Effect of Self-Care Guidelines on Chemotherapy Associated Symptoms for patients with lung Cancer

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Abstract

Background; Lung cancer is common cancers worldwide. In view of the high-symptoms burden and sever morbidity, Effective symptoms management requires comprehensive self –care strategies **Aim:** of this study was to evaluate the effect of self-care guidelines on Symptoms Burden for Patients with lung Cancer Undergoing Chemotherapy. **Methods:** This study was conducted at the outpatient clinics in Radiation Oncology and Nuclear Medicine Center, affiliated to Ain Shams University. **Sample: A** purposive sample of (50) Adult patients were recruited for this study **Tools:** 1- An interview questionnaire to assess, a- Patient's socio demographic characteristics, b- Patient's medical health profile, c- patients knowledge about lung cancer. 2- symptoms burden assessment and 3- patients' self-care practices assessment. **Results**: the present study revealed that more than one third of the patients in the study and control groups had satisfactory level of knowledge pre implementation of self-care guidelines which improved to the majority of the study group post implementation. There were statistically significant negative correlations between patients' total symptom severity and practices in the study group pre and post self-care guidelines implementation, there were statistically significant positive correlations between patients' total practices and knowledge in the study group pre self-care guidelines implementation while, post self –care guidelines implementation it becomes highly significant positive correlation, there were highly statistically significant negative correlations between patients' total symptoms severity and total knowledge in the study group pre and post self-care guidelines implementation **Conclusion:** self-care guidelines have a statistically significant positive effect on decreasing severity of lung cancer symptoms While, some chemotherapy-associated symptoms were slightly improved but there were no significant differences between pre and post self-care guidelines implementation. **Recommendations**: Health education programs about disease and its management should be provided for lung cancer patients.

Keywords: Lung carcinoma, chemo therapy, self-care

Introduction

Lung cancer is uncontrollable growth of the cells in the respiratory system. About 14 percent of all new cancers are lung cancers. Lung cancer is the leading cause of cancer death among both men and women. The average 5-year survival is 16.8 percent. Lung cancer mainly occurs in older people (**American Cancer Society's, 2017**).

According to the World Health Organization (WHO), there are two main types of lung cancer: small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC), each with their own

pathology. Which, also affect the treatment and management plan. A comprehensive recognition of the different lung cancer types, how they present, and how they may be treated is an important step in providing the best possible care for patients **(NCI, 2014 & Silverstri & Jett, 2013).**

Several risk factors for lung cancer have been associated with lifestyle choices, meaning that the risks can be either managed or avoided in many cases. The most common lifestyle risk factor in the development of lung cancer is smoking. There are other risk factors that contribute to the development of lung cancer including involuntary or secondhand smoking, industrial and environmental hazards **(Chapman et al., 2014).**

Lung cancer rarely gives an early sign of its presence. It may be detected accidentally, when viewing a routine chest x-rays, or it may be suspected by symptoms that presented by the patient such Cough, especially one that changes or becomes productive, Unilateral wheezing, Dyspnea, Pneumonia, Chest pain or pain in shoulder and arm, Hemoptysis, Vocal cord paralysis, Atelectasis, Neurologic changes and Weight loss **(Bezjak et al., 2017).**

Various treatment options are available for lung cancer patients. Traditional methods, including surgery, chemotherapy, and radiation, continue to be the mainstays, but alternative methods are being increasingly developed and used. Many of the treatment options available to lung cancer patients have extensive side effects, which should be discussed and minimized as much as possible **(Crawford, 2014).**

Serious short-term side effects occur with aggressive chemotherapy. The side effects on the hematopoietic (blood producing) system can be life threatening and are the most common reason for changing the dosage or schedule. The suppressive effects on the blood-forming cells of bone marrow cause anemia, neutropenia, and thrombocytopenia. Common distressing side effects include nausea and vomiting, weight loss, alopecia, mucositis, many skin changes, anxiety, sleep disturbance, altered bowel elimination, and changes in cognitive function. These side effects are referred to as cancer therapy symptom distress **(Ignatavicius et al., 2017).**

The definition of "symptom" derives from the Greek word "symptoma," which means "anything that has befallen one." Another description is provided by Webster's Third New International Dictionary that defines a symptom as "the subjective evidence of disease or physical disturbance observed by a patient." Implied in this definition is the negative nature of symptoms and, most importantly, that symptoms are observations of the patient, the person experiencing the evidence of disease or physical disturbance. In contrast to "signs" of disease (such as fever or high blood pressure), symptoms can only be known through patient report **(Cleeland et al., 2011).**

