



“A STUDY TO EVALUATE THE EFFECTIVENESS OF PLANNED EDUCATIONAL PROGRAMME ON KNOWLEDGE REGARDING STEM CELLS AND THEIR APPLICATIONS AMONG THE NURSING STUDENTS OF SELECTED COLLEGES, MORADABAD, U.P”.

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ABSTRACT

Aim & objective: To assess the level of knowledge about stem cells and their applications among nursing students. **Methodology:** A Quasi-experimental research design was conducted at Teerthanker Mahaveer College of Nursing and Teerthanker Parsvanath School of Nursing. The samples consisted of 100 nursing student's selected using purposive sampling technique. The intervention tool consisted of demographic variables and self structured knowledge questionnaire **Results:** The level of knowledge in the experimental group and control group regarding stem cells and their applications among B.Sc Nursing 2nd year Students on the basis of data of pre and post-test. The pre-test inadequate level of knowledge score 26 (52%) and post-test level of knowledge score 0(0%) with n=50 in experimental group. In pre-test, inadequate level of knowledge score 19(38%) and post-test level of knowledge score 24(48%) with n= 50 in control group. In pre-test, moderate level of knowledge score 24(48%) and post-test on the level of knowledge score 19(38%) with n=50 in experimental group. In pre-test, moderate level of knowledge score 31(62%) and post-test level of knowledge score 26(52%) with n= 50 in control group. In pre-test, adequate level of knowledge score 0(0%) and post-test on the level of knowledge score 31(62%) with n=50 in experimental group. In pre-test, adequate level of knowledge score 0(0%) and post-test level of knowledge score 0(0%) with n= 50 in control

group. The comparison of pre and post-test of level of knowledge among the experimental group showed that, the pre-test mean knowledge score was 8.56 with S.D 2.94 and the post-test mean knowledge score was 18.78 with S.D 3.38. The calculated 't' value of 16.1190 showed high statistical significance at $p < 0.0001$. In the comparison of the level of knowledge, in the control group the post-test mean knowledge score was 8.96 with S.D 2.78. The calculated 't' value of 15.8664 showed high statistical significance at $p < 0.0001$ level.

Discussion: The study concluded that there was a significant improvement in level of knowledge among Nursing Students after Interactive Discussion with planned teaching programme. Thus Interactive Discussion was an effective tool to improve knowledge and practices regarding stem cells and their applications.

Key words: stem cells, knowledge, Self structured questionnaire

INTRODUCTION

“If power is defined as the ability to do anything and create anything, then the stem cell is the most powerful *known* life force.”

Stem cells are special cells that arise from special cells that forms varied tissues of the physical structure. As an example, varied forms of blood cells are utilized by European researchers. Leukocytes, red blood cells and platelets (derived from certain stem cells).

An ability of the stem cells is to create different kinds of tissues when they divide and develop. Stem cells are very important for the growth and development, maintenance, repair of the brain, bones, muscles, neuro as well as other sensory organs of the body. This power to produce different kinds of specialized cells makes them so unique and potent for medical therapy.

BACKGROUND OF THE STUDY

The history of the stem cell research began in the mid – 18th century and began with the discovery that some cells can form other cells. When in the early 1900's it had been found that many stem cells were created in the blood, the primary somatic cell were discovered. In 1908, the Russian anatomist Alexander Maksimov was projected the term "stem cell" for scientific use. Bone marrow transplant between two siblings with success treated monogenic disease (Severe combined immunological disorder) in 1968. Hematogenic stem cells were found in human twine blood in 1978. In October 2006, the Korean Research Foundation (KERI) created several lines of human embryonic stem cells from human oocytes that created the primary human liver cells victimization cord blood stem cells at Newcastle University. Then, in early 2007, researchers led by Dr. Anthony Atala claimed that in amniotic fluid, a brand new sort of stem cell had been isolated. Embryonic stem cell isolated from one human hair was according in 2008.

NEED FOR THE STUDY

"To start with there is undifferentiated cells; it is the cause of a living being's life."

Undifferentiated cells have the capacity to form into cells that serve various capacities into various pieces of the body. There is yet no total comprehension of the information and demeanor of undeveloped cells among medical care takers. Scientist believes that study of stem cells may be helpful for treating and understanding diseases.

Jee LL, Leng KS, et.al., (2015) conducted a cross-sectional study on data and perspective regarding stem cells and their application in drugs among nursing in University Sains, Malaysia. Study was done on 88 nursing students. The result shows that 92% had moderate knowledge about stem cells. Many students (33%) distressed regarding stem application that it would hurt to humanity et al. had a positive (76.1%) angle towards its therapeutic potential. From this study the varied instructional programs on stem had enforced to enhance the stem cell information and encourage for additional positive angle towards stem cells in medication among those nursing students.

