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Research Article

IMPROVE THE KNOWLEDGE AND ATTITUDE OF ANTENATAL MOTHERS REGARDING UMBILICAL CORD STEM CELL BANKING

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ABSTRACT

Introduction: Umbilical cord stem cell banking is still an emerging concept in India and lot of people are unaware about this concept. This important scientific breakthrough has the potential to revolutionize the practice of medicine and can in turn improve the quality of life.
Aim: To assess the effectiveness of information booklet on the knowledge and attitude of antenatal mothers regarding umbilical cord stem cell banking. **Materials and Methods:** Quasi Experimental Research Design was used.60 antenatal mothers, who met the inclusion criteria, were recruited by non probability purposive sampling technique. Data was collected using a semi- structured questionnaire and was analyzed by using inferential and descriptive statistics. Information booklet based on umbilical cord stem cell banking was given. Post assessment was carried after two weeks. **Results:**. Findings revealed that, in pretest, most of the antenatal mothers (75%) had average knowledge and (13%) had poor knowledge respectively. Whereas, 70% had neutral attitude regarding umbilical cord stem cell banking. After the intervention, 50% of the antenatal mothers had average knowledge and 50% of them had good knowledge. Majority of antenatal mothers (65%) had good attitude and 35% had neutral attitude towards umbilical cord stem cell banking. Paired t-test was done for assessing the effectiveness of information booklet on the knowledge and attitude of antenatal mothers. Average knowledge and attitude score increased after the post test and therefore, the null hypothesis was rejected. Information booklet was proved to be significantly effective in improving the knowledge of antenatal mothers regarding umbilical cord stem cell banking. Association of knowledge and attitude of antenatal mothers with selected demographic variables was assessed using Fishers Exact test. None of the demographic variable was found to have significant association with knowledge and attitude of antenatal mothers.

INTRODUCTION

India has a population of over one billion people with about 5% being able to afford the very best treatment, 25% in the middle class with increasing income and 70% who cannot afford a transplant unless aided by the government.[1] The rate of haemoglobinopathies in India is high with nearly 12,000 infants being born every year with a severe disorder. These numbers imply that every hour 1 child is born who will suffer with this genetic disorder. The carrier rate for β -thalassemia varies from 1-17 % in India with an average of 3.2 %. Which indicates that on an average 1 in every 25 Indians is a carrier of thalassemia.[2] This eventually, shoots up the demand of stem cell therapy which is one of the effective treatment option.

Stem cells are master cells that can form virtually any tissue in the human body. Hence, stem cell research is one of the most important and, at the same time, the most controversial topics of science and technology today. Stem-cell therapy is the use of stem cells to treat or prevent a disease or condition. For over 3 decades, bone marrow has been used to treat cancer patients. Amazingly, this is the only form of stem-cell therapy that is widely practiced.[3]. Although, stem cell therapy was initially developed as a rescue therapy for patients with cancer after high doses of chemotherapy and radiation, it has at present evolved into an adoptive immune therapy for malignancies and autoimmune disorders.

The introduction of peripheral blood stem cell and umbilical cord blood stem cells as an alternative to bone marrow have caused tremendous changes in the practice of hemopoietic stem cell transplantation.[3] According to the CIBMTR data, there has been a significant decrease in the use of bone marrow and increase in the use of peripheral blood and cord blood as the stem cell source for HSCT performed during 1997-2006 period for patients under the age of 20. [8]

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Cord blood, which is more advantageous than other sources of stem cells, can be obtained from all infant deliveries conducted under aseptic conditions. The collection of cord blood is primarily carried out immediately after birth by obstetricians, midwives and nurses who have expertise in this area. The cord blood collection is done after the delivery of the infant and does not cause any kind of injury to the infant or mother which is certainly a major concern of the common people. Several other benefits include easy collection and availability of cord blood stem cells, decreased transmission of diseases[5] and lower chances of rejection[6]. As a result of the potential use of cord blood for health problems that develop in the future, a need has arisen for the collection and storage of cord blood throughout the world as it holds promise for the treatment of many devastating diseases of humankind. This important scientific breakthrough has the potential to revolutionize the practice of medicine and can in turn improve the quality and length of life.

