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ASSESSMENT OF KNOWLEDGE REGARDING STEM CELL BANKING AMONG WOMEN

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ABSTRACT

Stem cell banking is a process of procuring precious stem cells from the human body, processing and storing them for potential future use in stem cell treatment. Stem cells are currently used in modern day medicine and can help to treat more than 80 medical conditions through replacement and repair approaches. Stem cells have the ability to self renew and differentiate into different cell types. Stem cell therapy has found application in the treatment of various diseases. The objectives of the study were to assess the level of knowledge regarding stem cell banking among women and to find out the association between knowledge of stem cell banking among women with selected demographic variables. The quantitative research approach was used for the study. A sample of one hundred and thirty women were selected using purposive sampling. The knowledge on stem cell banking was assessed using a self structured questionnaire. The present study revealed that, majority 66 (50.76%) of women selected hospital had poor knowledge and 64 (49.24%) had moderate knowledge regarding stem cell banking. The study reported that there was association between knowledge and socio-demographic variables such as level of education & previous knowledge and there was no association between knowledge and socio-demographic variables such as age of women, religion of women, area of residence, family income and occupation.

Keywords: Assess; Knowledge; Stem cell banking; Women.

INTRODUCTION

BACKGROUND OF THE STUDY

Stem cell banking is the process of procuring precious stem cells from the human body, processing and storing them for potential future use in stem cell treatment. Stem cells are currently used in modern day medicine and can help to treat more than 80 medical conditions through replacement and repair approaches. Stem cells have the ability to self renew and differentiate into different cell types. Stem cell therapy has found application in the treatment of various diseases.[1] The umbilical cord is the vital connection between the fetus and placenta during the antenatal period. The blood present in the umbilical cord contains a different variety of stem cells which serve as the building blocks. The damaged cells throughout the body can be replaced or repaired through these stem cells and can also be used to treat possible infections in future life.[2] A descriptive study was conducted to assess the level of knowledge regarding stem cell banking among 90 antenatal mothers in Max Super Specialty Hospital Dehradun (2022). The data was collected through a self-structured questionnaire. The results revealed that 64.4% antenatal mothers had poor knowledge and 35.6% had average knowledge.[3]

NEED OF THE STUDY

The ability of stem cells to self-renew and potential for generation of tissues that can possibly replace diseased and damaged areas in the body, with minimal risk of rejection and side effects.[4] As per World Health Organization's International Agency for Research on Cancer, India has third highest number of blood cancer patients in the world after the US and China. India's current capacity is suboptimal to meet the needs for India's population with an estimated incidence of 1000000 new cancer patients per year. Despite this large need, very few patients in India receive transplants, due to lack of matching stem cells for treatment and prohibitive costs in sourcing a stem cell unit.[5] According to WHO (2018), transplantation of stem cells that are done annually is estimated to be more than 50,000. It is said that transplantation is increasing at high rates. More than 90% of blood related disorders can be treated by transplantation of stem cells if it is carried out in the early period.[1] Today, more than 70% of the global cord blood market is controlled by the world's 12 largest cord blood banking operators. For both therapeutic and financial reasons, the cord blood industry

has been witnessing record levels of merger and acquisition (M&A) activity in recent years, with market leaders gaining market share at the expense of smaller competitors and investors vying for buy-in opportunities. Novel pricing strategies, product cross-sells and up cells, and ingenious online and offline marketing strategies are being implemented by the industry's market leaders. Meanwhile, new technologies to support ex vivo cord blood expansion are advancing at a brisk pace.[6] Despite the many benefits of stem cell obtained from umbilical cord blood, it was considered as a medical waste after delivery along with the placenta due to lack of knowledge about its benefits and negative attitude of mothers regarding cord stem cell collection. Certain misconceptions and confusions exist among mothers. Hence, it is important to have knowledge regarding stem cell banking among women.[6]

STATEMENT OF THE PROBLEM

A study to assess the knowledge regarding stem cell banking among women attending departments of selected hospital, Pathanamthitta.

OBJECTIVES OF THE STUDY

1. Assess the level of knowledge regarding stem cell banking among women.
2. Find out the association between knowledge of stem cell banking among women with selected demographic variables.

OPERATIONAL DEFINITIONS

1. Assessment - In this study, assessment refers to evaluation or estimation of the knowledge regarding stem cell banking among women.
2. Knowledge – In this study, knowledge refers to the response given by the women regarding stem cell banking assessed by structured knowledge questionnaire.
3. Stem cell banking – In this study, stem cell banking refers to the safe guarding of the cord blood for future treatments and therapies in a cord blood bank.
4. Women – In this study, women refers to females in the age group of 18 to 49 years.