OBJECTIVES

- To assess the extent of information regarding stem cells and their applications among nursing students.
- To assess the effectiveness of planned academic programme on data relating to stem cells and their applications among nursing students.
- To seek out the association between the amount of data relating to stem cells and their applications among nursing students with their selected demographic variables.

OPERATIONAL DEFINITIONS

- I. **EVALUATE:** - In this study refers to determine the level of knowledge about stem cells and their applications among nursing students.
- II. **EFFECTIVENESS:** - In this study refers to the outcome of information about the Planned Educational programme on stem cells and its applications which will be measured by using knowledge structured questionnaire.
- III. **LEVEL OF KNOWLEDGE:-**It refers to the flexibility of nurses to reply to the questionnaire relating to stem cells and their applications that was induced by structured information questionnaire prepared by the investigators.
- IV. **PLANNED EDUCATIONAL PROGRAMME:-**It refers to a detailed proposal for achieving through instructions, measuring the activities with a particular long term aim.

- V. **STEM CELLS AND THEIR APPLICATIONS:-** Cells that may differentiate into various sorts of cells, and may in addition divide in self-renewal to produce lots of the identical sort of stem cells and their act in putt it into medical uses.
- VI. **NURSING STUDENTS:** - In this study, nursing students refers B.sc nursing 2nd year students in selected nursing colleges.

ASSUMPTIONS

- Nursing students can have some data relating to somatic cell and its applications.
- People may have ideas that stem cells therapy may cause dangerous adverse effects.
- New technologies are not much accepted in many areas.
- Stem cells are the advance treatment in treating diseases.

HYPOTHESIS

- **H1** –There will be important difference within the data scores relating to Planned academic programme on stem cells and their applications between experimental and control group.
- **H2** –There will be important association between level of data relating to stem cells and their applications among nursing students with their selected demographic variables.

REVIEW OF LITERATURE

NEELAM HANS, SANDEEP KAUR (2016) conducted a purposive sampling technique on effectiveness of structured programme on knowledge regarding menstrual blood stem cells banking among nursing students at Khalsa College Of Nursing, Amritsar, Punjab. This study was conducted on twenty six nursing students. This study shows that per pre-test information ninety two. 7% of scholars have average information blood stem cells banking and per post-test knowledge eighty eight. 5% of nursing students had sensible information. During this study the structured teaching programme was effective to reinforce the information of nursing student's concerning blood stem cells banking.

AMIRA MOHAMMED, SAED MOHAMMED KHALI, et.al.,(2016)conducted a descriptive study design on data, perspective and awareness of pediatric nurses towards application of stem cells medical care in children at pediatric department at Tanta University, Egypt. This was done on all the nurses World Health Organization work in pediatric ward. The result shows that 69% of nurses have inadequate and lacking knowledge about stem cells. The investigators indicate the necessity of creation of educational programme and continual training for the nurses with the use of stem cells.

HEND S MOHD. & HEND A EL SAYED (2015) conducted a quasi-experimental design on the knowledge and attitude of maternity nurses about cord blood collection and stem cells at Benha University, Egypt. This study was conducted on 52 staff nurses. The result shows that 88.7% of nurses had poor knowledge before interventions. 90.6% had good knowledge immediately and after 3 months of intervention respectively. As well as only 1.9% of nurses have positive perspective towards cord blood collection and stem cells before interventions. Meanwhile, at once and after three months of interventions the positive attitude modification to 66.0% and 69.8% severally. The investigators instructed that adequately planned in-service training programmes associated with cord blood collection and stem cells should be established to develop nurses knowledge, perspective and practices relating to stem cells.

METHODOLOGY

The methodology wants to collect data and information. Analysis methodology may be thanks to systematically solve the research drawback. The aim of this section is to speak to the readers what investigator performed to resolve the matter or to answer analysis question. This chapter deals with the methodology that was selected by the investigator in order to judge the effectiveness of instructional programme on knowledge regarding stem cells and their applications among the nursing students of selected colleges, Moradabad. The methodology of the study includes research approach, analysis vogue, variables, and population, setting of the study, sample and sampling technique, sampling criteria, development and outline of the tool, content validity of tool, responsible of the tool, pilot study, information collection method, and arrange for information analysis.