It is frequently difficult for patients (and clinicians) to accurately ascertain the underlying basis of symptoms. Symptoms can be produced by the disease itself, or by disease treatment, in which case they are often referred to as side effects or toxicities. Symptoms can also arise from comorbid medical conditions or acute injuries. Collectively, these sources of distress impose a **"symptom burden"** upon the patient that is a subjective counterpart of summary expressions of disease such as tumor or treatment burden. Symptom

burden can be thought of as the sum of the severity and impact of symptoms reported by a significant proportion of patients with a given disease or treatment **(Dahlberg et al., 2015).**

Self-care is the practice of activities that individuals initiate and perform on their own behalf in maintenance life, health and wellbeing. Self-care is purposeful and conducted to meet self-care requisites of individuals themselves or others in need for care (dependent care) self-care depends on knowledge, resources and action **(Black and Hawks, 2016).**

Significance of the study:-

Lung cancer is the most lethal malignancy in Egypt. According to the latest WHO data published in 2017; Lung Cancers Deaths in Egypt has reached 0.95 percent of total deaths. The age adjusted death rate ranks Egypt 116 in the world at 7.50 per 100,000 populations **(Ibrahim et al., 2014).** Knowledge of lung cancer and its effects on patients will better prepare healthcare professionals for the realities of the disease process and the necessity for comprehensive care and patient teaching.

Aim of the study

The present study was conducted to fulfill the following aim:

Evaluate the effect of self-care guidelines on chemotherapy associated symptoms for patients with lung cancer through the following:

1.Assessing the presence and severity of lung cancer and chemotherapy associated symptoms.

2.Assessing patients' knowledge related to lung cancer disease and chemotherapy associated symptoms.

3. Developing and implementing self-care guidelines based on patients' assessment.

4. Evaluating the effect of self-care guidelines on the associated symptoms.

Research Hypothesis:

The current study hypothesized that:

▪ The implementation of self-care guidelines for patients with lung cancer undergoing chemotherapy will affect symptoms severity positively.

Subjects and methods:

Technical design:

The technical design includes research design, setting, subjects and tools of data collection used in this study.

Research design:

A quasi experimental design was followed to achieve the aim of this study.

Setting:

This study was conducted in outpatient clinics in Radiation Oncology and Nuclear Medicine Center, affiliated to Ain Shams University.

Subject:

A purposive sample of 50 adult patients with lung cancer selected to certain inclusion and exclusion criteria were recruited in this study, based on the number of the patients with lung cancer

who admitted to the radiation oncology and nuclear medicine center at Ain shams university hospitals in 2016 which was 123 patients. The study subjects were randomly selected and divided into two groups: study group (25) who had the self- care guidelines & routine care and control group (25) who had only the routine care.

The sample size calculation done based on power analysis:

Sample size will be calculated using Epicalc, 2000 software with the following inputs:

The minimal sample size will be 25 cases in each group.

- Type I error (α) =5% with confidence level 95%.

- Study power 90 % (power of test) with type error II 10% (Beta).

- The significance level (α) at 0.05.

The total sample size from patients were taken according to this Formula.

Inclusion Criteria:

Adult patients, from both sexes, primarily diagnosed with lung cancer, undergoing chemotherapy, free from other chronic diseases that may be interfere with self-care abilities, able to respond to questions and agree to participate in the study were recruited in this study.

Exclusion Criteria:

Patients with mental or psychiatric disorders. Patients who were exposed previously to any education programs or guidelines about chemotherapy and its associated therapeutic regimens

(D)-Tools of data Collection:

Three tools were used for data collection:

Tool (1): Structured Interview Questionnaire for patients with lung cancer undergoing chemotherapy (Appendix I): this questionnaire was developed by the researcher in simple Arabic language based on reviewing the related recent literatures. And filled by the researcher. It includes the following three parts:

- Part 1: Patients' socio demographic characteristics:

This part aimed to assess patients' age, gender, occupation, marital status, level of education, income, treatment cost, need for care from other person and housing condition.

- Part 2: Patients' medical health profile:

This part aimed to assess and collect data about Patient's medical history including present history, past medical surgical history, family history and smoking history.

- Part 3: Patients knowledge related to lung cancer disease and chemotherapy associated symptoms:

This part aimed to assess the patients' knowledge related to following:

A. Lung cancer and chemotherapy treatment **(13 YES/NO questions).**

B. Types of treatment, factors contribute to choose the line of treatment

and possible complications of treatment **(10 YES/NO questions).**

C. Self-care practices for lung cancer and chemotherapy associated symptoms **(20 MCQ questions)**. **Scoring system for patient knowledge:**

The total score of knowledge was 43grades. Each correct answer was given one grade and the incorrect answer was given zero.