ASSUMPTIONS

1. Health is a priority for most of the people.
2. People operate on the basis of cognitive information.

RESEARCH METHODOLOGY

Research methodology deals with defining the problem, formulation of hypothesis, methods adopted for data collection and statistical techniques used for analyzing the data.[7] The methodology of research indicates the general pattern of organization of procedure and for gathering valid and reliable data for investigation.[8] It includes research approach, research design, the setting and the population, the sample and the technique, development and description of tools, procedure of data collection and plan for data analysis.

RESEARCHER APPROACH

The research approach is the master plan specifying the methods and procedure for collecting and analyzing the needed information in a research study.[7]

The research approach used in the study was **Quantitative Research Approach**.

RESEARCH DESIGN

A research design is the framework or guide used for planning, implementation and analysis of a study. It is a systematic plan of what is to be done, how it will be done and how the data will be analyzed. It basically provides an outline of how the research will be carried and the methods that will be used.[7]

Research design is defined as the overall plan for addressing a research question include specification for enhancing the study's integrity.[7]

The research design adapted in the study was **Descriptive Research Design.**

3.1 POPULATION AND SAMPLE

The physical location and condition in which data collection takes place in a study is called setting.[7] Based on feasibility and familiarity, present study conducted among women attending departments of selected hospitals in Pathanamthitta district. The present study was conducted at MGM Muthoot Hospital, Kozhencherry, Pathanamthitta district, Kerala. The criteria for selection of study setting were availability of subjects and feasibility of conducting the study.

Population refers to the entire set of individuals or objects that possess specific characteristics that the researcher is interested in studying.[9] The population under the present study involves 130 women. Sample refers to the population that is selected to participate in a particular study.[9] In this study, the sample were women of age group 18-49 attending all departments of selected hospital in Pathanamthitta district.[10]

3.2 DATA AND SOURCES OF DATA

The data was obtained from 130 women who met the inclusion criteria. Data collection extended over a period of two weeks from 31-07-2023 to 12-08-2023. The sample were given the questionnaire which includes baseline proforma to collect the demographic data

and self-structured questionnaire to assess the knowledge regarding stem cell banking. It took 15-20 minutes to complete the questionnaire. Daily 15-20 samples were obtained.

3.3 STATISTICAL TOOL

The statistical tool are those tools by which statistical methods are applied.[11] Statistical tools help with data sorting, to identify and remedy issues with the quality of data through various data sorting methods. The most well known statistical tool are mean, median, mode, range, dispersion standard deviation, coefficient of variation etc.[12]

3.3.1 DESCRIPTIVE STATISTICS

Data analysis is a process of organizing and synthesizing data so as to answer research questions and test the Hypothesis.[13] Data analysis is planned based on the objectives of the study. After collection of data, data were organized and tabulated using descriptive and inferential statistics manually using MS Excel, 2007 version. Frequency and percentage distribution were used to analyze the selected socio demographic variables. Chi-square test was used to find out the association between the knowledge of stem cell banking with the socio demographic variables.

A chi-squared test (also chi-square or χ^2 test) is a statistical hypothesis test used in the analysis of contingency tables when the sample sizes are large. In simpler terms, this test is primarily used to examine whether two categorical variables (two dimensions of the contingency table) are independent in influencing the test statistic (values within the table). The test is valid when the test statistic is chi-squared distributed under the null hypothesis, specifically Pearson's chi-squared test and variants thereof. Pearson's chi-squared test is used to determine whether there is a statistically significant difference between the expected frequencies and the observed frequencies in one or more categories of a contingency table.[14] The chi-square statistic compares the size of any discrepancies between the expected results and the actual results, given the size of the sample and the number of variables in the relationship. For these tests, degrees of freedom are used to determine if a certain null hypothesis can be rejected based on the total number of variables and samples within the experiment. As with any statistic, the larger the sample size, the more reliable the results.[15]

Formula for Chi-Square

$$\chi^2_c = \frac{\Sigma(O_i - E_i)^2}{E^2}$$

where: c = Degrees of freedom; O = Observed value(s); E = Expected value(s)

