
Social Media- Assisted In-services Training Program for Nurses Regarding Hematopoietic Stem Cell Transplantation in 57357 Outpatient Clinic

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Abstract:

Background: Nowadays hematopoietic stem cell transplantation (HSCT) is a reputable treatment modality for many hematological disorders with decisive indications. **Aim:** This study aim to appraise the effect of Social media-assisted in-services training program for nurses regarding hematopoietic stem cell transplantation in 57357 outpatient clinic. **Research design:** A quasi-experimental design was used in this study. **Setting:** The study was conducted at 57357 out-patient clinic affiliated to Cairo city, Egypt. **Subject:** a convenient sample that included (50) nurses. **Tools:** a structured interview Questionnaire tool that cover four parts. Part I: demographic characteristic, part II: nurses knowledge part III: attitude, part IV: reported practices (pre and post). **Results:** This study displayed statistically significant enhancement in nurse's knowledge, attitude, and reported practices (14.58 ± 1.85 to 23.92 ± 2.31) (20.32 ± 2.78 to 36.84 ± 3.32) (48.94 ± 5.05 to 65.50 ± 2.73) respectively pre VS post program. **Conclusion:** The current studies demonstrate importance of social media assisted in-services training program for nurses to improve their knowledge, attitude, and reported practices. **Recommendation:** Continuity of in-services training program for nurses in different health care setting

Keywords: *Assisted, Hematopoietic, in-services training, Outpatient clinic, Program, Social media, Stem Cell, Transplantation & 57357.*

Introduction

Hematopoietic stem cell transplantation (HSCT) is a forceful beneficial opportunity for numerous malignant and nonmalignant diseases. Worldwide each year about 40,000 transplantations are performed. Stem cells are consider body reparation units that help in the regeneration and maintenance of organs and tissues throughout an organism's lifetime, many scientists have demanded that the cells could possibly create treatments and management for several diseases containing cancers, Parkinson's, Alzheimer's, spinal cord injuries, cardiovascular disease, and igniting hopes of achieving stem cell-based replacement therapy in a medical setting (Mahmoud et al., 2019).

Cancer is unique of the main causes of illness and death around the world; statistical models predict that in 2020 there will be 15 million new cancer cases and mortality from cancer will increase by 104% worldwide that fivefold higher in the developing world. HCT is ingrained therapeutic cure for certain types of blood disorders, inherited diseases, immunodeficiency, autoimmune conditions and cancers. HCT activity is growing at an unparalleled pace with > 50,000 allogeneic transplants arising global yearly (Saito et al., 2018).

Multiple myeloma number of autologous HSCT performed worldwide increased by 107% from 2006 to 2015. HSCT signify 56% in USA and Canada.

Request of autologous HSCT was uppermost among the Northern America and European regions, with an increase from 13% to 24% and an increase from 15% to 22% in previous setting. In contrast, the exploitation of autologous HSCT was much lower in the Africa/Mediterranean and Asian/Pacific region, with autologous HSCT utilization only changing slightly from 1.8% in 2006 to 4% in 2015 (Andrew et al., 2019).

Billions of people round the world use social media which definition is broaden and continually developing. The term usually denotes to Internet-based tools that permit individuals and societies to share information, ideas, images, and other content; on a professional level, health care providers use social media to increase knowledge, improve health outcomes, progress professionalism, rise individual awareness, provoke patients, to argument health care rule and exercise issues, to promote health behaviors, and provide the community with health information (Lee Ventola, 2014).

Nursing is an ever-changing field necessitating the need for nurses to participate in in-service training programs. In-service training is defined as learning activities that's formal or informal work-related provided for employed professionals, paraprofessionals, and other practitioners through opportunities or is a proficient training or effort for staff development, where experts are trained their

work with others to obtain new knowledge, enhanced skills, more effective, efficient, and competent service in several fields and to diverse groups of people. Nursing care of the highest quality can only be provided in an environment where nurses are kept up to date on new advances by in-service training, which should be considered an intrinsic part of the job (Alex et al, 2020).