Objectives

1. To asses the knowledge of antenatal mothers regarding umbilical cord stem cell banking
2. To asses the attitude of antenatal mothers regarding umbilical cord stem cell banking
3. To asses the effectiveness of information booklet on the knowledge and attitude of antenatal mothers regarding umbilical cord stem cell banking
4. To find the association between selected demographic variables with the knowledge and attitude of antenatal mothers regarding umbilical cord stem cell banking

MATERIALS AND METHODS

Research Approach

Research approach used in this study was Quantitative Approach.

Research Design

Quasi Experimental Design was adopted to assess the knowledge and attitude of antenatal mothers regarding umbilical cord stem cell banking

Setting of the Study

The present study was undertaken in different hospitals of Pune City.

Population

Population for the present study were antenatal mothers.

Sample

The sample consisted of antenatal mothers above 28 weeks of pregnancy.

Sample Size

The total sample size of this study was 60.

Sampling Technique

Non probability purposive sampling technique was adopted.

Sampling Criteria

Inclusion Criteria

- Antenatal mothers in the last trimester (after 28 weeks).
- Antenatal mothers who have minimum education qualification up to higher secondary.
- Antenatal mothers who are present and are willing to participate in the study.
- Antenatal mothers who can read and write either English, Hindi or Marathi

Exclusion Criteria

- Antenatal mothers who refuse to participate in the study.
- Antenatal mothers who are before 28 weeks of pregnancy.
- Antenatal mothers who have undergone umbilical cord blood banking in the previous delivery.

Data Collection Tool

Semi-structured questionnaire was selected to determine the knowledge and attitude of the antenatal mothers. The tool was developed by the investigator, by appropriate search from the various related literature, books, journals, unpublished research studies and mass education and developed tool were validated by the subject experts and the guide.

Description of the Tool

A Semi-structured questionnaire was prepared which included 3 Sections:

- ***Section A:*** It includes the socio-demographic variables. It has been developed on the basis of the objectives of the study.
- ***Section B:*** It is a self-developed knowledge questionnaire consisting of 20 questions each containing 4 options and the subjects were asked to tick one correct answer for each question.
- ***Section C:*** This section consisted of statements assessing the attitude of antenatal mothers and consist of total of 15 questions.

Content Validity

Content validity of the tool was established by 13 experts from various fields of expertise.

Reliability

The reliability of the tool was established by using Split half technique and Correlation Coefficient. The reliability of the semi-structured questionnaire was found to be 0.95. Hence, the tool was found to be highly reliable.

Pilot Study

Pilot study was conducted on 10 subjects.

RESULTS

The collected data were analyzed organized and presented under the following sections.

- Section I - Description of samples (antenatal mothers) based on their personal characteristics
- Section II - Analysis of data related to the knowledge of antenatal mothers regarding umbilical cord stem cell banking

- Section III - Analysis of data related to the attitude of antenatal mothers regarding umbilical cord stem cell banking
- Section IV - Analysis of data related to the effectiveness of information booklet on the knowledge and attitude of antenatal mothers regarding umbilical cord stem cell banking
- Section V -Analysis of data related to the association between selected demographic variables and the knowledge and attitude of antenatal mothers regarding umbilical cord stem cell banking

Section I - Description of samples (antenatal mothers) based on their personal characteristics

Table 1 Description of samples (antenatal mothers) based on their personal characteristics

N=60

Demographic Variable	Frequency	%
	AGE	
18-25 Years	8	13.3%
26-30 Years	24	40.0%
31-35 Years	27	45.0%
Above 35 Years	1	1.7%
	Education Level	
Diploma	6	10.0%
Graduate	30	50.0%
Post-Graduate	24	40.0%
	Occupation Status	
Employed/ Full Time	38	63.3%
Employed/Part Time	4	6.7%
Homemaker	18	30.0%
	Family Income Per Month	
RS 10,000 –RS 30,000	17	28.3%
RS 30,000 – RS 60,000	27	45.0%
>RS 60,000	16	26.7%
	Gravida	
Primi	27	45.0%
Second	27	45.0%
Third And Above	6	10.0%
	Awareness About Umbilical Cord Stem Cell Banking	
YES	51	85.0%
NO	9	15.0%
	Source of Information	
Health Professionals	25	41.7%
Mass Media	22	36.7%
Family	2	3.3%
Others	**11**	18.3%

Section II Analysis of data related to the knowledge of antenatal mothers regarding umbilical cord stem cell banking

