Smoking Cessation Program for Lung Cancer Patients

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Abstract

Smoking cessation improves response to chemotherapy and targeted therapy which can decrease lung cancer so, this study aimed at evaluating the effectiveness of smoking cessation program on lung cancer patients. **Setting:** The study was conducted in the outpatient clinic of the oncology center, affiliated to Ain Shams University Hospitals. **Subjects:** The study was conducted on 60 patients. **Tools of data collection** were; **1)** Socio-demographic sheet to assess age, sex, residence, monthly income….etc, smoking history, quitting history& patients' knowledge. **2)** Fagerstrom Test For Nicotine Dependence. **3)** Computed assisted tomography scan (CT scan) of the chest. **4)** The piCO Smokerlyser (Bedfont Scientific, Harrietsham, England), a portable carbon monoxide (CO) monitor. **The result** showed that, there was a highly statistically significant difference between pre-and post-intervention of smoking intensity, total knowledge scores of the patients and CT scan findings to evaluate lesion response (p=≤0.001). In addition, there were highly statistically significant differences between pre-and post-intervention of the performance status of the patients and their perceived health (p=≤0.001). Moreover, there were highly statistically significant differences between pre-and post-intervention of methods of quitting and supporting system for the patients (p=≤0.001). **It was concluded** that, the implementation of the smoking cessation program had a positive effect on the lung cancer smokers' patients. The study highlighted **the recommendation** of incorporating smoking cessation intervention into nursing curriculum at all levels of nursing education and in oncology centers, it should focus not only on the risks of continued tobacco use, but also and mainly, on supporting long-term abstinence and reducing relapse risk factors, which are very common in these patients.

Key words: Smoking cessation- lung cancer patients**.**

Introduction

The use of tobacco products in Egypt is widespread. It is estimated that approximately 20% of the population uses tobacco products daily. Cigarettes are the most common form of tobacco consumption in Egypt, with an estimated twenty billion cigarettes smoked annually in the country. After cigarettes, Shisha water-pipes are the most common form of tobacco consumption. Smoking is far more common among men than it is among women. The number of adults smoking tobacco products in Egypt continues to rise as much as 4% to 5% percent annually **(Yolande, 2010).**

Smoking causes many serious diseases including; cardiovascular disease (heart disease), lung cancer, and chronic obstructive   pulmonary

diseases (emphysema, chronic bronchitis). Smokers are far more likely to become sick with one of these diseases than non-smokers. Smoking is also addictive and can be extremely difficult to stop **(CDC, 2010)**.

All of lung cancer cases in Egypt are due to tobacco use, 90% of all cases; because tobacco smoke contains more than 70 different substances that are thought to cause cancer. When someone inhales smoke, these chemicals enter his/her lungs and spread around the rest of the body causing damage of DNA and change the important genes **(National Cancer Institute of Egypt, 2011)**.

Smoking cessation for lung cancer patients yields both immediate and long-term benefits including; improved oxygenation, lowered blood pressure, improved smell, taste, circulation and breathing, increased energy and improved immune response. Smoking cessation is also associated with improved cognitive function, psychological well-being, and self-esteem. Lung cancer patients report after successful smoking cessation all of the same benefits plus, decreased fatigue and shortness of breath, increased activity level, improved performance status, appetite, sleep, and mood. In addition, there are significant positive effects of smoking cessation on the health of lung cancer patients as, decreased risk of disease, increased survival time, decreased post operative complications, increased efficacy of chemotherapy, decreased radiation therapy complications and improved quality of life **(Cooley, 2011)**.

Significance of the study:

According to the **WHO (2010),** smoking causes 90% of lung cancer cases in Egypt; it also increases complications of radiation therapy and can adversely affect outcomes. Smoking history was found to be a major risk factor for development of radiation pneumonitis (20%). Also, infection rates were higher among lung cancer patients receiving radiation treatment who had higher pack-years of smoking which was associated with decreased survival. The common complication among lung cancer patients with a history of smoking is the psychological complication commonly referred to as "Smoker's Guilt".

