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A Study to Assess the Effectiveness of Structured Teaching Program on Knowledge Regarding Stem Cell Collection and Preservation Among Nursing Students in Selected Nursing College Ankola

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ABSTRACT

BACKGROUND: Cord blood banking includes the collection, processing and storage of umbilical cord blood for future needs that are related to the treatment of family or others. Saved cord blood of baby can be lifesaving for baby or other family members and ensure that these cells are immediately available if ever needed.
AIM: To assess the effectiveness of structural teaching programs on knowledge regarding stem cell collection and preservation among nursing students in selected nursing colleges Ankola
MATERIAL AND METHOD: Pre-experimental study was conducted among 50 nursing students of selected colleges of Ankola. One group pre-test, post-test research design was used for the study. The samples were selected using non probability; purposive sampling technique. Data was collected by using questionnaire method. Data analysis was done by using descriptive and inferential statistics.
RESULT: Overall result of the study revealed that out of 50 subjects 39 (78%) had good knowledge, 06(12%) had average knowledge and 05(10%) had poor knowledge regarding umbilical cord stem cell collection and preservation.

Keywords: Knowledge, STP, Umbilical cord stem cell, Stem cell therapy, Nursing Students

INTRODUCTION

According to WHO health is a "state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity." Staying Healthy is vital for proper growth and development of mind and body. As the world is reaching to its greater heights of urbanization and technological advancements, the emerging newer and incurable disease poses a threat as well as a challenge to the medical field. Until now, menstrual blood has typically been discarded as unsanitary waste. Existing new research shows that menstrual blood is a rich source of self – renewing stem cells that have a high potential to treat ailments in the future through stem cell therapy. Recent advances in science have proven that stem cell could potentially generate cure and treatment for various diseases including cancers, cerebra vascular and immune diseases. This promising evidence supports

the hope of achieving stem cell therapy in the medical field.[1]

Health is the fundamental right of every individual and health care is considered as a very delicate issue globally. The study and research of human body and related health issues, helps us to understand, how human functions and the application of that knowledge to improve health and to prevent and cure diseases. The umbilical cord is the main link and vital attachment between mother and baby, always represented as a blood and emotional parenthood relationship. The placenta with umbilical cord blood was discarded as medical waste. The cord blood was revealed to include stem cells and initial precursor cells that would be lifesaving and applied in stem cell transplantation for both adults and children. [2]

Cord blood banking was an alien concept till a few years ago in India. So, people of India have lack of awareness regarding it. So, it increases the responsibility of health professionals to create awareness about cord blood banking and to motivate its utilization by pregnant women to move towards this bio health insurance.[3]

The practice of collecting cord blood stem cells is a part of the birthing process. It is a procedure that has been in existence since the year 1988 and after that more than 400,000 umbilical cord blood units have been collected worldwide and 20,000 umbilical cord blood transplants have taken place. Today, thousands of parents are using this once in a lifetime opportunity of collecting cord blood stem cells to be available later for possibly treating health problems. Banking a baby's cord blood stem cells in a cord blood bank is a type of insurance. Cord blood banking includes the collection, processing and storage of umbilical cord blood for future needs that are related to the treatment of family or others. Cord blood banking is once in a lifetime opportunity to save babies cord blood stem cells for potential medical uses. Saved cord blood of baby can be lifesaving for baby or other family members and ensure that these cells are immediately available if ever needed.[4]

The stem cell preservation industry has grown substantially with private businesses, public hospitals, and academic medical centre's considering preserving induced pluripotent stem cells, mesenchymal stem cells, and other cell types of patients and the public to potentially use them for stem cell therapy should such an intervention exist in the future. Despite this growth and interest among private firms and academic centre, no study has yet considered the bioethical issues of such platforms.[5]

MATERIALS & METHODS

Research design

The research design is a blue print for conducting the study that maximizes control over factors that can interfere with the validity of the findings. It is an overall plan investigators used to obtain valid answers to research questions. The research design used for the present study was pre-experimental: one group pre-test, post-test design.

