

## Effect of an Instructional Program on Knowledge and Anxiety Level among Patients Undergoing Hematopoietic Stem Cell Transplantation

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**Abstract:** Today, Hematopoietic SCT is an established treatment modality with definitive indications for many hematological disorders. Patients should have an accurate understanding of this treatment modality and its consequences to achieve better patients' outcomes. Therefore, the aim of this study was to evaluate the effect of an instructional program (IP) on knowledge and anxiety level among patients undergoing HSCT. Two research hypotheses were formulated H1: the post- instructional program total patient's knowledge score would be higher than the pre- instructional program total patient's knowledge score. H2: the post instructional program patient's anxiety level would be lower than the pre- instructional program patient's anxiety level. One group pre/post- test quasi-experimental research design was utilized. Setting: The study was conducted at Stem Cell Transplantation Center —Nasser Institute Hospital for Treatment and Research, Cairo, Egypt. A convenience sample of 50 adult male and female patients undergoing HSCT was recruited for this study and met the following inclusion criteria: fully conscious, willing to interact, no major health problems might interfere with researchers/patients interaction. Three tools were utilized to collect data pertinent to the study; 1- A semi-structured interview questionnaire, it contained two parts: a) Demographic data and b) selected medical variables pertinent to the study. 2- Patient's knowledge assessment questionnaire, it assesses patient's knowledge regarding HSCT. 3- The state- trait anxiety inventory (STAI). Results supported the two stated research hypotheses as a highly statistical significant difference existed in total and subtotal knowledge mean scores of the studied subjects before and after receiving an instructional program (IP) ( $t = 49.16, p.000$ ), as well as, patients' anxiety level was significantly less at the day of HSCT after receiving an instructional program as compared to pre- HSCT ( $t = 5.022, p .000$ ). Conclusion: the provision of an instructional program for patients undergoing HSCT may be of great value in enhancing patients' knowledge and reducing their anxiety level prior to HSCT. Recommendation: disseminate an audiovisual version of the IP to all patients undergoing HSCT. **Keywords:** Hematopoietic stem cell transplantation, instructional program, anxiety Level and patient's knowledge.

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### I. Introduction

Cancer is a leading cause of death worldwide, according to estimates from the International Agency for Research on Cancer (IARC), in 2012 there were 14.1 million new cancer cases and 8.2 million cancer deaths worldwide. By 2030, the global burden is expected to grow to 21.7 million new cancer cases and 13 million cancer deaths simply due to the growth and aging of the population (Global Cancer Facts & Figures/American Cancer Society, 2013). Hematopoietic stem cell transplantation (HSCT) is now an established treatment modality with definitive indications for many hematological disorders. The number of HSCTs increased based on survey carried by Passweg et al. (2012) who reported that HSCTs within the European group for Blood and Marrow Transplantation (EBMT) between 1990 and 2010 had increased from 4234 patients in the first survey in 1990 to 33,362 patients in 2010. The survey is based on 37 countries in Europe and eight affiliated countries. However, this line of treatment requires tremendous resources, and it becomes increasingly difficult for transplanters practicing in the developing world to reconcile the difference between what is possible and what is available (Mahmoud, et al 2008).

Hematopoietic stem cell transplantation is the accepted therapy of choice for a variety of malignant and non-malignant diseases in children and adults (Barriga, Ramírez, Wietstruck, Rojas, 2012&Brown, 2010). HSCT has led to the cure of diverse forms of cancer, bone marrow failure, hereditary metabolic disorders, hemoglobinopathies, and severe congenital immunodeficiencies that would otherwise have been fatal (Perumbeti, 2014). It is a medical procedure in the field of hematology, most often performed for patients with certain cancers of the blood or bone marrow, such as multiple myeloma or leukemia. Stem cell transplant (also called peripheral blood stem cell transplant) is a treatment to try to cure some types of cancer, such as leukaemia, lymphoid neoplasias including Non-Hodgkin lymphoma, Hodgkin lymphoma plasma cell disorders, solid tumors, and nonmalignant disorders (Passweg, et al &Wikipedia, 2015).