Aim of the study

This study aimed at evaluating the effectiveness of smoking cessation program for lung cancer patients.

Materials and Methods

Research design:

The study design was a quasi-experimental design.

Setting of the study:

The study was conducted at the outpatient clinic of the oncology center, affiliated to Ain Shams University.

Subjects:

The subjects of this study included 60 lung cancer smokers patients, they represented 10% of the total number of patients attending the outpatient clinic.

Tools of Data Collection:

The data were collected by:

First Tool:

An interview questionnaire was used by the researcher (pre& post the program) after reviewing recent literatures to assess smoking; it was include the following parts:

Part one:

Patients' socio-demographic characteristics as: age, sex, level of education, marital status, residence, occupation, income, etc…..

Part two:

Past and present smoking history to assess smoking behavior pattern.

Part three:

About quitting: to assess willing and current plan to stop smoking.

Part four:

Patients' knowledge assessment.

Second Tool:

Fagerstrom Test For Nicotine Dependence (FTND): is a standard instrument, it was used to determine the level of dependence on nicotine (pre the program) (Fagerstrom, K.O, British Journal of Addiction 1991). The test comprises 6 questions, with each question assigned to different points. The level of nicotine dependence is categorized in 5 groups based on the total scores.

Third Tool:

Computed assisted tomography scan (CT scan) of the chest before and after the program to assess response of the patient, it was evaluated by Response Evaluation Criteria in Solid Tumors (RECIST criteria), it assessed by oncologist and recorded in patient's file. Response Evaluation Criteria in Solid Tumors (RECIST) are widely used to assess the effect of treatment in patients with cancer by the change in dimensional tumor size.

Fourth tool:

The PiCO+ Smokerlyser - Bedfont Scientific, Harriet Sham, England.

A portable carbon monoxide (CO) monitor, it measures exhaled CO in parts per million (ppm CO).

Subjects were divided into the four following groups based on measured Carbon Monoxide level:

1- Non smoker (0- 6 ppm).

2- Low PICO (7-10 ppm).

3- Moderate PICO (11-20 ppm).

4- High PICO ($\geq$21ppm).

Results:

Table (1): About the socio-demographic characteristics of lung cancer smokers patients, the table reveals that, the entire study sample constitute males (100%). The table also shows that, more than one third of patients (35%) were in the

age group 55 - < 65 years with a mean age of 56.4±9.7, and 66.6% of them were married. Concerning the educational level, the table clarifies that, the highest percentages of patients under study were at primary school level representing 41.7%. As regards their occupation, more than one third of them (36.7%) were craftsmen, and more than two thirds of them had a monthly income <500L.E. Patients who lived in rural areas were representing 63.3%.

Figures (1, 2& 3): In the comparison between smoking intensity of the patients according to their breath Carbon Monoxide level, the figures clarifies that, at the beginning of the program, the highest percentage of exhaled Carbon Monoxide level was heavy (21- 30 ppm) in 41.7% of patients and gradually decreased during sessions, while at the end of the program, the exhaled Carbon Monoxide level shows that, the highest success rate of quitters were 46.7%.

Table (2): About the distribution of Fargerstrom Test for Nicotine Dependence (FTND) score pre the program, it is noticed that, more than half of the patients (51, 7%) were > 6 with a mean of 7.22 + 0.92, while 48.3% of them were had scores < 6 with a mean of 2.93+1.41. FTND mean scores for the whole patients were 5.2 + 2.5. On the other hand, there were 50% of the patients smoked the first cigarette soon after wake up within 6-30 minutes.

Table (3): The table clarifies that, there were highly statistically significant differences between pre and post the program among lung cancer smokers patients as regards smoking intensity (p=≤0.001). The table also shows that, those who consumed less than 30 cigarettes per day were significantly more successful in quitting smoking in comparison with those who smoked more than 30 cigarettes per day.

