework of the present study, the Health Belief Model (HBM) developed by Rosenstock (1974) is highly suitable because it explains how an individual's beliefs and perceptions influence health-related decisions and behaviors.

LITERATURE REVIEW

1. Literature related to knowledge regarding placental stem cell banking among mothers.

Nancy Shokeen et al. (2024) conducted a descriptive study among 100 women of reproductive age in Sharda Hospital, Greater Noida, to assess knowledge regarding umbilical cord blood banking. Convenience sampling was used. The findings revealed that 30% of women had poor knowledge, 63% had moderate knowledge, and only 7% had adequate knowledge regarding cord blood banking. Following data collection, informational pamphlets were distributed to improve awareness. The study concluded that although some women had heard about cord blood banking, comprehensive knowledge regarding collection, storage, and therapeutic applications was insufficient. Educational materials and awareness campaigns were recommended.⁴

2. Literature related to awareness, attitude, and perception toward stem cell banking among antenatal and postnatal mothers.

Anandgaonkar et al. (2024) conducted a cross-sectional study among 121 pregnant couples attending the antenatal outpatient department of a tertiary care hospital in Telangana, India, to assess awareness and attitudes toward umbilical cord blood banking. Stratified random sampling was used to select participants. The study revealed that only 28.1% (n=34) of participants had heard about umbilical cord blood banking, while only 11.5% possessed correct knowledge regarding its use. Awareness regarding public and private cord blood banks was extremely low (4.9%). Only 0.8% had previously stored cord blood, whereas 36.3% expressed willingness to store cord blood in the current pregnancy. About 62.8% considered cord blood banking useful. The researchers concluded that awareness and utilization of stem cell banking were inadequate among pregnant couples and recommended structured educational interventions by obstetricians and nurses to improve awareness and informed decision-making.⁵

3. Literature related to educational interventions regarding stem cell banking.

Ahmed and Ibrahim (2025) conducted a quasi-experimental study among 150 antenatal mothers to evaluate the effectiveness of a structured teaching programme on knowledge regarding placental

stem cell banking. The mean pre-test knowledge score was 8.42 ± 2.15 , which increased to 19.76 ± 3.12 after the educational intervention. The calculated paired t-value was statistically significant ($t = 18.72$, $p < 0.001$). The study demonstrated substantial improvement in knowledge regarding collection procedures, storage techniques, and future applications of stem cells. The authors concluded that educational programmes are highly effective in improving awareness among mothers.⁶