The source of hematopoietic stem cells can be either bone marrow or peripheral blood and/or fetal blood harvested from the placenta and umbilical cord (cord blood), is also a stem cell source. Three basic types of SCTs exist: autologous (self donor), allogeneic (from a donor other than self), and syngeneic (identical twin is the donor) (Dana-Farber Cancer Institute, 2015). Worldwide about 50000 people receive an allogeneic or autologous HSCT each year with a concomitant rise in the number of survivors. Despite these promising improvements, the treatment-related burden of HSCT is still high with 2 of every 5 patients given allogeneic HSCT for advanced cancer dying from the complications (Van Haren, Timmerman, Potting, Blijlevens, Staal, and Nijhuis-van der Sanden, 2012).

Patients undergoing HSCT receive various conditioning treatments before HSCT to prepare for the transplanted stem cells and to eliminate the disease. The conditioning can be myeloablative, which means high-dose chemotherapy with or without total body irradiation (Frödin, 2013). Pre and post HSCT, patients experience substantial physical, psychological, and psychosocial distress, and deterioration in quality of life (QOL). Complications caused by the transplantation emerge at different stages of the treatment. During the pre-transplant (conditioning) phase, side effects of high-dose chemotherapy and/or radiation include nausea, emesis, diarrhoea, loss of hair, cystitis/bladder infection, and mucositis. During the post-transplant phase, complications resulting from graft versus host disease include skin rash, bronchiolitis, nausea, emesis, diarrhoea, and jaundice, which cause weakness (Morishita&Domen, 2014). Later complications after HSCT, such as infertility and secondary malignancies, may be consequences of the conditioning treatment (Frödin, 2013). In addition, the transplant experience can include multiple hospital readmissions for acute complications, slow recovery and long-term issues. These side effects are negative impact on the recovery and treatment success and can result in patient death (Kapucu & Karacan, 2014).

Often the psychological and social issues can be more challenging for the health care team than the medical issues. Patients are at risk for poorer health outcomes, longer length of stay, and higher rate of morbidity and mortality not just physical complications such as opportunistic infection and graft-versus-host disease, but also psychosocial sequelae that can include clinically significant elevations in depression, anxiety, and family discord (Siegel, 2008). Anxiety represents a relevant problem for hematopoietic stem cell transplant patients. Early assessment of patient's learning needs could lower anxiety levels and help prevent psychological distress via nurse who provides patients with information before, during and after hematopoietic stem cell transplantation (Tecchio, et al 2013). Decreasing the level of anxiety may increase the survival rate and patient's cooperation which will result in the success of treatment in addition to improving his/her individual and social performance (Azar, et al 2010).

Comprehensive assessment of patients by health care providers is an important method through which to identify not only patient symptoms but also troublesome concerns before, during, and after HSCT. Accurate assessment is necessary to prepare patients for their future health care needs. Based on efficient, detailed, easily understandable assessment health care providers can incorporate patients' priority needs in treatment plans immediately prior to clinic visits and were found to significantly increase the frequency of discussing troublesome symptoms and quality of life issues (Sheldon, Kazmi, Klein, & Berry, 2013).

Stem cell transplantation patients and their families require the nurse to use excellent communication skills and compassion. Before the transplant, a complete work up is done. This usually consists of complete blood panels, including infectious serologies, and echocardiogram, ect... This evaluation phase is a difficult time for patients and their families. The nursing staff is involved intimately with them to address any questions, helping them understand complex medical information, providing support, and assisting them to understand all the information regarding the transplant process and possible complications. The most important points of education before, during, and after SCT include vascular access, dietary requirements, signs of infection, and psychosocial and financial resources. The patient, along with the caregiver and other members of the family support system, also must receive extensive education regarding post-transplant medications, general health guidelines, and follow-up requirements (Garrett&Yoder, 2007).

The nurse plays a vital role before, during and after HSCT, monitoring the patient's condition with thorough physical assessments and evaluation of vital signs, weight, fluid status, and lab values. The nurse must be vigilant for signs of side effects and complications of the conditioning regimen because early identification of problems can reduce morbidity and mortality for this very ill patient. As well as, the nurse's role in educating the patient and family is an extremely important part of successful HSCT; the patient and caregivers must be able to identify problems, such as fever or pulmonary and/or renal compromise (Ezzone & Pokorny, 2007).

