Patient Education: its Effect on Qualiy of Life of Patients with Cancer on Chemotherapy

Abeer William Aziz

Medical-Surgical Nursing, Faculty of Nursing, Ain Shams University, Cairo, Egypt
abeer.william99@yahoo.com

Abstract: Background: Cancer is a devastating disease that can negatively affect a patient's quality of life. Treatment for malignancies in particular, frequently involves complex, intense, and prolonged chemotherapy regimens. Aim of the Work: to assess the effect of educational intervention on quality of life for patients with cancer on chemotherapy. Subjects and Methods: This quasi-experimental study was conducted at the Radiotherapy and Nuclear Medicine Department affiliated to Ain-Shams University Hospitals, on a purposive sample of fifty patients recruited into this study. The inclusion criteria were adult patients, their age ranged between 20-50 years, on chemotherapy; received at least 2-3 sessions of chemotherapeutic agent. The tools included interviewing questionnaire sheet and Quality of Life Index Scale consisting of four dimensions: Physical, psychological, social and spiritual. The educational intervention was conducted through five sessions each one lasted from 30-45 minutes. Effects of the educational intervention on patient's condition investigated done through comparing the pre, post one month and post six months assessment of the patients regarding their level of knowledge and quality of life. Results: There is highly statistically significant difference in patient's level of knowledge pre, post one month and post six months from implementation of the educational intervention about cancer regarding to all items. Comparison of patient's quality of life dimensions pre, post one month and post six months from implementation of the educational intervention revealed there is highly statistically significant differences among them (77.78 ±6.54, 63.54 ±7.85& 50.24±5.47 respectively at $p<0.001$). Conclusion and Recommendations: Education has highly statistically significant positive effect in increasing the level of patients' knowledge and improving their quality of life. Further investigation could be undertaken to document the cost effectiveness of educational effects in reducing hospital stay, decreasing readmission, improving the personnel quality of life and minimizing complications of illness and therapies.

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Key word: Cancer, quality of life, educational intervention

1. Introduction

Cancer is a group of more than 200 diseases characterized by uncontrolled and unregulated growth of cells. It can occur in persons of all ethnicities and is a major health problem. The word cancer is viewed as being synonymous with death, pain, and disfigurement. However, attitudes toward cancer do not fit today's status of the treatment and control of cancer. Cancer is a synonymous with certain terms such as malignant neoplasm, tumor, malignancy, carcinoma, and aberrant cell growth (**Coleman, 2002).**

Cancer emerges as a public health problem around the world. Each year, it affects more than 10 million people and killed 7.6 million people all over the world (around 13% of all deaths in 2008).More than 70% of all cancer deaths occurred in low- and middle-income countries. Deaths from cancer worldwide are projected to continue to rise to over 11 million by year 2030. (**World Health Organization, WHO, 2011**).

Quality of life (QOL) is defined as individual perception of life, values, objectives, standards, and interests in the framework of culture. QOL is increasingly being used as a primary outcome measure in studies to evaluate the effectiveness of treatment. Patients generally instead of measuring lipoprotein level, blood pressure, and the electrocardiogram, make decisions about their health care by means of QOL which estimates the effects on outcomes important to themselves. (**Timby & Smith, 2007**).

An increasingly important issue in oncology is to evaluate QOL in patient with cancer .The cancer-specific QOL is related to all stages of the disease. In fact, for all types of cancer patients, general QOL instruments can be used to assess the overall effect of patients' health status on their QOL, however hand cancer-specific instruments assess the effect of a specific cancer on QOL. In some cancer diseases, QOL has become an important endpoint for treatments comparison in randomized controlled trials so that in these patients clinical studies increasingly incorporate QOL as the endpoint. (**Mauer, Bottomley & Martin, 2008**).

Cancer is a devastating disease that can negatively affect a patient's QOL. Treatment for malignancies in particular, frequently involves complex, intense, and prolonged chemotherapy regimens (**Padilla & Ropka, 2005).** A chemotherapy regimen is considered to be complex and prolonged when it includes many different

agents given alone and/or in combination repeatedly over a prolonged period time. These regimens are intense because dosage reduction is seldom considered. The primary treatment outcome is to eradicate and maintain the eradication of all abnormal cells in the bone marrow (**Black, & Hawks, 2009**).

Chemotherapeutic drugs are effective destroying or preventing the application, the multiplication of cancer cells and normal tissue is also affected. The most affected cell is gastrointestinal tract, hair follicles and bone marrow. As a result, side effects can be expected from the administration of these drugs. The severity of side effects is usually related to the strength of the dose (**Cohen, De-Moor, Eisenberg, Ming& Hu, 2007**).