MATERIAL AND METHODS

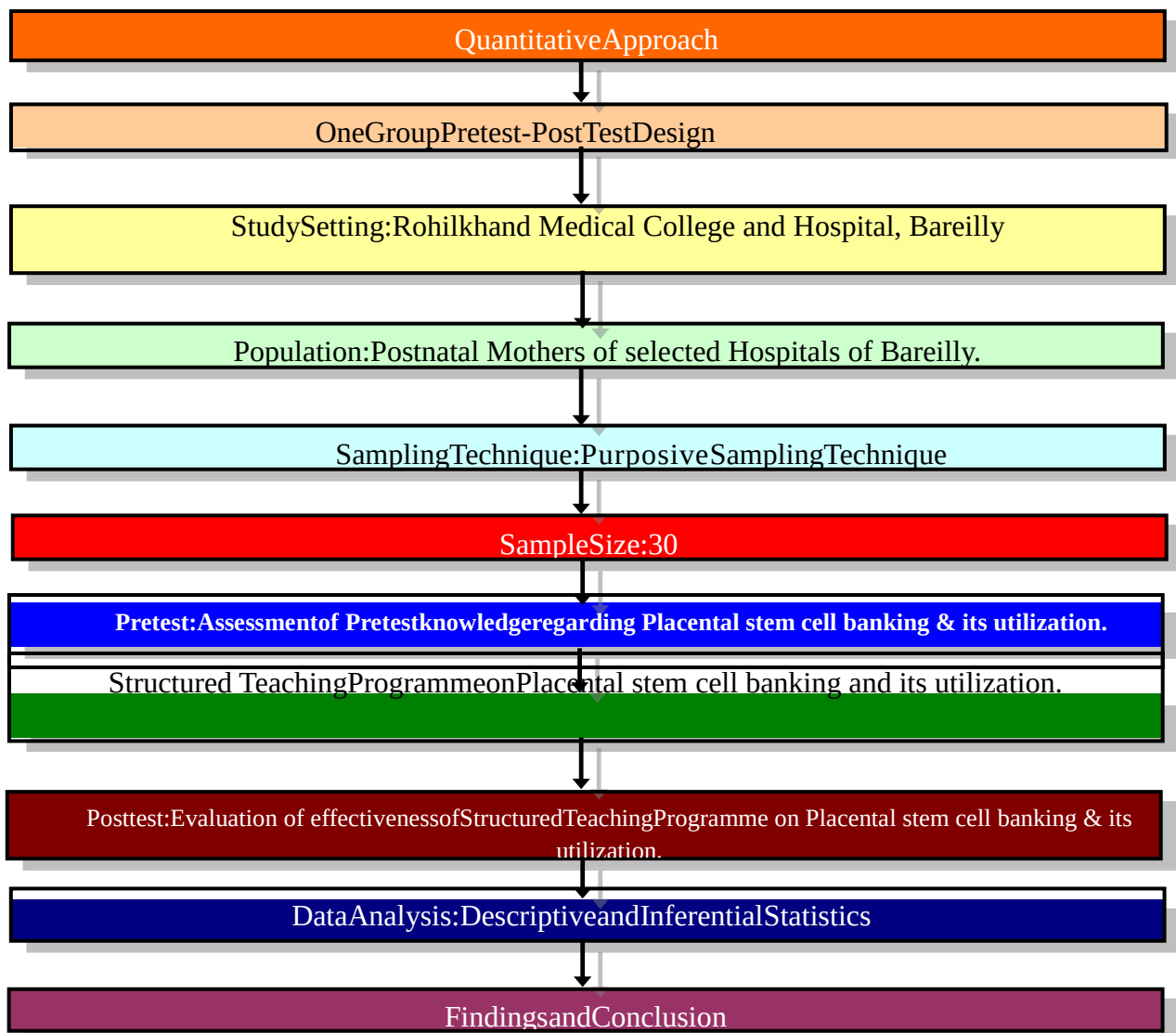


FIG. 1 :- Schematic Representation of Study

RESEARCH DESIGN

In present study pre-experimental research design one group pre-test post-test design was used.

RESEARCH SETTING

The study was conducted in selected hospital of Bareilly. The hospital were:

- For pilot study: RK Hospital, Bareilly
- For main study: Rohilkhand Medical College and Hospital, Bareilly U.P.

TARGET POPULATION

In present research study the target population consists of Postnatal Mothers.

SAMPLE SIZE AND SAMPLING TECHNIQUE

The sample size is 30 sample and the technique is Purposive sampling technique is used in this study.

TOOL

A structured questionnaire was developed on the basis of objectives of the study. Tool was developed after extensive review of literature from various text books, journals, internetsearchand discussion and guidance from the experts in the field of Nursing, and medical experts from the department of Obstetrics and Gynaecology and child health Nursing.

DATA COLLECTION

Before the data collection, the researcher introduced herself, explained the purpose of the study to the Postnatal mothers admitted at Rohilkhand Medical College and Hospital, Bareilly. The confidentiality was assured and consent was obtained from the participants.

Data collection was done using structured questionnaire method. In pretest the researcher administered structured questionnaire to each participant to assess the knowledge of Postnatal mothers on Placental Stem Cell Banking and Its Utilization. The subjects took 20-30 minutes to answer the questionnaire. After that a structured teaching programme was conducted on the same day approximately for 30 minutes. After that the researcher clarified many doubts asked by the participants regarding my study and also in general, according to the need of each participant. Then each participant was thanked and instructed to come on seventh day after the pretest. The researcher had given a reminder through phone on previous day.

Post test was conducted after one week by using the same questionnaire to find out the effectiveness of teaching programme. The data collection process was terminated after thanking the participants for their co-operation. After collecting the posttest questionnaire, every now and then, coding sheet were entered.

The data collection period was 4 weeks (1.05.2026 to 30.05.2026). Data was collected for 6 days in a week.