Total score was classified as follows:

• <70%was considered unsatisfactory (<30.25 marks)

• ≥ 70% was considered satisfactory (≥30.25 marks)

Tool (2): M. D. Anderson Symptom Inventory-lung cancer (MDASI-LC) (Appendix II):

This tool was adapted from **Mendoza et al. (2011)** and modified by the researcher then translated and back translated into Arabic, It contain two sections as follow:

Section 1-Symptom Severity scale:

This scale aimed to assess the severity of lung cancer symptoms (9 symptom items) as (breathlessness, cough, pain, weight loss, fatigue...etc.) and chemo therapy associated symptoms (16 symptoms items) as (nausea& vomiting, constipation, diarrhea, infection, bleeding, sleep problems, psychological stressors.. etc.).

Section 2- Symptom Interference scale:

This scale aimed to measure symptom impact on functioning, it contains (6) items measuring symptom interference with activity dimensions (walking ability, general activity& normal work) and affective dimensions (relations with other people, enjoyment of life& mood).

Scoring system:

The (MDASI-LC) scale included 31 items ranged from 0 grade (not at all), 1 grade (little), 2 grade (for somewhat), 3 grade (much) and 4 grade (too much).

The scores of the items in each subgroup were summed up and the total scores were divided by the number of items in each subgroup, giving a mean score for the subgroup, also, the total mean for the (MDASI-LC) scale was calculated and categorized as.

• Low severity/interference = 0-<50%

• Moderate severity/interference = 50-<75%

• High severity/interference= 75% & more

Tool (3): Lung Cancer and Chemotherapy Associated Symptoms Self-care practices Assessment Questionnaire (Appendix III):

This questionnaire was developed by the researcher in Arabic language based on the related literatures. It was used to assess patients' self-care practices for lung cancer and chemotherapy associated symptoms. This questionnaire includes two parts:

Part1- self-care practices related to lung cancer symptoms:

It was composed of (38) items. It was concerned with assessment of patient's self- care practices regarding lung cancer symptoms dyspnea (6), cough (6), pain (6), dysphagia (6), anorexia/weight loss (7), and fatigue (7).

Part 2- self-care practices related to chemotherapy associated symptoms.

It was composed of (113) items. It was concerned with assessment of patient's self- care practices regarding chemo therapy associated symptoms nausea/vomiting (11), diarrhea(6), constipation(7), mucositis (10), alopecia (8), infection (11), bleeding(9), anemia (5), neurological problems(6), urological problems(3), skin problems(9), sleep problems (8), extravasation(6), concentration /memory problems(7),sexual problems (7), psychological problems(5).

Scoring system for self-care practices

The response of each step was divided into (always done, sometimes done and never done). The total score of patient's self-care practice was (302) grades for 151 items. Two grade was given to the item which always done and one grade was given to the step which sometimes done and zero to the step which not done.

Total score was considered as the following:

● > 70% (> 202 grades) was considered satisfactory level of self-care practice.

● < 70% (< 202 grades) was considered unsatisfactory level of self-care practice.

2-Operational Design:

The operational design consists of the preparatory phase, validity and reliability of the tools, pilot study, ethical considerations, fieldwork, and limitations of the study.

A. The preparatory Phase:

This phase was carried out through the following steps:

1- Developing the data collection tools after reviewing the recent related literatures in periodicals, internet research and other resources.

2- Outlining all areas to be included in the self-care guidelines and educational booklet through extensive review of the literature and other available resources.

3- Designing the self-care guidelines, preparation of its content and developing the educational booklet. It aimed to equipped lung cancer patients with knowledge and skills related to self-care of the symptoms associated with chemotherapy, it included two parts as the following:

- **Part one: theoretical part:** it covered the following:

● Lung cancer definition, risk factors, clinical manifestations.

● Chemotherapy as definition, types, uses and side effect

● Self-care guidelines for the patients with lung cancer undergoing chemotherapy

- Part two: practical part: it concerned with self-care practices as oral care, hand washing, relaxation and breathing exercise.

B. Content validity and Reliability

Testing validity: face and content validity of the suggested tools was assessed through a jury of 7 experts that consisted of: (3 professors, 2 assistant professors, 2 lecturer) from Medical Surgical Nursing department at the Faculty of Nursing Ain Shams University and oncology and nuclear medicine department at faculty of medicine Ain shams university for the content validity. The jury reviewed the tools for clarity, relevance, comprehensiveness, and simplicity; then based on the opinion of the jury minor modifications were carried out, and then the final forms were developed.

Testing the reliability: it was done by using Alpha-Cronbach Test (0.833).

A pilot study: was conducted on five patients (10%) of total study subjects were included and chosen randomly from the previously mentioned setting in order to test the applicability and the clarity of the study tools, as well as estimating the average time needed to complete the tools. Accordingly, necessary modifications were made for the final development of the study tools. Some questions and items were omitted, added or rephrased and then the final forms were developed. Patients selected for the pilot study were excluded from the study subjects.

