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Research Article

Impact of Educational Intervention for Enriching Awareness on Menstrual Blood Banking and Menstrual Stem Cell Therapy

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Abstract

Introduction: With the whole world sealing under the shadow of many incurable and debilitating diseases, if there is some chance of helping in the treatment of these life-threatening medical conditions, then all sorts of new Possibilities may unfold in our life-times. One such possible way of improving the quality and perhaps even the duration of life is through the collection of potentially life-impacting stem cells found in the menstrual blood of common. The main aim of the study is to evaluate the effectiveness of the educational intervention on menstrual stem cell therapy among nursing students.

Materials and Methods: A pre-experimental study with one group pretest and post-test design was conducted in October 2017 from 50 nursing students. Data were collected by using convenient sampling technique. Keeping the objectives in mind the questionnaire was prepared to obtain information on demographic variables, menstrual stem cell storage method uses and menstrual stem cell therapy. Socio-demographic profile was used to assess the personal information of the subjects and self-structured questionnaire to assess the knowledge of nursing students regarding menstrual blood Banking. Data were analyzed using Statistical Package Social Software 20.0.

Results: Results of the study revealed that according to pre-test knowledge, the majority (60%) of nursing students had inadequate knowledge, 40% of them had moderate knowledge, and none of them had adequate knowledge. In post-test 52% had moderate and46% had adequate knowledge. On comparing, mean post-test knowledge score was more than pre-test knowledge score which was calculated by t-test ($t = 15.52$) at $p < 0.05$ level of significance which is indicated there was an improvement in knowledge regarding menstrual blood banking.

Conclusion: Educational intervention was effective to enhance the knowledge of nursing students regarding menstrual blood stem cells banking.

Keywords: *Menstrual Blood Banking; Menstrual Stem Cell Therapy; Educational Intervention*

Introduction

The whole world is sticking down the shadow of many untreatable and debilitating diseases. Emerging new technology is hunting for some chance of helping in the treatment of these life-threatening medical conditions. One such possible way of improving the quality and perhaps even the duration of life is through the collection of potentially life-impacting stem cells found in the menstrual blood of common

[1]. Cell-based therapies are promising treatment and are on the emerging paradigm in the treatment of many diseases and also replaces many other therapies [2]. Stem cells are repair units of the body that serve a central function in the maintenance and regeneration of organs and tissues throughout an organism's lifetime. Their main function is to replenish dying cells and regenerate damaged tissues [3].

There is a misconception about menstruation that is menstrual blood as unwanted and unsanitary waste. It is simply nothing, monthly disturbance to all women so they have been discarding. However, many research studies found that menstrual blood is a rich source of stem cells that can multiply and differentiate into any kind of cells. The abundance and plasticity of menstrual stem cells have a potential role in regenerative transplantation therapies for many different organs and tissues. Stem cells could be harvested from menstrual blood making it possible for all the women including those who have never given birth to preserve stem cells for themselves.

Menstrual blood banking enables women to store their menstrual blood under required conditions and preserve it for the future. These banks charge a minimal annual fee for storage and preservation and allow women to have lifelong benefits from them [4]. Stem cells in menstrual blood are highly proliferative and possess the unique ability to develop into various other types of healthy cells. During a women's menstrual cycle, these valuable stem cells are discarded but these stem cells for emerging cellular therapies that hold the promise of potentially treating life-threatening diseases [5]. However, now with the revolutionary discovery of menstrual blood stem cells therapy there is an innovative new service named (CELLESM), that empower women to collect and cryo-preserve stem cells harvested from their own menstrual fluid for future potential medical and cosmeceutical therapies [5]. The CELLE menstrual stem cell comes from the uterine lining (endometrium) that is shed as part of a women's menstrual cycle. They are unique since these cells have characteristics similar to both bone marrow and embryonic stem cells [1]. So, these stem cells hold promise for future use in clinical regenerative medical therapies. But new researches show that menstrual fluid contains self- renewing stem cells that can be collected, processed and cryopreserved for future cellular treatment therapies.

Menstrual Blood Banking enables women to store their menstrual blood under required conditions and preserve it for the future. These banks charge a minimal annual fee for storage and preservation and allow you to have lifelong benefits from them [4]. Although Menstrual Blood banking is still new and a lot of research is still going on menstrual blood, if its benefits are utilized, it can prove to be very beneficial for all women who want to give themselves the gift of good health. The process for collection of menstrual blood is simple; like a tampon, a silicone cup is inserted in the vagina on the day of the heaviest flow. The cup needs to be placed inside the vagina for at least three hours to collect approximately 20 milliliters of blood. This is then poured in the collection kit and is sent back to the menstrual blood bank laboratory where it is processed, frozen and stored. What makes this method user-friendly is that it is completely painless and non-invasive. Also, any woman who wants to preserve stem cells for the future can do so without having to wait for the delivery of a baby [2]. It is important to note that menstrual stem cells retain embryonic stem cell markers, giving them the remarkable potential to morph into many different healthy cell types. The unique properties of these cells demonstrate the exciting possibilities they offer in future therapeutic applications. Currently, they are being studied to treat stroke, heart disease, diabetes, neurodegenerative diseases and ischemic wounds in pre-clinical and clinical models.