RESEARCH APPROACH

The research approach influences design and provides a chance to think about advantages and limitations of assorted approaches accessible to the researcher (Crewel 2003). There are 2 ways accessible for data analysis – Qualitative and Quantitative. Quantitative research is predicated on data analysis to come up with dependability. A Quantitative approach was followed. Burns and Grove (1993) define measure as an accurate, objective, systematic technique to clarify and check relationships and examine cause and impact interactions among variables. Throughout this study, the investigators is fascinated by assess the effectiveness of educational programme on knowledge regarding stem cells and their applications among nursing students. Thus scientist found measure approach to be the foremost effective methodology to evaluate the effectiveness of educational programme on knowledge regarding stem cells and their applications among the nursing students of selected colleges, Moradabad.

RESEARCH DESIGN

According to Basavanthappa B.T. (2004) the research designs the plan. Structure and strategy of investigation of responsive the analysis question, is that the overall set up or print the researcher selects to hold out the study.

The research design provides an overall or blue print to hold out the study. The research design utilized in the study was similar experimental design. (Non-randomized control group Pre-test post-test design) in to evaluate the effectiveness of educational programme on knowledge regarding stem cells and their applications among the nursing students of chosen colleges.

SETTING OF STUDY

Setting is the location in which a study is conducted. The study was conducted among the nursing students of Teerthanker Mahaveer college of Nursing & Teerthanker Parsavnath school of Nursing, Moradabad.

POPULATION: Population of this study consisted students of second year B.sc nursing at Moradabad.

TARGET POPULATION: The target population of this study includes nursing students who are finding out in selected college of nursing, Moradabad.

ACCESSIBLE POPULATION: B.Sc Nursing 2nd year students who are study in Teerthanker Mahaveer College of Nursing & Teerthanker Parsavnath school of Nursing, Moradabad.

SAMPLING TECHNIQUE: It is a method of choosing some of the population that represents the whole population.

The samples of this study were selected by Convenience sampling Technique.

SAMPLE SIZE:

Sample was calculated through power analysis. Experimental group-50 students, Control group -50 students (total 100 samples)

SAMPLING CRITERIA

Inclusion criteria:

This includes:-

- Students who are willing to participate within the study
- Student who are studying in B.sc nursing.

Exclusion criteria

This include:-

- ▶ Students who are absent at the time of knowledge assortment.
- Students who are studying in GNM and B.Sc nursing first year.

VARIABLES

Research variable is an outline as qualities, attributes, properties or characteristics that are determined or measured in natural setting while not manipulating and establishing cause and impact relationship. The characteristics and attribute of study subject are considered demographic variable. The demographic variables are:- Age, Gender, Marital Status, Previous knowledge related to stem cells and it's applications, Habitat, Type of family.

RESEARCH VARIABLE: To evaluate the level of knowledge.

DEMOGRAPHIC VARIABLE: Demographic variable consist of 6 items as follows: Age, Gender, Marital Status, Previous knowledge related to stem cells and its applications, Habitat, Type of family.

DESCRIPTION OF THE DATA TOOL

The tool for data collection has two section A and B

Section A: Performa for collecting demographic data. Demographic variable consist of 6 items Age, Gender, Marital Status, Previous knowledge related to stem cells and it's applications, Habitat, Type of family.

Section B: Self-administered structured knowledge questionnaire to assess the knowledge of stem cells and their applications among 2nd year B.sc nursing students.

The knowledge questionnaires consist of 25 questions. The overall score is 25, with minimum score is 0 and maximum is 25. The questions were prepared in English. The highest possible score was 25. It was arbitrarily classified into three levels

- Inadequate level of knowledge ($\leq 50\%$)
- Moderate level of knowledge (51 – 75 %)
- Adequate level of knowledge ($\geq 76\%$)

VALIDATION OF THE TOOL

The prepared instrument together with the objective and blue print was submitted to 5 Nursing experts from Department of Medical Surgical Nursing, Community Health Nursing and one from mental health Nursing. The permission for tool validation was obtained by sending a requisition letter and an acceptance type. The experts were requested to grant their opinions and suggestions relating to each item among the tool. The demographic variables were changed to recommendation and suggestion of the experts.

PILOT STUDY

A Pilot study was conducted at in nursing colleges of Moradabad on 10th December 2018 after obtaining the written permission. Sample of 10 B.sc (N) 1st year students who fulfill the inclusion criteria using Non Probability technique was selected. Data was collected with the help of Adjustment Rating Scale. It was conducted in similar way as final data collection. Pilot study revealed that a majority of Moderate 70%,Mild 20%,Severe 10% Level of Adjustment Among 1st year Nursing student. No modification was created to tool or within the study design once the pilot study. The sample took 1hour to complete the tool. Confidentiality of the respond was maintained.

