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Effect of structured teaching programme on knowledge regarding umbilical cord stem cell banking among staff nurses working in Gauhati medical college & hospital, Guwahati, Assam.

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Abstract:

Background : *A baby's birth is one of the happiest moments in the parents' lives. however, getting a diagnosis for a chronic or severe disorder later in life is possibly a parent's worst nightmare. with the prevalence of congenital anomalies in children, parents are now prioritizing cord blood banking to secure their child's future.* ***aim:*** *to assess the effect of structured teaching programme on knowledge regarding umbilical cord stem cell banking among staff nurses.* ***methodology:*** *a quantitative evaluative approach and pre-experimental one-group pre-test post-test research design was adopted for the study.* ***sampling:*** *a total of 50 samples were selected using a non-probability purposive sampling technique. data were collected using self -administered questionnaire. conduction of pre-test was followed by structure teaching programme on the same day. post-test was conducted on the 7th day after the pre-test. data were analysed using descriptive and inferential statistics.* ***results:*** *findings revealed that the overall mean score 18.42 obtained by the participants in the post test was higher than the mean knowledge score 9.58 in the pre-test, with a mean difference of 8.84. there was a significant difference between pre-test and post-test at<0.05.* ***conclusion:*** *hence, the investigator concluded that structured teaching programme was significantly effective in improving the knowledge among staff nurses regarding umbilical cord stem cell banking.*

Keywords: *Effect, knowledge, structured teaching programme, stem cell banking, staff nurses.*

1. INTRODUCTION

"Although birth is only one day in the life of a woman, it has an imprint on her for the rest of her life. "
- Justine Qaines

BACKGROUND OF THE STUDY

A baby's birth is one of the happiest moments in the parents' lives. However, getting a diagnosis for a chronic or severe disorder later in life is possibly a parent's worst nightmare. With the prevalence of congenital anomalies in children, parents are now prioritizing cord blood banking to secure their child's future.[1]

Stem cells are essentially the building blocks of the human body. Stem cells are capable of dividing for long period of time, are unspecialized, but can develop into specialized cells. The earliest stem cells in the human body are those found in human embryo. The stem cells inside embryo will eventually give rise to every cell, tissue and organ in the foetus body. Unlike a regular cell, this can only replicate to create more of its kind of cell. A stem cell is pluripotent. When it divides, it can make any one of 220 different cells in the human body. Stem cells also have the capability to self renew-they can reproduce themselves many times over. [2]

Stem cells are currently believed as the next future in medicine, due to their considerable therapeutic and biotechnological benefits in treating significant diseases such as cardiovascular diseases, diabetes and neurodegenerative diseases.[3]Allogeneic hematopoietic stem cells (HSC) derived from umbilical cord have been used in treatment of more than 70 indications Common uses in regenerative medicine include myocardial infarction, heart valve replacement, diabetes mellitus, neurological disorder (Stroke, Parkinson's disease, Alzheimer's disease, spinal cord injuries.[4]

Continuous education modules need to be introduced for updating the medical/scientific community as well as individuals involved in all processes of cord blood banking for correct use of cord blood stem cells. The status of new scientific developments and innovative technologies relevant to cord blood banking, ethical issues related to them, and regulatory approval pathways need to be made a part of the curriculum for medical/science/lab technician/nursing education

2. NEED OF THE STUDY

"Happiness is not something you postpone for the future; it is something you design for the present"

- Jim Rohn

Umbilical cord blood was once considered a waste product and was discarded with the placenta after delivery. With advances in medicine, it has been found to be a rich source of life-saving hematopoietic stem cells and has saved many lives in the recent decades.[6]

The first successful treatment of cord stem cells was reported in 1988. Since then, cord blood has become increasing recognize as a source of stem cells. Recent studies have shown that cord blood has unique advantages over traditional bone marrow transplantation, particularly in children, and can be life saving in rare cases where a suitable bone marrow cannot be found. It can be used for siblings and family members who have matching tissue type. Siblings have 25% chance of compatibility, or it can be a match for parents (50%) and grandparents.[8]