Subjects

In the present study, 50 samples of nursing students in selected nursing colleges of Ankola, were selected through non-probability; purposive sampling technique.

Data collection tool

A structured knowledge questionnaire was designed and developed by the researcher after an extensive review of literature, discussion with the experts and based on the investigator's personal experience to collect data about the subjects. The tool consists of the following parts

Section I: This part consists of 9 items for obtaining information about socio demographic variables such as age, gender, religion, and educational status, type of family, area of residency, income, do you know regarding umbilical cord stem cell therapy? And source of information.

Section 2: This part consists of 25 items for measuring the level of knowledge of B.Sc. nursing student's regarding stem cell collection and preservation. Each correct answer carries 1 mark and incorrect answer with 0 marks.

Methods

Administrative approval

Administrative approval for study was obtained from the Principal of KLE's Institute of nursing sciences Ankola. The letter explains the purpose of the study to sough his cooperation before starting the data collection. The agreement and the aim of the study were explained to each subject.

Reliability of the tools

The tool was tested for reliability on 10 nursing students by using Split Half Method and applying Karl Pearson's Correlation Coefficient formula. There liability of Structured knowledge questionnaire was r =0.98. The tool was found to be reliable. Item analysis is done to test the internal consistency. This was done by critically evaluating questions based on difficulty index and discriminative index Procedure of data collection.

Validity of the tool

The tool and Structured Teaching Programme were validated by the experts in the field of Obstetrics and gynecology Nursing and child health nursing by the members of the research committee of KLE'S Institute of Nursing Sciences, Ankola. All the experts were requested to review and verify the tool and STP for adequacy, clarity, appropriateness and degree of agreement in each item tool. Modifications of the items were made on the basis of suggestions and comments given by the experts.

Pilot study

The investigator selected ten (10) samples using non probability; Purposive sampling technique. Study was conducted by using structured knowledge questionnaire. The data was collected and analyzed using descriptive and inferential statistics.

Ethical consideration

- Ethical approval was obtained from the K L E's Institute of Nursing Sciences, Ankola to conduct the research.

Field work

Operational phase

The initial data collection was conducted from

29nd July 2024 to7th August 2024 after getting permission from Principal and study setting 50 BSc nursing students were elicited after met the inclusion criteria. The investigators get written consent after explaining the importance and purpose of the study. Structured Knowledge questionnaire method was used for initial data collection. Sample of 50 nursing students were provided with questionnaire.

STATISTICAL ANALYSIS

The data obtained were analyzed in the terms of the objectives of the study using descriptive and inferential statistics. The plan of the data analysis was developed under the excellent direction of the experts in the field of nursing and statistics. The plan of the data analysis was as follows:

1. Organization of the data on the master sheet.
2. Tabulation of the data in terms of frequency, percentage, mean, standard deviation and range to describe the data.
3. Classification of the knowledge scores as follows:

- Good knowledge ---(X + $\overline{SD}$) and above
- Average knowledge --(X – $\overline{SD}$) to (X + $\overline{SD}$)
- Poor knowledge -- (X – $\overline{SD}$) and below
- [Note: $\overline{X}$ = Mean, SD = Standard deviation]

RESULT

Section I: Distribution of sample characteristics according socio-demographic variables.

Table1: Frequency and percentage distribution of subjects according to socio-demographic variables n=50

Sl no	DemographicVariable	Frequency(f)	Percentage(%)
01	Age in Years		
	a. 19-20	00	00
	b. 21-22	42	84
	c. c. 23-24	08	16
02	Gender		
	a. Male	10	20
	b. Female	40	80
03	Religion		
	a. Hindu	40	80
	b. Muslim	00	00
	c. Christian	10	20
	d. Others	00	00
04	Educational of mother		
	a. Illiterate	01	02
	b. Primary education	14	28
	c. Secondary education	05	10
	d. Pre university education	16	32
	e. UG / PG	14	28
05	Type of family		
	a. Joint	03	06
	b. Nuclear	47	94
06	Area of residence		
	a. Rural	38	76
	b. Urban	12	24
07	Monthly income of family		
	a. 1000 - 5000	06	12
	b. 5000 - 10000	15	30
	c. 10000 – 15000	14	28
	d. >15000	15	30
09	Sources of information		
	a. TV	00	00
	b. Magazine	06	12
	c. Health workers	01	02
	d. Others	00	00

