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Original Research Article

Assessment of the effectiveness of computer assisted teaching programme on knowledge regarding menstrual blood banking among B.Sc. nursing students at SRM College of Nursing, Kattankulathur, Chengalpet District

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ABSTRACT

Background: Stem cells in menstrual blood have regenerative capabilities as the stem cells in umbilical cord blood and bone marrow. Cryo – cell patent – pending menstrual stem cells service offers women in their reproductive years the ability to store and preserve these cells for potential controversy. Cryo–cell is the only bank in the world that can offer women the reassurance and peace of mind that comes with the opportunity. The objective of the study was to determine the effectiveness of computer assisted teaching programme on knowledge regarding menstrual blood banking among BSc Nursing students in study group.
Method: The research approach was Quantitative approach. The research design adopted for the study was quasi experimental research design. The sample size was 302 BSc Nursing students in which 151 in study group and 151 in control group. The samples were selected by non-probability convenient sampling technique at SRM College of Nursing, Kattankulathur 30 samples per day were selected and conducted pretest on the same day, Computer assisted teaching were provided on menstrual blood banking for 15 minutes and post test was conducted on 7th day. The data was collected from the sample were tabulated and analysed and interpreted using both descriptive and inferential statistical method.
Result: The p value is less than 0.01 and is highly significant at 1% level.
Conclusion: Therefore, we can conclude that the knowledge level was increased in study group due to computer assisted teaching programme and it was effective in improving the knowledge of BSc Nursing students regarding menstrual blood banking.

Keywords: Computer assisted teaching, Menstrual blood banking, Knowledge

INTRODUCTION

Till date women have been discarding menstrual blood as an unwanted and unsanitary waste.[1] A new research has found that menstrual blood is a rich source of stem cells that have the ability to multiply and differentiate into any kind of cells. The discovery of stem cells in the menstrual blood has given a new meaning to menstruation for women who earlier considered menstruation as nothing but a painful and necessary evil. Stem cells have the unique quality of differentiating into any type of cell.[2] As these cells are immunologically immature in nature, they are able to contribute successfully in the cell survival after a transplant.[3] Stem cells in menstrual blood have similar regenerative capabilities as the stem cells in umbilical cord

blood and bone marrow. Cryo-Cell's patent-pending menstrual stem cell service offers women in their reproductive years the ability to store and preserve these cells for potential use by herself or a family member free from ethical or political controversy. Cryo-Cell is the only stem cell bank in the world that can offer women the reassurance and peace of mind that comes with the opportunity.[4]

Researchers mention that Stem cells can be obtained from women's menstrual blood derived from the endometrium. The cells display stem cell markers such as Oct-4, SSEA-4, Nanog and c-kit (CD117) and have the various cell types, including the heart, nerve, bone, cartilage and fat. There has been no evidence of teratoma , ectopic formation or any immune response after transplantation into an animal model. These cells quickly regenerate after menstruation and secrete many growth factors to display recurrent angiogenesis. The plasticity and safety of the acquired cells have been demonstrated in many studies. Menstrual blood–derived stem cells (MenSCs) provide an alternative source of adult stem cells for research and application This study summarize the multi potent properties and the plasticities of MenSCs and other endometrial stem cells from recent studies conducted both in vitro and in vivo.[5]

Menstrual blood contains millions of stem cells that have many properties and characteristics similar to those of stem cells found in bone marrow and embryos. These stem cells exhibit capabilities for self-renewal and multi-potency. A company in Los Angeles developing medical treatments based on stem cells, called the discovery "exciting," saying the menstrual stem cells appear to have several advantages over other types of adult stem cells The menstrual stem cells seem to have an immune system-suppressing effect that could enable them to be transplanted into other people without rejection. Menstrual stem cell can be used for treating several ailments–chronic obstructive pulmonary disease, osteoarthritis, multiple sclerosis, cardiac disease, Type 1 diabetes, Parkinson's disease, spinal cord injury, acute lung injury and renal failure.