Side effects are classified as immediate, early, delayed, and late. An immediate side effects, early one such as hypersensitivity reaction, occurs within the first 24 hours. Diarrhea and alopecia have an onset of days to weeks and are considered early side effects. Delayed effects, such as anemia or pulmonary fibrosis occur within weeks to months, and late effects, such as second malignancies may not appear for months or years. (**Potter & Perry, 2009).**

Information about quality of life is important for planning treatment, decision making, and the provision of supportive care. Such information is useful for both clinicians and patients, as well as to promote communication between them. Oncology nurses play a critical role in providing this information to patients, so that they can evaluate the balance of risks and benefits associated with treatment **(American Cancer Society, 2010).**

One of the factors that emerge as important for the quality of life of patients with cancer is education**.** Patient education has demonstrated its potential to improve quality of life, ensure continuity of care, effectively reduce the incidence of complications of illness, promote adherence to health care treatment plans, decrease patient anxiety and maximize independence in the performance of activities of daily living. In addition, it energizes and empowers patients to become involved in the planning of teaching sessions which increases patient satisfaction **(Lewis, Heitkemper, & Dirksen, 2004**).

Significance of the study

Several studies reported that patients with cancer on chemotherapy are practicing poor health behaviors as result of severity of side effects, versus inability to manage side effects; previous researches emphasized the need for patient education, and clarification of instructions to each individual patient *(Mohamed, 2001; Mohamed, 2006).* The ability of patient with cancer to control chemotherapy side effects and maintain reasonable quality of life is limited due to lack of knowledge, guidance, and instructions from health care provider, who usually refrains from transferring responsibility for the treatment to the patient. So the education is important or needed for such group of patients treated by chemotherapy, instructions, and guidance are needed to enhance their self care abilities to overcome the problems and enhance their quality of life.

Aim of the Work

This study was aiming to assess the effect of educational intervention on quality of life for patients with cancer on chemotherapy.

Research Hypotheses

It was hypothesized that the patients who receive education will have adequate level of knowledge after one month and better quality of life scores after 6 months (physical**,** psychological, social, and spiritual) and reduction in the severity of side effects related to chemotherapy.

Subjects and Methods:

Research Design:

A quasi-experimental design was utilized in this study.

Setting:

The research was conducted in the Radiotherapy and Nuclear Medicine Center affiliated to Ain-Shams University Hospitals.

Subjects:

A purposive sample of fifty patients was consecutively recruited into this study. The sample was calculated by power and sample size calculation program to give power of 80%. The inclusion criteria were adult patients, their age ranged between 20-50 years, from both sexes and on chemotherapy; received at least 2-3 sessions of chemotherapeutic agent. Exclusion criterion was the presence of any diagnosed chronic disease such as, diabetes mellitus and hypertension.

Tools of Data Collection:

After reviewing literature, tools to be used were developed and data were collected by the researcher using the following:

1. Interviewing Questionnaire Sheet:

Constructed by the researcher, it consists of two parts:

Part 1: Patients' characteristics: They include age, sex, marital status& level of education, etc.

Part 2: Questionnaire sheet: To assess patient's level of knowledge about cancer, causes, chemotherapy, side effects, care to overcome these side effects, and relaxation techniques to reduce the side effects.

Scoring system:

Two grades were given when the response was completely correct, one grade was given when the response was incomplete, and zero was given when the response was unknown or incorrect.

2- Quality of Life Index Scale:

The scale was adopted from **Ferrell and Grant (2003**) to assess the effect of cancer on the quality of life for patients with cancer on chemotherapy. This scale was modified by the researcher to be suitable for patients with cancer on chemotherapy under the study. The quality of life scale covered four health's dimensions as the following: Physical well- being (10 items), psychological well-being (14 items), and social well-being (9 items), and spiritual well-being (7 items).

Scoring system:

According to patient's response ,the following classification was adopted normal condition(zero),mild disturbance (1), moderate disturbance (2), and sever disturbance (3).Patient's grades were collected and recorded as follows: Physical well-being (0-30), psychological well-being (0- 42), social well- being (0- 27), and spiritual well-being (0- 21) .So, the total score ranged from 0-120: Then, the total grade was evaluated as follows: poor when the total score was less than 60%, average when the total score was 60% to less than 75% and good when total score was 75% to 100%.

Validity:-

It was established for face and content by seven experts, three of them were doctors of medical staff (surgery & oncology) in El-Demerdash Hospital and the other four members from medical-surgical nursing staff at Ain Shams University (professors & assistant professors), who reviewed the tools for clarity, relevance, comprehensiveness, understanding, applicability and ease for implementation. According to their opinions minor modifications were applied.

Reliability:

Testing the proposed tool was done using Alpha Cronbach test. Results of Alpha Cronbach test was for the quality of life domains were as follows: Physical =0.927, psychological = 0.834, social = 0.959 and spiritual =0.739, indicating high reliability of quality of life scale (high internal consistency).