Significance of the study:

HSCT is currently a widely accepted therapy option for a variety of hematological diseases, with excellent indications. In 2008, HSCT procedures intensified with the opening of 15 HSCT units in Egypt based on 30 years of experience and 4256 transplants (60 percent allogeneic and 40 percent autologous). Egypt's population will surpass 100 million in 2020, there will be fifteen transplant centers, and the transplant rate per million will be 8.4, which is significantly higher than the number reported previously in 2008, when the transplant rate per million was 2.8, but still far below Western standards of 36–40 per million. (Mahmoud et al., 2020)

Professional healthcare providers, such as nurses, play a critical role in teaching their patients about the risks of stem cell-based therapy and serving as champions for medical knowledge. Nurses must provide balanced and accurate information to patients so that decisions can be made based on facts and unbiased responses. Specialized nursing helping to avoid and manage the expected and unexpected side effects of HSCT. Nurses are critical in putting in place strategies to prevent and treat infections and their side effects after HSCT. Additionally, reduce the risk it poses to individuals, patients, and the scientific profession as a whole. (Lima & Bernardino, 2020).

Aim of the study:

The study aims to appraise the effect of Social media-assisted in-services training program for nurses regarding hematopoietic stem cell transplantation in 57357 outpatient clinic through the following objectives:

- 1- Evaluate nurse's knowledge, attitude and reported practices regarding hematopoietic stem cell transplantation.
- 2- Design, and implement Social media- assisted training program that meets the needs of nurses.
- 3- Assess the effect of Social media- assisted training program.

Research hypothesis:

- In service training program will improve nurses' knowledge
- In service training program will improve nurses' attitude
- In service training program will improve nurses' practice

Subjects and Methods

Design: A quasi-experimental design was used to conduct this study

Setting: this study was conducted at 57357outpatients Clinic, Cairo city, Egypt.

Sample size, type, and technique: The required sample size was fifty nurses based on the following equation

$$n = \frac{t^2 xp (1 - p)}{M^2}$$

n= required sample size

t= confidence level at 95%

p= estimated population

m=margin of error at 5%

A convenient sample was used to choose 50 nurses included 10% for pilot study that represent 5 nurses to be rest 50 nurses in outpatient Clinic.

Tools of data collection

Data were collected using the following tools:
interview questionnaires that cover the following parts:

A. Demographic characteristic sheet:

This sheet was designed by the researchers after reviewing literature; for the purpose of collecting personal and demographic characteristics of nurses which included age, gender, level of education, occupation, and years of experiences.

B. Nurses knowledge:

Belong to stem cells and their application in medicine by (Kumar, et al., 2017), as meaning, types, contributing factors, uses, storage, and side effect this was evaluated through a true-false, and don't know questionnaire consisting of 20 statements. The knowledge unit was classified in the range of one to forty, (85% :100%) represented with 34 – 40 being good knowledge, (65% to less than 85%) constitute 26-33.6 being average knowledge and (50% to less than 65%) that represent 20-25.6 being poor knowledge

C. Nurses attitude: by (Kumar, et al., 2017)

composed of 17 statements

Assessed through a 3-point Likert scale (never, sometimes, and always) as concerned that stem cell transplantation could lead to human beings being killed for the benefit of others, the government should ban all embryonic stem cell research from embryos or aborted fetuses. Because life begins at conception, embryonic stem cell research that involves the destruction of embryos is immoral, illegal, and unnecessary. A blastocyst should be treated with the same dignity and right to life as an adult individual.

Stem cell transplantation should be widely practiced, advise pregnant mothers to store their umbilical cord blood stem cells for future use; competency in stem

cell knowledge is important for me as a health care provider; aware of the potential benefits, uses, and potential harms of stem cell research; there should be more awareness programs regarding stem cell research; Believe that cloning of human embryonic stem cells is immoral, that hospitals use cloned stem cells to treat patients with life-threatening diseases, and that scientists should retain a record of stem cells. Consider if human embryonic stem cells should be cloned for research and whether scientific research is necessary for the well-being of society.