Table (4): Comparing the mean scores of the patients' knowledge pre and post the program (N=60), the table shows that, the mean scores of total knowledge in the pre test increased sharply in the post test. However, the total mean of scores was 3.76±5.749 in the pre test and became 10.95± 4.441 in the post test.

Figure (4): In comparing CT scan findings to evaluate response of lesions pre and post the program, the figure demonstrates that, complete response of lesion was in stage I of disease, while 25% of partial response was in stage II and III. It is also noticed that, the highest percentage of stable and progressive disease was in stage III representing 18.3% and 6.7% respectively.

Table (5): As regard the lung cancer smokers patients' performance status (daily living activities), the results reveal that, there were highly statistically significant differences between pre and post the program (p=≤0.001).

Table (6): In the comparison between pre and post the program of the patients perceived health as poor, fair, good and excellent, the table reveals that, there were highly statistically significant differences (p=≤0.001).

Table (7): In the comparison between methods of quitting and supporting system pre and post the program, the table shows that, the highest percentage of cold turkey method that was used pre and post the program representing 28.3% and 46.7% respectively, while post the program group sessions and individual

sessions which supported patients to quit, were obtained the highest percentage representing 83.3% and 16.7% respectively. Moreover, 86.7% of the patients supported by their families. On the other hand, there are highly statistically significant differences between pre-and post the program as regards methods of quitting (p=≤0.001).

Table "1" : Socio-demographic characteristics of lung cancer smokers' patients.

Items	Lung cancer Patients (no=60)	
	No.	%
Age (years) :		
35 - <45	11	18.3
45 - <55	16	26.7
55 - <65	21	35
65+	12	20
Mean ± SD	56.4 ± 9.7	
Sex:		
Male	60	100
Marital status :		
Single	12	20
Married	40	66.6
Divorced	4	6.7
Widowed	4	6.7
Level of education:		
Read & write	10	16.6
Primary school	25	41.7
Preparatory school	15	25
Secondary school	4	6.7
Academic	6	10
Occupation :		
Not work	2	3.3
Employer	10	16.7
Craftsman	22	36.7
Seller / Trader	5	8.3
Farmer	15	25
Monthly income (L. E) :		
≤ 500	40	66.7
500 - < 1000	12	20
1000 +	8	13.3
Residence place		
Urban	22	36.7
Rural	38	63.3