After a comprehensive literature review the researcher found that in all study subjects were found to be with inadequate knowledge regarding umbilical cord stem cell banking. Following literature review it was also found that not many studies have been done regarding umbilical cord stem cell banking, especially in the northeastern part of India. From the researcher personal experience in the Obstetric and Gynecological department as a staff nurse observed that only few parents opt for stem cell preservation, for which the researcher assume that many parents and general population do not have much knowledge regarding umbilical stem cell banking. During clinical posting, umbilical cord stem cells collection was not seen. Considering this, researcher felt the need to conduct this study, to enhance the knowledge and promote awareness regarding umbilical cord stem cell banking. If Nurses have adequate knowledge on stem cell banking, then she can educate and create an awareness to people at large on umbilical cord stem cell banking

3. REVIEW OF LITERATURE

I. Literature related to knowledge regarding umbilical cord stem cell banking

Tomar S, Khatoon P, Malik R, Issachar A, Rana P, Ram P, et.al (2023)[19] conducted a study on study to assess the knowledge of antenatal mothers regarding umbilical stem cells banking in a selected hospital in Dehradun. In this study a quantitative approach was opted. A total of 90 samples antenatal mothers were collected using convenient sampling technique. The study findings revealed that majority (64%) of antenatal mothers had poor knowledge, 35% had moderate knowledge .This study concluded that there is a need to improve the knowledge with the help of educational programme.

Verma S, Siddiqui M I, Sandhya (2021)[22] conducted a descriptive study to assess the knowledge regarding Stem Cells Banking among staff nurses in Veerangana Avanti Bai Mahila Chiktsalaya Hospital at Lucknow, with a view to develop an Information Booklet. The result of the study revealed that majority (58.33%) of sample subjects had inadequate level of knowledge, (41.66%) had moderate level of knowledge and none of the sample subjects had adequate knowledge regarding stem cells banking. The study concluded that the staff nurses had inadequate knowledge regarding stem cells banking and there is a strong need to improve the knowledge level of staff nurses.

II. **Literature related to the effectiveness of STP regarding umbilical cord stem cells banking**

Asokan P, D'Souza ML(2023)[31] conducted a study to assess the effectiveness of Planned Teaching Programme on Knowledge Regarding Umbilical Cord Stem cell Banking. 60 samples were selected using purposive sampling technique. One group pre-test post- test research design was adopted for data collection. The results revealed that the mean post- test score (17.8± 3.74) was higher than the mean pre-test knowledge score (10.45±3.12). The computed 't' value (t59=1.67) at 0.05 level of significance. Hence, the study concluded that the planned teaching programme was effective in increasing the knowledge regarding umbilical cord stem cell banking among nursing students.

Sahoo R(2021)[34] conducted a study on effectiveness of video assisted teaching module on umbilical cord blood stem cells banking among nurses in a selected hospital of Odisha. The sample size was 190 and a convenience sampling technique was used. The study findings revealed that there was a significant difference between pre -test and post-test in the knowledge score of nurses after the intervention of video assisted teaching module on umbilical cord blood stem cells banking. The study depicted that the video assisted teaching module is effective in enhancing the knowledge level of staff nurses on umbilical cord blood stem cells banking

4. OBJECTIVE:

To assess the effect of structured teaching programme on knowledge regarding umbilical cord stem cell banking among staff nurses.

5. RESEARCH METHODOLOGY

The research design selected for this study was a pre- experimental, one group pre-test post-test design, in order to assess the knowledge regarding umbilical cord stem cell banking and to determine the effectiveness of structured teaching programme regarding umbilical cord stem cell banking. The pre-experimental design consists of pre-test and post-test observations made on different days with only one selected group and without a control group.

6.RESULTS / FINDINGS

SECTION I: DEMOGRAPHIC CHARACTERISTICS OF THE STAFF NURSES

TABLE 1.1
FREQUENCY AND PERCENTAGE DISTRIBUTION OF STAFF NURSES ACCORDING TO THEIR AGE
n=50

AGE IN YEARS	FREQUENCY(f)	PERCENTAGE (%)
25-35	30	60
36-45	12	24
46-55	7	14
>55	1	2
Total	50	100

The data presented in table 2.1 shows that the highest percentage of Staff Nurses i.e.60 % belong to age group of 25-35 years, 24% were from the age group of 36-45, 14% belong to 46-55 and the least i.e. 2% belong to age group of 56-65.