Field Work:

Field work included four phases: Assessment phase, planning phase, implementation phase and the evaluation phases.

Phase I. Assessment phase.

Data collection from patients for this study took about one year, started from February 2019 to the end of January 2020.data collected first from the control group from February to June2019, and then collected data from the study group from August 2019 to the end of January 2020.data were collected three days/week for both groups, first the researcher greeted the patients, introduced himself and explained the purpose of the study.

The researcher took telephone number of the patient or his family care giver at the first contact during outpatient clinic periodically visit to determine the next appointment in order to complete data collection process. Data collection take place at chemo therapy clinic when the patients received their chemo doses or at main hall when the patient waiting for doctor appointment.

For the control group, the assessment was done including all the study variables. Filling the tools took about 60-75mintues distributed as the following: patient's socio-demographic characteristics took about 5mintues, patient's clinical data took about 10-15, lung cancer knowledge took about 25, patients self-care practices took about 25 and symptoms severity took about 5 minutes. For the study group the assessment was done as same as the control group and took the same time approximately.

Phase II. Planning phase:

1. All data collected were analyzed to identify lung cancer self-care needs.

2. Based on patients' needs and the recent related literatures, an illustrated Arabic-language booklet was developed

Phase III. Implementation phase

Implementation of self-care guidelines were took place according to patients learning needs. The researcher explained the self-care guidelines to every patient individually. The total number of sessions is four sessions. Each session lasted from 30-40 minutes after explanation the objectives of each session.

Feedback was given in the beginning of each session about the previous one. The teaching methods used were discussion. Suitable teaching media were used, included posters, videos and booklet that were distributed to all patients that able to read and write. Also, the researcher communicated with patients via telephone call for instruction and reinforcement.

Phase IV. Evaluation phase

Evaluation was emphasized on determining the effect of self-care guidelines on chemotherapy associated symptoms for patients with lung cancer by comparing the result pre and post implementation of self-care guidelines by using the same data collection tools which were done to study and control groups.

Finally, the booklet was handled for each patient in control group in this study at the end of data collection process.

Administrative Design:

An official letter was issued from the faculty of nursing-Ain Shams University to the medical and nursing director of El- Demerdash hospital and the medical and nursing director of oncology center at El- DEmerdash hospital at which the study was conducted, explaining the purpose of the study and requesting the permission for data collection from the study group.

Ethical Considerations:

The ethical research considerations in this study included the following:

▪ The research approval was obtained from the faculty ethical committee before starting the study.

▪ The researcher assured maintaining anonymity and confidentiality of subjects' data of the patients included in the study

▪ Patients were informed that they were allowed to choose to participate or not in the study and they had the right to withdraw from the study at any time.

Statistical Design:

All data were collected, tabulated and subjected to statistical analysis. Statistical analysis is performed by SPSS in general (version 17), also Microsoft office excels is used for data handling and graphical presentation. Quantitative variables are described by the Mean, Standard Deviation (SD), while qualitative categorical variables are described by proportions and Percentages. Chi-squared test of independence is used for categorical variables. Test of significance was used and regarding significance of the result, the observed differences and associations was considered as follows:

• Non significant (NS) $P > 0.05$

- Significant (S) P ≤ 0.05

- Highly significant (HS) P ≤ 0.01

Results

Table 1 showed that, the mean age of the study group was 57.84±7.96, while the mean age of the control group was 53.88±9.08. Regarding, gender 68% and 44 % of patients in the study and control groups were males. Also 84% and 76% of patients study and control groups were married, 20% and 32% of them were illiterate. Also 68% and 80% of patients in the study and control groups were not working. In relation to need for care from others, 88% and 68% respectively of patients in the study and control groups stated that, they need care from others. There were no statistically significant differences between the two groups regarding their socio demographic characteristics (p >0.05).

Table 2 illustrated that, 48% and 60% of the study and control groups complain of symptoms from six months to less than one year, 44% and 52% of them started treatment from one month to less than six months. The same table also revealed that, 88% and 84% of them had NSCLC. 68% and 64 of the study and control groups were at stage three of tumor at the time of diagnosis, all of them were receiving chemotherapy, while none of them had surgical interventions. There were no statistical significant differences between the two groups regarding the previous items (p >0.05).

Table 3 revealed that, only 20% and16% of patients in study group and control group had other disease as peptic ulcer. 24% and 20% of patients in study and control group were hospitalized before. Also 16% and 8% of them had previous surgeries. 20 % and16% of the study and control group patients' family had cancerous disease with lung cancer representing 60% and 50% of them. Also all the cancerous disease occurred among first degree relationship in both groups. There were no statistically significant differences between

the two groups regarding past and family history (p >0.05).

