

## Effectiveness of Structured Teaching Programme (STP) on Knowledge Regarding Stem Cell Therapy and its Importance among Nursing Students

Jayashree Ajith<sup>1</sup>, Lini E Thomas<sup>2</sup>

**Author Affiliation:** <sup>1</sup>Director, Department of Nursing, Jai Institute of Nursing and Research, Gwalior, Madhya Pradesh 475001, India. <sup>2</sup>Lecturer, Department of Nursing, Post Graduate College of Nursing, Amkhoh, Gwalior, Madhya Pradesh 474009, India.

How to cite this article:

Jayashree Ajith, Lini E Thomas. Effectiveness of Structured Teaching Programme (STP) on Knowledge Regarding Stem Cell Therapy and its Importance among Nursing Students. *J Nurse Midwifery Matern Health*. 2019;5(3):115-120.

### Abstract

Stem cells therapy is one of the most challenging areas in the medical research. The goal of the stem cells therapy studies is to improve the human enhancement and to reduce some of the medical problems and diseases by using stem cells as a treatment. Stem cells have the ability to build every tissue in the human body. Hence, they have great potential for future therapeutic uses in tissue regeneration and repair. The discovery of stem cells has led to a revolution in modern medicine. Stem cells from umbilical cord blood are known to treat nearly 80 diseases, and have been used in more than 20,000 transplants worldwide. This study was set out to assess effectiveness of structured teaching programme on stem cell therapy and its importance in experimental group by Quasi-experimental, Non-equivalent or Non-randomized control group design non probability, purposive sampling. STP was developed to assess the effectiveness. The results of the study revealed that there was a significant difference between pre-test and post-test knowledge on stem cell and cord blood banking among antenatal mothers at  $p = 0.001$  level.

**Keywords:** Stem cells therapy; Structured teaching programme (STP).

### Introduction

Stem cell therapy, when coupled with conventional medicine, can be beneficial to patients suffering from serious diseases. Yet, not many are aware that such an alternate treatment exists. Stem cells can be sourced from an embryo, or an adult's bone marrow, tissues, muscles and from the umbilical

cord blood after delivery. We have less than 10 cord blood banks in India and awareness is one of the biggest challenges facing the industry.<sup>1</sup>

The incident rate of infertility is 30 to 50%. Culture of human embryonic stem cells in mitotically inactivated porcine ovarian fibroblasts (POF) causes differentiation into germ cells (precursor cells of oocytes and spermatozoa), as evidenced by

---

**Reprint Request:** Lini E Thomas, Lecturer, Department of Nursing, Post Graduate College of Nursing, Amkhoh, Gwalior, Madhya Pradesh 474009, India.

**E-mail:** [achchujith@gmail.com](mailto:achchujith@gmail.com)

gene expression analysis. Human embryonic stem cells have been stimulated to form Spermatozoan-like cells, yet still slightly damaged or malformed. It could potentially treat azoospermia. Stem cell treatments are a type of intervention strategy that introduces new cells into damaged tissue in order to treat disease or injury. Many medical researchers believe that stem cell treatments have the potential to change the face of human disease and alleviate suffering. The ability of stem cells to self-renew and give rise to subsequent generations with variable degrees of differentiation capacities, offers significant potential for generation of tissues that can potentially replace diseased and damaged areas in the body, with minimal risk of rejection and side effects.<sup>2</sup>

### **Review of Literature**

#### *Review Related to Stem Cells*

Paul VD, et al., 2011<sup>3</sup> conducted a study a study was conducted on patients with congestive cardiac failure who were not eligible for transplantation and had some limited therapeutic options. Stem cells therapy such as autologous bone marrow, mobilized peripheral blood, purified cells had been used clinically and 1000 patients had received cellular therapy. The result showed that patient with heart disease treated with combination of stem cell protocol have a beneficial effect than the aspects of cord blood CD34 and mesenchymal like stem cells.

Syrjala KL, et al. 2011<sup>4</sup> conducted a cross sectional study was conducted to assess the development and implementation of an internet- based survivorship care program for cancer survivor treated with hematopoietic stem cell transplantation. Of 1,775 participants approached for the study, 775 (58% of those eligible) consented and completed baseline assessment. The result showed mean age was 51.7, and SD-12.5, age range 18-79 with 56% male, 57% required staff contact one or more times; a majority were for minor technical issues or delays in completion of enrolment or baseline assessment. This study demonstrated the potential for providing Internet-based survivorship care to long-term survivors of HSCT.