DATA ANALYSIS

The data obtained from the sample was analyzed by descriptive and inferential statistics.

RESULT

Section I: Distribution of sample characteristics according to demographic variables.

Table 1: Frequency and percentage distribution of Postnatal Mothers according to socio-demographic variables.

S. No.	Demographic variables	Frequency	Percentage (%)
1	Age in years		
	21-25 years	03	10%
	26-30 years	09	30%
	31-35years	06	20%
	36 years and above	12	40%
2	Parity		
	Primipara	00	00%
	Multipara	30	100%
3	Area of living		
	Urban	18	60%
	Rural	12	40%
4	Educational Qualification		
	10 th Passed	14	46.66%
	12 th Passed	12	40%
	Graduated and above	04	13.33%
5.	Source of information		
	Print media	03	10%
	Electronic media	06	20%
	Peer group & social group	06	20%
	Health professionals	15	50%
6.	Previous Knowledge		
	Yes	06	20%
	No	24	80%

Table reveals that:

- Maximum no. of Postnatal mothers 12(40%) were in the age group of 36 yrs and above, 9(30%) in 26-30 years, 6(20%) in 31-35 years, 3(10%) in the age group of 21-25 years.
- Maximum numbers of the Postnatal Mothers 30(100%) were multiparous and no mothers were Primipara.
- Maximum numbers of the Postnatal Mothers 18(60%) were living in Urban Area, and 12(40%) Postnatal Mothers were living in Rural Area.
- Maximum numbers of the Postnatal Mothers 14(46.66%) were X passed 12(40%) were 12th passed and 4(13.33%) were graduated and above.
- Maximum no. of Postnatal Mothers 15(50%) were having previous knowledge through Health Professional 6(20%) were having previous knowledge through Peer group and social groups, 6(20%) were having previous knowledge through electronic media, and 3(10%) were having previous knowledge through Print media.
- Maximum no. of Postnatal Mothers 24(80%) were having previous knowledge, 6(20%) were not having Previous Knowledge.

Section II: Assessment of pre-test knowledge& post-test knowledge regarding Placental cell banking and its utilization.

Table 2: Frequency and percentage distribution of pre -test and posttest level of knowledge of Postnatal Mothers.
N=30

Sl.no	Knowledge Level	Pre test		Post test	
		Knowledge	Frequency	Knowledge	Frequency
1	Good (15 and above)	03	10%	24	80%
2	Average (10-14)	09	30%	06	20%
3	Poor (Below 10)	18	60%	00	00

Table 4.2 show that distribution of level of knowledge regarding stem cells banking and its utilization among postnatal mothers during pre-test and post-test. Most of the subjects in the pre-test 18(60%) had poor knowledge, 9(30%) had average knowledge, and 3(10%) had good knowledge. In post-test, maximum no. of postnatal mothers 24(80%) had good knowledge, 6(20%) had average knowledge scores.

Section III: Comparison of pre-test and post-test knowledge scores to determine effectiveness of the Structured Teaching Programme.

Table3: Mean, Median, Mode, Standard Deviation and Range of knowledge scores of subjects regarding Placental stem cells banking and its utilization among Postnatal Mothers.N=30

Area of analysis	Mean	Median	Mode	Standard deviation	Range
Pre test	19.14	21	23	2.90	12
Post test	36.89	39	38	4.60	19
Difference	17.72	18	15	1.7	07

Table 3: reveals that the pre-test mean knowledge score was 19.14, median 21, mode 23, standard deviation 2.90, and range 12. Whereas the post-test, mean knowledge score was 36.89, median 39, mode 38, standard deviation 4.60 and range 19. The overall difference in mean knowledge score was 17.72, median 18, mode 15, standard deviation 1.7 and range 07. The findings of the table reveal that the mean knowledge scores of post-test (36.89) is higher than pre-test (19.14). There is mean difference of pre-test and post-test is 17.72. It means the knowledge score increased after structured teaching programme.

Section IV: Association between pre-test knowledge scores and selected demographic variables.

Table 4: Association Between pre-test knowledge scores of subjects and selected socio-demographic variables.