RESULTS AND DISCUSSIONS

4.1 DISTRIBUTION OF SAMPLES ACCORDING TO SOCIO-DEMOGRAPHIC DATA

DEMOGRAPHIC VARIABLES		FREQUENCY (f)	PERCENTAGE (%)
(A) Age			
i)	18-25	30	23.07
ii)	26-33	41	31.54
iii)	34-41	34	26.16
iv)	42-49	25	19.23
(B) Religion			
i)	Christian	65	50
ii)	Hindus	51	39.24
iii)	Muslims	12	9.23
iv)	Others	2	1.53
(C) Area of residence			
i)	Urban	34	26.15
ii)	Rural	73	56.16
iii)	Semi-urban	23	17.69
(D) Family income in rupees			
i)	Below 5000	14	10.77
ii)	Between 5000- 10000	56	43.08
iii)	Between 10000-50000	45	34.60
iv)	Above 50000	15	11.53
(E) Level of education			
i)	Primary or Secondary education	8	6.16
ii)	Higher Secondary education	37	28.46
iii)	Diploma or Graduate	65	50

iv)	Post Graduate and above	20	15.38
(F)	Occupation		
i)	Homemaker	54	41.54
ii)	Govt. employee	14	10.77
iii)	Private employee	47	36.16
iv)	Self employed	13	10
v)	Daily wage workers	2	1.53
(G)	Previous knowledge		
i)	Yes	13	10
ii)	No	117	90

4.2 ASSESSMENT OF LEVEL OF KNOWLEDGE OF WOMEN REGARDING STEM CELL BANKING

The knowledge of women regarding stem cell banking was assessed among 130 women, majority 66(50.76%) women had poor knowledge and 64(49.24%) had moderate knowledge. Thus, there is a need to create awareness and organize campaigns to increase popularity of stem cell banking among women to avoid misconceptions and confusions. Hence, it is important to have knowledge regarding stem cell banking among women.

4.3 ASSOCIATION BETWEEN LEVEL OF KNOWLEDGE OF WOMEN WITH SOCIO-DEMOGRAPHIC VARIABLES

The chi- square value showed that the socio- demographic variables such as level of education (p value= 90.17) and previous knowledge (p value= 125.98) have significant association whereas socio-demographic variables such as age, religion, area of residence, family income and occupation had no association with level of knowledge regarding stem cell banking.

NURSING IMPLICATIONS

The findings of the present study generate some implications to the health care delivery system. It has implications in nursing practice, nursing administration, nursing education and nursing research.

NURSING PRACTICE

1. Nurses can increase the knowledge regarding stem cell banking among women and it helps them to take appropriate measures for improving the utilization of stem cell.
2. Greater understanding of benefits and uses of stem cell may facilitate prompt response and better utilization of these services.
3. Specific guidelines regarding proper collection and transfer of stem cells should be implemented among the staff nurses.
4. Health education should be provided to the nurses in clinical area for handling of umbilical cord stem cells.

NURSING ADMINISTRATION

1. Nurse administrator can use the study results as the baseline data to organise educational programmes regarding stem cell banking and its usage with outpatient departments and community setting.
2. Improve the knowledge level of staff nurses by conducting continuous nursing education programme.
3. Clinical nurse should prepare effectiveness of learning practices to provide information to the public.

NURSING EDUCATION

1. The nurse can also act as an educator by educating the women.
2. The knowledge level of women regarding stem cell banking and its usage should be improved by conducting webinar, orientation programmes and quiz competitions.
3. Nurses can conduct in-service education for the JPHN and Asha workers regarding stem cell banking and its usage in order to educate the women at their door step.
4. Community health nurse can take an active role in health awareness programme and conduct health education programme, health camp to educate women of reproductive age group regarding stem cell banking.

NURSING RESEARCH

1. The nurse researcher can work towards developing a tool to measure various dimensions in terms of knowledge, attitude and practice towards the utilization of stem cell.
2. There is a need for research in this area so that the strategies for educating women regarding the benefits of stem cells and its usage in future can be accomplished.
3. The tool used in the study can be standardised by conducting similar studies.

LIMITATIONS

1. Sample size was small, this limit the generalization of study.
2. The study was limited to women attending departments of specific hospital.
3. The study focused only on the knowledge aspect of stem cell banking.

RECOMMENDATIONS

1. Similar study can be conducted among large sample to generalize the findings.
2. Similar study can be conducted among different hospital settings.
3. Study can be carry out among community setting.
4. A qualitative study can be conducted to assess the attitude and practice regarding stem cell banking among women.

CONCLUSION OF THE STUDY

The aim of present study was to assess the knowledge regarding stem cell banking among women attending various departments in selected hospital, Pathanamthitta. Purposive sampling was used to select 130 women of selected hospital. The data collection was done using self-structured questionnaire. The collected data was analyzed by descriptive statistics, in forms of frequencies, percentage and inferential statistics using chi-square test. The analysis was done on the basis of objectives of the study. The findings of the study concluded that 66(50.76%) have poor knowledge and 64(49.24%) have moderate knowledge regarding stem cell banking. The women should be encouraged to enhance their knowledge on stem cell banking.

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