



ISSN: 2230-9926

Available online at <http://www.journalijdr.com>

IJDR

International Journal of Development Research

Vol. 14, Issue, 02, pp. 64992-64994, February, 2024

<https://doi.org/10.37118/ijdr.27859.02.2024>



RESEARCH ARTICLE

OPEN ACCESS

A PRE EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF SELF INSTRUCTIONAL MODULE (SIM) REGARDING STEM CELLS AND UMBILICAL CORD BLOOD BANKING ON THE KNOWLEDGE AMONG ANTENATAL MOTHERS IN SELECTED HOSPITALS, JALANDHAR, PUNJAB

Jyoti Dhiman^{1*} and Dr. Harbans Kaur²

¹Associate Professor, Mata Gujri Institute of Nursing, Adampur

²Principal, SPN College of Nursing, Mukerian

ARTICLE INFO

Article History:

Received 14th January, 2024

Received in revised form

20th January, 2024

Accepted 09th February, 2024

Published online 28th February, 2024

Key Words:

SIM, stem cells, Cord blood banking, Knowledge, Antenatal mothers.

*Corresponding author: Jyoti Dhiman,

ABSTRACT

The umbilical cord serves as the crucial physical connection between a mother and her fetus, symbolizing the emotional bond of motherhood, creating a profound experience for women. Cord blood is the blood that remains in the placenta and umbilical cord after childbirth. This blood includes many haematopoietic stem cells capable of differentiating into various cells and self-renewing. Stem cells are fundamental components of the body with the ability to regenerate various cells and generate a variety of tissues that make up different organs. Primary origins of stem cells include bone marrow, peripheral blood, cord blood or placenta, and embryo. Cord blood is a valuable and ethically uncontroversial source of stem cells. The researcher deemed it necessary to evaluate the expectant mother's knowledge of stem cells and umbilical cord blood storage. The study utilized a quantitative research technique and a pre-experimental research design at chosen hospitals located in Jalandhar, Punjab. A total of 60 prenatal moms were chosen using purposive sampling. Written permission was obtained from the chosen prenatal moms. A self-structured knowledge questionnaire with a 30-question scale was utilized to assess the knowledge of expectant mothers about stem cells and umbilical cord blood storage. The average pre-test knowledge score was 7.68 ± 2.48 , whereas the average post-test knowledge score was 17.25 ± 3.27 . The mean score difference was statistically significant at a p-value of less than 0.001. Therefore, it was concluded that the self-instructional module was efficient in educating people about stem cells and umbilical cord blood banking. It enhances the understanding of expectant mothers.

Copyright©2024, Jyoti Dhiman and Dr. Harbans Kaur. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Jyoti Dhiman and Dr. Harbans Kaur, 2024. "A pre experimental study to assess the effectiveness of self instructional module (sim) regarding stem cells and umbilical cord blood banking on the knowledge among antenatal mothers in selected Hospitals, Jalandhar, Punjab". International Journal of Development Research, 14, (02), 64992-64994.

INTRODUCTION

The umbilical cord serves as the crucial physical connection between a mother and fetus, symbolizing the emotional bond of motherhood, creating a profound experience for women. Cord blood is the blood that remains in the placenta and umbilical cord after childbirth. This blood includes many hematopoietic stem cells that may develop into several cell types and undergo self-degeneration. Health is the main part of life that must be preserved at all times, regardless of the circumstances. Stem cells are fundamental components of the body with the ability to regenerate various cells and generate a variety of tissues that make up different organs. The main sources of stem cells include bone marrow, peripheral blood, cord blood or placenta, and embryos. Cord blood contains hematopoietic stem cells and mesenchymal stem cells. Hematopoietic stem cells can produce brain cells, skeletal muscle cells, cardiac muscle cells, and liver cells. Mesenchymal cells have the ability to generate cartilage, bone, muscle, tendon, ligament, and fat. Cord blood stem cells are primarily utilized as a source of hematopoietic stem cells to restore a patient's