Breath Carbon Monoxide levels/ppm (CO/ppm)
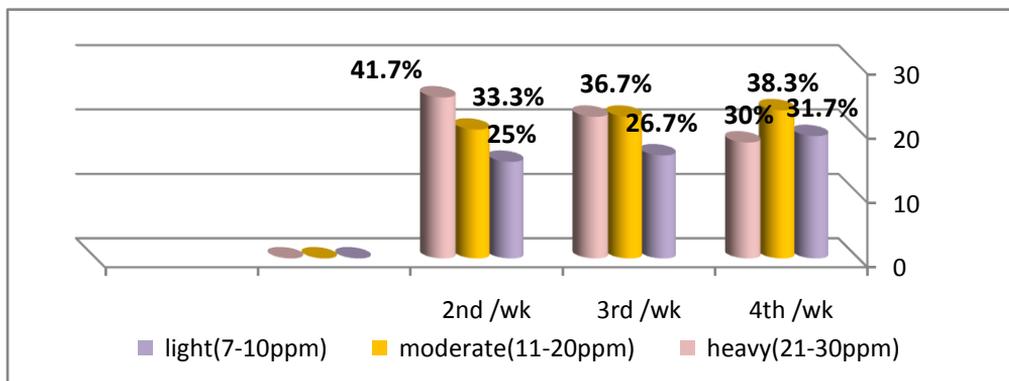
Figure ''1'': 1ˢᵗ Month (CO/ppm)
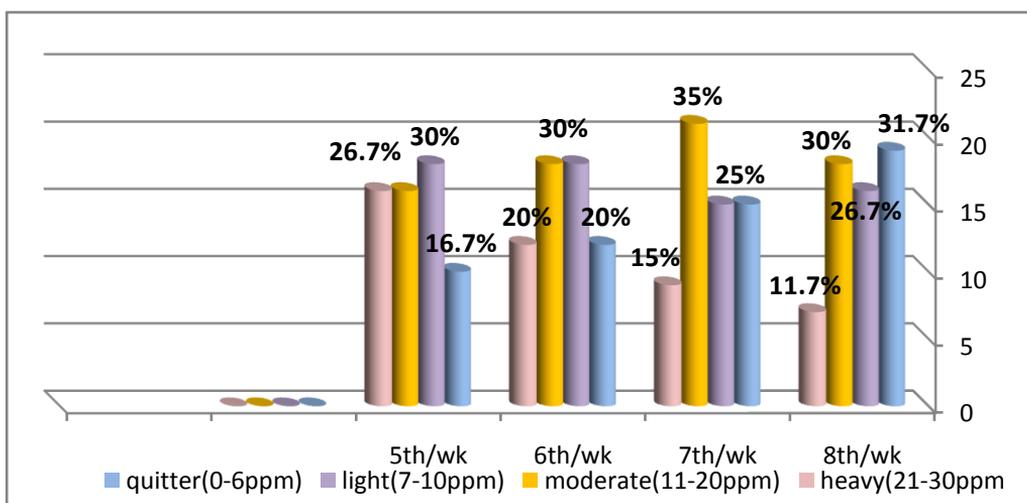
Figure ''2'': 2ⁿᵈ Month (CO/ppm)
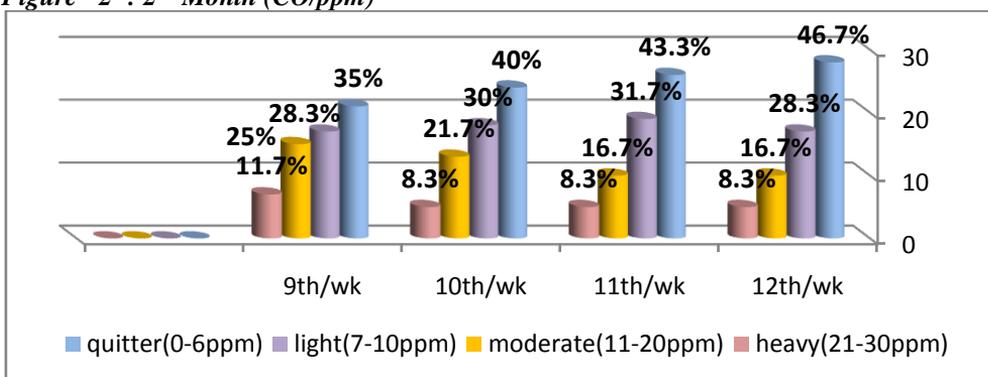
Figure ''3'': 3ʳᵈ Month (CO/ppm)

Figures "1, 2& 3": Comparison between smoking intensity of the patients according to their breath Carbon Monoxide level.

Table "2": Distribution of Fargerstrom Test score for Nicotine Dependence (FTND) pre the program.