Proposed educational intervention:

This educational intervention was designed to improve patients' level of knowledge and their quality of life to help them understand the potential side-effects of the drugs they are receiving and learn helpful management techniques that will ensure an effective and manageable (less toxic) chemotherapy experience. It was designed in a simplified illustrated and comprehensive Arabic handout. It consists of two major sections, the first one concerned with providing the patient with the essential information about cancer, causes, treatment, administration of chemotherapy, chemotherapy side effects, nutritional manipulation, and the self care measures that patient can apply to overcome those side effects. This information was provided to the patients, in the form of handout and in addition to oral explanation. This handout describes side effects of chemotherapy on different body systems, and strategies for minimizing these side effects. The second section was concerned with teaching the patient progressive muscle relaxation technique through demonstration and redemonstration in front of patient in addition to answering patient's questions and giving feedback.

Pilot Study:

A pilot trial was carried out on five patients with the same inclusion and exclusion criteria. Based on the pilot trial findings, necessary revisions were made in the data collection forms. These five patients were not included in the main study sample.

Administrative and ethical aspects

To carry out the study in the predetermined hospitals, letters including the aim of the study were directed from the researchers' faculty of nursing to the hospital's director and also to nursing director to obtain their permission and help to conduct the study in their facility, then the researcher met them and explained the purpose of the study and methods of data collection. The researcher also obtained the study subjects' approval orally after explaining the purpose of the study and method of data collection. Confidentiality of subjects' responses was assured to them and they were informed about their right to withdraw from the study at any time without giving any reason.

Procedures

First phase:

At the beginning of this study, all patients were interviewed and asked to fill in the questionnaire sheet and quality of life index scale with the help of the researcher in the previous mentioned setting, in the same day of chemotherapy dose to assess their knowledge and quality of life. The whole field work lasted for about ten months from beginning of June 2009 to end of June 2010.

The educational intervention covered the various essential aspects related to cancer and chemotherapy and according to patient's needs. Patients were taught individually or in small groups. This intervention took a period ranging from 5-6 consecutive sessions for

patients on chemotherapy .Each session took 30-45 minutes on individual basis as it was not possible for patients be to gathered in the same sessions because they didn't come regularly to the unit and because each patient was treated as a unique case based on his needs, condition and personal characteristics.

At the beginning of the first session, patients were oriented about the content and its effects on their condition. Patients were informed about the time of the next session at the end of each session. Each session started by
a summary about what has been discussed in the previous one then the objectives of the new session were mentioned using simple arabic language. As well, the session ended by a summary of its contents and feedback from the patients was obtained to ensure that he/she got the maximum benefit.

Second phase:

Effect of the patient education on patient's condition was evaluated through comparing the pre, post one month and after six months, assessment of the patients delt with their level of knowledge and quality of life index scale. This phase was applied two times; immediate evaluation which has been done immediately post completion of the implementation phase, then post six months, the second evaluation was done.

Statistical design:

Data entry and analysis were done using the SPSS program, version 11.0 applying appropriate statistical methods i.e. descriptive statistics, Paired T- test, ANOVA test (F- test) and student-t-test.

3. Results:

The demographic characteristics of patients involved in the study revealed that less than three fifths of patients (58%) their age ranged between 18-<45 years, 56% were females, and 64% were married . As regards level of education, 40% of patients were illiterates; half of them (50%) were working some time. Concerning monthly income, majority of them (80%) had income ranged between 300 -< 700 L.E (Table 1).

There were highly statistically significant differences in patient's level of knowledge pre/ post one month and post six months from the educational intervention about cancer in relation to all items (definition & causes of cancer, treatment of cancer, definition and purpose of chemotherapy, etc) (t1=26.36 at P<0.001). Meanwhile, there were highly statistically significant differences in patient's level of knowledge post one month and after six months in relation to all items (t2=15.9 at P<0.001) and a statistically significant difference for side effect of chemotherapy on reproductive system(t2=3 at P<0.05)(Table 2).

There were highly statistically significant differences in all items of physical health dimension of quality of life between pre and post one month of the educational intervention except for items of diarrhea/constipation and skin changes (t1= 0.25 & 1.7 respectively at P>0.05) (Table 3).As well, there were highly statistically significant differences in all physical health dimension of quality of life between pre and post six months of the educational intervention except for item of skin changes (t2=0.37 at P=>0.05) (Table 3).

There were highly statistically significant differences in all items of psychological health dimension of quality of life between pre and post one month of the educational intervention except in items of good over all quality of life, satisfying your life, ability to concentrate or remember things, and fearful from side effects of chemotherapy (t1=0.000, 0.22, 1.81 &1.85 respectively at P>0.05). As well, there were highly statistically significant differences in all items of psychological health dimension of quality of life between pre and post six months of the educational intervention except in fearful from side effects of chemotherapy and fearful from spreading (t2=1.88 & 1.5 respectively at P>0.05) (Table 4).

There were a highly statistically significant differences in all items of social health dimension of quality of life between pre and post one month of the educational intervention except in support received from others and rate overall social status (t1=1.09 & 1 respectively at P>0.05). As well, there were a highly statistically significant differences in all items of social health dimension of quality of life between pre and post six month of the educational intervention except in support received from others(t2=1.46 at P>0.05) (Table 5).