Figure 1 revealed that, 36% and 40% of the study and control groups had satisfactory level of total knowledge about lung cancer, its treatment, self-care for lung cancer and chemotherapy associated symptoms pre implementation of self-care guidelines. Which improved to 84% post implementation of self- care guidelines in study group.

Figure 2 showed that, 24% and 20% of the patients in the study and control groups had satisfactory level of total self-care practices pre implementation of self-care guidelines. While, post implementation of self-care guidelines 84% of the study group and 32% of the control group had satisfactory level of self-care practice.

Figure 3 showed that, 64% of the study group and 72%of the control group had severe symptoms with no statistical significant differences between two groups pre implementation of self-care guidelines (P>0.05). While, post self-care guidelines implementation, only 16% of the study group had severe symptoms in contrast to 60%of the control group still had severe symptoms.

Table 4 showed that, there were statistically significant negative correlations between patients' total symptom severity and practice in the study group pre and post self-care guidelines implementation (p<0.05).

Table 5 revealed that, there were statistically significant positive correlations between patients' total practice and knowledge in the study group pre self-care guidelines implementation (p<0.011) while, post self – care guidelines implementation it become highly significant positive correlation (p<0.001). Also there were highly statistically significant negative correlations between patients' total symptoms severity and total knowledge in the study group pre and post self-care guidelines implementation (p<0.001).

Table (1): Number and percentage distribution of the patient in the study and

control groups according to socio-demographic characteristics (n=50).

Socio-demographic characteristics	Study (N=25)		Control (N=25)		X^2	P-value
	N	%	N	%		
Age						
from 40 to 60	14	56	17	68	0.764	0.382
Mean ±SD	57.84±7.96		53.88±9.08			
Sex Male	17	68	11	44	2.922	0.087
Female	8	32	14	56		
Marital status						
Married	21	84	19	76	0.500	0.480
Educational level						
Illiterate	5	20	8	32		
Reads and writes	7	28	3	12	4.110	0.250
Basic	6	24	10	40		
Higher education	7	28	4	16		
Occupation					0.936	0.333
No	17	68	20	80		

In-significant P>0.05

Table (2): Statistical differences of patients in the study and control groups regarding time of complain, time of treatment, tumor type, stage and type of treatment (n=50).

Items	Study (N=25)		Control (N=25)		Chi-square	
	N	%	N	%	X^2	P-value
Time of complaint						
Up to 6 months	6	24	5	20		
Up to 12 months	12	48	15	60	0.758	0.685
More than 12 months	7	28	5	20		
Mean ± SD	10.76±5.43		11.12±5.38			
Time of starting treatment						
Up to 6 months	11	44	13	52		
Up to 12 months	10	40	7	28		
More than 12 months	4	16	5	20	1.391	0.499
Mean ± SD	5.36±3.86		5.88±4.02			
Type of tumor						
Non-small cell lung cancer(Nsclc)	22	88	21	84	0.166	0.684
Small cell lung cancer (Sclc)	3	12	4	16		
Stage of lung cancer						
Stage II	0	0	1	4		
Stage III	17	68	16	64	1.030	0.597
Stage V	8	32	8	32		
Type of treatment						
• Chemotherapy	25	100	25	100	0.000	1.000
• Radiation therapy	7	28	9	36	0.368	0.544
• Surgery	0	0	0	0	0.000	1.000

In-significant   P>0.05

Table (3): Number and percentage distribution of patients in the study and control groups regarding their past and family history (n=50).

Items	Groups					
	Study (N=25)		Control (N=25)		Chi-square	
	N	%	N	%	X^2	P-value
*Number of patients having ❖ other diseases	5	20	4	16	0.136	0.713
*Hospitalization related to other disease	6	24	5	20	0.117	0.733
*Having previous surgeries	4	16	2	8	0.758	0.384
*Receiving medications for other reasons	3	12	4	16	0.166	0.684
*Positive family history with cancerous diseases	5	20	4	16	0.136	0.713
*Type of cancerous disease among family						
1- leukemia	1	20	0	0	1.440	0.487
2- lung cancer	3	60	2	50		
3- breast cancer	1	20	2	50		
*Degree of relationship						
1. first degree	5	100	4	100	4.140	0.126
2. second degree	0	0	0	0		