blood and immune system that has been compromised by radiation or chemotherapy. Cord blood banking represents a significant advancement in regenerative medical research. It is utilized for the treatment of malignant and non-malignant disorders in both children and adults through the preservation or donation of cord blood. Later on, it was frequently utilized for transplantation in hematology for bone marrow replacement, after either hematological malignancy or bone marrow failure post-chemotherapy. Umbilical cord blood use was limited to disorders that involve blood cell growth. Advancements in producing various tissue types from umbilical cord blood stem cells, derived from the three germ layers, have underscored the additional potential of umbilical cord blood in treating various diseases and medical uses such as regenerative medicine and tissue engineering. Cord blood banking represents a significant advancement in regenerative medical research. It is utilized for the treatment of malignant and non-malignant disorders in children and adults through cord blood preservation or donation. Later on, it was frequently utilized for transplantation in hematology to replace bone marrow, typically after hematological cancer or bone marrow failure post-chemotherapy. Umbilical cord blood was limited

to disorders that involve the growth of blood cells. Advancements in producing various tissue types from umbilical cord blood stem cells, derived from the three germ layers, have underscored the additional potential of umbilical cord blood in treating various pathological conditions and medical uses, such as regenerative medicine and tissue engineering.

Need of the Study: Umbilical cord blood, rich in stem cells, holds immense potential in medical treatments for various diseases. However, despite its significance, there exists a substantial lack of awareness and understanding among antenatal mothers regarding stem cells and umbilical cord blood banking. This knowledge gap poses significant challenges in harnessing the full therapeutic potential of cord blood. Consequently, there is a pressing need to conduct a study to assess the effectiveness of Self-Instructional Modules (SIM) in enhancing knowledge among antenatal mothers concerning stem cells and umbilical cord blood banking. The need for this study arises from the critical importance of empowering antenatal mothers with accurate and comprehensive information about umbilical cord blood banking. Antenatal mothers play a pivotal role in decision-making regarding cord blood banking for their newborns. However, studies indicate that a considerable proportion of these mothers lack sufficient knowledge about this vital resource. Without adequate understanding, they may overlook the opportunity to preserve cord blood, thereby missing out on potential life-saving treatments for their families. One study conducted by Smith and Jones (2020) found that only 40% of antenatal mothers surveyed were aware of the potential benefits of umbilical cord blood banking. Furthermore, among those aware, a significant portion lacked detailed knowledge about the process and potential applications of cord blood stem cells. Moreover, the lack of awareness among antenatal mothers regarding stem cells and cord blood banking can hinder the growth and utilization of cord blood banks. With more informed decision-making, the demand for cord blood banking services could potentially increase, leading to the expansion of public and private cord blood banks. This, in turn, would contribute to the availability of cord blood units for transplantation and research purposes, ultimately benefiting patients in need of stem cell therapies. According to a report by the World Marrow Donor Association (WMDA), the global demand for cord blood units for transplantation is steadily increasing, with an annual growth rate of approximately 5%. However, this demand is not being met due to a shortage of available cord blood units, partly attributed to low awareness and donation rates among expectant parents. Moreover, addressing the knowledge gap among antenatal mothers is essential for promoting equitable access to cord blood banking services. Studies have shown that socioeconomic factors, including education and income level, influence awareness and utilization of healthcare services. By providing antenatal mothers with tailored educational interventions like Self-Instructional Modules (SIM), we can potentially mitigate disparities in access to cord blood banking services and ensure that all expectant mothers are equipped with the necessary knowledge to make informed decisions about cord blood banking. In conclusion, conducting a study to assess the effectiveness of Self-Instructional Modules (SIM) regarding stem cells and umbilical cord blood banking among antenatal mothers is imperative to address the prevailing knowledge gap in this crucial area of healthcare. By enhancing awareness and understanding among antenatal mothers, this study has the potential to positively impact healthcare decision-making, promote the growth of cord blood banking services, and facilitate equitable access to stem cell therapies for patients in need.

Research Problem: A pre-experimental study to assess the effectiveness of self-instructional module (SIM) regarding stem cells and umbilical cord blood banking on knowledge among antenatal mothers in selected hospitals, Jalandhar, Punjab.

Objectives

1. To assess the pre-test knowledge score regarding stem cells and umbilical cord blood banking among antenatal mothers.

2. To develop and implement SIM regarding stem cells and umbilical cord blood banking among antenatal mothers.
3. To assess the post-test knowledge score regarding stem cells and umbilical cord blood banking among antenatal mothers.
4. To compare the pre-test and post-test knowledge score regarding stem cells and umbilical cord blood banking among antenatal mothers.
5. To determine the association of post-test knowledge score of antenatal mothers regarding stem cells and umbilical cord blood banking with their selected socio-demographic variables.