Questions	Score point	Lung cancer Patients responses (no=60)	
		No.	%
How soon after you wake up do you smoke your first cigarette?			
- Within 5 minutes	3	-	-
- 6-30 minutes	2	30	50
- 31-60 minutes	1	21	35
- After 60 minutes	0	9	15
Do you find it difficult to refrain from smoking in places where it is forbidden?			
- Yes	1	34	56.7
- No	0	26	43.3
Which cigarette would you hate to give up?			
- The first one in the morning	1	34	56.7
- All the others	0	26	43.3
How many cigarettes/day do you smoke?			
- 10 or less	0	19	31.7
- 11-20	1	15	25
- 21-30	3	21	35
- 31 or more	3	5	8.3
Do you smoke more frequently during the first hours after waking than during the rest of the day?			
- Yes	1	35	58.3
- No	0	25	41.7
Do you smoke if you are so ill you are in bed most of the day?			
- Yes	1	39	65
- No	0	21	35
Mean ± SD			
FTND for whole subject	5.2 ± 2.5		
<6 scores = 29(48.3%)	2.93 ± 1.41		
≥6 scores = 31(51.7%)	7.22 ± 0.92		

Table "3": Comparison between pre & post smoking intensity according to packs used per day among lung cancer smokers' patients.

Items	Lung cancer Patients (no=60)					
	Pre		Post			
	No	%	No	%	t-test	p-value
Smoking intensity: - 0 (quitter) - 0 - ½ packs (light smoker) - ½ - 1 pack (moderate smoker) - 1½ - 2 packs (Heavy smoker) - > 2 (Heavy addict smoker)	- 20 15 23 2	- 33.3 25 38.3 3.3	28 17 10 5 -	46.7 28.3 16.7 8.3 -	12.186	.000 (HS) .
Mean ± SD 3.12 ± 0.922			Mean ± SD 1.87 ± .982			

Table "4": Comparison of the mean scores of the patient's knowledge pre and post program (N=60).

| Items	Pre test Mean ± SD	Post test Mean ± SD	t test	p-value
1.Knowledge regard to component of cigarette : - *Cigarette contains* - *Chemical components of cigarette* - *Nicotine is an addictive substance*	1.2±1.637	3.42±1.127	- 8.25	0.000 HS
2.Knowledge regard to effects of smoking : - *Smoking causes* - *Smokers have more*	0.58±1.4	2.47±1.146	- 9.7	0.000 HS
3. Knowledge about lung cancer - *what increase lung cancer chance* - *warning signs of lung cancer* - *Smoking contribute to disease*	1.03±1.368	2.5±1.117	- 7.17	0.000 HS
4. Knowledge about quitting : - *90% of people* - *General benefits of quitting* - *Specific benefits of quitting*	.95±1.344	2.56±1,051	- 8.197	0.000 HS
Total	3.76±5.749	10.95±4.441	33.317	0.000 HS
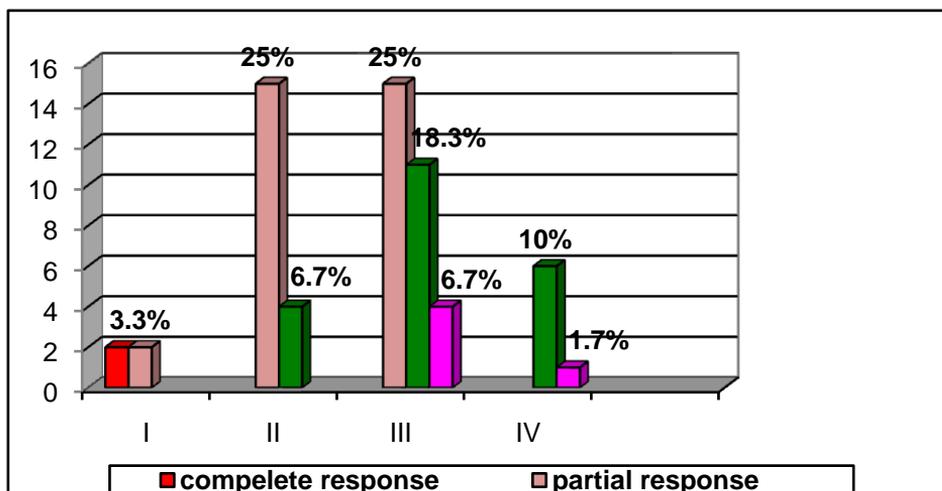
Figure "4": Comparison between pre and post the program CT scan findings to evaluate response of lesions.