* Other diseases rather than chronic diseases as peptic ulcer   In-significant P>0.05   * Numbers are not mutually exclusive
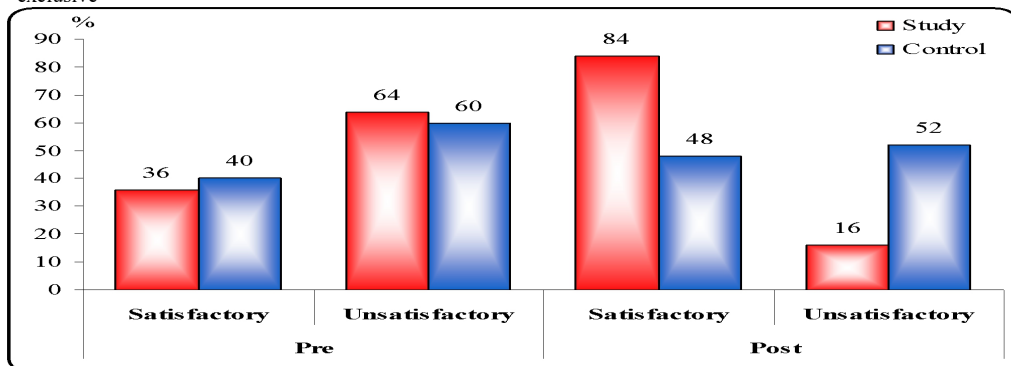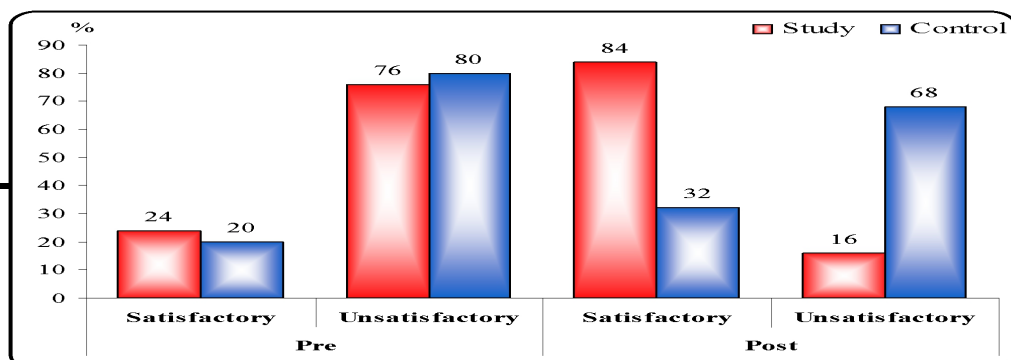

Figure (1): **Total level of knowledge pre and post implementation of self-care guidelines among patients in the study and control group (n=50)**

Figure (2): Total satisfactory level of self-care practices pre and post implementation of self- care guidelines among the study and control groups (n=50).
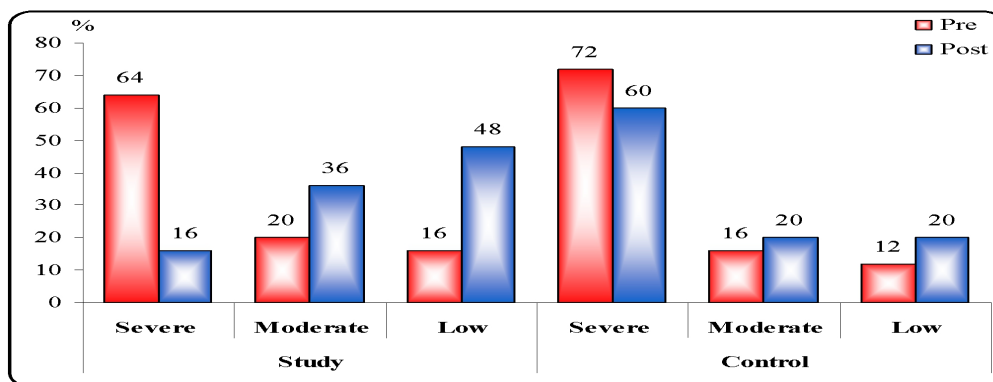
Figure (3): Comparison between study and control group regarding total symptoms severity pre and post implementation of self-care guidelines (n=50).

Table (4): Correlation between patients total symptoms severity and practice in the study group pre and post implementation of self-care guidelines (n=25).

Items	Total practice Study(n=25)			
	Pre		Post	
	R	P-value	R	P-value
Total symptoms	-0.265	0.041*	-0.327	0.011*

Significant p≤0.05

Table (5): Correlation between patients total knowledge and symptoms severity and practice in the study group pre and post implementation of self-care guidelines (n=25).

