AN ASSESSMENT OF AWARENESS ON STEM CELL PRESERVATION AMONG THE PREGNANT WOMEN

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Abstract

The use of stem cells in medical treatment is growing in popularity because of its ability to regenerate and repair damaged organs and tissues. Even though stem cell therapies have a lot of promise for treating a variety of chronic illnesses, it's crucial that those who are thinking about getting stem cell treatments understand the risks involved. Additionally, new medications are tested using human stem cells. The study mainly aimed to know the awareness level of pregnant women on stem cells in Erode District. 110 pregnant women were chosen as sample through convenience sampling. Questionnaire was used to collect the information. Human pluripotent cell lines are used to generate differentiated cells used to test new medications for safety. This kind of application is well-established for other types of cell lines. Potential anti-tumor drugs, for instance, are screened using cancer cell lines. Drug testing on a larger variety of cell types would be possible with the availability of pluripotent stem cells. But when comparing different drugs, the conditions need to be the same for the screening process to be effective. Consequently, in order to test drugs on a particular cell type, scientists must be able to precisely control how stem cells differentiate.

Keywords: Stem cells, Organs, Tissues, Screening, Drugs.

Introduction

Human bodies are made of stem cells, which have the capacity to differentiate into any kind of cell. Adult stem cells and embryonic stem cells are the two primary categories of stem cells. Originating from embryos, embryonic stem cells possess the capacity to differentiate into any form of cell found in the human body. Adult stem cells can only differentiate into specific cell types and are only present in adults. An individual's age affects the quantity of stem cells in their body. The amount of stem cells in adults is lower than that in newborns. As we age, stem cells also undergo changes in composition. For a variety of reasons, stem cells are

essential to living things. The inner cells of the 3- to 5-day-old embryo, known as a blastocyst, give rise to every part of the organism, including all of the various organs and specialized cell types like the skin, heart, lung, sperm, eggs, and other tissues. Distinct populations of adult stem cells produce replacements for cells lost due to normal wear and tear, injury, or disease in some adult tissues, including the brain, muscle, and bone marrow. Investigation on stem cells advances our basic knowledge of how organisms grow and develop as well as how tissues are preserved throughout adulthood. This information is necessary to determine what causes illness and injury and, eventually, potential treatments for these conditions. A variety of human tissue-specific and embryonic stem cell lines will be developed, giving researchers the means to test medications, model disease, and create increasingly potent treatments. A promising application of stem cells in the treatment of disease is cell therapy, which is the replacement of unhealthy cells with healthy ones. This procedure is comparable to organ transplantation, but the replacement of cells takes place in place of organs.

Aim of the study

The present study aimed to awareness on stem cell preservation among the pregnant women in Erode District.

Need of the study

The human body contains unusual cells called stem cells that have the capacity to differentiate into a wide variety of cell types. Muscle, brain, nerve, and many other cell types can all be formed from stem cells. Because stem cells naturally proliferate and regenerate, they are incredibly valuable in medicine. It's safe to assume that some treatment approaches that use stem cells are quite effective, even though more research is necessary to fully realize the potential of these cells. In essence, stem cell therapy involves using stem cells to treat conditions in the human body brought on by malfunctioning or degenerating cells. The use of bone marrow-derived blood-forming stem cells to replace malfunctioning ones is one of the most commonly accepted forms of stem cell therapy. Patients with blood cancer have shown encouraging responses to this treatment approach. Hematopoietic stem cells are the only stem cells currently utilized in medical treatment. These are the adult stem cells that form blood cells that are present in bone marrow. In the bone marrow, stem cells give rise to all other types of blood cells. Stem cells are immature blood cells with the capacity to develop into other blood cells that fulfill specific functions.

Statement of the problem

Ethical and legal concerns are raised in addition to technical and medical ones when tissue from one person is taken for therapeutic use in another. Donors of cord blood are not just leaving behind the leftover byproducts of birth to be deposited with interested researchers and doctors; instead, they are choosing to take action that might help members of their own family or unidentified beneficiaries. Expectant mothers are inundated with information, some of it contradictory, regarding the process of organ donation and the effects of various banking options. It is important to tell the prospective donor about a number of things, such as where and how the cord blood is stored, and who can access it after it is donated. Since stem cell banking offers novel treatments and cures for a variety of diseases, it has the potential to completely transform the medical industry. Stem cell research raises ethical and financial questions, but it also has significant advantages for human health. For those looking to protect their own and their loved ones' health, stem cell banking is a wise investment.