The menstrual blood is a valuable resource of stem cells. By preserving our own menstrual blood stem cells, we can secure our life against such future ailments. Scope and Future Menstrual Blood Banking has a wide scope as the need for regenerative therapies incorporating cells that can engraft and differentiate is vast. Though Menstrual Stem Cell technology is yet to be utilized in human treatments and therapies, the research has established the beneficial properties of these cells and their potential use in treatment of several medical conditions like atherosclerosis, diabetes, stroke, rheumatoid arthritis, Parkinson disease, Alzheimer's disease and many more. Alongside, menstrual blood can overcome the problem of immune rejection during the transplant, allowing the female patients to use their own stem cells for the treatment. Thus, it can be said that Menstrual Blood Banking has a vast scope in future and is the next big thing in the medical world.[6]

Objectives

To assess and compare the pre and post level of knowledge regarding menstrual blood banking among BSc nursing students between study and control group. To determine the effectiveness of computer assisted teaching programme on knowledge regarding menstrual blood banking among BSc nursing students at SRM college of nursing.[7] To associate the pre and post-test level of knowledge regarding menstrual blood banking among BSc nursing students with their demographic variables in study and control group.

METHODS

Variable

Independent variable

Computer assisted teaching programme on Menstrual Blood Banking.

Dependent variable

Knowledge regarding Menstrual Blood Banking.

Demographic variables

Age, sex, year of study, area of living, mother's education, father's education, mother's occupation, father's occupation, type of family, family monthly income.

Extraneous variable

Mass media, health related books, health personnels.

Study design

A Quantitative approach and Quasi Experimental research design was conducted on a sample of students who were studying in the SRM College of Nursing during the academic year 2020–2021.

Study population and sampling

All the students from the Nursing college were the study population. A Non- Probability convenient sampling technique was used to select a sample. The sample size was 300. Based on Inclusion and Exclusion criteria the sample were selected.

Inclusion criteria

Students who were available during data collection, who were willing to participate in the study and who were having android mobile with net facilities.

Exclusion criteria

Students who had already attended any awareness program on menstrual blood banking.

Development of description tool

Part A

A structured questionnaire was used to assess the demographic variables such as age, sex, year of study, area of living, mother's education, father's education, mother's occupation, father's occupation, type of family, income.

Part B

A structured questionnaire consists of 30 questions to assess the level of knowledge regarding menstrual blood banking among BSc Nursing students was used. Each correct answer was awarded 1 mark and wrong answer was awarded 0 mark .

Scoring interpretation

Adequate knowledge=23 to 30 (76 to 100%). Moderately adequate knowledge = 16 to 22 (51 to 75%). Inadequate knowledge = 1 to 15 (3.3 to 50%).

Ethical considerations

The proposed study was conducted after the approval of institutional review board of SRM College Of Nursing, SRMIST, Kattankulathur, Chengalpet District. Setting Permission was obtained from Dean of SRM College of Nursing, Kattankulathur, Chengalpet district and the oral and Written Consent will be obtained from the Participants. Before the collection of data, Assurance was given to the individuals and the confidentiality of each individual was maintained and the participants are free to withdraw from the study at any time.

Participants made aware of the benefits of being study samples.

Data collection procedure

Data was collected from 10.05.2021 to 17.05.2021 SRM college of Nursing Chengalpet district. Before conducting data collection permission was obtained from Dean of SRM College Of Nursing. The purpose of the study was explained and confidentiality was ensured from the study participants. For the main study 302 nursing students were selected who fulfilled the inclusion criteria in which 151 in study group and 151 in control group. Non–probability convenient sampling method was used to select the sample and demographic data and study variables were collected from them. Pre-test was conducted on 1st day for study group and control group and for study group computer assisted teaching programme on menstrual blood banking for 15 minutes was provided. Computer-assisted Teaching Programme (CATP) refers to instruction or remediation presented on a computer. In this study it refers to imparting he knowledge regarding menstrual blood banking by means of power point presentation which includes scope, importance, purposes, benefits of menstrual blood banking, menstrual stem cells, menstrual blood banking areas, collection, process and storage on menstrual blood and research studies related menstrual blood banking for 30 minutes through zoom online video conferencing.

On 7th day the post test was conducted for study group and control group. The data were collected from 300 nursing students and the completion of tool was ensured. The investigator collected the data by using structured questionnaire method by using google form. The link was sent to all the study participants and received response for the structured questionnaire.