#### *Review Related to the Effectiveness of Structured Teaching Programme on Stem Cell Therapy and its Importance*

A study was conducted to assess the effectiveness of structured teaching programme on stem cell therapy among IV year B.sc nursing students. Consequent sampling of 60 nursing students were

taken. Knowledge was assessed by structured knowledge questionnaire. the result showed that during pre-test mean value was 12.33 (S.D. 2.81) at ( $p < 0.05$ ) had inadequate knowledge, after intervention showed that mean value was 25.52 (S.D. 2.19) at ( $p < 0.05$ ) gained adequate knowledge.

A study was conducted in Coimbatore to evaluate the effectiveness of structured teaching programme on umbilical cord stem cell collection, preservation and utilization. Thirty health professionals were involved in the study. The study results showed that post-test score (mean:  $39.6 \pm 2.57$ ) was higher than that of pre-test score (mean:  $13.23 \pm 3.88$ ). It was concluded that structured teaching programme was effective in enhancing the knowledge of health professionals regarding umbilical cord stem cell collection preservation and utilization.<sup>5</sup>

### **Objectives**

This study endeavored to:

- (1) Assess the pre-test and post-test knowledge scores of stem cell therapy and its importance among nursing students in experimental group.
- (2) Assess the pre-test and post-test knowledge scores of stem cell therapy and its importance among nursing students in control group.
- (3) Assess the effectiveness of structured teaching program me on stem cell therapy and its importance in experimental group.
- (4) Compare the knowledge scores regarding stem cell therapy and its importance in experimental group and control group.
- (5) Determine the association of the post-test knowledge scores with selected demographic variables.

### **Materials and Methods**

Evaluative research approach was found to be most appropriate. Quasi-experimental, Non-equivalent or Non-randomized control group design was selected as the research design for the present study. The design chosen for the study is as follows.

#### **Key**

$O_1$  : Assessment of knowledge by pre-test.

X : Structured teaching programme on stem cell therapy and its importance.

$O_2$  : Assessment of knowledge by post-test.

Table 1:

Group	Pre-test (day-1)	Intervention	Post-test (day 7)
Experimental	0 <sub>1</sub>	X	0 <sub>7</sub>
Control	0 <sub>2</sub>	-	0 <sub>7</sub>

**Validity and Reliability:** Content validity was done based on criterion checklist which was submitted to five experts in the field of obstetric nursing and medicine for content validity. The selection of experts was done based on their experience and clinical expertise. The experts were requested to give their opinions regarding relevancy, accuracy and appropriateness of the items for further modifications. The reliability of a measuring tool can be assessed in the aspects of stability, internal consistency, and equivalence depending on the nature of the instrument and aspects of the reliability concept.

The method adopted for the present study was Test-retest method using Split Half Method's formula. The reliability score was  $r = 0.86$  which shows that tool was highly reliable.

$$\text{Split Half Method } r = 2r/1 + r$$

**Data collection & Analysis:** A quasi-experimental design with evaluative approach was adopted in order to evaluate the effectiveness of structured teaching programme regarding stem cell therapy and its importance among Nursing students studying in BSc Nursing 2<sup>nd</sup> year at PG College of Nursing, Gwalior, M.P. Open ended questions were used to assess the pre-test and post knowledge score regarding stem cell therapy and its importance and implemented the STP. Data was collected from the sample after obtaining permission from the concerned authority. A structured questionnaire was administered to nursing students from bsc Nursing 2<sup>nd</sup> year (18–25 years) studying at pg college of nursing, gwalior, M.P.

On the day 1, the group was divided into experimental and control group and a pre-test was conducted for both, following that a structured teaching programme on stem cell therapy and its importance was delivered only to experimental group. Post-test was conducted for the group on day 7 to assess the effectiveness of structured teaching programme. This study was conducted in pg college of nursing, Gwalior, M.P. PG College of nursing was selected for the study on the basis of feasibility of conducting study and the availability of the sample. 60 nursing students studying at pg college of nursing.