Materials and methods

Wankhede and Laghate (2015) examined women's awareness and acceptance of cord blood stem cells in the Mumbai region. They also sought to understand the relationship between awareness and acceptance of stem cell banking, as well as the demographic profile of expectant mothers. Expectant mothers' awareness of stem cell storage in Mumbai city was found to vary based on their individual profiles. Environmental elements including doctors and gynaecologists, stem cell banks, and the government's sensitivity to stem cell storage banking also had a big impact. Furthermore, the expecting mothers' attitudes toward preventive healthcare also had a big impact on whether or not they accepted the storage of stem cells for their unborn child. This study used the survey method. This study used a well-designed questionnaire to collect the necessary responses on this topic from expecting mothers. The researchers used the Convenience Sampling method to select a sample size of 189 mothers in the Mumbai region. The collected sample data were analysed using statistical techniques such as bivariate statistical analysis, cross tabulation, and Chi-square analysis to investigate the relationship between variables. In their 2017 study, Philip and Devi attempted to determine the usefulness of an informational booklet on the attitudes and knowledge of pregnant women about the banking of umbilical cord stem cells. This research design was quasi-experimental in nature. According to the findings, the majority of pregnant women had average knowledge, while the least amount had poor knowledge. The average knowledge and attitude score

increased following the post-test, demonstrating the rejection of the null hypothesis in this study. Additionally, it was shown that the information booklet had a significant positive impact on antenatal mothers' understanding of umbilical cord stem cell banking. Peberdy et al. (2018) evaluated the parents' sources and preferred sources of information regarding stem cell use, private banking options, cord blood donation, and parent knowledge and awareness of these topics. Studies using mixed and qualitative methods were evaluated for the study's objectives. The validity and caliber of the studies that were part of the review were assessed in this study using the CASP tool. The authors discovered that parents were more aware of the options for cord blood banking than they were of the low knowledge they had regarding cord banking and/or donation. Furthermore, there was a lack of consensus regarding the uses of cord blood; many study participants were unable to correctly identify these uses. Furthermore, it was discovered that parents preferred to learn about cord blood banking from medical professionals.

The geographical area selected for the study is Erode District, purely based on convenience sampling. Questionnaire has been used for collection of data. This study is based on primary data and secondary data. The primary data was collected from a sample of 110 pregnant women. Multiple Regression Analysis was used for further analysis.

Results and Discussions

Multiple linear regression analysis is the most widely used kind of linear regression analysis. Multiple linear regression is a predictive analysis used to explain the relationship between one continuous dependent variable and two or more independent variables.

Hypothesis

The following hypothesis was framed.

Ho : There is no relationship between awareness of pregnant women towards stem cells and independent variables.

H_1 : There is a relationship between awareness of pregnant women towards stem cells and independent variables.

The relationship between awareness of stem cells and a few chosen independent variables is presented in this study. The study's model summary is provided below.

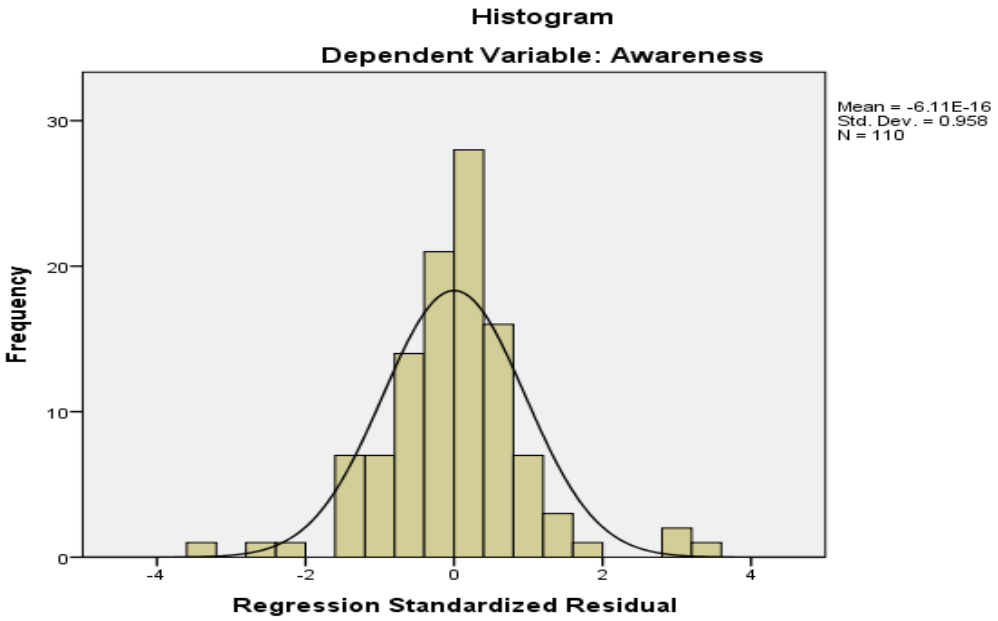
Table 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.826[a]	.683	.654	5.909

This method's primary objective is to calculate the dependent variable's uncertainty using its covariance with every independent variable. The measured Sample Regression Plane's (SRP) goodness-of-fit is evaluated using the R-square coefficient of determination, which expresses the percentage of variance in the dependent variables as defined by the fitted sample regression equation. It is renowned that R square value is 0.683 which shows that four variables such as family type, family size, education level and source of information are contributing 68% on the awareness of pregnant women towards stem cells and these are significantly associated at 1% and 5% level.

