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Original Article

Factors Associated with Poor Quality of Life in Lung Cancer Patients Undergoing Chemotherapy in Erbil City

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ABSTRACT

Background and aims: Lung cancer is one of the most prevalent types of cancer in the world, and the aim of the study was to determine the quality of life. and its related factors in lung cancer patients undergoing chemotherapy.

Methods: A descriptive cross-sectional study design was conducted in Iraq in 2022 on 100 cancer patients undergoing chemotherapy who were randomly collected in Rizgary Teaching Hospital and Nanakaly Hospital for blood disease and cancer. The instrument used for data collection consisted of demographic and medical data (age, gender, educational level, marital status, occupation, economic status, residency, cigarette smoking, family history, stages of lung cancer, and types of lung cancer), another section was the functional assessment of cancer therapy-lung questionnaire (FACT-L), specifically designed for the measurement of quality of life in patients with lung cancer. Categorical data were presented as frequency and percentage and the mean± SD was calculated for continuous data, independent t-test, and Chi-square test was also used; Binary logistic regression was run to determine the effect of the predictors on poor quality of life in lung cancer patients a P-value ≤0.05 was considered statistically significant.

Results: The overall quality of life was poor (59%), the mean± SD for Functional Assessment of Cancer Therapy Lung Cancer Subscale (FACT-L) was 66.19 ± 10.54, and Trial Outcome Index (TOI) was 39.77±5.51, The following variables were associated with a poor quality of life: age >50 (P-value =0.020, OR= 2.47), female (P-value =0.006, OR= 3.02), uneducated (P-value =0.0005, OR= 1.86), ex-smoker (P-value =0.040, OR= 2.14), insufficient income (P-value =0.037, OR= 2.69).

Conclusion: The quality of life of lung cancer was lower in physical well-being, functioning well-being, and lung cancer subscale compared to social/family well-being, and emotional well-being, as generally, the quality of life of most lung cancer patients was poor.

keywords: Quality of life; Functional assessment of cancer therapy lung cancer subscale; Chemotherapy.

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INTRODUCTION

Lung cancer is a popular malignancy and the most predictable cause of death worldwide. According to the world health organization an estimated 2.21 million new patients and the mortality rate was 1.8 million cases in 2020 [1]. Remarkably unfavorable outcomes are estimated in developing countries where with inadequate healthcare services, there is increased exposure to risk factors such as environmental, and economic factors, and lifestyles changed to Western lifestyles [2]. In Iraq, there is increasing in the incidence of cancer and death, despite implemented of national cancer registries and control program since 1974, According to the latest estimates from the International Agency for Research reported number of cancer in new cases was >25,000, and cancer-related deaths was14,000 in 2018 (3). The earliest reported cancer incidence rates in Erbil, Duhok and Sulaymaniyah were 50.0 and 61.5, and 61.7 cases/100,000 individuals, respectively [4]. Quality of life (QoL) is one of the most familiar health issues for cancer patients. QoL is multidimensional and includes the emotional, social, and physical activities of patients.The value of quality of life has to be highly considered, because of the extreme symptom burden and commonly restricted life expectancy [5]. As a result of the advancement in medical science and continuing development of treatment, the survival rate of patients with cancer has been estimated longer. This has resulted in a continued interest in studying the health-related quality of life (HRQoL) of cancer survivors. So, there is a subsequent need to satisfy cancer patients' needs, enabling them to live healthy life [6]. Cancer impacts patients' quality of life (QOL) in the whole domain. The deterioration in the QoL begins with the identification of cancer and persists with the advancing nature of the treatment. Chemotherapy is one of the well-known treatment choices for patients to fight cancer [7], as well. These treatment effects also have severe unwanted effects on the patient's quality of life. Moreover, patients who received chemotherapy treatment for a longer time to get the preferred effect and require regular hospital admission for disease treatment, which causes a further burden on cancer patients [8]. There are several factors impacting the quality of life of lung cancer patients undergoing chemotherapy such as age, gender, marital status, education levels, pathological types, family income, and metastasis the independent factors affecting the deterioration of their quality of life [9], there is no study in the literature reporting on the quality of life of lung cancer patients among the Kurdish population. The objective of the present study was to assess the factors associated with poor quality of life of lung cancer patients undergoing chemotherapy.