Table"5": Comparison between pre and post the program performance status (daily living activities) among the patients.

Items	Lung cancer Patients (no=60)					
	Pre		Post			
	No	%	No	%	t-test	p-value
Performance status scores:					14.197	.000
score (0)	10	16.7	18	30		(HS)
score (1)	30	50	37	61.7		.
score (2)	20	33.3	5	8.3		
Mean ± SD 2.37± 0.61			Mean ±SD 1.38 ± 0.64			

Table "6": Comparison between pre and post the program of the patients perceived health as (poor, fair, good and excellent)

Items	Lung cancer Patients (no=60)					
	Pre		Post		t-test	p-value
	No	%	No	%		
Patients perceived health as: 1. Excellent 2. Good 3. Fair 4. Poor	- - 24 36	- - 40 60	- 6 47 7	- 10 78.3 11.7	8.523	.000 (HS) .
Mean ± SD 3.6 ± 0.494			Mean ± SD 3.02 ± 0.469			

Table "7": Comparison between methods of quitting and supporting system pre and post the program.

Items	Lung cancer Patients (no=60)					
	Pre		Post		t-test	p-value
	No	%	No	%		
Methods name of quitting attempts - Cold turkey (stop at once) - Nicotine fading (change type of cigarette) - Cuting down (decrease number of cigarette)	17 8 7	28.3 13.3 11.7	28 26 6	46.7 43.3 10	8.638	.000 (HS) .
	Mean ± SD 2.77±1.31		Mean ± SD 1.63±0.663			
What supported patients in quitting attempts : - Self motivation - Nothing - Individual sessions - Group sessions	22 10 - -	36.7 16.7 - -	- - 10 50	- - 16.7 83.3	14.392	.000 (HS)
	Mean ± SD 4.92±1.47		Mean ± SD 2.17±0.46			
Who supported patients in quitting attempts : - Family - Friends - Everybody - Nodody	11 - - 21	18.3 - - 35	52 6 2 -	86.7 10 3.3 -	-4.463	.000 (HS)
	Mean ± SD 3.5±2.38		Mean ± SD 4.83±0.38			

Discussion

Concerning the socio-demographic characteristics of lung cancer smokers patients, the present study findings show that, the entire study sample constitute males , and more than one third of them were in the age group 55 - < 65 years with a mean age of 56.4+9.7, while more than two thirds were married. According to their education and occupation, the highest percentage of them were at primary school level and craftsmen. As regards their monthly income and residence, more than two thirds of them had a monthly income <500L.E. and lived in rural areas. These findings may be due to low socioeconomic status of lung cancer smokers patients. This result is similar to that of **Labriola (2010)** who carried out a study on lung cancer smokers patients and reported that, the majority of patients were male, married with primary school and from rural areas with low socioeconomic status, **Labriola** added that, more than one third of patients were in the age group 55- 69. Moreover, this result is similar to that of **Eriksen (2013)** who stated that, the prevalence of lung cancer and current smoking is greatest among adults with working class jobs, low educational level, and low income. **Beane (2011)** also added that, compared with the general population, the rates for certain diseases, including lung cancer, appear to be higher among agricultural workers, which may be related to their work environments.

• The findings of the present study clarify that, at the beginning of the program, the highest percentage of exhaled Carbon Monoxide level was heavy (21- 30 ppm) in more than one third of the patients and gradually decreased during sessions. While at the end of the program, exhaled Carbon Monoxide level showed that, the highest success rate of quitters constitute less than one half of patients, in those with moderate CO (11 - 20 ppm) and the light CO (7-10 ppm) levels, were 16.7% and 28.3. % respectively, and in those with heavy CO (21-30 ppm) level, was 8.3. %. These results may be due to high motivation to quit for patients' health problem and PiCO smokerlyzer monitor helped to encourage them for quitting. These results are parallel to the study of **Ortiz (2011),** who found that, the mean amount of expired CO for less than one half of patients was more than 20 ppm at the assessment period of intervention. During the 3 months of follow up, the number of cigarettes smoked daily significantly decreased for all patients and quitting rate was 43% at the end of intervention. In addition, there was a significant inverse correlation between the exhaled Carbon Monoxide level and successful smoking cessation (p=≤0.001).