TABLE 1.2
FREQUENCY AND PERCENTAGE DISTRIBUTION OF STAFF NURSES ACCORDING TO THEIR RELIGION

n=50

RELIGION	FREQUENCY(f)	PERCENTAGE(%)
Hinduism	38	76
Islam	7	14
Christianity	2	4
Others	3	6
Total	50	100

The data shown in table 2.2 depicts that 76% of the Staff Nurses were Hindu, 14% were Islam, 4% were Christian and 6% belong to other religion.

TABLE 2.3
FREQUENCY AND PERCENTAGE DISTRIBUTION OF STAFF NURSES ACCORDING TO THEIR MARITAL STATUS

n=50

MARITAL STATUS	FREQUENCY (f)	PERCENTAGE (%)
Married	38	76
Unmarried	12	24
Total	50	100

The data presented in table 2.3 shows that maximum i.e. 76% of the Staff Nurses were married and 24% were Unmarried.

TABLE 2.4
FREQUENCY AND PERCENTAGE DISTRIBUTION OF EDUCATIONAL QUALIFICATION OF STAFF NURSES

n=50

EDUCATIONAL QUALIFICATION	FREQUENCY(f)	PERCENTAGE (%)
GNM	45	90
B.Sc (N)	5	10
Total	**50**	**100**

The data presented in table 2.4 presents that majority of the Staff Nurses i.e.90 % were GNM and 10% were B.Sc (N).

TABLE 2.5
FREQUENCY AND PERCENTAGE DISTRIBUTION OF STAFF NURSES ACCORDING TO THEIR TOTAL DURATION OF PROFESSIONAL EXPERIENCE

n=50

TOTAL DURATION OF PROFESSIONAL EXPERIENCE	FREQUENCY(f)	PERCENTAGE (%)
< 1 years	6	12
1-5 years	17	34
6-10 years	7	14
>10 years	20	40
Total	**50**	**100**

The data given in the table 2.5 depicts that majority i.e.40 % of Staff Nurses have a total duration of professional experience of >10 years, 34% had an experience from 1-5 years, 14% had an experience of 6-10 years, and 12 % had <1 year of experience.

TABLE 2.6
FREQUENCY AND PERCENTAGE DISTRIBUTION OF STAFF NURSES ACCORDING TO THEIR DURATION OF PROFESSIONAL EXPERIENCE IN O&G DEPARTMENT

n=50

DURATION OF PROFESSIONAL EXPERIENCE IN O&G DEPTT	FREQUENCY (f)	PERCENTAGE (%)
< 1 years	15	30
1-5 years	17	34
6-10 years	5	10
>10 years	13	26
Total	50	100

Data presented in table 2.6 shows that majority i.e.34% of Staff Nurses were having a professional experience of 1-5 years in O&G department, 30% had less than 1 year of experience, 26% had >10 years of experience and 10% between 6-10 years' experience.

TABLE 2.7
FREQUENCY AND PERCENTAGE DISTRIBUTION OF STAFF NURSES ACCORDING TO THE PREVIOUS SOURCES OF KNOWLEDGE REGARDING UMBILICAL CORD STEM CELL BANKING

n=50

PREVIOUS SOURCES OF KNOWLEDGE	FREQUENCY (f)	PERCENTAGE (%)
Professional experience	17	34
Relatives	1	2
None	32	64
Total	50	100

Data presented in table 2.7 shows that majority of the Staff Nurses i.e. 64% did not have any previous sources of knowledge regarding to umbilical cord stem cell banking, 34 % got the previous sources of knowledge from professional ex

SECTION-II: FREQUENCY AND PERCENTAGE DISTRIBUTION OF PRE-TEST AND POST-TEST LEVEL OF KNOWLEDGE REGARDING UMBILICAL CORD STEM CELL BANKING AMONG STAFF NURSES.