METHODS

A descriptive cross-sectional study design was performed on 100 Lung cancer patients collected successively in oncology units at both Rizgary Teaching Hospitals and Nanakaly Hospital for blood disease and cancer in Erbil City. The sample of the study was lung cancer patients according to the inclusion criteria were asked to participate in the study in two oncology regional units in Erbil City. Before starting the study, approvals were taken from the College of Nursing /Hawler Medical University and hospital authorities for the conduct of the study. The researcher obtained ethical from; they were assured about data confidentiality informed consent was obtained from all participants before starting interviews with them. The researcher was aware of research ethics therefore patients' dignity, values, and

security may impact during data collection. The participants of this study were lung cancer patients, according to a statistical specialist, the sample size was determined to be 100 patients by this statistical formula marked $n=Z^2 pq/d^2$ (Z =1.96, P= 0.067, q= 0.933, d= 0.05) , to obtain accurate data and a representative sample a purposive sampling method was used to select the samples: patients who were willing to participate in the study, age over 18 years, confirmation of the Lung cancer diagnosis by an oncologist, undergoing chemotherapy and Kurdish speaker. The patients excluded were unwillingness to participate in the study, newly diagnosed patients with Lung cancer, uncooperative patients, being treated with psychotropic medication, and patients who have severe illness with serious complications and unstable. Data were collected between February 2022 and December 2022 through face-to-face interviews. The instrument consisted of demographical characteristics and medical data (age, gender, educational level, marital status, occupation, economic status, residency, cigarette smoking, family history, stages, and types of lung cancer). The second part was the functional assessment of cancer therapy-general questionnaire (FACT-G) widely used to measure the quality of life in cancer patients, it was established by a group of oncology specialists [10]. In addition, the Lung Cancer Subscale (LCS) to the FACT-G, together create (FACT-L) which is specifically designed for Lung cancer. It contains 34 items that assess five primary dimensions of QoL: physical well-being (PWB; 7 items), functional well-being (FWB; 7 items), emotional well-being (EWB; 6 items), and social/family well-being (SFWB; 7 items). Lung Cancer Subscale (LCS 7 items). The Trial Outcome Index (TOI) calculates the total of the physical well-being, functional. well-being, and lung cancer subscale. The TOI is described for the measurement of functional outcomes. A 5-point Likert-type scale asked patients to respond to each item with a score of 0–4, where not at all=0, a little bit=1, somewhat = 2, quite a bit=3, and very much=4. The total FACT-L score is the summation of the 5 subscale scores and ranges from 0 to 136 and the TOI score array between (0 to 84). The lung cancer subscale applied a 5-point Likert scale to patient responses to measure the intensity of lung cancer symptoms rated as non = 0, mild= 1, moderate = 2, marked= 3 and severe= 4). All statistical analyses using (SPSS software version 26), descriptive and inferential statistical tests were performed. Categorical data were presented as frequency and percentage distribution, and the mean± SD was calculated for continuous data. independent t-test and Chi-square test were also used. Binary logistic regression models were used to find and predict factors affecting the quality of life in lung cancer patients ,P-value equal or less than 0.05 was considered statistically significant.