Scoring system:

Sixteen statements were provided. Scores ranged from 1 point which was 'never' to 3 points, which was 'always'. The attitude sector was categorized in the range of 16 to 48 points, the higher score, the higher support and encouragement among nurses. Thus, this indicated an overall positive attitude to stem cell use in health.

D. Nurses reported practices:

Divided to seven subcategories' to assess nurses practices toward HSCT before, during and after the operation as general practice, managing pain, observing and managing complications related to transplantation process, maintain infection prevention, promote exercise and ambulation , Provide hygienic care and monitor nutritional status by using done and not done score that done practices take score 2 and not done take grade 1, and then the total practices scores divided to satisfactory (>85%) and unsatisfactory (<85%).

Tools content and face validity:

The tools were tested and evaluated in this study to meet the criteria for trustworthiness of data gathering, content validity by three experts from faculty members in the nursing and medical fields. Different academic categories and different specialties were represented in the group such as; medical health nursing, and community health nursing. To ascertain relevance, clarity, and completeness of the tools, experts elicited responses were either agree or disagree for the face validity (Pascoe & Michael (2022)).

Tools reliability:

The reliability of the tools that was assessed through 20% of cases using the developed questionnaires and reassessment was done after 7 days on the same sample and the results were the same each time. Testing reliability of proposed tools was done by Cronbach alpha test. The result for knowledge was 0.74, 0.82 for attitude and 0.88 for reported practices.

Pilot study:

The pilot study used 10% (5) of the total sample to confirm that the tools were clear and applicable, as

well as to estimate the time required to complete them.

Ethical Considerations:

Participant permissions were obtained after the study's purpose was stated prior to data collection; nurses were informed of the studies goal. They were given the option to decline participation and were informed that they might withdraw at any moment during the research without giving a reason. They were also told that the information they provided would be kept private and only used for research purposes, as this is an ethical requirement.

Field work:

The field work started in august 2020 to December 2020. The researchers made one (two not one) visits/week for one months, (Sundays & Mondays, from 10.00 a.m. to 12.00 moon) to complete pre and as the same with posttest. The average time needed to complete the tools ranged from 30-45 minutes. The rest of the program done by using social media as WhatsApp, telegram and Facebook applications.

Social media program construction:

It consisted of three phases, preparatory phase, implementation phase and evaluation phase.

Preparatory phase:

This study was preceded by a preparatory phase in which the following activities were performed:

- An official letter requesting permission to conduct the study was submitted from the Dean of the Faculty of Nursing, Helwan University to the manager of the 57357 hospital. This letter included the aim of the study and a photocopy from the data collection tools in order to get the permission and cooperation in the collection of data and implementation of the medical and community nursing intervention.
- Then, the researchers met nurses who agreed to participate in the study and explain the aim and objective of the study as evaluating the effect of the social media assisted educational program on nurse's knowledge, attitude, reported practices then oral or written approval consent was obtained from them before the program method was applied.
- Assessment using the previous tool was done by reviewing past and current literature covering the various aspects of the research in books, articles, periodicals, magazines and studies related to the research study.

Implementation phase:

The researchers using telephone number to reach to all participants through social media as Whats app, telegram, and Facebook the most available and routinely used by study sample and then send the data or information through previous mentioned methods. The program was implemented in the form of text, video, brochure. The content was covered overview

of HSCT meaning, types, sources, contributing factors, complication and uses as a theoretical parts and videos to show practices or measures that be done pre, during and after the operation.

Evaluation phase:

Upon the completion of program, the post test was done for nurses to estimate the effect of the program using the same preprogram tools.

Statistical Design:

Results:

Table (1): Distribution of demographic characteristics of the studied sample (N=50).