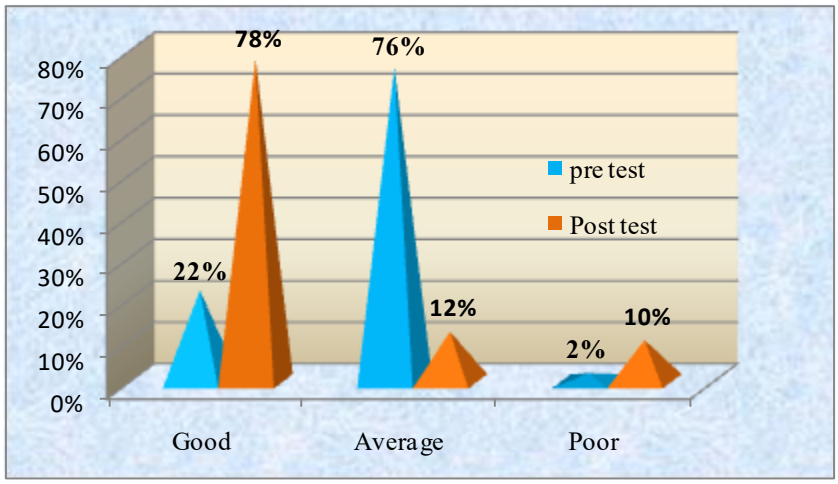
Section II: Analysis and interpretation of knowledge scores of BSc nursing students regarding umbilical cord stem cell collection and preservation.

Table 2: Mean Median, Mode, Standard Deviation and Range of knowledge scores of subjects regarding umbilical cord stem cell collection and preservation. N= 50

Area ofanalysis	Mean	Median	Mode	Standarddeviation	Range
Pre-test	14.4	14	13	2.73	11
Post-test	18.72	21	23	5.43	8
Difference	4.32	07	10	2.7	3

Table 3: Frequency and percentage distribution of knowledge scores of subjects regarding umbilical cord stem cell collection and preservation. N=50

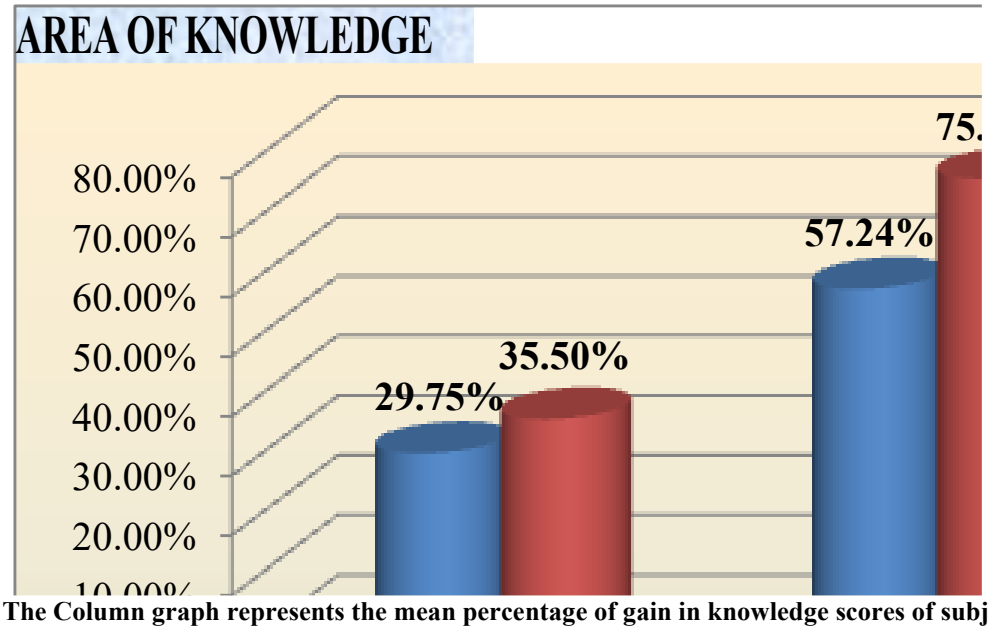
Level of knowledge	Pre-test		Post-test	
	Frequency(f)	Percentage(%)	Frequency(f)	Percentage(%)
Good (above 16)	11	22	39	78
Average (16 -9)	38	76	06	12
Poor (below 9)	1	02	05	10