RESULTS

Among the total of 100 patients with lung cancer in Table 1 the findings indicated that, the mean age of patients was 54.25± 8.13 and the highest percentage was 75% more than 50 years old, and 70% of them were male. Regarding educational level, nearly half of them 46% were uneducated, and most of them were married. Regarding occupational status 54% of them were unemployed, also more than half of the participants were insufficient family income accounting for 61%, and most of them were living in a rural area 65%. In addition, the table showed that the highest percentage 73% of the participant was ex-smoker, about 18% had a positive family history, and most of the samples had stage III of

lung cancer 57%, regarding types of lung cancer, adenocarcinoma was the highest percentage 44%, followed by squamous cell carcinoma 35%, small-cell carcinoma 11%, and large-cell carcinoma 9% respectively. Moreover, table 1 shows a significant association between quality of life and age (p=0.003), gender (p=0.005), level of education (p=0.001), family income (p=0.001), residency, (p=0.047), cigarette smoking(p=0.005) and stage of lung cancer (p=0.001), while there was no significant found between quality of life with marital status (p=0.187), occupation (p=0.310), family history (p=0.743) and types of lung cancer (p=0.300).

Table 1: Association between quality of life and variables of the study

Demographic and medical data		Quality of life (FACT-L)			P-value
		Poor N(%)	Good N(%)	Total N(%)	
Age	≤50	4(16.0)	21(84.0)	25(25)	0.003
	>50	37(49.3)	38(50.7)	75(75)	
Gender	Male	35(50.0)	35(50.0)	70(70)	0.005
	Female	24(80.0)	6(20.0)	30(30)	
Level of education	Uneducated	28(60.9)	18(39.1)	46(46)	0.001
	Educated	13(24.1)	41(75.9)	54[(54)	
Marital status	Married	37(39.4)	57(60.6)	94(94)	0.187
	Widowed	4(66.7)	2(33.3)	6(6)	
Occupation	Employed	10(62.5)	6(37.5)	16(16)	0.310
	Retired	9(64.3)	5(35.7)	14(14)	
	Unemployed	17(31.5)	37(68.5)	54(54)	
	Housewife	5(31.3)	11(68.8)	16(16)	
Family income	Insufficient	44(72.1)	17(27.9)	61(61)	0.001
	Sufficient	24(61.5)	15(38.5)	39(39)	
Residency	Urban	22(33.8)	43(66.2)	35(35)	0.047
	Rural	19(54.3)	16(45.7)	65(65)	
Cigarette smoking	Non-smoker	5(18.5)	22(81.5)	27(27)	0.005
	Ex-smoker	36(49.3)	37(50.7)	73(73)	
Family history	No	33(40.2)	49(59.8)	82(82)	0.743
	Yes	8(44.4)	10(55.6)	18(18)	
Stage of lung caner	Stage III	9(15.8)	48(84.2)	57(57)	0.001
	Stage IV	32(74.4)	11(25.6)	43(43)	
Types of lung cancer	Large-cell carcinoma	1(11.1)	8(88.9)	9(9)	0.300
	Small-cell carcinoma	4(36.3)	7(63.3)	11(11)	
	Squamous cell carcinoma	16(44.4)	20(55.6)	35(35)	
	Adenocarcinoma	19(43.1)	25(56.8)	44(44)	

Table 2 shows the mean score for quality of life domains was a low mean score ≤ 2 which is considered a poor QoL while a mean score of more than 2 is a good QoL [10], the analysis of the QoL revealed a mean total score of functional assessment of cancer therapy lung cancer subscale (FACT-L) was 66.19 ± 10.54, Trial Outcome Index (TOI) was 39.77±5.5. Also, the results demonstrate that the quality of life domains was lower in physical well-being 13.74 ± 3.02 functioning well-being 13.15 ± 4.12, lung cancer subscale 12.88 ± 3.54, compared to other domains of social/family well-being 14.29 ± 4.48, emotional well-being 12.13 ± 3.23.