• The findings of the present study notice that, more than half of the patients' Fagerstrom Test for Nicotine Dependence score (FTND) were > 6 with a mean 7.22 + 0.92, while less than half of them scored, < 6 with a mean 2.93+1.41 and the mean of FTND for the whole subjects was 5.2 + 2.5. In addition, half of the patients smoke their first cigarette soon after wake up within 6- 30 minutes. On the other hand, the findings also reveal that, the highest percent of the patients were heavy smokers with highly and very highly Nicotine dependence levels. These results may be related to intensity of smoking, duration, young age at starting smoking, and numbers of cigarettes used per day. These findings are consistent with **Pinto (2011),** who found that, the mean FTND score was 5.8 ± 2.3 points for the sample as a whole. Of the patients, more than half of them had a high or very high FTND score, and the prevalence of heavy smoking (more than 20 cigarettes/day) for long periods was high. It was found that, heavy smokers are

more dependent on Nicotine than others, as they are more likely to have their first cigarette within 30 minutes after awakening. The result of the study was supported by **Song (2011),** who explains that, the mean FTND scores for light, moderate, and heavy intensity groups were 1.00 (SD = 1.19), 3.05 (SD = 1.60), and 5.67 (SD = 1.65), respectively. More than half of the patients had their first cigarette of the day within 30 minutes of awakening and the greater number of cigarettes per day the person smoked, the greater chance that they would meet strict diagnostic criteria for having become Nicotine dependent.

• The findings of the present study also display that, the quitters constitute less than one half of smoker patients, who previously want to stop smoking, seriously and did efforts for quitting. On the other hand, there is a highly statistically differences between pre and post the program regarding smoking intensity (p=≤0.001). These results may be due to the high motivation to quit for patients' health problem and they have good social support network also, it may be related to their multiple attempts to stop.

• These results are parallel with **Liang (2010)** who carried out smoking cessation program for lung cancer patients and reported that, at 3 months, more than one third of cancer patients had stopped smoking, while more than half of them were still smoking, **Liang** also reported that, the patients had reduced number of cigarettes per day with half or more. Moreover, previous attempts to quit smoking appeared to have a statistically significant positive influence. Patients, who had made earlier attempts to stop before entering into smoking cessation program, showed better smoking cessation results than patients who never had tried to stop.

• The findings of the present study show that, patients who had satisfied knowledge pre test were less than one quarter, while post test, they were more than two thirds. Moreover, less than one half of quitters post the program had satisfied knowledge. On the other hand, there was highly statistically significant differences between pre and post the program among lung cancer smokers patients as regards their knowledge (p=≤0.001). This result may be related to positive effectiveness of smoking cessation program on patients' knowledge. This result is agreeing with **Stein (2012)** who found that, knowledge scores were significantly much higher after the intervention indicating a possible positive effect of the training program on patients' knowledge. Only less than one quarter of patients had good knowledge scores before the intervention, the percentage increased to more than two thirds after the intervention. Similarly, many studies showed that, smoking cessation programs achieve a great deal in improving knowledge about smoking and benefits of smoking cessation. In addition, the effect of the program on levels of knowledge was significant among quitters (P < 0.01).

• The findings of present study indicate that, there were highly statistically differences between pre and post the program regarding to patients' performance status and their perceived health.