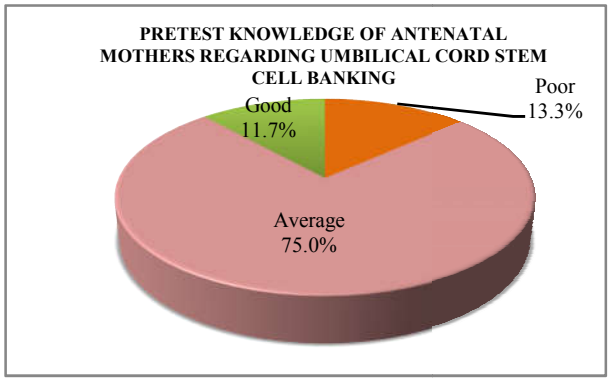


Fig 1 Pie Diagram Depicting Knowledge of Antenatal Mothers Regarding Umbilical Cord Stem Cell Banking

In pretest, 13.3% of the antenatal mothers had poor knowledge (score 0-6), 75% of them had average knowledge (score 7-13) and 11.7% of them had good knowledge (score 14-20) regarding umbilical cord stem cell banking.

Section III-Analysis of data related to the attitude of antenatal mothers regarding umbilical cord stem cell banking

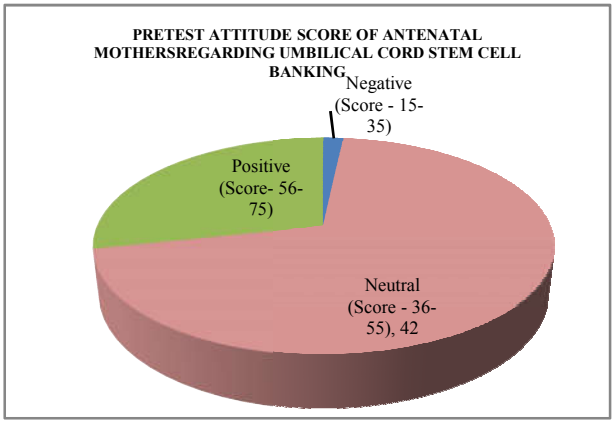


Fig 2 Pie Diagram Depicting Knowledge of Antenatal Mothers Regarding Umbilical Cord Stem Cell Banking

In pretest, 1.7% of the antenatal mothers had poor attitude (score 15-35), 70% of the antenatal mothers had average attitude (score 36-55) and 28.3% of them had good attitude (score 56-75) towards umbilical cord stem cell banking.

Section IV - Analysis of data related to the effectiveness of information booklet on the knowledge and attitude of antenatal mothers regarding umbilical cord stem cell banking

Table 2 The effectiveness of information booklet on the knowledge of antenatal mothers regarding umbilical cord stem cell banking

N=60

	Retest		Posttest	
	Freq	%	Freq	%
Poor (score 0-6)	8	13.3%	0	0.0%
Average (score 7-13)	45	75.0%	30	50.0%
Good (Score 14-20)	7	11.7%	30	50.0%

In pretest, 13.3% of the antenatal mothers had poor knowledge (score 0-6), 75% of them had average knowledge (score 7-13) and 11.7% of them had good knowledge (score 14-20) regarding umbilical cord stem cell banking. In posttest, 50% of the antenatal mothers had average knowledge (score 7-13) and 50% of them had good knowledge (score 14-20) regarding umbilical cord stem cell banking. This indicates that the knowledge of the antenatal mothers improved remarkably after implementation of information booklet.

Researcher applied paired t-test for the effectiveness of information booklet on the knowledge. Average knowledge score in pretest was 9.8 which increased to 13.8 in post-test. T-value for this test was found to be 13.7 with 59 degrees of freedom. Corresponding p-value was of the order of 0.000, which is small (less than 0.05), the null hypothesis is rejected. Thus, information booklet is proved to be significantly effective in improving the knowledge of antenatal mothers regarding umbilical cord stem cell banking.

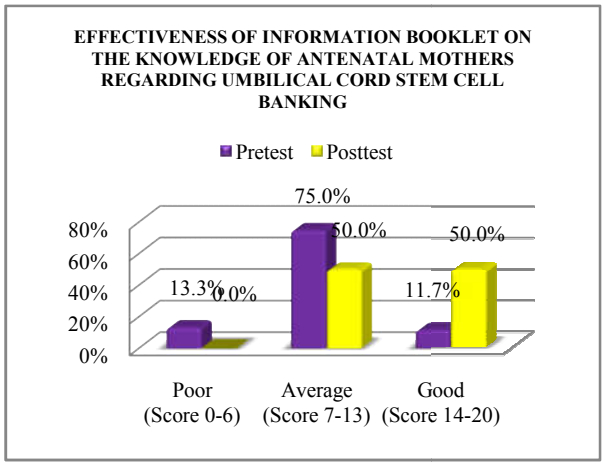


Fig. 3 Bar Diagram Showing The Effectiveness Of Information Booklet On The Knowledge Of Antenatal Mothers Regarding Umbilical Cord Stem Cell Banking