Statistical analysis

The information collected from the study participants was scored and tabulated. The data were entered into the master coding sheet and saved in Microsoft Excel. Frequency and percentage distribution will be used to analyze demographic variables. Mean and standard deviation was used to analyze the pre and post-test level of knowledge on menstrual blood banking. Paired t test was used to determine the effectiveness of computer assisted teaching programme on knowledge regarding Menstrual blood banking among BSc Nursing students at SRM college of Nursing. Chi square was used to associate the pre and post-test level of knowledge regarding Menstrual Blood Banking among BSc Nursing students with their demographic variables.

RESULTS

Demographic variables

The above table reveals the frequency and distribution assessment of demographic variables of BSc Nursing students at SRM College of Nursing. In study group, regarding the age 136 (90.1%) of them belonged to the age group 18–20 years. Considering the gender, 109 (72.2%) of them were female. Regarding year of study , 102 (67.5%) of them belonged to BSc Nursing 1st year. Considering the area of living 81 (53.6%) of them belonged to rural. Considering the mothers education 51 (33.8%) of them were high school certificate/ diploma holders. Considering the fathers education 71 (47.0%) of them were high school certificate / diploma holders. Regarding mothers occupation 63 (41.7%) of them were semi-skilled labours. Regarding fathers occupation 57 (37.7%) of them were skilled labours. Regarding type of family 96 (63.6%) of them belonged to nuclear family. Regarding monthly family income 117 (77.5%) of them were earning from Rs. 25,000 to 50,000.

In control group, regarding the age 97 (64.2%) of them belonged to the age group 18–20 years. Considering the

gender, 110 (72.8%) of them were female. Regarding year of study, 50 (33.1%) of them belonged to BSc Nursing 2nd year. Considering the area of living 134 (88.7%) of them belonged to urban. Considering the mothers education 115 (76.2%) of them were high school certificate/ diploma holders. Considering the fathers education 115 (76.2%) of them were high school certificate / diploma holders. Regarding mothers occupation 115 (76.2%) of them were skilled labours. Regarding fathers occupation 114 (75.5%) of them were skilled labours. Regarding type of family 118 (78.1%) of them belonged to nuclear family. Regarding monthly family income 114 (75.5%) of them were earning from Rs. 76,000 to 1,00000.

From the table the p value is less than 0.05 and was significant at 5% level. Hence, authors can say that there was significant difference between the pre and post-tests means in study group. Also, the mean value of post test score was greater than the pre test scores. Therefore, we can conclude that the knowledge level is increased due to computer assisted teaching programme in study group. From the above table the p value was not less than 0.05 and is not significant at 5% level. Hence we can say that there was no significant difference between the pre and post-tests means in control group.

From the above table the p value was less than 0.01 and is highly significant at 1% level. Hence we can say that there was high significant difference between the mean knowledge scores of control and study groups. Also the mean value of study group was greater than the mean value of control group at post-test level. Therefore we can conclude that the knowledge level was increased in study group due to computer assisted teaching programme.

Association between the demographic variables and the level of knowledge in study and control group at post-test level (Chi-Square test)

The p values corresponding to the demographic variables were not less than 0.05 and were not significant at 5% level for both Study and Control Group. Hence we can say that there was no significant association between the demographic variables and the level of knowledge regarding menstrual blood banking in study and Control group.

Table 1: Frequency and percentage distribution of demographic variables of BSc Nursing students (n=302).