Items	Total knowledge Study(n=25)			
	Pre		Post	
	R	P-value	R	P-value
Total practice	0.303	0.011*	0.543	<0.001**
Total symptoms severity	-0.378	<0.001**	-0.443	<0.001**

Significant p ≤0.05* High significant p ≤0.001*

Discussion

Lung cancer leading to high morbidity and mortality. A person who diagnosed with lung cancer faced with the shocking experience of the diagnosis, the burden of a painful, lasting and potential life threatening treatment, and many psychological, social and financial concerns that had impact on patient's life. So that, lung cancer patients need for information about the disease and its management Studies states that many of symptoms seen after chemotherapy can be significantly reduced by education and care. Patient education is inexpensive and does not require a particular place or time **(Mahdi & Mohammed, 2016).**

Regarding socio-demographic characteristics, the results of the present study revealed that, the mean age of the study group was (57.84±7.96), while mean age in the control group was (53.88±9.08,), this result was supported by **Shokralla & Rahouma, (2016)** in a study entitled "Prognostic clinico-pathological features of 99 cases advanced non-small cell lung cancer— Egyptian National Cancer Institute" who found that the median age of studied patients was 54 years (range: 30 - 70) with 53% of cases are ≥ 54 years.

Regarding to gender, about two thirds of patients in the study group and near to one half of patients in control group were males. This finding is supported by **The American Cancer Society, (2019)** who stated that; lung cancer occurs more common in males than females. That may be because male patients were at greater risk in their work environment and most of them are active smokers.

Related to marital status and work the majority of patients in the study and control groups were married and not working. This may be because they are in a retirement age or their health condition forced them to take sick leave or delegated their responsibilities.

This finding is in the same line with what was reported by **Dorland et al., (2016)** in the study entitled "Factors influencing work functioning after cancer diagnosis" in Groningen, The Netherlands., a focus group study with cancer survivors and occupational health professionals" who found that, the majority of the studied patients with lung cancer were married, more than half of them didn`t work.

Concerning to educational level, less than one quarter of the patients in the study group and one third of the patients in the control group were illiterates that may be related to their social class as most of them come from low social class. This finding isn't in consistent with **Willén et al., (2019)** in the study entitled "Educational level and management and outcomes in non-small cell lung cancer". In Sweden who stated that only ten percent of study patients with cancer were illiterate. This may be related to differences between the economic resources between the countries since Egypt had high rate of illiteracy.

Regarding present history, the current study revealed that, the current study showed that about half of the study group and two thirds of the control group complaint symptoms from six month to less than one year and near to half of both groups start their treatment up to six months.

This finding was supported by **Helsper et al., (2017).** Who stated that time interval or delay from first cancer symptom to diagnosis and treatment, was 98 days. Most of the total delay stemmed

from patient (median 49 days) and system delay (median 54 days).

Related to type of tumor, cancer stage and type of treatment the current study showed that the majority of the patients in both groups had Non-Small Cell Lung Cancer and two thirds of them were at stage there lung cancer and all of them under going chemo therapy while none of them had surgical interventions.

This findings supported by **Shokralla & Rahouma, (2016)** in the study entitled "Prognostic clinico-pathological features of 99 cases advanced non-small cell lung cancer" Egyptian National Cancer Institute who stated that Non-small cell lung carcinoma (NSCLC) accounts for 80% - 85% of all lung carcinomas. All cases received platinum containing chemotherapy. The majority of cases experienced a progressive disease 60.6%; most patients are diagnosed with a non-resectable disease. The researcher think this is normal sequences of delaying seeking medical consultation when the patients start complaint, lack of screening program for lung cancer in high risk groups.

Regarding family and past history the current study showed that near to quarter of patients in the study and control groups had past history and hospitalized before but not for chronic disease. Only twenty percent of the study group and sixteen percent of the control group had family history with cancerous disease. Lung cancer represents more than half of cancerous disease among patients of two groups. Also 100% of cancerous disease occurred among first degree relationship in both group.

This finding was conflicted with **Omar et al., (2017):** who report that Underlying chronic obstructive pulmonary disease (COPD) diagnosis was reported in about 25% of the cases. About 13.7% had a past history of malignancy. On the other hand, family history was positive for malignancy in 8.6% of the cases. this confliction resulted from inclusion criteria for selection the patients to include in the current study whereas the researcher select patients free from chronic disease and primarily diagnosed with lung cancer.

This finding was in the same line with **Kanwal & Cao, (2017):** who report that Genetic factors contributing to the development of sporadic lung cancer, but only a few specific genes and other genetic factors affecting lung cancer have been identified to date.

Concerning patients` total level of knowledge regarding lung cancer, its treatment, self-care for lung cancer symptoms and self-care for associated symptoms, the current study revealed that more than one third of the patients in the study and control groups had satisfactory level of total knowledge pre implementation of self-care guidelines at (P=0.771). With no statistically significant difference between two groups. Which improved to the majority of patients in study group post implementation of self- care guidelines regarding total level of knowledge with statistically significant difference between them at (P=0.007).