S. No.	Demographic Variable	Good	Average	Poor	Chi-Square		Df
					Cal	Tab	
1	Age in Year						
	21-25 years	00	01	02	13.23	12.59	6
	26-30 years	00	00	09			
	31-35 years	01	02	03			
	36 years and above	02	06	04			
2	Parity						
	Primipara	00	00	00	4.10	5.99	2
	Multipara	03	09	18			
3	Area of living						
	Urban	02	03	03	3.8	5.99	2
	Rural	01	06	15			
4	Educational qualification						
	10 th Passed	00	01	13	10.05	9.49	4
	12 th Passed	01	06	05			
	Graduated or above	02	02	00			
6	Sources of information						
	Print media	00	01	02	2.90	12.59	6
	Electronic media	00	01	05			
	Peer group & social group	01	01	04			
	Health professionals	02	06	07			
7.	Previous Knowledge						
	Yes	03	03	00	2.67	5.99	2
	No	00	06	18			

Table 4: reveals that there was association found between two variables, those were age of subject's & education of subjects. Hence H2 was accepted. Whereas in regards with remaining variables there was no association found.

DISCUSSION

Comparison of pre-test and post-test

The findings of the study revealed a marked improvement in the knowledge level of postnatal mothers following the implementation of the Structured Teaching Programme. The mean pre-test knowledge score was **19.14**, with a median of **21**, mode of **23**, standard deviation of **2.90**, and a range of **12**, indicating that the participants had limited knowledge regarding placental stem cell banking and its utilization before the

educational intervention. After the administration of the Structured Teaching Programme, the mean post-test knowledge score increased substantially to **36.89**, with a median of **39**, mode of **38**, standard deviation of **4.60**, and a range of **19**. The overall mean difference between the pre-test and post-test knowledge scores was **17.72**, with a median difference of **18**, mode of **15**, standard deviation of **1.70**, and a range of **7**.

The considerable increase in the post-test mean knowledge score clearly demonstrates that the Structured Teaching Programme was highly effective in improving the knowledge of postnatal mothers regarding placental stem cell banking and its utilization.

Association between pretest knowledge scores and socio-demographic variables.

The findings revealed that **age** and **educational qualification** had a statistically significant association with the pre-test knowledge level of postnatal mothers. The calculated Chi-square value for age was **13.23**, which was greater than the table value of **12.59** at **6 degrees of freedom**, indicating a statistically significant association. Similarly, the calculated Chi-square value for educational qualification was **10.05**, which exceeded the table value of **9.49** at **4 degrees of freedom**, indicating a significant association.

In contrast, **parity**, **area of living**, **sources of information**, and **previous knowledge** were not significantly associated with the pre-test knowledge level. The calculated Chi-square values for parity ($\chi^2 = 4.10$), area of living ($\chi^2 = 3.80$), sources of information ($\chi^2 = 2.90$), and previous knowledge ($\chi^2 = 2.67$) were all lower than their respective table values at the 0.05 level of significance. Therefore, these variables did not significantly influence the baseline knowledge of the postnatal mothers.

RECOMMENDATIONS

1. Similar studies may be conducted with a larger sample.
2. The study may be replicated in different settings.
3. Different teaching methods may be evaluated for effectiveness.
4. Awareness programmes on placental stem cell banking should be strengthened.
5. Further research may assess knowledge, attitude, and practice regarding placental stem cell banking.

SUMMARY

The primary aim of the present study is to evaluate the effectiveness of Structured teaching programme on the knowledge regarding Placental stem cells banking and its utilization among postnatal mothers and equip them with adequate knowledge to deal with the problem.

CONCLUSION

Based on the findings of the study, the following conclusions were drawn.

1. The overall pretest knowledge scores about Placental stem cell banking and its utilization was average.
2. Structured teaching programme was administered to the Postnatal Mothers.
3. Post test results showed the significant improvement in the level of knowledge regarding Placental stem cell banking and its utilization.

In conclusion, the present study established that the Structured Teaching Programme was an effective educational intervention for improving the knowledge of postnatal mothers regarding placental stem cell banking and its utilization. The statistically significant improvement in post-test knowledge scores confirms the effectiveness of the educational programme in achieving its objectives.

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