Table 2. Quality of life scores in lung Cancer Patients undergoing chemotherapy

Quality of life domains	Min	Max	Mean ± SD/ Total	Mean ± SD/ Scale
Physical well-being	7.00	21	13.74 ± 3.02	1.96 ± 0.43
Social/family well-being	5.00	21	14.29 ± 4.48	2.04 ± 0.64
Emotional well-being	1.00	24	12.13 ± 3.23	2.02 ± 1.03
Functioning well-being	7.00	21	13.15 ± 4.12	1.88 ± 0.59
Lung cancer subscale	5.00	21	12.88 ± 3.54	1.84 ± 0.50
Trial Outcome Index	1.89	57	39.77 ± 5.51	1.89 ± 0.26
FACT-L score QoL	47.0	99	66.19 ± 10.54	1.95 ± 0.31

Comparison of quality of life of scores according to stages of lung cancer as shown [in table 3]. The quality of life mean score was significantly higher in stage III lung cancer compared to stage IV, patients with stage III lung cancer had better physical well - being (14.44±3.33 to 13.21±2.67), higher social well-being (16.84±4.15 to 12.37±3.72), better emotion status (14.91±6.09 to 10.04±5.51), well improved functioning status (14.65±4.64 to 12.02±3.29), better able to control lung cancer symptoms (14.09±2.86 to 11.28±3.67) consequently.

Table 3: Comparison of quality of life of scores according to stages of lung cancer

Quality of life	Stage of lung cancer III Mean±SD	IV Mean±SD	Mean Difference	*t.* test	p-value
Physical well-being	14.44±3.33	13,21±2,67	-1.23	-2.05	0.043
Social well-being	16.84±4.15	12,37±3,72	-4.46	-5.66	0.001
Emotional well-being	14.91±6.09	10,04±5,51	-4.87	-4.18	0.002
Functioning well-being	14.65±4.64	12,02±3,29	-2.63	-3.31	0.001
Lung cancer subscale	14.09±2.86	11.28±3,76	-2.80	-3.61	0.001

A logistic regression model was constructed to assess the association between selected variables of study as predictors and poor quality of life (FACT-l), as shown in [Table 4]. Variables chosen in the model were based on the bivariate analysis of age, gender, level of education, residency, smoking, and economic status were put into the model. Model fit was measured by the likelihood ratio statistic (χ2= 3.26, p-xvalue=0.004) and the Hosmer and Leme show test (χ2= 4.67, p=0.69), the variability observed in the target variable is explained by the regression mode was R2 = 49.1%. The following variables were associated with a poor quality of life: age >50 (P-value =0.020, OR= 2.47), female (P-value =0.006, OR= 3.02), uneducated (P-value =0.0005, OR= 1.86), ex-smoker (P-value =0.040, OR= 2.14), insufficient family income (P-value =0.037, OR= 2.69).

Table 4: Factors associated with poor quality of life (FACT-L)

Variables		P-value	OR	95% CI	
				Lower	Upper
Age /year	≤50		Ref.		
	>50	0.020	2.47	1.31	11.8
Gender	Male	0.006	3.02	1.68	10.5
	Female		Ref.		
Level of education	Uneducated	0.005	1.86	1.62	7.58
	Educated		Ref.		
Residency	Urban		Ref.		
	Rural	0.095	2.23	0.85	7.47
Cigarette smoking	Non-smoker		Ref.		
	Ex-smoker	0.040	2.14	1.06	8.04
Family income	Insufficient	0.037	2.69	0.91	7.94
	Sufficient		Ref.		

Figure 1 shows a comparison of quality of life sores each scale in male and female lung cancer patients, the male reported higher mean scores compared to females in physical well-being (PWB), social/family well-being (SFWB), emotional well-being (EWB), functioning well-being (FWB) lung cancer subscale (LCS), functional assessment of cancer therapy-lung (QoL-FACT-L).