There were no statistically significant differences in all items of spiritual health dimension of quality of life between pre and post one month of the educational intervention except in amount of uncertainty about future, it was highly significant (t1=3.38 at p<0.001). Meanwhile, there were a highly statistically significant differences in all items of spiritual health dimension of quality of life between pre and post six months of the educational intervention except in amount of support from religious activities, amount of support from personal spiritual activities and positive change in life due to illness (t2=1.83, 0.000 & 1.16 respectively, at P>0.05) (Table 6).

A comparison of means of patient's quality of life dimensions at pre, post one month and post six months from the educational intervention is shown in Table (7). It can be noticed that, there are highly statistically significant differences between them (77.78 ±6.54; 63.54 ±7.85; and 50.24±5.47 respectively at p<0.001).

Relations between total mean knowledge scores among patients in the study and their sociodemographic

characteristics pre, post one month and post six months from the educational intervention are displayed in table (8).There was a statistically significant difference regarding to age pre and post one month from the educational intervention and sex post six months(F2=2.02 & F3= 2.73 respectively at P<0.05).AS well, There are highly statistically significant differences regarding level of education and total knowledge scores pre, post one month and post six months from the educational intervention (F=13.73, 3.79 & 8.84 respectively at P<0.001). However, There was no statistically significant difference between patient's income and total knowledge scores pre, post one month and post six months from the educational intervention (T=1.31, 0.01& 0.11 respectively, at P>0.05).

Relations of total quality of life scores among patients in the study and their sociodemographic characteristics pre, post one month and post six months from the educational intervention; There were statistically significant differences regarding marital status pre educational intervention, level of education post one month and post six months, and patient's income post six months (F=2.3, 2.34 & 2.71; and T=2.43 respectively at P<0.05). Meanwhile, there were no statistically significant differences between patient's age and sex with total quality of life scores pre, post one month and post six months (F=0.917, 0.027, & 0.14;and T=0.317,0.804; and 0.552 respectively, at P>0.05) (Table 9).

There is obvious decrease in frequency of patient's health problems related to chemotherapy administration as reported by the studied patients pre and post six months from the educational intervention regarding to the majority of the problems as nausea, vomiting, constipation/diarrhea, altered in taste, anorexia, fatigue, anxiety and alopecia (table10).

Table (1): Sociodemographic characteristics of the study sample (n=50).

Variables	No	%
Age (years)		
18-<45	29	58
45-<60	15	30
60+	6	12
Gender		
Male	22	44
Female	28	56
Marital status		
- Single	8	16
- Married	32	64
- Divorced	5	10
- Widowed	5	10
Level of education		
- Illiterate	20	40
- Read & write/ primary	13	26
- Secondary	8	16
- University	9	18
Job status after disease		
- Working full time	10	20
- Working some time	25	50
- Leaving work	15	30
Monthly income (L.E)		
<300	6	12
300-	20	40
500-	20	40
700-900	4	8

Table (2): Comparison of patient's level of knowledge scores at pre, post one month & post 6 months of the educational intervention

Items	Mean ± SD			t1	p	t2	P
	Pre	Post one month	Post 6 months				
Definition & causes of cancer	2.7 ±1.3	5.7 ±0.7	4.7 ±1.1	16.9	<0.001**	6.9	<0.001**
Treatment of cancer	1.6 ±0.8	2.9 ±0.3	2.5 ±0.5	11.3	<0.001**	4.9	<0.001**
Definition of chemotherapy	1.4 ±0.6	2.8 ±0.4	2.3 ±0.5	12.9	<0.001**	6.2	<0.001**
Purpose of chemotherapy	1.3 ±0.5	2.7 ±0.5	2.4 ±0.6	15.5	<0.001**	3.7	<0.001**
Methods of administration	1.3 ±0.5	2.9 ±0.4	2.5 ±0.5	19.8	<0.001**	3.6	<0.001**
Side effects on integumentary system & care	4.8 ±1.7	11.1 ±1.1	9.8 ±1.8	26.5	<0.001**	6.2	<0.001**
Side effects on GIT and care	8.5 ±3.6	19.6 ±1.8	16.9 ±3.1	22.2	<0.001**	7.4	<0.001**
Side effects on neuromuscular	1.2 ±0.5	2.7 ±0.4	2.4 ±0.5	16.3	<0.001**	3.9	<0.001**
Side effects on hematopoitic	7 ±2.7	16.7 ±1.7	15.1 ±2.4	23.6	<0.001**	4.4	<0.001**
Side effects on reproductivty	2.3 ±1	5.8 ±0.5	5.4 ±0.9	20.9	<0.001**	3	<0.05*
Relaxation technique exercise	3.4 ±1.4	8.3 ±1.1	7.4 ±1.7	21.6	<0.001**	4.5	<0.001**
Total Knowledge	34.2 ±12.17	81.2 ±6.51	71.4 ±11.15	26.36	<0.001**	15.9	<0.001**

t1 (Pre Vs post one month) t2 (post one month Vs post 6 months) (*) Significant at p<0.05 (**) Highly significant at p<0.001

Table (3): Comparison of patient's physical health dimension of quality of life scores at pre, post one month & post 6 months of the educational intervention