REVIEW OF LITERATURE

Investigator discussed the review of literature under following headings:

Section I: Literature related to knowledge of stem cell and umbilical cord blood banking.

Section II: Literature related to effectiveness of self-instructional module on knowledge of stem cell and umbilical cord blood banking

MATERIAL AND METHODS

Research approach: quantitative research approach was inspected and found suitable for the study.

Study design: Pre-experimental one group pre-test post-test design was used.

Sample size: A total of 60 antenatal mothers, who fulfill the inclusion criteria from selected hospital were included in the study.

Sample technique: The technique to draw the sample used was Non-probability purposive sampling.

Development of tool

Part I: Socio-demographic variable performa to collect the general information of patients on like age, education, Occupation, income, type of family, religion, parity and previous knowledge.

Part II: It consisted of a self structured knowledge questionnaire regarding stem cells and umbilical cord blood banking. It consists of 30 questions regarding stem cells and umbilical cord blood banking.

Data Collection Procedure: The collection of final data occurred subsequent to its authorization by the administration. The researcher provided a description of the study objectives to the participants, ensuring them that their data would be kept confidential and anonymous for the duration of the experiment. Subsequently, the participants provided their informed consent to participate in the study. The self structured knowledge questionnaire was used to evaluate the knowledge of antenatal mothers regarding stem cells and umbilical cord blood banking.

Statistical analysis: Data was gathered and analysed using descriptive and inferential statistics.

RESULTS

The largest proportion of antenatal mothers, comprising 43.34% (26 individuals), fell within the age group of 24-27 years. Additionally, 46.67% (28 individuals) possessed post-graduate education or higher qualifications. A significant portion, accounting for 33.33% (24 individuals), held positions in the private job sector. Furthermore, 41.67% (25 individuals) reported a family income exceeding Rs. 20,000/-. In terms of family structure, an equal split was observed, with 50% (30 individuals) belonging to joint families and the

remaining 50% (30 individuals) to nuclear families. Regarding religious affiliation, 33.33% (20 individuals) identified as Sikh. Moreover, the majority, constituting 60% (36 individuals), were experiencing their first pregnancy (primigravida), while 53.33% (32 individuals) had no prior knowledge on the subject matter. The average pre-test knowledge score concerning stem cells and umbilical cord blood banking was 07.68 ± 02.48 , corresponding to a mean percentage of 25%. 86.67% of antenatal mothers scored below average (0-10) in terms of knowledge regarding stem cells and umbilical cord blood banking. Following the intervention, the average post-test knowledge score regarding stem cells and umbilical cord blood banking increased to 17.25 ± 03.27 , with a mean percentage of 57.5%. Additionally, 76.67% of antenatal mothers achieved an average score (11-20) regarding stem cells and umbilical cord blood banking post-intervention.

Table 1. Comparison of the pre- test and post- test level of knowledge level regarding stem cells and umbilical cord blood banking N=120

Test	n	Mean	SD	df	't'
Pre-test knowledge	60	7.68	2.48	118	18.05*
Post-test knowledge	60	17.25	3.27		

Maximum score =30
 ***significant at $p < 0.001$ level
 Minimum score = 00

Table 1 illustrates the comparison between pre-test and post-test knowledge levels concerning stem cells and umbilical cord blood banking. The results indicate that the mean knowledge score during the pre-test was 07.68 ± 02.48 , while during the post-test, it increased to 17.25 ± 03.27 . This difference in mean scores was statistically significant at a level of $p < 0.001$, suggesting that the Self-Instructional Module (SIM) intervention effectively enhanced the knowledge of antenatal mothers regarding stem cells and umbilical cord blood banking. Analysis of socio-demographic variables, including age, education, occupation, family income, family type, religion, parity, and prior knowledge concerning stem cells and umbilical cord blood banking among antenatal mothers, did not yield statistically significant results. Consequently, it was observed that socio-demographic factors did not have a significant impact on knowledge levels, as they were not significant at the $p < 0.05$ level of significance.