Assessing patients' understanding is important and requires a comprehensive approach because patients may not know what they need to ask and may not feel comfortable asking or raising objections because their fears, particularly that of dying, are barriers. Providing information in a way patients can understand reduces risks for negative outcomes. It is very crucial for patients to have an accurate understanding of their diagnosis, treatment and support options. With this knowledge, patients can work with members of the oncology team to

move forward with the hope of remission and recovery. Therefore, the majority of patients who have been diagnosed with blood cancers could be cured or be able to manage their disease and achieve a good quality of life (Cohen, Jenkins, Holston & Carlson, 2013).

## **II. Significance Of The Study**

In Egypt along with other countries, as transplant technology progresses and advances, the number of patients undergoing transplantation is rising steadily. In order to make stem-cell Transplantation (SCT) safer and more effective, psychological distress of patients must be taken into account. Patients are facing challenges pre- and post-transplantation. Patients need to know therapeutic procedure, pharmaceutical treatment, complication, and lifestyle modification ...ect, The transplant rate increased dramatically with the opening of the SCT unit at the Nasser Institute. The total number of transplants performed till June 2007 is 1362; 80% of the cases are allogeneic and 20% autologous (Mahmoud et al, 2008). Statistical analysis exist in Stem Cell Transplantation Center at Nasser Institute Hospital reported that the numbers of patients admitted through three consecutive years 2013, 2014 and 2015 were 160, 142, and 159 patients respectively.

Nurses are faced with intensive care giving responsibilities involving the provision of both instructional and emotional support. Qualitative and quantitative research investigations reveal recurrent themes for patients uncertainty, depression, guilt, loneliness, geographic separation from friends and other family members, employment/work disruptions, role changes, fatigue, sleep and sexual problems, difficulty looking towards the future, and financial concerns associated with medical costs. Nurses should Identify unmet informational needs among HSCT patients to increase patient's knowledge that may be limiting patient's anxiety. Moreover, when nurses meet these needs could reduce patients' and caregivers' anxiety surrounding the care process; reduce information asymmetry between caregivers/patients and providers; empower patients/caregivers to participate in the care process; and, ultimately, increase patient/caregiver engagement in the care process.

To date, there have been no empirical evaluations to support the use of instructional program for HSCT patients. While it could be assumed that information would be helpful in reducing anxiety and depression in HSCT as it is in oncology generally, the information provided to these patients is usually more confronting and therefore, may be less reassuring. Thus, it is not known whether providing patients with education about HSCT reduces patient and carers distress or whether it might actually increase adverse outcomes. Patients undergoing HSCT have been shown to have even higher rates of clinical distress than other cancer patients. This finding is not surprising considering the fact that HSCT has much higher risk of mortality and more stressful side effects. Fifty percent of patients undergoing HSCT are likely to experience clinical levels of distress prior to receiving information about their treatment (Wallbank, 2008). Patient, who is not properly instructed about the course of therapy causing therapeutic non-compliance (poor compliance with the therapeutic plane of care), increase incidence of complications, decrease patients' adherence and reduce quality of life. Moreover, may compromise the results of transplant. Hence, this may be crucial providing patients who had undergone HSCT a clear, simplified and organized instructional program that may reducing the level of non-compliance in general, and to enhancing the possibility of achieving the desired healthcare outcomes.

In the field of nursing, the few published scientific studies on nursing care and of transplant patients are deficient (Barban, et al 2014). Therefore, the present study was done with hope to the results obtained will be helpful for patients, nurses and other health care professionals as well as to nursing education and research.

### **Aim:**

The aim of the present study was to evaluate the effect of instructional program on knowledge and anxiety level among patients undergoing hematopoietic stem cell transplantation.

### **The research hypotheses:**

The following hypotheses were proposed:

H1: the post- instructional program total patient's knowledge score will be higher than the pre- instructional program total patient's knowledge score.

H2: the post- instructional program patient's anxiety level will be lower than the pre-instructional program patient's anxiety level.