Physical Items	Mean ± SD			t1	p	t2	P
	Pre	Post One month	Post 6 months				
1- Feeling of fatigue	2.4 ±0.8	1.8 ±0.6	0.9 ±0.5	5.2	<0.001**	12.85	<0.001**
2-Loss of appetite	2.3 ±0.8	1.7 ±0.6	0.7 ±0.5	4.95	<0.001**	12.04	<0.001**
3- Presence of pain	1.9 ±0.1	1.2 ±0.7	0.2 ±0.4	4.76	<0.001**	12.82	<0.001**
4-Sleeping disturbance	2 ±0.9	1.1 ±0.8	0.2 ±0.4	7.37	<0.001**	15.44	<0.001**
5-Nausea & vomiting	2 ±0.8	1.3 ±0.6	0.2 ±0.4	5.58	<0.001**	15.28	<0.001**
6-Diarrhea /constipation	1.2 ±1	1.2 ±0.6	0.4 ±0.5	.25	>0.05	5.02	<0.001**
7-Skin changes	0.9 ±1.1	1.2 ±0.7	0.8 ±0.4	1.7	>0.05	.37	>0.05
8-Alopecia	1.7 ±1.2	1.4 ±0.7	0.5 ±0.5	1.99	<0.05*	7.57	<0.001**
9-Dry mouth	1.2 ±1	0.7 ±0.8	0.1 ±0.3	3.18	<0.001**	7.91	<0.001**
10-Rate your physical status	1.1 ±0.8	1.1 ±0.6	2.2 ±0.6	0.16	>0.05	8.06	<0.001**

t1 (Pre Vs post one month) t2 (Pre Vs post 6 months)
( ) In significant at p >0.05 (*) Significant at p<0.05 (**)Highly significant at p<0.01

Table 4): Comparison of patient's psychological health dimension of quality of life scores at pre, post one month & post 6 months of the educational intervention

Psychological Items	Mean ± SD			t1	p	t2	P
	Pre	Post one month	Post 6 month				
1- How difficult tocope with chemotherapy?	2.32 ±0.7	1.76 ±04	0.9 ±0.6	5.62	<0.001**	14.92	<0.001**
2-Good over all quality of life	1.44 ±0.8	1.44 ±0.6	2.24 ±0.6	0.000	>0.05	6.6	<0.001**
3- Satisfying your life	1.56 ±0.8	1.58 ±0.7	2.38 ±0.6	0.22	>0.05	7.02	<0.001**
4-Ability to concentrate or remember things	2.00 ±0.7	1.78 ±0.5	2.42 ±0.6	1.81	>0.05	3.61	<0.001**
5-How useful do you feel?	2.26 ±0.8	1.76 ±0.6	1.8 ±1	3.63	<0.001**	2.1	<0.05*
6-Distressing about initial chemotherapy	2.52 ±0.6	1.66 ±0.6	0.82 ±0.6	7.77	<0.001**	12.91	<0.001**
7-Distressing about the time of chemotherapy	2.32 ±0.8	1.5 ±0.6	0.58 ±0.6	6.31	<0.001**	11.55	<0.001**
8-Feeling of anxiety	2.46 ±0.7	1.42 ±0.7	0.42 ±0.6	7.6	<0.001**	12.98	<0.001**
9-feeling of depression	2.1 ±0.9	1.42 ±0.8	0.34 ±0.6	4.81	<0.001**	12.43	<0.001**
10-Fearful from second cancer	2.6 ±0.8	2 ±0.6	1.28 ±1	4.58	<0.001**	7.65	<0.001**
11-Fearful from side effects of chemotherapy	2.7 ±0.8	2.46 ±0.8	2.4 ±0.8	1.85	>0.05	1.88	>0.05
12-fearful from spreading	2.72 ±0.8	2.46 ±0.6	2.5 ±0.7	2.16	<0.05*	1.5	>0.05
13-Rate over all psychological well being.	0.72 ±0.9	1.12 ±0.7	1.86 ±0.7	3.06	<0.05*	7.98	<0.001**

t1 (Pre Vs post one month) t2 (Pre Vs post 6months)
( ) In significant at p >0.05 (*) Significant at p<0.05 (**) Highly significant at p<0.001

Table (5): Comparison of patient's social health dimension of quality of life scores at pre, post one month & post 6 months of the educational intervention