S. no.	Demographic variable	Class	No. of respondents in			
			Control group	%	Study group	%
1	Age (in years)	18-20	97	64.20	136	90.10
		21-23	54	35.80	11	7.30
		24-26	0	0.00	4	2.60
		Above 26	0	0.00	0	0.00
2	Gender	Male	41	27.20	42	27.80
		Female	110	72.80	109	72.20
3	Year of study	B.Sc. Nursing 1st year	47	31.10	102	67.50
		B.Sc. Nursing 2nd year	50	33.10	38	25.20
		B.Sc. Nursing 3rd year	28	18.50	5	3.30
		B.Sc. Nursing 4th year	26	17.20	6	4.00
4	Area of living	Urban	134	88.70	81	53.60
		Rural	13	8.60	62	41.10
		Semi urban	4	2.60	8	5.30
5	Mother's education	No formal education	18	11.90	41	27.20
		Primary school certificate	8	5.30	27	17.90
		High school certificate/diploma	115	76.20	51	33.80
		Graduate	10	6.60	32	21.20
6	Father's education	No formal education	18	11.90	29	19.20
		Primary school certificate	8	5.30	24	15.90
		High school certificate/diploma	115	76.20	71	47.00
		Graduate	10	6.60	27	17.90
7	Mother's occupation	Semi-skilled labour	26	17.20	63	41.70
		Skilled labour	115	76.20	56	37.10
		Semi professional labour	0	0.00	16	10.60
		Professional labour	10	6.60	16	10.60
		Semi skilled labour	27	17.90	39	25.80
		Skilled labour	114	75.50	57	37.70
8	Father's occupation	Semiprofessional labour	0	0.00	19	12.60

Continued.

S. no.	Demographic variable	Class	No. of respondents in			
			Control group	%	Study group	%
		Professional labour	10	6.60	36	23.80
		Nuclear family	118	78.10	96	63.60
		Joint family	18	11.90	26	17.20
9	Type of family	Single parent family	3	2.00	29	19.20
		Extended family	12	7.90	0	0.00
10	Monthly family income	Rs. 25,000 to 50,000	0	0.00	117	77.50
		Rs. 51,000 to 75,000	28	18.50	12	7.90
		Rs. 76,000 to 1,00000	114	75.50	14	9.30
		Rs. 1,00001 to 1,30000	9	6.00	8	5.30

Table 2: Frequency and percentage distribution of level of knowledge regarding menstrual blood banking among BSc Nursing students in study and control group. Level of Knowledge (Study group) N=151.

S. no.	Level of knowledge	No. of respondents in			
		Pre test	%	Post test	%
1	Inadequate knowledge	88	58.3	57	37.7
2	Moderately adequate knowledge	59	39.1	77	51.0
3	Adequate knowledge	4	2.6	17	11.3

Table 3: Level of Knowledge (Control group).

S. no.	Level of knowledge	No. of respondents in			
		Pre test	%	Post test	%
1	Inadequate knowledge	124	82.1	126	83.4
2	Moderately adequate knowledge	21	13.9	18	11.9
3	Adequate knowledge	6	4.0	7	4.6

Table 4: Comparison between the mean pre and post-test knowledge scores in study group (Paired t test).

S. no.	Test	N	Mean	SD	P value
1	Pre test	151	13.33	4.969	0.024*
2	Post test	151	14.87	6.898	

**-Significant at 5% level, *-Significant at 1% level.

Table 5: Comparison between the mean pre and post-test knowledge scores in control (Paired t test).

S. no.	Test	N	Mean	SD	P value
1	Pre test	151	11.80	4.540	0.894
2	Post test	151	11.77	4.556	

**-Significant at 5% level, *-Significant at 1% level.

Table 6: Comparison between the mean knowledge scores of control and study groups (Independent t test).

S. no.	Group	N	Mean	SD	P value
1	Control	151	11.77	4.556	0.000**
2	Study	151	14.87	6.898	

**-Significant at 5% level, *-Significant at 1% level.

DISCUSSION

Menstruation is a normal physiological cycle common to all females of the reproductive age group. Menstruation may be defined as “a periodic vaginal bleeding which the women herself must diagnose as menstruation based on her previous experience and on accompanying signs and symptoms.” Rodrigues et al, the cell directly extracted from the endometrium and present dual expression of mesenchymal and embryonic cell markers, thus becoming interesting tools for relative medicine. Functional and reports show higher proliferative and self-renewal capacities than bone marrow-derived stem cells, as well as successful differentiation into hepatocyte-link cells, glial like cells, endometrial stroma-like cells, among others.[8]