## Results and Discussion

### Socio demographic profile

Socio demographic profile of nursing students frequency and percentage distribution of Nursing Students for both the experimental and control group according to age, gender, type of family, religion, marital status, source of information, educational status. Among the experimental group (30), the majority of nursing students were in the age group of 18-20 years, i.e. 25 (83.33%) were 20–22 years, i.e. 5 (16.66%) and 22–25 years, i.e. 0 (0%). For the control group (30), the majority of nursing students were in the age group of 18–20 years, i.e. 22 (73.33%) were 20–22 years, i.e. 8 (26.66%) and 22–25 years, i.e. 0 (0%). In relation to Gender, the experimental group had majority of nursing students were female, i.e. 20 (66.66%) and male nursing students, i.e. 10 (33.33%). For the control group (30 in all), the majority of nursing students were female 17 (56.66%) and male nursing students, i.e. 13 (43.33%). Regarding the type of family, the experimental group had majority from nuclear family 22 (73.33%) and joint family, i.e. 8 (26.66%) were extended family, i.e. 0 (0%). For the control group had majority from nuclear family 22 (73.33%) and joint family, i.e. 8 (26.66%) were extended, i.e. 0 (0%). With regard to the religion, the experimental group had majority of nursing students being Hindu 24 (80%), Muslim 2 (6.66%) and Christian 4 (13.33%). For the control group, the majority of nursing students were again from Hindu 21 (70%), Muslim 2 (6.66%) and Christian 7 (23.33%). With regard to source of information, the experimental group had majority of nursing students were getting knowledge from newspaper 14 (46.66%), 10 (33.33%) were getting knowledge from TV, 6 (20%) were getting knowledge from Magazine. In control group had majority of nursing students were getting knowledge from TV 20 (66.66%), 6 (20%) were getting knowledge from Newspaper, 4 (13.33%) were getting knowledge from Magazine. In relation Marital status, both the experimental group and control group nursing students were unmarried, i.e. 60 (100%). In relation to Educational status, both the experimental group and control group nursing students were BSC Nursing.

**Knowledge of nursing students regarding stem cell therapy and its importance in pre-test and post-test for the experimental group**

Table 2 showed distribution of respondents according to pre-test and post-test knowledge scores is given for the experimental group. The pre-test was conducted before administration of structured teaching to the nursing students. Among which 17 (56.66%) nursing students were having good knowledge, 13 (43.33%) were having Average

knowledge. The above data clearly indicates the need for a planned teaching programme to be imparted for improving the knowledge level of nursing students. The post-test was conducted after administration of the structured teaching programme. The post-test knowledge scores shows a significant difference from that of pre-test, i.e. 2 (6.66%) were having very good knowledge, 26 (86.66%) gained good knowledge and only 2 (6.66%) of them were average knowledge

**Table 2:** Knowledge and percentage distribution of respondents for experimental group

Level of knowledge	Pre-test		Post-test	
	F	%	F	%
V Good (31-40)	-	-	02	6.66
Good (21-30)	17	56.66	26	86.66
Average(11-20)	13	43.33	02	6.66
Poor (0-10)	-	-	-	-
<b>Total</b>	<b>30</b>	<b>100.00</b>	<b>30</b>	<b>100.00</b>

**Knowledge of nursing students regarding stem cell therapy and its importance in pre-test and post-test for the control group**

Table 3 showed distribution of respondents according to pre-test and post-test knowledge scores is given for the control group. There was no administration of structured teaching to the nursing students. For the pre-test, majority of 25 (83%)

nursing students were having average knowledge, 5 (17%) were having good knowledge. The post-test was conducted without any administration of the structured teaching programme. The post-test knowledge scores shows no significant difference from pre-test score, i.e. 26 (86.66%) were having average knowledge, 2 (6.66%) were having poor knowledge and only 2 (6.66%) were having good knowledge.

**Table 3:** Knowledge and percentage distribution of respondents for control group.

Level of knowledge	Pre-test		Post-test	
	F	%	F	%
V Good (31-40)	-	-	-	-
Good (21-30)	5	17	2	6.66
Average(11-20)	25	83	26	86.66
Poor (0-10)	-	-	02	6.66
<b>Total</b>	<b>30</b>	<b>100</b>	<b>30</b>	<b>100.00</b>

**Effectiveness of STP**

This table 4 shows that in the experimental group,

- The pre-test score was minimum 14 and maximum 25, Mean and SD was 20.33 and 3.18 respectively.

- The post-test score was minimum 17 and maximum 33, Mean and SD was 26.53 and 3.44 respectively.
- The obtained 't' value 7.38 is statistically at 0.05 level.