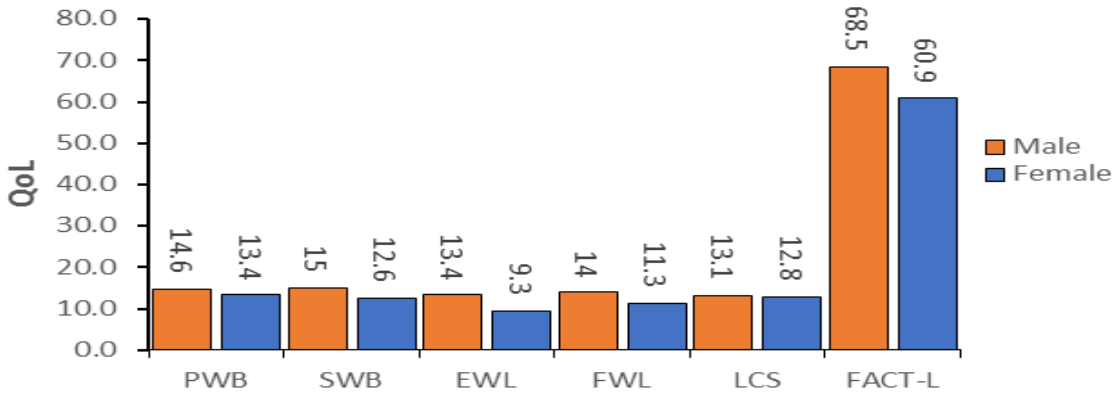

Figure 1: Changes FACT-L total score in male and female patients

Also, [Figure 2] shows the lung cancer subscale of symptoms the highest percentage of lung cancer patients had severe difficulty breathing 43%, poor appetite 41%, cough 40%, shortness of breath 38%, chest tightness 34%, and other symptoms 49% unclear thinking was marked and 39% moderate weight loss.