Social Items	Mean ± SD			t1	p	t2	P
	Pre	Post one month	Post 6 months				
1-Your illness is distressing your family	2.74 ±0.5	2.6 ±0.5	1.18 ±0.9	6.73	<0.001*	11.11	<0.001*
2-Support received from others	2.62 ±0.6	2.52 ±0.6	2.42 ±0.9	1.09	>0.05	1.46	>0.05
3-To what degree a chemotherapy interfered with your personal relationship?	1.62 ±0.9	1.2 ±0.6	0.34 ±0.5	2.88	<0.05*	9.77	<0.001*
4- To what degree chemotherapy interfered with your sexuality?	1.9 ±1.2	1.08 ±0.9	0.4 ±0.7	5.56	<0.001*	9.11	<0.001*
5- To what degree chemotherapy interfered with your employment?	1.59 ±1.3	0.84 ±1.1	0.36 ±0.7	4.38	<0.001*	7.54	<0.001*
6- To what degree chemotherapy interfered with your activities at home?	2.08 ±0.7	1.58 ±0.7	0.34 ±0.6	3.71	<0.001*	14.85	<0.001*
7- Isolation caused by chemotherapy	1.66 ±0.9	1.04 ±0.5	0.22 ±0.5	4.64	<0.001*	11.51	<0.001*
8-Financial burden	1.78 ±1.1	1.22 ±0.6	0.46 ±0.6	3.91	<0.001*	7.87	<0.001*
9-Rate overall social status	1.04 ±0.6	1.16 ±0.6	2.22 ±0.8	1	>0.05	8.87	<0.001*

t1 (Pre Vs post one month) t2 (Pre Vs post 6months)
( ) In significant at p >0.05 (*) Significant at p<0.05 (**) Highly significant at p<0.001

Table (6): Comparison of patient's spiritual health dimension of quality of life scores at pre, post one month & post 6 months of the educational intervention

Spiritual Items	Mean ± SD			t1	p	t2	P
	Pre	Post one month	Post 6 month				
1-Amount of support from religious activities	2.48 ±0.6	2.58 ±0.5	2.64 ±0.5	1.04	>0.05	1.83	>0.05
2-Amount of support from personal spiritual activities	2.48 ±0.6	2.58 ±0.5	2.58 ±0.6	1.15	>0.05	0.00	>0.05
3-Amount of uncertainty about future	2.28 ±1	1.32 ±0.9	0.32 ±0.6	3.38	<0.001*	12.75	<0.001**
4-Postive change in life due to illness	0.24 ±0.7	0.28 ±0.8	0.4 ±0.8	0.33	>0.05	1.16	>0.05
5-Sense of being a life	2.4 ±0.9	2.46 ±0.6	2.7 ±0.5	0.44	>0.05	2.28	<0.05*
6-Do you feel hopeful	1.7 ±0.9	1.72 ±0.7	2.24 ±0.7	0.14	>0.05	3.69	<0.01*
7-Rate over all spiritual well being	1.36 ±0.6	1.48 ±0.6	0.32 ±0.6	1.06	>0.05	8.99	<0.001**

t1 (Pre Vs post one month) t2 (Pre Vs post 6months)( ) Insignificant at p >0.05 (*) Significant at p<0.05 (**)Highly significant at p<0.001

Table (7): Comparison of total means of patient's quality of life dimensions at pre, post one month and post six months from the educational intervention

Items	Mean ± SD	t- test	P-value
Total quality of life dimensions pre educational intervention.	77.78 ± 6.54	Pre & post 12.25	<0.001**
Total quality of life dimensions post one month educational intervention.	63.54 ± 7.85	Pre & follow up 30.1	<0.001**
Total quality of life dimensions post six months from educational intervention (follow up).	50.24 ± 5.47	Post& follow up 20.01	<0.001**

(**)Highly significant at p<0.01

Table (8): Relations between total mean knowledge scores among patients under study and their sociodemographic characteristics

Socio -demo graphic characteristics	Total Knowledge Scores						F- test	P-value
	Pre		Post one month		Post six months			
	Mean	±SD	Mean	±SD	Mean	±SD		
Age(years)								
18-< 45	33.61	11.65	82.33	5.62	72.61	10.4	***F1*** 0.374	***p1*** >0.05
45- <60	34.15	13.48	79.75	6.4	70.77	11.31	***F2*** *2.02*	***P2*** <0.05*
60+	39.25	14.36	76.25	11.73	64	16.55	***F3*** 1.1	***P3*** >0.05
Gender							**Student t- test**	
Male	33.68	10.03	83.21	5.43	76.53	9.95	***t1*** 0.232	***p1*** >0.05
Female	34.52	13.47	79.97	6.89	68.32	10.82	***t2*** 1.84	***P2*** >0.05
							t3 2.73	***P3*** <0.05*
Marital status								
Single	38.43	11.09	87	0	84.29	5.62	***F1*** 2.16	***P1*** <0.05*
Married	31.86	10.92	81.16	5.81	70.43	9.7	***F1*** 4.76	***P2*** <0.05*
Divorced	41.33	16.65	75	1	59.33	2.52	***F2*** 6.05	***P3*** <0.001**
Widowed	46	19.67	74.33	13.58	66	19.67		
Level of education								
Illiterate	28.86	2.27	78.73	5.74	66.32	9.08	***F1*** 13.73	***P1*** <0.001**
Read & write	30.5	4.4	83.17	5.24	73.42	8.88	***F2*** 3.79	***P2*** <0.01**
Secondary	37.33	14.01	80.11	9.06	69.67	12.49	***F3*** 8.84	***P3*** <0.001**
University	53.29	17.97	87	0	86.43	1.51		
Income							**Student t- test**	
Enough	35.38	14.17	81.21	6.75	71.32	11.73	***t1*** 1.31	***P1*** >0.05
Not enough	31.69	5.65	81.19	6.2	71.69	10.14	***t2*** 0.01	***P2*** >0.05
							t3 0.11	***P3*** >0.05