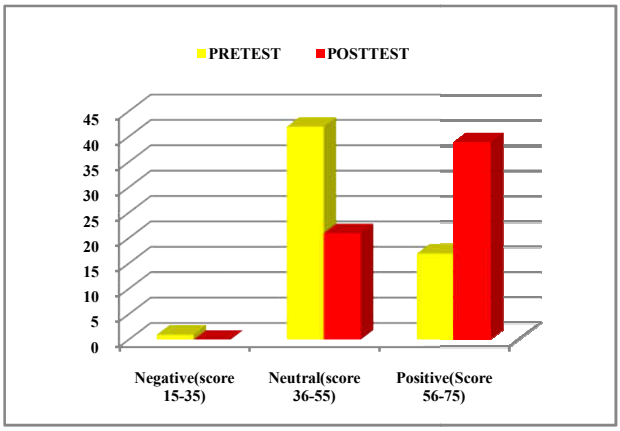
Table 3 The effectiveness of information booklet on the attitude of antenatal mothers regarding umbilical cord stem cell banking N=60

ATTITUDE	PRETEST		POSTTEST	
	Freq	%	Freq	%
Negative(score 15-35)	1	1.7%	0	0.0%
Neutral(score 36-55)	42	70.0%	21	35.0%
Positive(Score 56-75)	17	28.3%	39	65.0%

In pretest, 1.7% of the antenatal mothers had negative attitude (score 15-35), 70% of the antenatal mothers had neutral attitude (score 36-55) and 28.3% of them had positive attitude (score 56-75) towards umbilical cord stem cell banking.

In posttest, 35% of the antenatal mothers had neutral attitude (score 36-55) and 65% of them had positive attitude (score 56-75) towards umbilical cord stem cell banking. This indicates that the attitude of the antenatal mothers improved remarkably after implementation of information booklet.

Researcher applied paired t-test for the effectiveness of information booklet on the attitude. Average attitude score in pre-test was 51 which increased to 58.7 in post-test. T-value for this test was found to be 10 with 59 degrees of freedom. Corresponding p-value was of the order of 0.000, which is small (less than 0.05), the null hypothesis is rejected. Thus, information booklet is proved to be significantly effective in improving the attitude of antenatal mothers regarding umbilical cord stem cell banking



Section V -Analysis of data related to the association between selected demographic variables and the knowledge and attitude of antenatal mothers regarding umbilical cord stem cell banking

Table 4 Fisher's exact test for association between selected demographic variables and the knowledge of antenatal mothers regarding umbilical cord stem cell banking

Demographic variable		Average	Good	Poor	p-value
Age	18-25years	5	0	3	0.188
	26-30years	18	2	4	
	31-35years	21	5	1	
	Above 35 years	1	0	0	
Educational status	Diploma	4	1	1	0.586
	Graduate	23	2	5	
	Post - Graduate	18	4	2	
Occupational status	Employed/ Full time	30	4	4	0.650
	Homemaker	12	3	3	
	Part time	3	0	1	
Monthly family income	Rs 10,000 –Rs 30,000	12	1	4	0.531
	Rs 30,000 – Rs 60,000	22	3	2	
	>Rs 60,000	11	3	2	
Gravida	Primi	19	3	5	0.782
	Second	20	4	3	
	Third and above	6	0	0	
Awareness	Yes	38	6	7	1.000
	No	7	1	1	
Source of information	Health professionals	19	2	4	0.924
	Mass media	15	4	3	
	Others	9	1	1	
	Family	2	0	0	
Are there umbilical stem cell banks in Pune?	No	3	0	0	0.917
	Uncertain	12	3	2	
	Yes	30	4	6	
Interested to know more on UCB?	Yes	41	7	7	0.776
	No	4	0	1	

Table 5 Fisher's exact test for association between selected demographic variables and the attitude of antenatal mothers regarding umbilical cord stem cell banking