DATA ANALYSIS AND INTERPRETATION

PRESENTATION OF THE DATA

The data analyzed data has been organized and presented in the following sections:

Section I – Data on distribution of demographic variables

Section II – Data on the level of knowledge score regarding stem cell and their applications

Section III – knowledge on association of selected demographic variables with mean differed level of information within the experimental and control group.

SECTION I :

Descriptive analysis of demographic variables.

Descriptive analysis also termed as percentage analysis that were performed for each question contained in the self-administered questionnaire mainly to ascertain the distribution of respondents under each category.

Table 1. Frequency and percentage distribution of demographic variables such as age, gender and marital status in experimental and control group.

S.No.	Demographic variables	Experimental group N=50		Control group N=50	
		No.	%	No.	%
1.	Age (In year)				
	Below 18 years	2	4	2	4
	18-20	44	88	41	82
	21-23	4	8	5	10
	24 and above years	0	0	2	4
2.	Gender				
	Male	20	40	14	28
	Female	30	60	36	72
3.	Marital Status				
	Single	49	98	48	96
	Married	1	2	2	4

In the experimental group,

- Considering age, 2(4%) were aged below 18 years, 44(88%) were aged between 18-20, 4(8%) were aged between 21-23 and 0(0%) were aged 24 and above years.
- Considering gender, 20(40%) are males and 30(60%) are females.
- Considering marital status, 49(98%) are unmarried and 1(2%) are married.

In the control group,

- Considering age, 2(4%) were aged below 18 years, 41(82%) were aged between 18-20, 5(10%) were aged between 21-23 and 2(4%) were aged 24 and above years.
- Considering gender, 14(28%) are males and 36(72%) are females.
- Considering marital status, 48(96%) are unmarried and 2(4%) are married.

Table 2 :- Pre and post-test level of knowledge in the experimental group and control group regarding stem cells and their applications.

Level of Knowledge	Inadequate ($\leq 50\%$)				Moderate adequate 51-75%				Adequate $>75\%$			
	Experimental Group n=50		Control Group n=50		Experimental Group n=50		Control Group n=50		Experimental Group n=50		Control Group n=50	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Pre-test	26	52%	19	38%	24	48%	31	62%	0	0%	0	0%
Post-test	0	0%	24	48%	19	38%	26	52%	31	62%	0	0%

Depicts the Pre-test and post-test knowledge level in the experimental group, control group

With regards to pre-test knowledge level in the experimental group majority of the 2nd year B.Sc nursing had Inadequate knowledge 26(52.00%), moderate knowledge 24(48.00%), Adequate knowledge 0(0.00%).

With regard to pre-test knowledge level in the Control group, majority of the 2nd year B.sc nursing had Inadequate knowledge 24(48.00%), moderate knowledge 26(52.00%), Adequate knowledge 0(0.00%)

With regard to post-test knowledge level in the experimental group, majority of the 2nd year B.sc nursing had Inadequate knowledge 0(0.00%), moderate knowledge 19(38.00%), Adequate knowledge 31(62.00%).

With regards to post-test knowledge level in control group, majority 24(64.00%) had inadequate level of knowledge and 26(52.00%) had moderate knowledge, Adequate knowledge 0(0.00%).

Table 3: Comparison of pre and post-test level of knowledge in the experimental group.

N=100

Group	Pretest		Post test		Paired 't' value
	Mean	S.D	Mean	S.D	
Experimental n=50	8.56	2.94	18.78	3.38	t= 16.1190 p= <0.0001, S***

***p<0.0001, S-Significant

Table 3 shows the comparison of pre-test and post-test level of knowledge in the experimental group.

In relation with the knowledge level in experimental group, the pre-test mean knowledge score was 8.56 with S.D 2.94 and the post-test mean knowledge score was 18.78 with S.D 3.38. The calculated 't' value of 16.1190 showed high statistical significance at p<0.0001 level

Table 4: Comparison of post-test level of knowledge between the experimental and control group.

N=100

Group	Post test		Unpaired 't' value
	Mean	S.D	
Experimental n=50	18.78	3.38	t= 15.8664
Control n=50	8.96	2.78	p= <0.0001, S***

***p<0.0001, S-Significant

The table 4 shows the comparison of post-test level of knowledge between the experimental and control group.

With regard to,

In the comparison of the knowledge level, in the experimental group, the post-test mean knowledge score was 18.78 with S.D 3.38.

In the comparison of the knowledge level, in the control group the post-test mean knowledge score was 8.96 with S.D 2.78. The calculated 't' value of 15.8664 showed high statistical significance at p<0.0001 level.

Table 5: Association of mean differed score of pre-test knowledge score with selected demographic variables regarding stem cells and their applications.