Menstrual stem cells have the potential to differentiate into possibly every other cell type in the human body. Although the menstrual stem cell technology has not yet been utilized to date in human therapies, the collective body of ongoing research may potentially change the type of therapies, and to diagnose or treat a host of significant medical conditions in the future affecting hundreds of millions worldwide like Alzheimer's disease, atherosclerosis, diabetes mellitus, heart disease, inflammatory bowel disease, Parkinson's disease, rheumatoid arthritis, and many others. The goal of mesenchymal cell therapy is to treat the disease of non-hematopoietic tissue in an analogous fashion to treating leukemia with hematopoietic stem cell transplantation [7]. An experimental study was conducted to find the effectiveness of Mesenchymal Stem Cells in Multiple Sclerosis to evaluate putative neuroprotective therapies in progressive MS (Multiple sclerosis). The result revealed that mesenchymal stem cells were successfully isolated, expanded and characterized *in vitro* for all

participants in the treatment [8]. A research study was conducted on menstrual blood as a source for regenerative medicine. Menstrual blood-derived cells have the high replicative ability, similar to stem cells and differentiate into myocytes *in-vitro* at unexpectedly high frequencies. Results revealed that endometrial cells supplied as a form of menstrual blood tissue mixture which can be used for cell-based therapy in addition to a place for embryo implantation [9]. Thus the potential for stem cell for the future is immense.

Hence nurses need to develop their knowledge regarding menstrual stem cells, importance and all. „Nurses must be a knowledge worker who can analyze and synthesize date". The nursing students need to educated about (menstrual stem cell therapy) because of the complexity of patient care, advances in technology and patients with chronic illness who are living longer and need more specialized and sophisticated care. There is a need for highly skilled nurses in clinical practice.

Materials and Methods

Design

A pre-experimental study with one group pre and post-test design is focused on investigating the effectiveness of an educational intervention on menstrual stem cell therapy knowledge level of undergraduate nursing students in selected nursing college towards storage, uses stem cell application.

Sampling and participants

This study used a random sampling method to draw a representative sample from a study population using a lottery method. 10 samples were drawn from each year In this study, a total of 50 respondents were randomly chosen from the population for analysis.

Instrument development

The self-administered instrumentation tool used in this research study was a self-developed questionnaire formulated by the researcher based on the literature reviewed regarding menstrual stem cell therapy and method of storage, uses among health care professionals that particularly focus and/or reflected on the knowledge.

Validity and reliability of the instrument

To validate the accuracy and reliability of the instrument developed by the researcher in this study, the instrument content was reviewed and validated by an expert panel followed by a pilot study. Results from the pilot study showed the Cronbach alpha of 0.67 for the questionnaire. By doing so, it was able to demonstrate the validity and reliability scores of the instrument.

Ethical consideration

The approval to conduct this study was obtained from the IEC of our institution. The guidelines stated in the IEC were completely followed before conducting this study. Before taking part in the study, all respondents were asked to sign on a written consent form confirming their willingness to participate. They were also explained about the purpose and objective of the study by the researcher. This research provided autonomy, allowing respondents the freedom to decide whether to participate and give information. All respondents of the study were assured that confidentiality would be maintained.

Data collection

Once the ethical approval was obtained from the IEC data collection resumed as the next stage of study using structured questionnaires with the participants. Each respondent was explained the purpose of the study and rapport was established, then the informed written consent was obtained from the samples. The researcher had passed the questionnaire, information sheet, and consent form to the respondents, and they were given approximately 15 - 20 minutes to complete the questionnaire. Upon completion, the researcher collected the questionnaire.

The questionnaire consists of 2 parts.

Socio-demographic profile

This Part consists of items for obtaining personal information of the subjects such as age (in years), religion, marital status, place of living, occupation, education years, and the highest level of education. Part B was the Self structural questionnaire that has 25 multiple choice questions regarding knowledge of menstrual stem cells including the definition of menstrual stem cells, collection, storage, and therapy. Each item of the questions holds one correct answer If the subjects answered the correct answer '1' mark was awarded to each and for the wrong answer zero '0' mark was awarded. So, the total scores were 25 out of which interpretation was made.