This finding was supported by **Mahdy & Mohammed, (2017)** in the study entitled " Effect of educational guidelines intervention on symptoms burden and information regarding chemotherapy among patients with lung cancer.8th international conference "faculty of nursing-Helwan University. They reported that educational guidelines intervention had positive effect on patients' information regarding

chemotherapy and the chemotherapy-induced symptoms burden among patients with lung cancer.

Regarding satisfactory level of total self-care practices The current study revealed that, less than quarter of patients in the study and control groups had satisfactory level of total self-care practices with no statistically significant differences pre self-care guidelines implementation at (p>0.333), which improved to majority of patients in study group with highly statistically significant difference post implementation of self-care guidelines at (P< 0.001).

This result reflects the positive influence of self-care guidelines on improving self-care practices.

This finding is on the same line with the finding of **Loerzel, (2018)** in the study entitled "Symptom Self-Management: Strategies used by older adults receiving treatment for cancer" in USA who found that on average, strategies used to manage symptoms were moderately effective, the positive impact of self-management strategies on symptom management and patient outcomes, in study entitled "Symptom self-management strategies used by older adults receiving treatment for Cancer".

Regarding total symptoms severity, the current study showed that, more than two thirds of patients in the study and control groups had severe symptoms, which improved to less than quarter of patients in the study group post implementation of self-care guidelines with statistically significant differences at **p**-<0.05 between pre and post implementation of self-care guidelines among both groups. This result indicates the important role of self-care guidelines in improving symptoms that patients experienced.

This finding is supported by **Howell et al., (2017**) in Canada in research review that examined the effectiveness of nurse-delivered interventions and reported beneficial effects of nursing programs and psychotherapeutic, psychosocial and educational interventions on quality of life. This review focused solely on lung cancer and quality of life endpoints.

Regarding correlation between patients total symptoms severity and self - care practice in the study group pre and post implementation of self-care guidelines. The current study showed that, there were statistically significant negative correlations between patients' total symptom severity and self-care practice in the study group pre and post self-care guidelines implementation (p<0.05).

The researcher founded that once the patient felt some improvement related their symptoms as a result of following self-care guidelines they start to participate actively in self-care activities.

These findings in agreement with **Tuominen et al., (2019).** who report that, the effectiveness of educational nursing interventions was inconsistent on quality of life (QoL), attitudes, anxiety and distress, but positive on level of knowledge, symptom severity, sleep and uncertainty. Psychosocial nursing interventions had a significant effect on spiritual well-being, meaning of life, fatigue and sleep. Psychological nursing interventions reduced cancer-related fatigue.

Concerning correlations between patients` level of knowledge, self-care practice and symptoms severity among patients in the study group pre and post implementation of self-care guidelines. The current study revealed that, there

were statistically significant positive correlations between patients' total practice and knowledge in the study group pre self-care guidelines implementation (p<0.011) while, post self –care guidelines implementation it become highly significant positive correlation (p<0.001). Also there were highly statistically significant negative correlations between patients' total symptoms severity and total knowledge in the study group pre and post self-care guidelines implementation (p<0.001).

This finding supported by **Howell et al., (2017)** in the study entitled " Self-management interventions for breathlessness in adult cancer patients " in Canada who report that, the effectiveness of self-management education on supporting patients with cancer and developing the skills needed for effective self-management of their disease and the acute or immediate, long-term, and late harmful effects of treatments in the study about Self-management education interventions for patients with cancer: a systematic review".

At the end, the study results found that the implementation of self-care guidelines significantly have a positive effect on patient knowledge and practice and help in decreasing disease and some of chemotherapy associated symptoms for patients with lung cancer which prove the study hypothesis.

Conclusion

Based on findings and research hypothesis of the present study, it can be concluded that:

Self-care guidelines had positive effect on lung cancer patients' knowledge with a statistically significant difference at (P≤ 0.001) pre and post implementation of self-care guidelines among the study

and control groups. Also there was a significant improvement on patients' self-care practices post implementation of self-care guidelines with a highly statistically significant difference at (P≤ 0.001) pre and post implementation of self-care guidelines among the study and control groups.

Implementation of self-care guidelines for patients with lung cancer undergoing chemotherapy has a statistically significant positive effect on decreasing severity of symptoms which support the stated hypothesis.

Recommendations

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

1. Educational programs about disease and its treatment modalities should be provided for lung cancer patients.

2. Developing a simplified illustrated and comprehensive Arabic booklet to be available for all patients early when diagnosed including latest information about lung cancer, its therapeutic regimen and how the patients can manage their symptoms.

3. The study should be replicated on large sample and different hospitals setting in order to generalize the results.

4. Lung cancer screening program should be implemented for those who at risk at national base through the collaboration of various Concerned institutions.

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Conflict of interest

The authors declare no conflict of interest or otherwise.

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