### **Research design:**

One group pre/post- test quasi-experimental design was utilized. According to this design the researcher has a new intervention, randomization is absent. Quasi-experimental designs introduce some research control when full experimental rigor is not possible (Polit, Beck, & Hunger, 2001 and Boswell & Cannon, 2012)

### **Setting:**

The study was conducted at Stem Cell Transplantation Center (SCTC) —Nasser Institute Hospital for Treatment and Research, Cairo, Egypt. SCTC considered the largest center for HSCT in the Middle East. It

divided into two main sectors: a- patients' sector included 20 inpatients' isolation rooms. b- the second sector consisted of: big aphaeresis room, 2 secretary and administrators' rooms, physician room, nurses' room and archive and statistical room.

**Sample:**

A convenience sample of 50 adult male and female patients undergoing HSCT was recruited for this study and met the following inclusion criteria: fully conscious, willing to interact, no major health problems might interfere with researchers/patients interaction. The study sample calculated using a power analysis of 95( $\beta=1-.95=.5$ ) at alpha .05 (one sided) with large effect size (0.5) will be used as the significance level because this level has been suggested for use in the most areas of behavioral science research with confident level 95% (Borenstein, Hedges, Higgins & Rothstein, 2010)

**Tools:**

Data pertinent to the study were collected using the following tools:

- A Semi-structured Interview Questionnaire, It contained two parts:
  - a- Demographic data as age, sex, education, occupation, and marital status etc....
  - b- Selected medical variables include patients' diagnosis, the source of hematopoietic stem cells, types of SCTs and family history of previous experience with HSCT.
- Patient's Knowledge Assessment Questionnaire, it assesses patient's knowledge pre and post- HSCT. It included 39 questions that classified under six categories as the following: a- basic knowledge regarding stem cell (4 questions), b- basic knowledge concerning HSCT (6 questions), c - preparatory instructions for HSCT (5 questions), d-basic knowledge pertaining procedure (6 questions), e-complications of HSCT (7 questions), and f- post -HSCT instructions (11 questions). A score of one (1) is given for each question if patient knows the answer correctly and zero (0) if patient didn't know.
- The A-State- A-Trait Anxiety Inventory (STAI): it developed and tested by Spielberger & Reheiser (2009) is a self report scale on which subjects rate themselves on a four point scale of increasing intensity. A-Trait scale asks people to describe how they feel generally. A- State scale requires people to indicate how they feel at the present moment and is a sensitive indicator for the level of anxiety. The A-State scale evaluates qualities of tension, nervousness, worry, and apprehension. The range of possible scores for the STAI varies from a minimum of 20 to a maximum score of 80 on both the A-Trait and A-State subscales. An individual may score from 1 to 4 points for each item depending on his/her response. Test- retest reliabilities for the A- Trait scale are reasonably high, ranging from 0.73 to 0.86 while those for the A-state scale were somewhat low ranging from 0.16 to 0.54. Data analysis indicated that the anxiety level can be divided into the following categories: (20-< 40) mild anxiety, (40- < 60) moderate anxiety, (60- < 80) severe anxiety.

**Validity and reliability:**

Face and content validity of this study tools were reviewed by panel of five experts in field of medical -surgical nursing, blood disorders and HSCT. While reliability of the tool was conducted by the researchers as (Cronbach's alpha) =0.76

**Pilot study:**

Once permission was granted to proceed with the proposed study, a pilot study was conducted on 10% of sample to judge the feasibility and applicability of the study, objectivity and test ability of the tool to elicit the desired information.

**Ethical consideration:**

Permission to conduct the study will be obtained from research ethical committee of faculty of nursing, Cairo University. Prior to the initial interview, the researchers introduced themselves to patients; each potential patient was fully informed about the purpose and nature of the study, each potential subject who will agree to participate in the study will be asked to sign a written consent form. The researchers emphasized that participation in the study is entirely voluntary and withdrawal from the study would not affect the care provided; anonymity and confidentiality will be assured through coding the data.