Data analysis and scoring measurements

Data were entered and analyzed using the Statistical Package Social Sciences (SPSS) software program version 20.0. Demographic data were analyzed and reported with descriptive statistics using number and percentage. The numbers of correct answers for each question were quantified in percentages. The knowledge score obtained was categorized into 3 levels: Inadequate 1 - 10, Moderate 11 - 17, Adequate 18 - 25. To evaluate the effectiveness of the intervention paired t-test was used.

Results

A total of 50 completed questionnaires were received from undergraduate nursing students in table 1 shows the demographic characteristics of undergraduate nursing students. The majority of the nursing students were undergoing 30 (60%) Bsc Nursing Programme and 20 (40%) students were PBBSc Nursing students.

Score	Pre test		Post test	
	F	%	F	%
Inadequate (1 - 10)	30	60	3	6
Moderate (11 - 17)	19	38	26	52
Adequate (18 - 25)	1	2	12	42

Table 1: *Frequency and percentage distribution pre and post test knowledge on Menstrual blood bank (N = 50).*

Table 1 and figure 1 depicts the frequency and percentage distribution of nursing students according to pre-test knowledge and post-test knowledge on menstrual blood banking. In the pre-test majority of nursing students, 30 (60%) had inadequate knowledge, followed by 19 (38%) had moderate knowledge whereas the remaining 1 (2%) had below adequate knowledge regarding menstrual blood cell banking. But in the post-test, after the intervention Majority, 26 (52%) of the participants had Moderate and 12 (42%) of them were obtained adequate Knowledge.

The above table 2 shows that there is a significant difference between pre and post-test knowledge score on Menstrual blood banking. The pre-test mean was 58.63 with a SD of 7.33 whereas the post-test mean knowledge score was 74.4 with SD of 4.3 and the obtained t value was 13.174 which is higher than the table value which indicates there is an increased knowledge score on Menstrual blood banking after the educational package.

Discussion

The present study reveals that the educational package was significantly effective in improving knowledge. The mean post-test knowledge score significantly higher than the mean pretest score. These findings are consistent with the study conducted on the effectiveness of a structured teaching program on knowledge regarding menstrual blood stem cell banking among nursing students by Neelam and Sandeep Kaur [6]. Making aware of particular aspect that is on menstrual blood banking through educational package is an effective source for health care professionals especially for the nurses to implement and educate others as well.

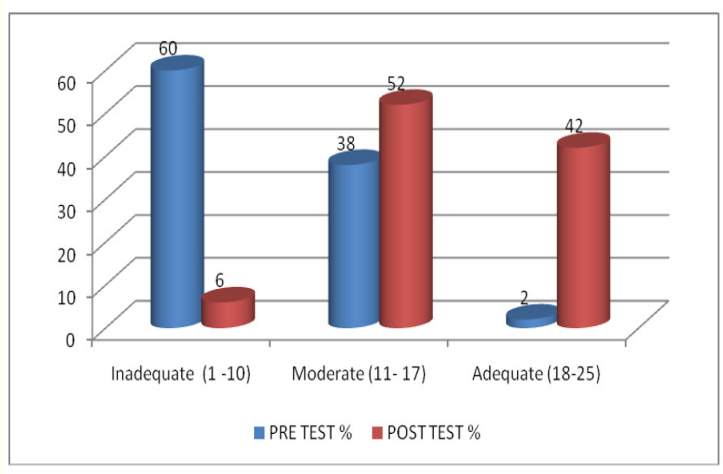

Figure 1: *Frequency and percentage distribution according to pre-test knowledge and post test knowledge on menstrual blood banking.*

S. No	Variable	Maximum	Pre test		Post test		t value
			Mean	SD	Mean	SD	
1	Knowledge	25	58.63	7.33	74.4	4.3	13.174*

Table 2: *Effectiveness of educational package on knowledge regarding menstrual blood banking (N = 50). P < 0.05 significant.*

Conclusion

Imparting knowledge of Menstrual Blood banking is deemed important in nursing. Particularly for undergraduate nursing students who are the future nurses. And they very soon have the responsibility to publicize a recent trend in the medical field to other public as an advocator and teacher, and as a healthcare provider. This present study may be an eye-opener to promote knowledge on menstrual blood banking. Thus, helps to create an awareness of its application in the medical field and update up to date information regarding menstrual blood banking among nursing students. Adequate knowledge will empower future nurses to gain more knowledge, thus, would directly make an impact on the quality of life of many patients

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Conflict of Interest

No conflict of interest.

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