This section deals with pre-test and post-test knowledge of Staff Nurses regarding umbilical cord stem cell banking through self-administered structured questionnaire consisting of 24 multiple choice questionnaires having only one correct answer. The total score of each subject was calculated and converted to percentage and interpreted.

TABLE 3.1
DISTRIBUTION OF SUBJECTS ACCORDING TO THEIRPRE-TEST AND POST-TEST LEVEL OF KNOWLEDGE

n=50

LEVEL OF KNOWLEDGE	PRE-TEST		POST-TEST	
	f	%	f	%
Inadequate knowledge (0-6)	12	24	0	0
Moderately adequate knowledge (7-17)	38	76	13	26
Adequate knowledge (18-24)	0	0	37	74
Total	50	100	50	100

Data given in table 2.8 depicts the frequency and percentage distribution of pre-test and post-test level of knowledge regarding umbilical cord stem cell banking among Staff Nurses. Results revealed that in pre-test majority 38(76%) of participants had moderately inadequate knowledge and 12(24%) of participants had adequate knowledge while in post-

test majority participants 37(74%) had adequate knowledge and 13(26%) had moderately inadequate knowledge regarding umbilical cord stem cell banking.

SECTION – III: EFFECT OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING UMBILICAL CORD STEM CELL BANKING AMONG STAFF NURSES

This section deals with the assessment of effect of structured teaching programme on knowledge regarding umbilical cord stem cell banking among Staff Nurses. To compare the knowledge of pre-test and post-test results, paired 't' test was used and the mean, SD, 't' value, degree of freedom and p value was computed.

In order to find the effect of structured teaching programme regarding knowledge on umbilical cord stem cell banking, the following hypothesis was stated.

H_1: There is a significant difference between the mean pre-test and post-test knowledge score on umbilical cord stem cell banking among Staff Nurses.

A null hypothesis is formulated against the research hypothesis H_1.

H_{01}:There is no significant difference between the mean pre-test and post-test knowledge score on umbilical cord stem cell banking among Staff Nurses.

TABLE 4.1
DESCRIPTIVE STATISTICS OF PRE-TEST AND POST-TEST KNOWLEDGE REGARDING UMBILICAL CORD STEM CELL BANKING AMONG STAFF NURSES

n=50

CHARACTERISTICS	PRE-TEST VALUES	POST-TEST VALUES
Minimum score	5	13
Maximum score	16	23
Range	11	10
Mean	9.58	18.42
Median	9	19
Mode	6	18
Std. Deviation	3.208	2.548

TABLE 5.1
PRE-TEST AND POST-TEST SCORES IN TERMS OF OVERALL MEAN AND SD TO DETERMINE THE EFFECTIVENESS OF STP BY PAIRED 'T' TEST

n=50

COMPARISON OF LEVEL OF KNOWLEDGE	MEAN	SD	MEAN DIFFERENCE	T- TEST VALUE	DF	P VALUE
Pre-test	9.58	3.208	8.84	23.03	49	**0.001****
Post-test	18.42	2.548				

***P<0.05 level of significance NS-Non significant**

Data presented in table 2.10 depicts the effect of structured teaching programme on knowledge regarding umbilical cord stem cell banking among staff nurses Findings showed that pre-test mean knowledge score was 9.58±3.208 and post-test mean knowledge score was 18.42±2.548 with mean difference was 8.84 The comparison was tested using paired 't' test with obtained (t=23.03) at df=49 was statistically significant at p<0.05 level.

Findings revealed that structured teaching programme was effective in improving the knowledge regarding umbilical cord stem cell banking among Staff Nurses. Hence, the research hypothesis H_1 hypothesis is accepted and the formulated null hypothesis (H_{01}) is rejected.

SECTION - IV: ASSOCIATION BETWEEN PRE-TEST LEVEL OF KNOWLEDGE REGARDING UMBILICAL CORD STEM CELL BANKING AMONG STAFF NURSES WITH THEIR SELECTED SOCIO-DEMOGRAPHIC VARIABLES.