**Procedure:**

A review of the past, current Arabic and English related literature covering various aspect of the problem was done, using available books, articles, and journals to get acquainted with the research problem and develop the study tools. After extensive literature review the researchers develop an Arabic version Patient's knowledge assessment questionnaire to evaluate patients undergoing stem cell transplantation information

before, during and after HSCT process; the researchers rendered Arabic Patient’s knowledge assessment questionnaire to three experts two in medical surgical nursing and one in blood disorders and bone marrow transplantations to review content and clarity of questions then all necessary modifications were done. Once official permission is granted from the pertinent authoritative personnel to proceed with the proposed study. The researchers were proceeding with data collection. A list of potential subjects who met the criteria for possible inclusion was obtained daily from the head nurse of the SCTC. While patient was admitted to the SCTC each patient was approached individually by the researcher, at that time the nature and purpose of the study was explained as well as the other ethical considerations mentioned previously were assured, too. Patient who agreed to participate in the study was asked to sign the consent form. At that point demographic data form was completed by the researchers as well as the A-Trait Anxiety Inventory and the Knowledge Assessment Questionnaire Sheet. After pretesting patients was subjected to three consecutive instructional sessions, each session was lasted for 40 min regarding: a. basic knowledge regarding stem cell, HSCT and preparatory instructions for HSCT. b. basic knowledge pertaining procedure and complications of HSCT and c. post –HSCT instructions. At the day of transplantation the researchers contact each potential subject to fill down the A-State Anxiety Inventory. One week after transplantation each patient will be contacted by the researcher to fill down the post Knowledge assessment questionnaire sheet. Data collection took place in the period from October 2015 to Marsh 2016.

### III. Results

The analysis of the current study results is presented into two sections: the first section represented description of studied subjects’ demographic characteristics and selected medical data. The statistical analyses testing the research hypothesis are presented in the second section.

#### Section I:Description of the demographic characteristics among the studied subjects (n=50).

Socio-Demographic data	No	%
<b>Age:</b>		
< 20	06	12%
20 - >30	21	42%
30 - >40	14	28%
40 - >50	08	16%
50 - >60	01	02%
<b>Mean ±SD= 30.60 ±9.019</b>		
<b>Gender:</b>		
-Male	29	58%
-Female	21	42%
<b>Marital Status:</b>		
- Single	18	36%
- Married	30	60%
- Divorced	02	04%
<b>Educational level:</b>		
- Illiterate	16	32%
-Basic primary	04	08%
-Secondary	05	10%
-Diploma	12	24%
-University	13	26%
<b>Occupation:</b>		
- Student:	05	10%
- House wife	12	24%
- Employee	14	28%
- No work	02	04%
- Private work	08	16%
- Vocational work	09	18%
<b>Place of residence:</b>		
- Rural	31	62%
- Urban	19	38%
<b>Income:</b>		
< 1000	01	02%
1000 - >2000	16	32%
2000 - >3000	16	32%
3000 - >4000	11	22%
>4000	06	12%
<b>Mean ±SD=2638.00±1435.40</b>		

Table (1): it is clear from table (1) that the mean age of the studied subjects was  $30.60 \pm 9.019$ . More than half of the studied subjects were males, married and from the rural area (58%, 60% and 62% respectively). Less than

one third of the studied subjects was illiterate and worked as employees (32%, 28% respectively). Concerning income, the mean income of the studied subjects was 2638.00±1435.40 pounds.

**Table (2) Frequency and percentage distribution of selected medical variables among the studied subjects (n=50).**

Medical variables	No	%
<b>Patients' diagnosis:</b>		
- AML	20	40%
- CML	05	10%
- ALL	07	14%
- SAA	06	12%
- MDS	05	10%
- BAL	03	06%
-PNH	01	02%
- MPN	01	02%
- HLH	01	02%
- NHL	01	02%
<b>No Family history of previous experience with SCT:</b>	50	100%
<b>The source of HSCT:</b>		
-Peripheral blood	50	100%
<b>Type of HSCTs:</b>		
- Allogeneic	48	96%
- Syngeneic	01	02%
- Relapse	01	02%

As noticed from table (2) 40% of studied subjects had acute myeloid leukemia (AML). The majority of the studied subjects (96%) undergoing allogeneic type of HSCTs. All studied subjects had no family history of previous experience with HSCT as well as the source of HSCT was peripheral blood.

**Section II:**

Results related to hypotheses testing:

H1: the post- instructional program total patient's knowledge score will be higher than the pre- instructional program total patient's knowledge score.