Graph 1: The cone graph represents percentage distribution of subjects according to their level of knowledge scores in pre-test and post-test

Table 4: Frequency and percentage distribution of knowledge scores according to the areas of knowledge. N= 50

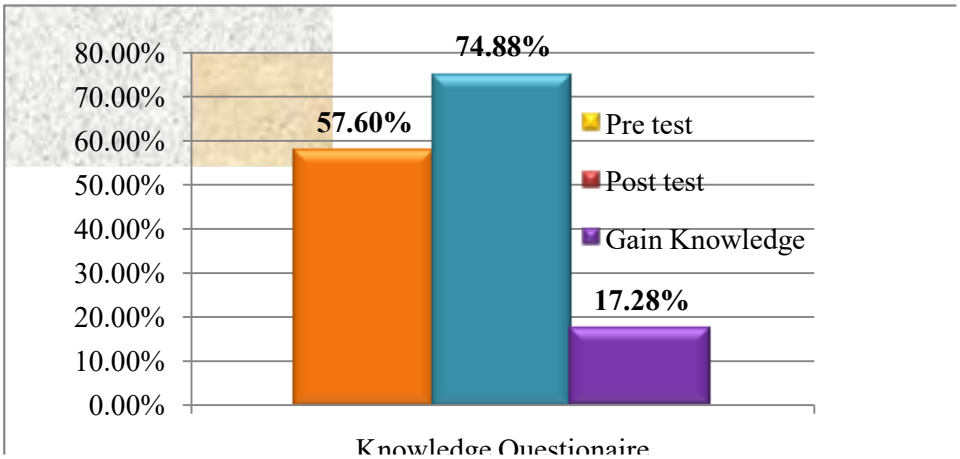
Pre-Test					Post-Test		
Sl No	**Area of knowledge**	**Total Score**	**Score Obtained (f)**	**Percentage (%)**	**Score obtained (f)**	**Percentage (%)**	**Gain In knowle dge (%)**
01	Knowledge items on anatomy and physiology of umbilical cord	400	119	29.75	142	35.5	5.75
02	Knowledge items on stem cell collection and preservation	850	601	70.70	794	93.41	22.71



Graph 2: The Column graph represents the mean percentage of gain in knowledge scores of subjects according to area of knowledge

Table No.5: Pre-test, post-test percentage of knowledge scores of subjects regarding umbilical cord stem cell collection and preservation.

Items	Total Score	Mean % of knowledge scores of subjects		
		Pre-test	Post-test	Gain in knowledge
Structured knowledge questionnaire	1250	57.6%	74.88%	17.28%



Graph 3: The Column Graph diagram represents the mean percentage of gain in knowledge scores of subjects according to their knowledge scores

Section III: Testing of Hypotheses

H_1: The mean post-test knowledge scores of BSc nursing students who have been exposed to Structured Teaching Program (STP) will be significantly higher than the mean pre-test knowledge scores at 0.05 level of significance.

Table 6: Mean difference ($\bar{d}$), Standard Error of difference ($SE\bar{d}$) and paired 't' values of knowledge score of subjects regarding umbilical cord stem cell collection and preservation.