( ) In significant at p >0.05; F1, t1& P1 for pre;
(*) Significant at p <0.05; F2, t2 & p2 for post one month (**) Highly significant at p<0.001; F3, t3 & p3 for post six months

Table (9): Relations between total quality of life mean scores among patients under study and their sociodemographic characteristics

Sociodemographic characteristics	Total Quality of Life Scores						F - test	P-value
	Pre		Post one month		Post six months			
	Mean	±SD	Mean	±SD	Mean	±SD		
Age(years)								
18-< 45	78.55	5.8	63.73	7.85	49.94	5.84	***F1*** 0.917	***P1 >0.05***
45-< 60	76.72	8.59	63.15	8.9	50.85	5.13	***F2*** 0.027	***P2*** >0.05
60+	0.74	4.44	63.25	5.74	50.75	4.11	***F3*** 0.14	***P3 >0.05***
Gender							**Student t- test**	
Male	78.16	5.29	64.68	7.78	50.79	3.84	***t1*** 0.317	***P1 >0.05***
Female	77.55	7.28	62.84	7.94	49.9	6.3	***t2*** 0.804	***P2*** >0.05
							t3 0.552	***P3 >0.05***
Marital status								
Single	74.29	5.5	62.29	5.79	49.71	2.43	***F1*** 2.3	***P1*** <0.05*
Married	79.05	5.96	63.95	8.24	50.57	6	***F2*** 0.26	***P2 >0.05***
Divorced	71.33	10.79	60.33	8.96	45.33	3.22	***F3*** 1.019	***P3 >0.05***
Level of education								
Illiterate	77.68	7.05	60.86	7.65	48.41	4.09	***F1*** 0.173	***P1 >0.05***
Read & write	77.33	5.96	64.25	8.54	52.33	5.61	***F2*** 2.34	***P2*** <0.05*
Secondary	77.33	5.98	65.44	7.55	49.22	3.73	***F3*** 2.71	***P3*** <0.05*
University	79.43	7.66	68.29	5.49	53.71	8.52		
Income							**Student t- test**	
Enough	78.26	6.41	63.35	7.4	50.18	5.79	***t1*** 0.761	***P1 >0.05***
Not enough	76.75	6.9	63.94	8.9	50.38	4.88	***t2*** 2.43	***P2*** <0.05*
							t3 0.12	***P3 >0.05***

( ) In significant at p >0.05
(*) Significant at p <0.05
(**)Highly significant at p<0.001

F1, t1& P1 for pre
F2, t2 & p2 for post one month
F3, t3 & p3 for post six months

Table (10): Frequency of health problems related to chemotherapy administration as reported by the studied patients at pre; post one month and post six months from the educational intervention.

variables	Pre		Post one month		Post six months	
	No	%	No	%	No	%
Nausea	48	96	47	94	13	26
Vomiting	40	80	2	4	0	0
Mucositis	11	22	8	16	4	8
Constipation / diarrhea	41	82	46	94	22	44
Bleeding	3	6	5	10	3	6
Altered taste	47	94	37	74	22	44
Anorexia	48	96	37	74	20	40
Dry mouth	20	40	10	20	5	10
Fever	24	48	9	18	4	8
Fatigue	48	96	39	78	35	70
Anxiety	46	92	7	14	7	14
Difficult swallowing	17	34	2	4	1	2
Heart burn	12	24	3	6	2	4
Weight loss	26	52	39	78	31	62
Alopecia	44	88	33	66	4	8
Other problems	30	60	0	0	0	0

4. Discussion:

Quality of life has become an important issue in evaluating the effectiveness of health care, especially in the field of cancer care, where treatment is often debilitating (***Bondini et al., (2007)***. Now QOL assessment is considered one of the clinical standard outcomes ***(Amgen, 2006).*** Patients' education has demonstrated its potential to improve QOL, ensure continuity of care, effectively reduce the incidence of complications of illness, promote adherence to health care treatment plans, decrease patient anxiety and maximize independence in the performance of activities of daily living. In addition, it energizes and empowers patient to become involved in the planning of teaching session that increases patient satisfaction ***(Black & Hawks, 2009)***. So, the aim of this study was to assess the effect of educational intervention on quality of life for patients with cancer on chemotherapy.

As regards age, less than three fifths of the sample

is in middle adulthood that is characterized by work and being a productive person for both the family and society. So, feeling of not being able to perform social roles could affect the person's quality of life. This result comes in agreement with a study done by **Abd *El-Moneem (*2004),** who assessed quality of life among cancer patients receiving opioids which revealed that the majority of sample was in the middle adulthood. However, this result disagrees with that of a study carried out by ***Ibrahim (2001),***on self- care practices of cancer patients undergoing chemotherapy which revealed that the majority of patients were 50 years old and more.