**Table 3: Mean, standard deviation and t- test of total and subtotal knowledge scores of studied subjects pre and post HSCT after receiving the instructional program (n=50).**

Variables	pre- HSCT	Post- HSCT	t- Test	p
-Basic knowledge regarding stem cell	.73 ± 1.11	3.63 ± .64	18.64	.000***
-Basic knowledge concerning HSCT	2.27 ±1.47	5.48 ±.62	16.64	.000***
-Preparatory instructions for HSCT	3.48 ±1.54	5.00 ±.000	6.83	.000***
-Basic knowledge pertaining Procedure	3.00 ±1.27	5.58 ±.77	14.11	.000***
-Complications of HSCT	.54 ±.65	6.00 ±1.03	36.70	.000***
-Post -HSCT instructions	1.29 ± 1.30	9.88 ±.82	36.96	.000***
-Total knowledge mean scores ± SD	11.42 ± 4.40	35.56 ± 2.40	49.16	.000***

\*\*\* Significant at p= 0.000

NB: Two patients died thus Post- HSCT (48).

It is apparent from Table (3) that, there were a highly statistical significant differences exist among the studied subjects total and subtotal knowledge scores before and after receiving an instructional program (P=.000).

H2: the post- instructional program patient's anxiety level will be lower than the pre- instructional program patient's anxiety level.

**Table 4: Frequency and percentage distribution of anxiety levels of the studied sample pre and at the day of HSCT after receiving the instructional program using the State -Trait Anxiety Inventory (STAI) Scale (n=50).**

Level of anxiety	pre- HSCT (trait)		At the day of HSCT (state)	
	No	%	No	%
- Mild	03	06%	02	04%
- Moderate	43	86%	48	96%
- Severe	04	08%	00	00%

It was observed from table (4) that: Frequency distribution of anxiety level among the studied subjects pre- HSCT were moderate, severe, and mild (86%, 8%, &6% respectively). While after the studied subjects

receiving an instructional program it changed into moderate and mild (96% &4% respectively). There was no evidence of severe anxiety in post transplant patients

**Table 5: Mean scores and t- test of total anxiety scores among the studied subjects pre –HSCT and at the day of HSCT after receiving the instructional program using the State –Trait Anxiety Inventory (STAI) Scale (n=50).**

Statistical test	pre- HSCT (trait)	At the day of HSCT(state)	p
Mean	49.84	44.90	.000***
SD	6.30	3.30	
t	5.022		

\*\*\* Significant at p= 0.000

There was statistically significance difference regarding total anxiety scores among the studied subjects between pre- HSCT (trait) and at the day of HSCT (state), patients' anxiety level was significantly less at the day of HSCT after receiving an instructional program as compared to pre- HSCT (p=.000).

#### **IV. Discussion**

The purpose of this study was to evaluate the effect of an instructional program on knowledge and anxiety level among patients undergoing HSCT. The following discussion will focus upon the finding related to the two stated research hypothesis. The discussion of finding is presented in the following two sections:

##### **Section I: Interpretation of the study results pertinent to the first stated research hypothesis:**

During the first contact with patients undergoing HSCT the researchers found that all patients had extremely knowledge deficits regarding HSCT and they reported that there is none of the health care providers informed them anything about SCT before the procedure. This patients' report is consistent with Stiff's et al (2006) who reported that patients referred for hematopoietic stem cell transplantation (HSCT) often have knowledge deficits about their disease and overestimate their prognosis making it difficult initially to discuss potentially life-threatening transplant options. On the same vein, a review of the literature failed to identify a measure to assess patients' level of knowledge regarding HSCT and patients' emotional reactions before and after HSCT. Therefore, it was hypothesized that H1: the post- instructional program total patient's knowledge score would be higher than the pre- instructional program total patient's knowledge score. The statistical analysis indicated that there were highly statistically significant differences among the studied subjects total and subtotal knowledge means scores before and after receiving an instructional program. The hypothesis was supported as the mean total and subtotal knowledge mean score of studied subjects after receiving HSCT Instructional Program were higher than the mean total and subtotal knowledge score pre-instructional program.

