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ORIGINAL ARTICLE

A cross-sectional study for assessing perceived symptoms, depression and quality of life in advanced lung cancer patients

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Summary

Purpose: *The purpose of the present study was to assess the perceived symptoms, depression and quality of life (QoL) in advanced lung cancer patients undergoing chemotherapy.*

Methods: *The study was cross sectional and was conducted in the oncology department of General Hospital "George Papanikolaou", Thessaloniki, Greece. The sample was convenient and consisted of 76 advanced lung cancer patients. A questionnaire including instruments such as Center for Epidemiologic Studies Depression Scale- CES-D, Revised Edmonton Symptom Assessment Scale r-ESAS, EORTC QLQ-C30 and demographic and clinical information was used to collect data.*

Results: *The most frequently observed symptoms were tiredness, shortness of breath, anxiety and well-being. The vast majority of patients (75.3%) had total score in CES-depression higher than 16. The type of residence affected ESAS emotional score (p=0.010). Gender affected the level of depression (p=0.014) and the type of lung cancer affected depression (p=0.036). The type of residence affected emotional functioning (p=0.010), the type of treatment influenced the score of global health status (p=0.007), the role functioning (p=0.032) and social functioning (p=0.024). Multivariate regression analysis was conducted to identify the predictors of overall QoL and depression. The statistically significant factors for QoL were pain (p<0.001) and tiredness (p=0.003), while the type of lung cancer (p<0.007), the type of insurance (p<0.025) and the type of treatment (p<0.041) influenced depression as well.*

Conclusions: *Advanced lung cancer patients experienced moderate level in QoL and mild levels of symptoms. Demographic and clinical characteristics influenced depression and QoL.*

Key words: *symptoms, depression, quality of life, lung cancer*

Introduction

Lung cancer is the most common and deadly form of cancer in the world. In 2018, it was estimated that 2.1 million new cases and 18.4% of cancer deaths were due to lung cancer, a rate which corresponds to 1.8 million deaths. In Greece, according to WHO, it was calculated that in 2018 the number of new cases of lung cancer for both sexes was equal to 9964 (14.8%) while the number of deaths was 8343 (25.1%) [1].

Depression in advanced lung cancer patients range from 28.9 to 32.9% [2,3] and came from newly diagnosed patients with incurable lung cancer [4], from patients undergoing chemotherapy [2] or from those that were about to receive treatment for

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disease control [3]. It is reported that many factors such as gender, age, income, social support, type of lung cancer and cancer stage contribute to the occurrence of depression in lung cancer patients [5]. Specifically, gender and hope were associated with depression in advanced lung cancer patients [3,5].

Health-related QoL is a multidimensional concept and represents patients' perceived impact of disease and its treatment on functional health. Generally, QoL in lung cancer patients is influenced by age, gender, marital status, ethnicity, staging, duration of disease and comorbidities [6,7].

Advanced lung cancer patients undergoing chemotherapy experienced stable levels of QoL during chemotherapy [6,8]. On the other hand, cancer-related symptoms, age, depression [2], cancer stage, marital status, surgery, comorbidities, health system and information needs [6] seem to have a predictive role to QoL in advanced lung cancer patients.

It was also found that sleep disorders, fatigue, cough (as adverse effects of chemotherapy) were symptoms affecting the QoL. At the end of palliative chemotherapy alopecia, sore throat and constipation worsened the QoL [8].

Advanced lung cancer patients experienced a variety of symptoms because of cancer and its treatment (usually chemotherapy). The most prevalent symptoms in advanced lung cancer patients before starting chemotherapy were dyspnea, fatigue, insomnia, pain and coughing [9]. In another study it was found that higher levels of symptoms in older patients (>50 years old) with advanced lung cancer receiving chemotherapy or chemotherapy and radiotherapy were insomnia, fatigue and dyspnoea [6]. Similar results were shown in another study conducted on advanced lung cancer patients receiving first-, second-, or third-line chemotherapy [10]. All the above studies used different scales for assessing symptoms, while some of them used QoL scales [6,9] leading to conflicting results. A group of Greek patients with various types of advanced cancer was investigated and it was found that the most prevalent symptoms were fatigue, sleep disturbance, dyspnea, depression and anxiety [11].

There is an ever growing interest in depression, symptoms and QoL in advanced lung cancer patients. To the best of our knowledge, no research in this field has been conducted in Greece.

The purpose of the present study was to assess the perceived symptoms, depression and QoL in advanced lung cancer patients undergoing chemotherapy. Specifically, we aimed to assess the following research questions:

1. The influence of demographic and clinical characteristics (symptoms, depression and QoL).
2. Are depression and QoL influenced by the severity of symptoms?
3. Which are the predicting factors of depression and QoL?

Methods

Study design and sample

This study was cross-sectional and was conducted in the oncology department of the General Hospital "George Papanikolaou" in Thessaloniki, Greece, between April 2018 and April 2019. The sample was convenient and consisted of 76 lung cancer patients. The inclusion criteria were: patients had to have been diagnosed with advanced lung cancer, at least 18 years old, were native Greek-speaking and had ECOG performance score 0. Patients with confusion, uncontrolled psychiatric disease, cognitive dysfunction, or any other disabling disease that could hinder their ability to answer the study questionnaires, or were undergoing concomitant chemotherapy and radiotherapy were excluded from the study. Out of 89 patients, 76 agreed to participate in the study (response rate: 85,4%).