According to the present study findings, more than half of sample were females, and the study results revealed no statistically significant difference detected between male and female patients in relation to total mean scores of quality of life. This result comes is congruent with that of a study carried out by ***Abd Elhy(2004),*** that assessed self- esteem among cancer patients receiving chemotherapy in Shebin EL Kom University, which reported that the majority of the sample (80%) were females.

In relation to educational level, illiteracy or just abilities to read and write was prevalent among almost two thirds of these study sample. Educational level had no statistically significant difference in QOL. This conclusion comes in agreement with a study done by ***Abd ELmoneem (2004),*** on Egyptians with cancer receiving opioids, which revealed that the educational level had no statistically significant difference in QOL. On the other hand, ***Chen, Wang and Zhu (2007)*** mentioned that patients with higher education had high global health status and had better QOL.As well, ***Mouw, Koster and Wright (2008)*** clarified that the higher level of educational attainment had lower cancer risk.

Concerning patient's monthly income, the present study results revealed that the majority of the studied patients had moderate income, however after the disease occurrence, almost half of them required reduced work, and about one third of them became unemployed. This means that their moderate income wasn't sufficient to meet the costs of the treatment and their family needs, so feeling of inability to perform family role would certainly have had negative impact on their quality of life. This finding was supported by ***Hanafy (2003)*** who mentioned that in reference to the employment status; thirty percent of the study sample became unemployed and delegated this responsibility to their sons.

The study result revealed that there was no statistically significant relation between patient's total mean scores of quality of life and all sociodemographic characteristics. This is in accordance with ***Hassan and Robert (2007***), and ***Dehkordi,Heydarnejad and Fatehi (2009)***, who found that there was no correlation between QOL and variables such as age, sex, marital status and economic conditions. This finding may indicated that the most vulnerable groups who showed lower quality of life were patients aged over 60 years , divorced females, and manual workers (unemployed),and those who read and write, while the least vulnerable were patients aged 18- 44 years old, married and with university education.

As regards knowledge assessment, there were statistically significant improvements in all items of knowledge scores for chemotherapeutic patients post educational intervention compared with pre intervention. These results were in agreement with ***Guren, Dueland and Skovlund (2003)***, who stated that knowledge of how patients perceive the treatment-related toxicity is important in order to prepare them for what to expect during and after treatment. This was attributed to the positive effect and importance of patient's education of different modalities in managing the disease and side effects of chemotherapy to improve QOL and this finding proved this study hypothesis. However, post six months, there were inadequacies in total knowledge scores than post educational intervention. This result could be due to forgetting some factors and moving the patients to another type of treatment such as radiotherapy.

The present study finding also revealed that, there were no statistically significant relations between patient's knowledge and others sociodemographic characteristics such as age, marital status, level of education and income. This result disagreed with ***Ali (2004***), who stated that the subject's information level was statistically significant and negatively correlated with the age, while a positive association was detected between educational level and subject's knowledge level.

Post educational intervention, results of present study indicated that there was slight reduction in post chemotherapy nausea and vomiting as shown by the difference between means, however, after six months of educational intervention there was a highly statistically significant reduction in severity of post-chemotherapy nausea and vomiting after exposure to the educational intervention, and teaching the patient the relaxation technique as an effective non-pharmacological intervention for anticipatory nausea and vomiting, which developed during the course of chemotherapy. These findings were supported by the previous reports of ***Molassiotis (2000) and Ali (2004*).** The results of their studies suggested that progressive muscle relaxation training was effective in reducing the duration and intensity of post-chemotherapy nausea and vomiting.

Conclusion:

Educational intervention showed a significant effect as there was remarkable increase in patient's level of knowledge related to chemotherapy, its purpose, side effects and how to overcome chemotherapy side effects. As regards quality of life of patients, by comparing the results in the pre- and post-educational intervention, the results showed a slight improvement in patient's quality of life post one month, while post six months there was general improvement in all dimensions of quality of life; physical, psychological, social, and spiritual status.

Recommendations:

Based on the results of the current research, the following suggestions for future research and practice are proposed**:**

1- Cancer rehabilitation program for patient treated by chemotherapeutic agent must be implemented through the collaboration of various rehabilitation team members.
2- Hospital teaching methods must be examined so that patient teaching is individualized and available at time when the patient is ready to learn. New methods of teaching are to be applied using new technologies such as computer assisted instructions and home videos.
3- Further investigation could be undertaken to document the cost effectiveness of educational effects in reducing hospital stay, decreasing readmission, improving the patient's quality of life and minimizing complications of illness and therapies.
4- Replication of the current study on a larger probability sample is recommended to achieve generalization and wider utilization of the designed educational intervention.

Corresponding author
Abeer William Aziz
Medical-Surgical Nursing, Faculty of Nursing, Ain Shams University, Cairo, Egypt
abeer.william99@yahoo.com

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