Demographic data		No	%
1. Sex	a. Male	23	46.0
	b. Female	27	54.0
2. Educational level	a. Nursing diploma 3 years	6	12.0
	b. Technical institute	18	36.0
	c. Bachelor nursing	26	52.0
3. Occupational type	a. Nurse	18	36.0
	b. Head nurse	32	64.0
4. Years of experiences	a. Less than 10 years	42	84.0
	b. Ten years and more	8	16.0
5. Attending stem cell training courses	a. No	27	54.0
	b. Yes	23	46.0

Data were analyzed using the statistical package for social sciences (SPSS), version 22. Qualitative data were presented as number and percent. Mean and standard deviation for each of the demographic, data, and t test and Chi-square test were recorded. Comparison between pre and posttest; $P > 0.05$ was considered to be statistically significant of results; $P > 0.05$ was statistically significant of results.

Table (2): Distribution of total knowledge scores among studied nurses at pre and post assisted in-services training program (n= 50).

Total knowledge scores about HSCT	Nurses pre and post applying program			
	Pre-applying		Post- applying	
	No.	%	No.	%
Levels of total knowledge:				
Poor	50	100	22	44
Average	---	---	28	56
Mean scores of total knowledge pre applying:				
Mean \pm SD	14.58 \pm 1.85			
Mean change of scores of total knowledge post applying:				
Mean \pm SD	23.92 \pm 2.31			
Paired T test	23.93			
P value	0.000**			

*: Significant at $P \leq 0.05$.

**: Highly significant at $P < 0.001$

Table (3): Distribution of total attitude scores among studied nurses at pre and post assisted in-services training program (n=50).

Total attitude scores	Nurses pre and post applying program			
	Pre-applying		Post- applying	
	No.	%	No.	%
Levels of total attitude:				
Negative	50	100	---	---
Positive	---	---	50	100
Mean scores of total attitude pre applying:				
Mean \pm SD	20.32 \pm 2.78			
Mean change of scores of total attitude post applying:				
Mean \pm SD	36.84 \pm 3.32			
Paired T test	28.40			
P value	0.000**			

*: Significant at $P \leq 0.05$.

**: Highly significant at $P < 0.001$

Table (4): Mean difference scores of total reported practices and sub items among studied nurses at pre and post assisted in-services training program (n=50).

Nurses practice	Pre education	Post education	t- value	P-value
	Mean ± Std. Deviation	Mean ± Std. Deviation		
1.General practice	5.160 ± 1.530	7.540 ± 0.645	10.185	0.000**
2. Managing pain	8.280 ± 1.161	9.20 ± 0.782	5.039	0.000**
3.Observing and managing complications related to transplantation process	6.140 ± 0.756	7.660 ± 0.478	14.098	0.000**
4. Maintain infection prevention	10.760 ± 1.221	13.240 ± 0.743	14.037	0.000**
5. Provide hygienic care	8.220 ± 1.130	11.00 ± 0.968	16.152	0.000**
6.Promote exercise and ambulation	5.120 ± 0.939	7.180 ± 0.918	12.865	0.000**
7. Monitor nutritional status	5.260 ± 0.964	7.680 ± 0.652	15.441	0.000**

*: Significant at $P \leq 0.05$.

** : Highly significant at $P < 0.001$

Table (5): Distribution of total reported practice scores among studied nurses at pre and post assisted in-services training program (n=50).

Total reported practice scores	Nurses pre and post applying program			
	Pre-applying		Post- applying	
	No.	%	No.	%
Levels of total practice:				
Satisfactory	21	42	50	100
Unsatisfactory	29	58
Mean scores of total practice pre applying:	48.94 ± 5.05			
Mean ± SD				
Mean change of scores of total practice post applying:	65.50 ± 2.73			
Mean ± SD				
Paired T test	23.07			
P value	0.000**			

*: Significant at $P \leq 0.05$.