N=100

S. N O	DEMOGRAPHIC VARIABLES	LEVEL OF KNOWLEDGE			d f	X ² value	P value
		INADEQUATE	MODERATE	ADEQUATE			
1	AGE						
	A. BELOW 18 YEARS	1	1	0	4	2.105*	0.716
	B. 18-20 YEARS	33	10	1			
	C. 21-23 YEARS	2	2	0			
D. 24 AND ABOVE	0	0	0				
2	GENDER						
	A. MALE	16	4	0	2	1.425*	0.491
B. FEMALE	20	9	1				
3	MARITAL STATUS						
	A. SINGLE	35	13	1	2	0.397*	0.820
B. MARRIED	1	0	0				
4	PREVIOUS KNOWLEDGE						
	A. NO	0	0	0	6	4.278*	0.639
	B. ELECTRONIC MEDIA	9	2	1			
	C. PRINTED MEDIA	11	5	0			
	D. BY HEALTH PROFESSIONALS	11	5	0			
E. FAMILY MEMBERS/RELATIVES /OTHERS	5	1	0				
5	HABITAT						
	A. URBAN	17	7	0	2	1.110*	0.574
B. RURAL	19	6	1				
6	TYPES OF FAMILY						
	A. NUCLEAR FAMILY	19	9	0	2	1.800*	0.407
B. JOINT FAMILY	17	4	1				

It shows that none of the demographic variables in the experimental group, control group revealed significant statistical association with the mean differed pre-test knowledge score.

SUMMARY

The determination of the study was to assess the effectiveness of planned educational programme on information with reference to stem cells and their applications in chosen colleges of Moradabad. Quantitative approach was used for the study. The abstract framework was supported Imogene King's Goal Attainment Theory. The information was collected by victimization demographic Performa and information form were used. A self-structured tool was valid by the researchers and information was tested. The data obtained were evaluated and understood in terms of the objectives and hypothesis of the study. Quantitative statistics,

(frequency, percentage, mean, standard, deviation) and inferential statistics (chi-square test) were accustomed analyzed the information and to check the hypothesis

CONCLUSION

The present study measure the effectiveness of planned educational programme relating to stem cells and their applications among nursing students with acquire information of stem cells and its applications. The study findings disclosed that there was a big distinction within the pre-test and post-test of information relating to stem cells and their applications among the nursing students.

IMPLICATIONS

The investigator has drawn the subsequent implications from the study, that is of significant concern within the nursing observe, nursing education, nursing management and research.

Nursing Practice

The researchers have an initial role to teach nursing students relating to stem cells and their applications to strengthen the level of information of students. This can be facilitated by educating nursing students.

- Investigators can play a major role in providing knowledge to the nursing students related to stem cells and their applications.
- Investigators can implement the education about stem cells and their applications to the nurses to increase knowledge based on treatments and storage process of stem cells.
- Investigators can motivate the patients to donate their stem cells for the disease prevention and treatment of others.

Nursing Education

- Investigators should educate and motivate parents to donate stem cells after delivery and should also educate those regarding benefits of donating stem cells in disease prevention of others.
- Participants in sessions, workspaces and meetings for scholars and faculty as relating to the stem cells and their applications should be encouraged in mandate to afford up to date evidence to develop the information level of nurses.
- Inspire the nursing scholars for actual exploitation of evidence based rehearsal.

Nursing Organization

- Nurse administrators can organize formal teaching programme for nurses to enhance their knowledge level regarding stem cells.
- Nurse Managers should encourage the administration to recommend utilization of stem cells for treatment and disease prevention.
- Nurse Manager can reinforce interdisciplinary and multidisciplinary cooperation with investigators.

Nursing Research

- Circularize the results of the study through discussions, workspaces and meetings by publication in periodicals and websites. Promote more research in developing new techniques in treatment of stem cells.
- Expand the research to study a larger population to know about stem cells and their applications.
- Nurse researcher should inspire the staff nurses to implement the research answers in bring out more techniques to promote new techniques in treatment of stem cell.

RECOMMENDATIONS

1. The nurse investigator encourages the nursing students to grasp related to stem cells and their treatment regimens in Teerthanker Mahaveer College of Nursing and Parsavnath School of Nursing.
2. Parallel study can be done as comparative study to assess the efficiency of stem cells and their applications.
3. Comparable study can be simulated on a larger sample to increase validity and generalizability of conclusions
4. A true experimental study may be directed to consider the level of data relating to stem cells and their applications. A related study can be conducted in numerous settings like public area like village Khata.
5. Study with matching of samples.

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