**Table 4:** Analysis of observational scores in experimental group (N = 30)

Group	Minimum	Maximum	Mean	SD	t-value	p-value
Pre-test	14	25	20.33	3.18		p-value
Post-test	17	33	26.53	3.44	7.38	<0.001 (S)
df = 29						

Level of significant at 0.05 is 2.05

**Analysis of observational scores in control group**

Table 5 shows that in the control group, The pre-test score was minimum 12 and maximum 27, Mean and SD was 17.53 and 3.48 respectively. The post-test score was minimum 9 and maximum 27, Mean and SD was 16.83 and 3.55 respectively.

Obtained *t*-value 0.77 is not statistically significant at 0.05 level. Hence  $H_1$ , i.e. the research hypothesis is accepted and  $H_{01}$  the null hypotheses is rejected because calculated *t*-value for the experimental group is greater than tabulated *t*-value.

**Table 5:** analysis of observational scores in control group (N = 30)

Group	Minimum	Maximum	Mean	SD	<i>t</i> -value	<i>p</i> -value
Pre-test	12	27	17.53	3.48		
Post-test	9	27	16.83	3.55	0.77	0.4475 (NS)
df = 29						

Level of significant at 0.05 is 2.05

**Comparison of knowledge scores regarding stem cell therapy and its importance in experimental group and control group.**

The pre-test and post-test mean knowledge scores of respondent regarding stem cell therapy and its importance for the experimental group and control group. For experimental group, the total enhancement of the respondent in Section: A was 10.63% and for Section: B was 17.24%. the overall enhancement was 15.5% from pre-test to post-test.

The investigator, analyzed the data and came to the conclusion that the effectiveness of structured teaching programme (STP) brought an impact on knowledge regarding stem cell therapy and its importance among nursing students in experimental group and those in control group who did not received STP, showed no change in their knowledge level.

For the control group, the total enhancement of the respondent in Section: A was 4.5% and for Section: B was 0.68%. the overall enhancement was only 1.75% from pre-test to post-test. Hence, it was concluded that there was significant difference between the knowledge scores of experimental group and control group.

**Implications**

*Nursing Practice:* Continuous education is of paramount importance in order to enhance practice and increase positive outcomes. The role of the clinical facilitator in the improvement of nursing practice needs to be addressed.

**Association of post-test knowledge scores of nursing students with selected demographic variable**

The knowledge is not associated and is not significant with almost all the demographic variables like age, gender, type of family, religion, source of information, marital status, educational status at 0.05 level for the experimental group. Thus the null hypotheses  $H_{02}$  is accepted and research hypotheses  $H_2$  is rejected.

*Nursing Education:* During formative, undergraduate training, student nurses must be exposed to evidence-based practice and why research plays such an integral part in nursing education and practice. This exposure may lead to a greater embracement and understanding of the stem cell therapy and its importance. Nursing Students must be made aware that textbooks and research articles supplement each other and teaching must be aimed at broadening the students' skills. Nurse educators have a key role to play in reaching this goal.

**Conclusion**

*Nursing Administration:* The present study is proposed to help the student administrators to strategically plan and gain knowledge about stem cell therapy and its importance. The administrators in both private and government sectors should take initiative actions to update the knowledge of student nurses on stem cell therapy and its importance.

Good health is not only about not being ill, it is about being happy and feeling whole from a physical, mental and spiritual point of view. The study and research of human body and related health issues, helps to understand how human function, and the application of that knowledge to improve health and to prevent and cure diseases.

*Nursing Research:* The study will be a valuable reference material for further researchers. This study is a preliminary set up for exploring the

concept of knowledge of stem cell therapy and its importance.

### References

1. Adele Pillitteri. Stem cell therapy and its importance. maternal and child health nursing, 1<sup>st</sup> Edition, published by JB Lippincott, published at Philadelphia, p.567.
2. Annamma Jacob. Stem cell therapy and its importance. A comprehensive textbook of midwifery and gynecological nursing, 3<sup>rd</sup> edition, published by Jaypee brothers, published at New-Delhi, p.418.
3. Paul VD, et al. Effectiveness of stem cell treatment on congestive cardiac failure. Transplant Proc (abstract) 2011;32(3):231-45.
4. Karen L. Syrjala, Allison C. Stover, Jean C. Yi, et al. Development and Implementation of an Internet-Based Survivorship Care Program for Cancer Survivors Treated with Hematopoietic Stem Cell Transplantation. J Cancer Surviv. 2011 Sep;5(3):292-304.
5. Storer, et al. Mesenchymal stem cell therapy on the time course of pulmonary remodelling depend on the etiologic of lung injury. Transplant Proc 2005;20(5):143-15.