Mathew et al Stem cells are acquired from two leading sources namely the embryonic stem cells and the adult stem cells. Embryonic stem cells are derived and isolated from the human embryo which are generally obtained from the leftover embryos of the in-vitro fertilisation treatment and the foetal tissues obtained from aborts. Generally, these cells are surrounded by the ethical concerns. Mature stem cells are acquired from the following; umbilical cord blood. Bone marrow, peripheral blood stem cells, menstrual blood, skin, teeth, placental tissue, endometrium.[9] A similar study result on effectiveness of structured teaching programme among nursing students on knowledge regarding menstrual blood stem cell banking reports that 92.7% nursing students had average knowledge regarding blood stem cell banking in the pre-test and most (88.5%) of nursing students had good knowledge in the post- test. While comparing, means post-test knowledge score was more than pre-test knowledge score which was calculated by t-test (t=19.197) at $p<0.05$ level of significance.[10]

A study conducted on menstrual bleeding patterns are considered relevant indicators of reproductive health the authors evaluated self-reported bleeding patterns, incidence of spotting and association with reproductive hormones among 201 women in the BioCycle study with 2 consecutive cycles. Women bled for a median of 5 days (standard deviation: 1.5) during menstruation, with heavier bleeding during the first 3 days. Only 4.8% of women experienced midcycle bleeding. Increased levels of follicle- stimulating hormone (β=0.20,95% confidence interval: 0.13,0.27) and progesterone (β=0.06,95% confidence interval: 0.03, 0.09) throughout the cycle were associated with heavier menstrual bleeding and higher follicle-stimulating hormone levels were associated with longer menses. Bleeding duration and volume were reduced after anovulatory compared with ovulatory cycles (geometric mean blood loss: 29.6 vs 47.2 ml; p=0.07).[11]

A cross-sectional study in 2 Asian countries. A standard questionnaire was designed inclusive of socio-demographic characteristics of subjects as well as menstrual history. Quantitative variables were analyzed using falconars' formula as well as maximum likelihood analysis. Structure modelling was then applied to twin correlations to provide estimates of the relatives genetic and/or environmental factors contribution in determining the measured trait. Menstrual characteristics were found to be under environmental influence where the best fitting model for menstrual interval and duration was common environment. Proband-wise concordance analysis for amount of menstruation, amenorrhea and irregular menstruation revealed no genetics influence. The best fitting model for menstrual irregularity was CE(C73%, E27%). The same model was defined for amenorrhea (C48%, E52%). Environment factors are most likely responsible to determine the menstrual flow, its integrity and regularity.[12]

A study revealed that menstrual blood is easily accessible, renewable and inexpensive source of stem cells. In this study, we investigated the chondrogenic differentiation potential of menstrual blood-derived stem cells (MenSCs) compared with that of bone morrow-derived stem cells (BMSCs) in two-dimensional culture. MenSCs were strongly positive for mesenchymal stem cell markers similar to that of BMSCs. Differentiated MenSCs showed strong immunoreactivity to a monoclonal antibody against collagen type 2, in a pattern similar to BMSCs.[13]

A study conducted on menstrual blood stromal cells have been demonstrated to exhibit stem cell. Menstrual blood was collected from healthy donors after menstrual blood flow initiated and its mononuclear cell fraction was separated. Cells were subsequently cultured and adherent cells were allowed to propagate and used as stem cells. For functional analysis, PBMCs were co-cultured with MBSCs, collected after 4 days and added to allogeneic .MBSCs showed surface and intracellularion of markers of mesenchymal stem cells with the exception of the high expression of oct-4A.[14]

CONCLUSION

Authors were the beginning of the era of regenerative medicine and many researchers are testing adult stem cells to be used for tissue repair and regeneration in human body. Many adult stem cells have been discovered since the late 1990's with more recently a novel adult stem cell described in menstrual blood. The menstrual blood is derived from shedding of the endometrial lining, specifically the functionalis layer, which contains highly proliferative cells used to prepare the female body for implementation of a fertilized egg. Cell characterized experiments of stromal stem cells discovered in menstrual blood have demonstrated cells to be multipotent which can successfully differentiate in vitro into cells lineages derived from the mesoderm and the ectoderm. The study assessed the effectiveness of the intervention knowledge regarding menstrual blood banking in SRM College of nursing studying BSc nursing student in Kattankulathur. The findings of the study which enable us to concluded that an educational intervention package will improve the knowledge regarding menstrual blood banking among BSc nursing students.

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