Chart 1



The above table shows the histogram chart of the study. The multiple regression analysis that presents the relationship between independent variables and pregnant women's awareness of stem cells is displayed in the following table.

Table 2
Multiple Regression Analysis

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.243	4.803		2.133	.035
	Age	-.523	.632	-.049	-.827	.410
	Family type	-2.792	1.218	-.139	-2.292	.024**
	Occupation	-1.102	.971	-.085	-1.135	.259
	Income level	-.603	.889	-.050	-.679	.499
	Family size	3.994	.938	.316	4.258	.000*
	Number of children	1.220	.626	.122	1.949	.054
	Education level	1.815	.497	.248	3.655	.000*
	Type of hospital for taking treatment	1.428	.739	.122	1.932	.056
	Source of information on stem cells	2.237	.451	.345	4.961	.000*

*- Significant at 1% level: ** - Significant at 5% level

It is divulged that the variables such as family size, number of children, education level, type of hospital for taking treatment, and source of information on stem cells are positively associated with the awareness of pregnant women's awareness of stem cells. The velocity of raising the level of awareness pregnant women's awareness of stem cells shows better results of the key indicators of financial performance such as family size with 3.994 units change, with 1.220 units change in number of children, with 1.815 units change in educational level, with 1.428 units change in type of hospital for taking treatment, and with 2.237 units change in Source of information on stem cells.

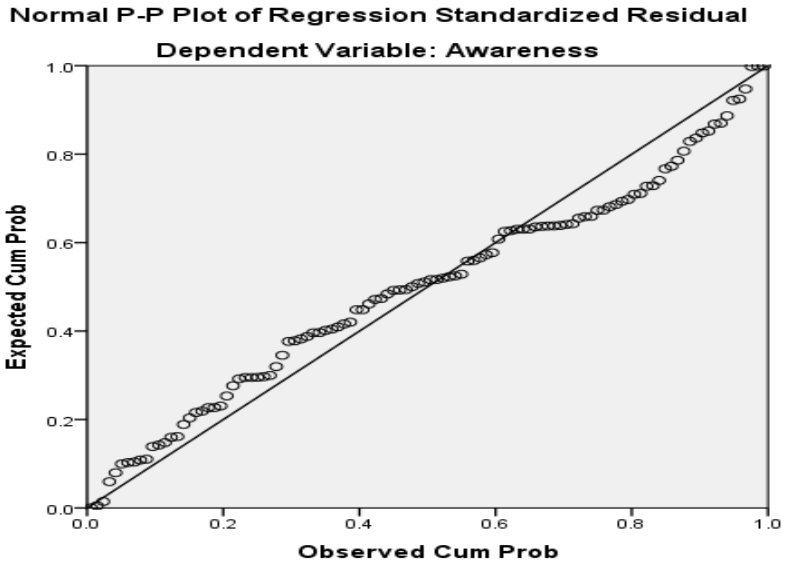
Table 3

ANOVA						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	7514.023	9	834.891	23.913	.000[b]
	Residual	3491.441	100	34.914		
	Total	11005.464	109			
a. Dependent Variable: Awareness of investors						

The variables in the Anova table have a F Value of 23.913 and a corresponding F test probability of less than or equal to 0.05. As a result, the study is perfectly suited to determine

the relationship between the chosen variables, and the F value is significant at the 1% level. The Normal P-P plot of the regression standardized residual is displayed in the following figure.

Chart 2



It is found from the study that R square value is 0.683 which shows that four variables such as family type, family size, education level and source of information are contributing 68% on the awareness of pregnant women towards stem cells and these are significantly associated at 1% and 5% level. At the same time, the variables such as the variables such as family size, number of children, education level, type of hospital for taking treatment, and source of information on stem cells are positively associated with the awareness of pregnant women's awareness of stem cells.

Recommendations and conclusion

For many cancerous and non-cancerous life-threatening illnesses, stem cell transplantation (SCT) is a life-saving treatment. Although previously believed to be a waste product, umbilical cord blood (UCB) is now valued. It is a valuable source of stem cells for the hematopoietic system. The process of replacing sick or damaged cells with healthy ones is known as a stem cell transplant. The ability of stem cells to both self-renew and initiate one or more differentiation programs is unique. The potential of stem cells for regenerative medicine has spurred recent research, despite the fact that cell replacement therapy is still a way off. The

current study's findings indicated that although the majority of pregnant women have faith in stem cell transplants and banking, there are still significant financial barriers. Given that UCB cells have been demonstrated to possess special traits and promise, UCB banks may significantly expand the range of clinical applications for these cells. The future of modern medicine lies in stem cell therapy and regenerative medicine. They may eventually replace stem cell therapy as the standard of care for illnesses for which it is the only effective treatment. Regenerative medicine is about to undergo a revolution thanks to cost-cutting measures like providing the therapy at a subsidized rate. At the outset, Government and health care hospitals should conduct awareness program among the pregnant women in particular among the rural women to know about stem cells and its applications.

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