** : Highly significant at $P < 0.001$

Table (6): Correlation between knowledge, attitude, and reported practices regarding HSCT Post applying program (N= 50)

Items	Correlation between scores of total knowledge, attitude, and reported practices					
	Knowledge		Attitude		Reported practice	
	r	p	r	p	r	p
Knowledge	1		0.311	0.02*	0.155	0.282
Attitude	0.311	0.02*	1		0.294	0.03*
Reported practice	0.155	0.282	0.294	0.03*	1	

** . Correlation is significant at the 0.01 level (2-tailed).

r= person correlation coefficient

*. Correlation is significant at the 0.05 level (2-tailed).

Table (1): Shows that, 54% of studied subject were females, as well as Bachelor nursing educational level represents (52.0%). Regarding to occupational type (64%) were head nurses, while (84%) had less than 10 years' experience & (54%) of them not attending stem cell training courses before.

According to the research hypothesis, which stated providing Social media assisted in-services training program for nurses regarding hematopoietic stem cell transplantation in 57357 outpatient clinic, will improve their knowledge, attitude, and practices was approved in tables (2,3, 4, 5, & 6) .

Table (2): Explains that, the nurse's knowledge was improved post social media assisted in service

training program than pre (14.58 ± 1.85 to 23.92 ± 2.31) respectively at $p = 0.000$ -level ≤ 0.05 .

Table (3): refers to, the total scores of nurse's attitude showed a highly statistical significant difference at $p = 0.000$ -level ≤ 0.05 .

Table (4): Indicates that, the nurse's practice was improved after application social media assisted in service training program than pre with highly statistically significant difference at all items $p = 0.000$ -level ≤ 0.05 .

Table (5): Shows that, the total mean score of nurses practice was improved in the post assisted in-services training program to (65.50 ± 2.73), than (48.94 ± 5.05) in the pre-program at $p = 0.000$ -level ≤ 0.05 .

Table (6): Delineates that positive significant correlation between nurses knowledge and attitude also attitude and reported practice although insignificant positive correlation between nurses knowledge and reported practices post program,

Discussion:

Stem cells are special cells that can make copies and change into the many different kinds of cells. There are several kinds of stem cells and are found in different parts of the body at different times. Cancer and cancer treatment can damage hematopoietic stem cells. Hematopoietic stem cells are stem cells that turn into blood cells. Bone marrow is soft, spongy tissue in the body that contains hematopoietic stem cells. It is found in the center of most bones, so bone marrow transplantation today considers a life-saving treatment for many incurable diseases. (Sekerci & Kir Bice 2020)

Stem cell transplant is the process by which stem cells are collected by aspiration with a needle from the posterior iliac bone of a person of a suitable tissue type or from the individuals, and after preparation, are given to the recipient. So education plays an important role in achieving organizational goals and nurses need to update occupational knowledge and professional skills and improve the best practices for fulfilling various tasks and responsibilities (Chaghari, et al 2017).

Where is the aim of the study is to appraise the effect of Social media- assisted in-services training program for nurses regarding hematopoietic stem cell transplantation in 57357 outpatient clinic .

Regarding demographic characteristics the current study shows; more than half of study subject were female, this result in accordance Ali, et al (2019), "who study the Effect of Teaching Program on Nurse's Performance Regarding Bone Marrow Transplantation" Egypt, stated that the most of nurses included in their study were female. In the same line Ibrahim, et al (2018) "effectiveness of an educational program about stem cell challenges on knowledge and attitude of internship nursing students", Egypt, reported that most of subject included in their study were female as well as finding of the current study. Also they are stated that according to age of their subject study more than half of them aged between 18 to <25 years, this result agreed with the current study results which indicate the largest nurses age group include in the study aged between 18 years to <34 years, this may due to such places mainly depends on female and young age nurses.

The current study revealed to; more than half of nurses include in this study had bachelor nursing education, this result in accordance with Vaghar

(2018) who study "The Impact of an Educational Program on Blood and Blood Products Transfusion on Nurses' Level of Knowledge and Performance", stated that the more than 2/3 of participants were women with a B.Sc. degree. As well as this result contradict with Abed El-Hay, et al (2018) "Effect of educational guidelines on nurses' performance regarding management of Patients undergoing bone marrow transplantation" ,they are stated that; regarding to level of nurse's education, about (70.0%) from nurses were diploma and only (30%) were Baccalaureate degree. As regards years of experience they stated that, three quarters of study less than 10 years this result agreed with the finding of the current study which stated that more than two third had less than 10 years' experience.