This section deals with findings related to the association between pre-test knowledge on umbilical cord stem cell banking with the selected socio-demographic variables. Chi square and Fisher's exact test was computed to examine the association between the pre-test knowledge score of the Staff Nurses and selected socio-demographic variables.

In order to find the association between pre-test knowledge on umbilical cord stem cell banking with the selected socio-demographic variables the following hypothesis was stated.

H_2: There is a significant association between the pre-test knowledge score of the Staff Nurses and selected socio-demographic variables.

A null hypothesis is formulated against the research hypothesis H_2.

H_{02}: There is no significant association between the pre-test knowledge score of the Staff Nurses and selected socio-demographic variables

TABLE 6.1
ASSOCIATION BETWEEN PRE-TEST LEVEL OF KNOWLEDGE REGARDING UMBILICAL CORD STEM CELL BANKING AMONG STAFF NURSES WITH THEIR SELECTED SOCIO-DEMOGRAPHIC VARIABLES

n=50

SL. NO	DEMOGRAPHIC VARIABLES	PRE-TEST LEVEL OF KNOWLEDGE		χ^2 VALUE	FISHER'S EXACT TEST	df	p VALUE
		INADEQUATE	MODERATELY ADEQUATE				
1	**Age in years**						
	25-35	3	27	-	9.330	3	0.029*
	36-45	6	6				
	46-55	3	4				
	>55	0	1				
2	**Religion**						
	Hinduism	12	26				
	Islam	0	7				
	Christianity	0	2	-	3.734	3	0.240^{NS}
	Others	0	3				
3	**Marital status**						
	Married	11	27				
	Unmarried	1	11	2.125	-	1	0.145^{NS}
4	**Educational qualification**						
	GNM	12	33				
	B.Sc (N)	0	5	1.754	-	1	0.185^{NS}

5	**Total duration of professional experience** < 1 year 1-5 years 6-10 years >10 years	 0 3 2 7	 6 14 5 13	2.678	-	3	0.298^{NS}
6	**Duration of professional experience in maternity department** < 1 year 1-5 years 6-10 years >10 years	 4 4 0 4	 11 13 5 9	-	1.700	3	0.707^{NS}
7	**Previous Sources of knowledge** Professional experience Relatives None	 6 0 6	 11 1 26	1.988	-	2	0.370^{NS}

***P<0.05 level of significance** **NS-Non significant**

Table 11 depicts the association between pre-test levels of knowledge regarding umbilical cord stem cell banking among Staff Nurses with their selected demographic variables which was tested using chi-square test. The Fisher's exact test value revealed that age was found significant association at $p<0.05$ level. Hence, the research hypothesis (H_2) is accepted in terms of age and formulated null hypothesis is rejected. However, no significant association was found between other socio-demographic variables such as religion, marital status, educational qualification, Total duration of professional experience, duration of professional experience in maternity department and previous sources of information were statistically non-significant at $p<0.05$ level with pre-test level of knowledge regarding umbilical cord stem cell banking among Staff Nurses. Therefore, the researcher rejects the research hypothesis (H_2) and accepted the null hypothesis (H_{02}) for religion, marital status, educational qualification, total duration of professional experience, professional experience in O&G department and previous source of information.

6. DISCUSSION

In the present study, it was found that majority of the Staff Nurses i,e, 60 % belonged to the age groups of 25-35 years. In contrary, the study conducted by Sahoo. R, Rana. L (2021)[34]revealed that majority i.e. 14(47%) of Staff Nurses belongs to the age groups of 31-40.

In this study it was also found that 90% of the staff nurses were GNM. The present study also reveals that majority's i.e. 34 % of the staff nurses were having an experience in maternity department in between 1-5years. The study conducted by Sahoo. R, Rana. L (2021)[34] revealed 24 (80%) were GNM.

Regarding the total professional experience, in the present study, it was found that out of fifty, 20(40%) of the Staff Nurses had an experience of >10 years. A contrast study conducted by, Sahoo. R, Rana. L (2021)[34] shows that 11(37%) had a total duration of professional experience of 1-5 years

Considering the duration of professional experience in Obstetrics & Gynaecology department in the present study, the results revealed that majority i.e. 17(34%) of Staff Nurses were having a professional experience of 1-5 years. Similarly, a study conducted by Sahoo. R, Rana. L (2021)[34] depicts that out of 30, i.e. majority 14(47%) were having an experience of 1-5 years in Obstetrics & Gynaecology department.