This finding is consistent with Wallbank (2008) who studied the effectiveness of an education intervention for HSCT patients and carers. The mentioned study was carried on 62 participants at the University of Sydney, which reported that education was effective in increasing patients' knowledge and patients were most satisfied with treatment information. In the same line the study carried by Lancelle, et al (2013) which entitled "Patient therapeutic education program after allogeneic stem cell transplantation" that aims to increase patients' understanding and knowledge of their treatments within the national cancer program 2009-2013. They reported that the patients education overcome patients' lack of knowledge and bring about an improvement to their adherence and learn more about their treatments. Moreover, Lim, Kenyon, Doorga & Cave (2013) where 114 participants at Haematology, King's College Hospital, London, United Kingdom reported that the program was informative, excellent and reassuring. There is general consensus in the literature that cancer education programs will improve patient outcomes (Adams, 2010 and Shea-Budgell, Kostaras, Myhill & Hagen, 2014).

##### **Section II: Interpretation of the study results pertinent to the second stated research hypothesis:**

There are emotional and psychosocial variables such as anxiety, anger, depression and isolation accompanied HSCT patients, (Pandy, et al 2007). These variables may affect the outcome of HSCT itself, as well as survival. HSCT patients experience higher rates of anxiety and depression than do other oncology patients (Wallbank, 2008). Research on patient education in oncology has shown that providing patients and carers with information about their illness and treatment reduces anxiety and distress. While it could be assumed that information would be helpful in reducing anxiety and depression in HSCT as it is in oncology generally. Decreasing the level of anxiety may increase the survival rate and patient's cooperation which result in the success of treatment in addition to improving his/her individual and social performance (Stuart & Sanden, 2007 in Azar, et al 2010). Therefore, the current study was hypothesized that the post- instructional program patient's anxiety level will be lower than the pre- instructional program patient's anxiety level (H2).



The current study findings revealed that, anxiety level among the studied subjects pre- HSCT were moderate, severe, mild (86%, 8%, &6% respectively). While after the studied subjects receiving the instructional program it changed into moderate and mild (96% &4% respectively). There was no evidence of severe anxiety in post-transplant patients. There was statistically significance difference regarding total anxiety scores among the studied subjects between pre- HSCT (trait) and at the day of HSCT (state), anxiety was significantly less at the day of HSCT after receiving an instructional program as compared to pre- HSCT. This result may be attributed to exposure of the studied subjects to the instructional program. This finding supported the second stated research hypothesis which stated that H2: the post- instructional program patient's anxiety level will be lower than the pre- instructional program patient's anxiety level.

This finding is consistent with a study carried by Azar, et al (2010) aimed to measure and compare levels of anxiety and depression before and after SCT without any intervention. This study revealed that there is statistically significant difference between pre and post transplant anxiety. Anxiety was significantly less at post transplant as compared to pre transplant. Also, the results of the present study are congruence with similar study carried by Stiff, et al (2006) entitled as "Patients' understanding of disease status and treatment plan at initial hematopoietic stem cell transplantation consultation" at the Cardinal Bernardin Cancer Center at Loyola University Medical Center. They carried out a survey on ninety nine consecutive eligible patients in order to measure their perceived knowledge deficits of disease, prognosis, and emotional status before and after their initial consultation. They reported that Patients were not overwhelmed or confused due to the effect of the consultation visit and there was significant decrease in negative effect. However the study results go inconsistent with a similar study carried by Wallbank (2008) to examine the effect of a psychoeducation programme for patients undergoing HSCT and their carers on knowledge, distress, information satisfaction, social support and caregiver burden. The results indicated that there is significant emotional distress among patients prior to receiving HSCT. While after patients receiving psychoeducation programme, Patients' anxiety level was shown to be elevated among 51.6% of SCT patients who scored in the non-clinical range for anxiety and 48.4% scored in the clinical range based on a cut-off point of 8.

## V. Conclusion

In light of the study findings, the provision of an instructional program for patients undergoing HSCT may be of great value in enhancing patients' knowledge and reducing their anxiety level prior to HSCT. There was a statistically significant improvement in patients' knowledge mean scores, as well as anxiety level after receiving an instructional program Therefore, the stated research hypotheses was statically supported.

## VI. Recommendations

- HSCT patients should receive continuous one-to-one instructional sessions along with written materials instructions in pre, during and after HSCT, as well as during follow up visits.
- Disseminate the IP to all patients undergoing HSCT.
- Provide SCT patients with multidisciplinary instructional program.
- Find out funding sponsors that sponsor publication and dissemination of an instructional program.
- Replicate the study on a larger probability sample in different settings for generalizing the findings.

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