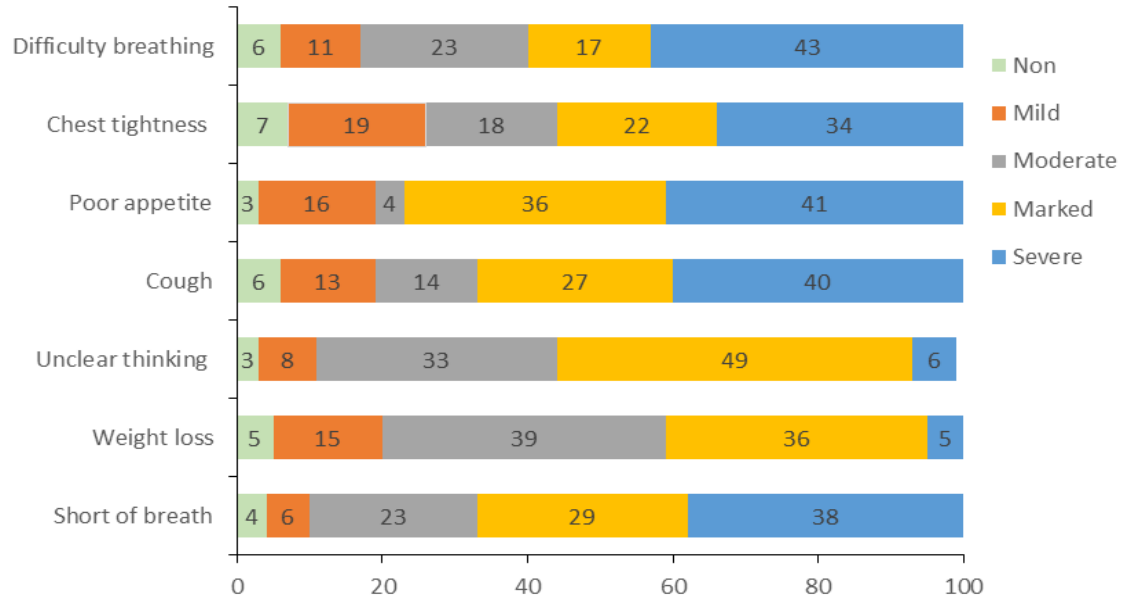

Figure 2. Lung cancer symptoms intensity for patients undergoing chemotherapy

DISCUSSION

Cancer is one of the main problems throughout the world. It is frequently increasing day by day, and many cancer patients need to improve their quality of life. It is detected that the incidence of cancer in old age raised continuously, as older age may itself be an important risk factor due to certain physiologic changes that go along with the ageing process, in addition to the presence of a variety of comorbidities, and adverse effects associated with the medications for chronic disease [11, 12]. The results show the mean age of the patients was 54.25± 8.13 and the main proportion of the age group of lung cancer patients was more than 50 years old, and about 70% were male that significant association with the quality of life, which agree with a study conducted in an oncology center in Hilla City, 2019 which revealed that most of the participants were men, their age 60 years and above (13). Also, in the current study supported by a study done in Egypt most of the sample was male, which might reflect the higher smoking rate and industrial and environmental pollutant exposures among males in these countries, in the current study, males had a better quality of life than female similar to the existing literature, also showed that the females gender was significantly associated with the poor QOL[14, 15] . Higher education has been displayed to have a positive effect on survival for cancer patients. In current study, the highest percentage of samples were illiterate and had a significant association with quality of life this agrees with the study shows that education is one factor that positively affects QoL. Moreover, patients who completed primary or further education were observed to have better social and physical

functions [16, 17]. In this study, most of the participants were living in rural areas, which was supported by a study that reported lung cancer more frequently caused death in rural areas [18]. Insufficient monthly income accounted for significantly associated with the quality of life in comparison with a study that has shown that individual income measures are significantly and independently associated with cancer risk factors, quality of life, and survival [19]. Cigarette smoking appears to be a risk factor that influences the quality of life of patients with lung cancer [20] in this study demonstrated that patients who smoked previously are three times more at risk for developing lung cancer than non-smokers and had significant impacts on quality of life. Patients with stage III lung cancer had significantly better physical well-being, higher social well-being, emotional status, well-improved-functioning status, and better ability to control Lung Cancer symptoms which agrees with a study done in Turkey when considering the stage of the tumor, the scale scores varied significantly in all dimensions among patients with stage III cancer [21] . In addition, the study done in China by [22] found that stage IV lung cancer patients had lower all domains of FACT-L scores than stage III patients. The current study focused on patients with advanced-stage lung cancer, the highest percentage of symptoms perceived by patients were severe in difficulty breathing, poor appetite, cough, shortness of breath, and chest tightness, which was supported by a study in the case of small cell lung cancer, the most frequent symptoms were cough, dyspnea, pain and weight loss [23], in other instances, which seems to be similar to the results of another study in Sweden showed that the symptom burden in lung cancer patients, the most prominent symptoms were dyspnea., fatigue., coughing., insomnia., and appetite loss [24]. The analysis of the QoL revealed a mean total score of the functional assessment of cancer therapy lung cancer subscale (FACT-L) was 66.19 ± 10.54, trial outcome index (TOI) was 39.77±5.51. whereas a study done in Germany shows that FACT-L total score was 86 ±21.5, and TOI 50.5 ±14.9 [25]. Furthermore, this study seems to be the most impacted in our study samples in physical well-being and functioning well-being, which lowers scores compared to social/family well-being, and emotional well-being that comes along with previous studies done in USA, Germany, and France [26, 27]. The present study was carried out on a limited sample and the generalization of the results should be done with caution, selecting an available sampling method according to the type of study due to the diversity and metastasis of cancers. Moreover considering important variables such as types of treatment including radiotherapy and surgery and the presence of other diseases associated with cancer were other limitations that affected the outcome of the study

Conclusion

In summary, lung cancer patients had lower quality of life in physical well-being, functioning well-being, and lung cancer subscale, Compared to social/family well-being, and emotional well-being. In general, the quality of life of most lung cancer patients was poor

Conflicts of interest

The authors declare that they have no competing interests.

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