Mean Difference($\bar{d}$)	Standard error ofdifference ($SE\bar{d}$)	Paired 't' values	
		Calculated	Tabulated
4.32	0.4042	4.41*	1.671

*** Significant at 0.05 level of significance**

H_2: There will be statistical association between pre-test knowledge scores of BSc nursing students with their socio-demographic variables at 0.05 level of significance

Table No.7: Association Between pre-test knowledge scores of subjects and selected socio-demographic variables.

Sl. No	DemographicVariable				Chi Square		
		Good	Average	Poor	Cal	Tab	Df
01)	Age in Years						
	a. 19-20	00	00	00	3.35	9.49	04
	b. 21-22	12	29	01			
	c. c. 23-24	00	01	00			
02)	Gender						
	a. Male	00	10	0	3.73	5.99	02
	b. Female	11	28	01			
03)	Religion						
	Hindu	10	29	01	1.563	12.59	06
	a. Muslim	00	00	00			
	b. Christian	01	09	00			
	c. Others	00	00	00			
04)	Educational status ofmother						
	a. Illiterate	00	01	00	7.032	15.51	08

	b. Primary education c. Secondary education d. PUC e. PG / UG	04 02 01 04	10 03 14 10	00 00 01 00			
05)	Type of family						
	a. Joint b. Nuclear	11 00	35 03	01 00	1.041	5.99	02
06)	Area of residence						
	a. Rural b. Urban	07 04	30 08	01 00	1.363	5.99	02
07)	Monthly income						
	a. 1,000-5,000 b. 5,000-10,000 c. 10,000-15,000 d. >15,000	03 03 03 02	03 12 11 12	00 00 00 01	5.62	12.59	06
08)	Knowledge regarding stem cell therapy						
	a. Yes b. No	05 06	16 22	00 01	0.78	5.99	02
09)	Source of Information						
	a. TV b. Magazine c. News papers d. Health workers e. Other	03 00 00 04 04	08 00 02 03 25	00 00 00 0100	12.17	15.5	08

DISCUSSION

The proposed study was undertaken to evaluate the effectiveness of a structured teaching problem (STP) approach on knowledge regarding umbilical cord stem cell collection and preservation among BSc nursing students at selected nursing college Ankola. The overall knowledge scores revealed that most of them in the pre-test 11 (22%) had an average knowledge, 38 (76%) had good knowledge and 1 (2%) had poor knowledge in post-test after the administration of Structured Teaching Program, all the subjects 39 (78%) had good knowledge regarding umbilical cord stem cell collection and preservation. These findings were supported through a study conducted by Ms Pooja Asokan, Ms Manila Laveena D'souza who observed that 68.3% (41)of the students had average knowledge, 25.1% (15) had poor knowledge and 6.66%(6) had good knowledge in pre test. In post test after administering Planned Teaching Program, 18.4% (11) had average knowledge, 3.27% (2) had poor knowledge and 78.3% (47) had good knowledge which indicated that planned teaching program was effective in improving the knowledge level of the student's post-test. There was a significant gain in knowledge i.e. 43.01% among the BSc nursing students who exposed to the information education communication approach. The calculated paired 't' value (t_{cal}=4.41) was greater than the tabulated value (t_{tab}= 1.671). Hence, H_1 was accepted. This indicates that the gain in knowledge score was statistically significant at 0.05 levels. Therefore, the Information education communication approach was effective in improving the knowledge of subjects. These findings were supported through knowledge i.e., 38.24% among the subjects who exposed to planned health teaching. The 't' value obtained is 0.26; this value is significant at 0.05 levels. Therefore, this show that planned teaching program on knowledge regarding umbilical cord stem cell collection and preservation has brought about significant gain in knowledge of the subjects.

CONCLUSION

The study concludes that knowledge regarding umbilical cord stem cell collection and preservation among BSc Nursing students in order to raise knowledge regarding stem cell collection and preservation on Nursing students to

promote their knowledge and the informational booklet would be helpful.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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