Findings of this study showed a highly statistically improvement of nurse's knowledge and practice post social media assisted in service training program than pre, this result due to training the nurses and providing their valuable information about bone marrow and stem cell transplantation which enhancing and improving their knowledge and practice. This result in agreement with Abed El-Hay, et al (2018), whom reported that the levels of nurses' knowledge about management during and after transplantation of patients throughout all intervention periods of the study was improved post education.

Moreover, this result also in accordance with Ali, et al (2019), they are reported that in their study, regarding to nurses' knowledge there were significant improvement regarding total levels of nurses' knowledge and practice about bone marrow transplantation

before and after implementation of teaching program compared with Low level of nurses' knowledge and practice before implementation of teaching program. In the same point Abo-Bake & Masoud (2021). Stem cell therapy: health care providers' knowledge and attitude, Egypt; Illustrated the knowledge of health care providers concerning stem cells that the majority

of health care providers' have average level of knowledge regarding stem cell therapy.

Also regarding nurse's knowledge, Azzazy & Mohamed (2016). Effect of educational intervention on knowledge and attitude of nursing students regarding stem cells therapy, KSA, who are reported that the results of their study proven that participants knowledge wasn't enough in the pretest and improved post the educational intervention

Regarding to nurses attitude current study shows; highly statistically difference in nurses attitude post education this may due to the effect of education which improving and enhancing their attitude to be

the best through acquired knowledge and practice from education, this result in accordance with **Miok & Minho (2019)**. "Effect of Educational Program on Knowledge, Attitude, and Willingness of Nursing Students for Hematopoietic Stem-Cell Donation " and stated that as a result, post-test scores of the nurses attitudes regarding hematopoietic stem-cell donation showed statistically significant differences between the experimental group that scored 3.86 ± 0.37 points and the control group that scored 3.12 ± 0.35 points. Also, this result agreed with **Lye, et al (2016)**. "association between nurses' knowledge and attitudes toward stem cell application in medicine ", They reported that among the questions measuring nurses' attitudes towards stem cell application in a medical setting, the majority of nurses showed a good attitude. The result was supported by **Azzazy & Mohamed (2016)** who explained the attitude of subject included in their study, half of them reported positive attitude regarding stem cells therapy in the pretest and this percentage was doubled in the posttest.

Mohammed & EL Sayed (2015), knowledge and attitude of maternity nurses regarding cord blood collection and stem cells: an educational intervention, Egypt, explain that concerning nurses' attitude in their study the findings revealed that about two thirds of the studied nurses had negative attitude before intervention. While intervention the percentage changed to more than two thirds of the studied nurses had positive attitude as the results clarified in the current study.

Regarding to correlation between knowledge, attitude and reported practice the finding of this study stated that; there are a positive significant correlation between nurse's knowledge and attitude also attitude and reported practice although insignificant positive correlation between nurse's knowledge and reported practices post program. **Mohammed & EL Sayed (2015)** reported that, there is a positive statistically significant correlation between knowledge and attitude, with improved knowledge being associated with positive attitude. Moreover **Askarian, et al, (2007)** who reported a linear positive correlation between knowledge and attitude scores of studied nurses

Conclusion:

The current studies demonstrate importance of social media assisted in-services training program for nurses to improve their knowledge, attitude, and reported practices.

Recommendations:

1. Designing and implementing another in-service training programs related to cord blood collection and stem cells to develop nurses' knowledge,

attitude, and practices at different time and in different sitting

2. The educational materials should include the updated and recent technologies and design a booklet to be available to the nurses all times.
3. Further research on a large size and other setting is recommended.

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