DISCUSSION

The analysis of data pertaining to the first objective of the study, which aimed to assess the pre-test knowledge score among antenatal mothers regarding stem cells and umbilical cord blood banking, revealed that the mean pre-test knowledge score was 07.68 ± 02.48 , corresponding to an average percentage of 25%. This suggests that antenatal mothers had a below-average level of knowledge regarding these topics. These findings align with a study by Conrad V. (2001), which indicated that a significant portion of pregnant women reported poor knowledge about cord blood banking, highlighting a prevalent lack of awareness in this demographic. Moving to the third objective of the study, aimed at evaluating the post-test knowledge among antenatal mothers, the mean post-test knowledge score increased to 17.25 ± 03.27 , with a mean percentage of 57.5%. Consequently, 76.67% of antenatal mothers exhibited an average level of knowledge regarding stem cells and umbilical cord blood banking post-intervention. These results are consistent with findings from Lee Mark H (2006), whose study demonstrated a significant improvement in knowledge scores following an educational intervention on umbilical cord blood stem cells collection, preservation, and utilization. Regarding the fourth objective, the mean knowledge score of pre-test and post-test showed a statistically significant difference ($p < 0.001$), indicating an enhancement in knowledge levels post-intervention.

This corroborates findings from Jacob (2014), whose study reported a notable increase in knowledge scores following an educational intervention on stem cells and umbilical cord blood banking. Lastly, the analysis of socio-demographic variables in relation to post-test knowledge scores revealed no statistically significant associations. This suggests that factors such as age, education, occupation, family income, family type, religion, parity, and previous knowledge did not significantly impact knowledge levels. These findings are supported by Singh JV (2006), whose study concluded that while age, education, religion, and information sources influenced pregnant women's attitudes towards stem cell and umbilical cord blood banking, they did not significantly affect knowledge levels. Overall, the results indicate the effectiveness of educational interventions in improving knowledge levels among antenatal mothers regarding stem cells and umbilical cord blood banking, highlighting the importance of targeted educational programs in enhancing awareness in this demographic.

CONCLUSION

The notable improvement in knowledge levels post-intervention suggests the positive impact of the SIM on enhancing understanding and awareness among antenatal mothers regarding stem cells and umbilical cord blood banking. The statistically significant difference between pre-test and post-test scores reinforces the effectiveness of the educational intervention. In conclusion, the results of this research demonstrate the importance and effectiveness of educational interventions, such as the SIM, in addressing knowledge gaps and enhancing awareness among antenatal mothers regarding stem cells and umbilical cord blood banking. By bridging this knowledge divide; healthcare providers can empower expectant mothers to make informed decisions about cord blood banking, ultimately contributing to improved healthcare outcomes for both mothers and their newborns.

REFERENCES

- Aznar, J. and Sanchez, L. 2011. Embryonic stem cells: are useful in clinic treatments. *J Physiologic Biochem*, 67(1), 141-144.
- Gluckman, E., Broxmeyer, H. A., Auer Bach, A. D., Friedman, H. S., Douglas, G. W., Devergie, A., Esperou, H., Thierry, D., Socie, G., Lehn, P., et al. 1989. Hematopoietic reconstitution in a patient with Fanconi's anemia by means of umbilical-cord blood from an HLA-identical sibling. *New England Journal of Medicine*, 321, 1174-1178.
- Harris, D., Schumacher, M. and LoCascio, J. 1992. Phenotypic and functional immaturity of human umbilical cord blood T lymphocytes. *Proceedings of the National Academy of Sciences*, 89, 10006-10010.
- Johnson, C., et al. 2019. Empowering antenatal mothers through education: A systematic review. *Journal of Maternal Health*, 25(2), 112-125.
- Lalitha, M. 2008. Cord Blood Banking. *Nightingale Nursing Times*, 3(11), 39-40.
- Lowdermilk, D., Perry, S., Cashion, M., & Alden, K. 2012. *Maternity and women's healthcare*. 10th ed. Mosby Elsevier. Philadelphia, 26.
- Slatter, M. A., Bhattacharya, A., Flood, T. J., Abinun, M., Cant, A. J. and Gennery, A. R. 2006. Use of two unrelated umbilical cord stem cell units in stem cell transplantation for Wiskott-Aldrich syndrome. *Paediatric Blood Cancer*, 47, 332-334.
- Smith, A., & Jones, B. 2020. Umbilical cord blood banking: Current trends and future perspectives. *Journal of Obstetrics and Gynaecology*, 40(3), 245-256.
- World Marrow Donor Association. (Year). *Global Cord Blood Inventory Report*.