• The findings may be related to quit smoking or decrease number of cigarette consumed per day which increasing the efficacy of treatment for the patients and improving their quality of life. These results were similar to the study of **Yang (2011)** who carried out smoking cessation program for lung cancer patients, and mentioned that, two thirds of the study sample perceived their health as either fair or poor before intervention, while more

than one half perceived their health as either fair or good after intervention with highly statistically significant difference (p<0.001). In addition, quitting smoking after lung cancer diagnosis is associated with a better performance status, whereas, persistent smokers have worse overall quality of life. **Gridelli (2013)** added that, more than three quarters of patients had good performance status and 20% had poor performance status after intervention in which performance status improved more quickly in the patients and survival of patients with poor performance status was significantly worse. **Baser (2010)** stated that, patients who quit smoking after a lung cancer diagnosis had a significantly better performance status (quality of life) at 12 months.

• The findings of the present study indicate that, according to Response Evaluation Criteria in Solid Tumors (**RECIST criteria**), there were more than half of patients had partial response of lesion, while more than one third of them had stable disease. On the other hand, there were highly statistically significant differences between pre and post the program of the CT scan findings for lung cancer smokers patients as regards their response of lesions   (p=≤0.001). This results may be due to smoking cessation after lung cancer diagnosis have greater benefits for the patients after stoppage smoking and cessation increasing the efficacy of treatment. These results are supported by **Aapro (2010)** who reported that, a partial response was documented in less than one half of the patients. There was a trend for a higher response rate in which the response rate was significantly higher in patients with good performance status than in those with poor performance status. Moreover, **Parkin (2010)** illustrated that, according to Response Evaluation Criteria in Solid Tumors   (**RECIST**

criteria), there was significant difference in the percentage changes of target lesions before and after treatment were found (t=−3.31, P=0.002). In addition, the risk of lung cancer decrease significantly after the cessation of smoking and for all histological types of the disease. The magnitude of reduction varies among the histological types of lung cancer.

• The findings of the present study reveal that, the cold turkey method, group sessions and family support were obtained the highest percentage which supported patients to success in quitting. On the other hand, there are highly statistically significant differences between pre and post the program among lung cancer smokers patients as regards, methods of quitting, who and what supported patients in quitting (p=≤0.001).

• The results of the study were supported by **Schnoll (2013)** who mentioned that, having family and/or caregiver support to quit smoking can greatly influence the outcome of a patient's success at quitting smoking. **Giovino (2011)** stated that, less than one half of smoking cancer patients quit smoking after their cancer diagnosis, and two thirds of them received smoking cessation group sessions program, which is more effective in success rate of quitting. Moreover, **Borland (2012)** reported that, more than two thirds of the smokers who had made a quit attempts, reported using the cold-turkey method. Of those who used the cold turkey method, one half success rate, compared with the less than one quarter, who used the cut-down method.

Conclusion

In the light of the present study findings, it can be concluded that:

• The smoking cessation program had a positive effect on the lung cancer smokers patients.

• There was a highly statistically significant difference between pre and post the program of the smoking intensity ,total knowledge scores of the patients and CT scan findings to evaluate lesion response (p=≤0.001) .

• There was a highly statistically significant difference between pre and post the program of the performance status of the patients and their perceived health (p=≤0.001).

• There was a highly statistically significant difference between pre and post the program of the methods of quitting and supporting system for the patients (p=≤0.001).

Recommendations

In the light of the present study findings, the following are the main recommendations deduced:

Education:

-Incorporating the smoking cessation program into the nursing curriculum at all levels of nursing education with emphasizing on practice performance.

-Regular in-service training programs to be developed for nursing students to consider smoking cessation skills in their performance.

Community:

-Oncology centers should focus not only on the risks of continued tobacco use, but also and mainly, on supporting long-term abstinence and reducing relapse risk factors which are very common in these patients.

-It is essential that oncologists and oncology nurses understand that smoking is a disease that should be approached and treated properly which are components of the cancer treatment process as a whole.

Research:

-A further research is needed to investigate the needs and circumstances that may hinder or enhance the lung cancer smokers patients to quit.

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