Demographic variable		Average	Good	Poor	p-value
Age	18-25years	7	1	0	0.310
	26-30years	13	10	1	
	31-35years	21	6	0	
	Above 35 years	1	0	0	
Educational status	Diploma	6	0	0	0.260
	Graduate	19	11	0	
	Post - Graduate	17	6	1	
Occupational status	Employed/ Full time	26	11	1	0.160
	Homemaker	15	3	0	
	Part time	1	3	0	
Monthly family income	Rs 10,000 –Rs 30,000	16	1	0	0.017
	Rs 30,000 – Rs 60,000	18	9	0	
	>Rs 60,000	8	7	1	
Gravida	Primi	20	6	1	0.680
	Second	18	9	0	
	Third and above	4	2	0	
Awareness	Yes	34	16	1	0.374
	No	8	1	0	
Source of information	Health professionals	17	8	0	0.733
	Mass media	15	6	1	
	Others	9	2	0	
	Family	1	1	0	
Are there umbilical stem cell banks in Pune?	No	1	2	0	0.129
	Uncertain	15	2	0	
	Yes	26	13	1	
Interested to know more on UCB?	Yes	38	16	1	1.000
	No	4	1	0	

Since all the p-values are large, none of the demographic variable was found to have significant association with knowledge of antenatal mothers regarding umbilical cord stem cell banking.

Since the p-value corresponding to monthly family income is small, monthly family income is the demographic variable which was found to have significant association with Attitude of antenatal mothers regarding umbilical cord stem cell banking.

DISSCUSSIONS

Umbilical cord blood is used as a source of hematopoietic stem cells for bone marrow transplantation in the treatment of malignant and non malignant disease. The study sought to examine pregnant women's knowledge and attitude regarding cord blood banking, as their support is crucial to the success of cord blood transplant programs. The present research was conducted to determine the effectiveness of information booklet on improving the knowledge and attitude of antenatal mothers.

The present study outlined that the average knowledge of antenatal mothers regarding umbilical cord stem cell banking was 9.8 which increased to 13.8 in posttest using the paired t - test. Since the p-value was small (less than 0.05), the null hypothesis is rejected. Information booklet was found to be significantly effective in improving the knowledge of antenatal mothers regarding umbilical cord stem cell banking.

In addition, the results of paired t-test showed average attitude score of antenatal mothers regarding umbilical cord stem cell banking was 51.0 which increased to 58.7 in posttest. T-value for this comparison was 10 with 59 degrees of freedom. This case indicated the effectiveness of information booklet on the attitude of antenatal mothers regarding umbilical cord stem cell banking.

A similar descriptive study was conducted to determine the level of awareness and perception of 254 antenatal mothers regarding umbilical cord stem cell banking in India with the help of an explorative questionnaire. Study results revealed that only 25.6% antenatal mothers had appropriate knowledge of umbilical cord stem cell banking whereas a large proportion (55.1%) was undecided on whether they want to bank umbilical cord blood or not. More than half of the pregnant women expected their obstetrician to inform them regarding umbilical cord stem cell banking and one third of the women had undue expectation from banking of umbilical cord blood. Thus the study concluded that obstetricians should play an active role in explaining the patients regarding pros and cons of umbilical cord blood banking.[20] The present study also had the similar findings to support.

A study was conducted to asses the knowledge of 100 antenatal mothers regarding collection and storage of umbilical cord stem cell banking attending antenatal opds in a selected hospital in Bangalore. The study results shows that most of the antenatal mothers (95%) had poor knowledge regarding collection and storage of umbilical cord stem cell banking. Hence, the study concluded with emphasis on the role of health care professionals in providing adequate information about umbilical cord stem cell banking during the mothers visit to the hospital.[30] The present study also had similar findings with respect to the knowledge and attitude of antenatal mothers regarding umbilical cord stem cell banking.

CONCLUSION

Information booklet given to the antenatal mothers had a positive effect on creating an awareness among antenatal women regarding umbilical cord stem cell banking. The present research can be regarded as a basis of future studies. Knowledge about umbilical cord stem cell banking is valuable. Health care providers, especially nurses, should pay close attention to this concept in planning for antenatal counseling sessions. Pregnant women should be provided with unbiased information about umbilical cord stem cell banking options including their benefits and limitations.

Health care professionals should be aware of current recommendations for education, counseling, obtaining informed consent, collection, and storage of umbilical cord blood. This is primarily important as health care personnel are a major source of disseminating information on umbilical cord stem cell banking.

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Conflict of Interest

The author does not have any conflict of interest.

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