In the present study, in relation to the previous sources of knowledge regarding umbilical cord stem cell banking, 64% of the Staff Nurses have not heard about the umbilical cord stem cell banking and where as in contrast study was supported by Venugopal A, Joshi P, Deka D, Seth T (2016)[49] where the results of the study shows that majority i.e. 62.5% of the nurses had heard about UCBB.

Discussion on findings related to the knowledge of the staff nurses regarding umbilical cord blood banking

The present study shows that in the pre-test majority of the Staff Nurses i.e. 76 % were having a moderately adequate knowledge and 24% with inadequate knowledge and none of them had an adequate knowledge regarding umbilical cord blood banking. After the Structured Teaching Programme 74% of the Staff Nurses were having an adequate knowledge and 26% were having a moderately adequate knowledge regarding umbilical cord blood banking.

The present study is supported by a study carried out by Malathi. P (2021)[35]which revealed that, most of the staff nurses 47(78%) have moderate knowledge, 13 (22%) have inadequate knowledge and no one in pre-test having adequate knowledge

In contrast the study is also supported by Venugopal A, Joshi P, Deka D, Seth T (2016)[49] where the results of the study revealed that majority i.e. 42.86% of the nurses had a good knowledge.

Discussion on findings related to the effectiveness of structured teaching programme regarding umbilical cord stem cell banking

The findings of the present study showed that pre-test mean knowledge score was 9.58±3.208 and post-test mean knowledge score was 18.42±2.548 with mean difference was 8.84. Thus, findings revealed that Structured Teaching Programme was effective in improving the Knowledge regarding umbilical cord stem cell banking among Staff Nurses.

In a similar study conducted by Arshid Nazir.A Shah (2019)[40]revealed that the overall mean knowledge score 23.96 obtained by the students in the post test was higher than mean knowledge score (9.42) in the pre-test and the mean difference was 14.42. Hence it was concluded that structured teaching programme on umbilical cord blood banking was effective.

Discussion on findings related to association of knowledge of the staff nurses regarding umbilical cord blood banking with the selected socio demographic variable

In this study revealed that age was found significant association at $p<0.05$ level but other demographic variables such as religion, marital status, educational qualification, total duration of professional experience, professional experience in O&G and previous sources of knowledge were statistically non-significant. This is supported by the study conducted by Elmarakby NTA, Mohammed HSE, AbdEl-hady RM, Aliem RSAEl(2022)[33] where the study displayed that there was a significant association between age and the socio-demographic variables.

In contrast, the present study is supported by Malathi. P (2021)[34]where the chi square results showed, there was significant association found between the pre-test knowledge and selected socio-demographic variable such as gender, years of experience, area of residence. However, there was no significant association found between age, educational qualification and previous training course attended.

7.Conclusion

the study was conducted to find out the effectiveness of structured teaching programme on umbilical cord stem cell banking among staff nurses' working in the o&g department. the present study findings highlighted in the pre-test none of the staff nurses had adequate knowledge and after implementation of structured teaching program it was found that maximum number of staff nurses 'was having adequate knowledge regarding umbilical cord blood banking. hence the study can be concluded that structured teaching programme significantly improves the staff nurses' knowledge regarding umbilical cord blood banking

8.Limitations

- The study was focussed only on Staff Nurses' working in the O&G department of Gauhati Medical College & Hospital. Therefore, the exact representation of population cannot be ensured and generalization is limited to the population under the study.
- The Knowledge questionnaire was self- structured. Hence limitation may be there.

9.Recommendation

- The present study can be replicated on the large samples with different study setting
- A Comparative study between the Staff Nurses working in private and government sector can be conducted
- Similar study can also be conducted with an experimental research approach having the control group
- The study can be conducted among others health professionals to assess the Knowledge regarding umbilical cord blood banking

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