All eligible participants provided written informed consent before completing a structured questionnaire. The study was approved by the "George Papanikolaou" Research Committee.

Instruments

A questionnaire including instruments for assessing depression, symptoms, QoL and demographic and clinical information was used to collect data.

Depression was assessed using the Center for Epidemiologic Studies Depression Scale (CES-D). The CES-D scale consists of 20 items. Participants reported how often they have experienced each of the 20 symptoms during the past week. Each item was scored on a four-point Likert scale ranging from 0 (rarely or none of the time) to 3 (most or all of the time). Scores ranging from 0-60 and higher indicated higher levels of depression. A score of 16 which was a cut-off point or above and was accepted to be a symptom of clinical depression [12,13]. The Cronbach's a coefficient for this sample was 0.85.

The revised Edmonton Symptom Assessment Scale (r-ESAS) was used to assess ten common symptoms (pain, tiredness, nausea, anxiety, depression, drowsiness, lack of appetite, well-being, shortness of breath, and sleep disturbance). The severity of each symptom rated from 0 to 10, with 0 indicating that the symptom is absent and 10 describing the worst possible severity. The total symptom distress score (TSDS) represented the sum of all ESAS symptoms (from 0 to 100). There were two subscales of the scale: physical symptoms and emotional symptoms, which is a well known instrument used in advanced cancer patients [14]. The Cronbach's a coefficient for this sample was between 0.71-0.78.

The QoL in cancer patients was assessed with EORTCQLQ- C30 questionnaire. The EORTC QLQ-C30 consists of five functional dimensions on physical, role, cognitive, emotional, and social functioning, three symptom dimensions (fatigue, pain, and nausea and vomiting),

global health status, and a number of single items assessing additional symptoms commonly reported by cancer patients (dyspnoea, loss of appetite, insomnia, constipation and diarrhoea) and perceived financial impact of the disease. All items were answered on a 4-point Likert scale ranging from 'not at all' to 'very much', while the questions regarding the global QoL were scored on a 7-point scale. Item scores were linearly transformed to a 1 to 100 scale. Higher scores of the functional scales and global QoL represented a higher level of functioning and respectively a high QoL. Additionally, higher scores of the symptoms represented a greater extent of symptoms [15]. Cronbach α for this study ranged between 0.86-0.97.

Table 1. Demographic and clinical characteristics of participants

Variables	*n*	%
Gender		
Male	54	75
Female	18	24.7
Family status		
Single	1	1.4
Married	61	85.9
Divorced	5	7
Widowed	2	2.8
Unmarried couples	2	2.8
Educational status		
Primary school	29	40.3
Middle school	13	18.1
High school	24	33.4
Technological education	1	1.4
University	5	6.9
Occupational status		
Unemployed	2	2.7
Private-sector employees	6	8.2
Civil servants	2	2.7
Retired	51	69.9
Other	12	16.4
Health insurance status		
Public	61	83.6
Private	10	13.7
No insurance	2	2.7
Residence		
Urban	39	55.7
Semi-urban	16	22.9
Rural	15	21.4
Type of lung cancer		
Small cell	10	37
Non small cell	17	63
Stage of cancer		
II	2	3.7
III	30	55.6
IV	22	40.7
Treatment		
Surgical	2	3
Chemotherapy	19	28.4
Immunotherapy	17	25.4
Chemotherapy and immunotherapy	11	16.4
Chemotherapy and targeted therapy	2	3
Other	16	23.9

Statistics

The statistical software SPSS 25 was used to analyze the data. Descriptive statistics were used in order to analyze the demographic and clinical characteristics of the sample. In order to examine the difference between the QoL and depression due to the severity of symptoms we formed eight categorical variables. Two levels for each of them were made (0-3: mild level and 4-10: moderate-severe). The normality of the data was assessed using the Kolmogorov-Smirnov test, whereas the homogeneity of variances was tested using the Levene's test. For the data that met the assumptions of the parametric tests, differences in the means were assessed using one-way ANOVA or t-tests where appropriate. For data that were not normally distributed, nonparametric tests (Mann-Whitney U test, Kruskal–Wallis test, and Spearman's correlation coefficient) were used. Correlations were calculated using the Spearman's correlation coefficient. Multivariate regression analysis was performed in order to determine the predictors of overall QoL and depression. The reliability of the scales' internal consistency was estimated based on Cronbach's α. The significance level was set at $p<0.05$.

Results

The mean patient age was 67.07±7.76 years. The majority of the patients were men (n=54, 74%), married (n=61, 83,6%), were retired (n=51, 69,9) and were primary school graduates (n=29, 39,7%). They had non-small cell lung cancer and most of them had stage III (n=32, 43.7%). The majority of the sample received chemotherapy and had no other comorbidities. The demographic and clinical characteristics of the sample are presented in Table 1.

Table 2 presents the means and standard deviations of symptoms in the ESAS scale and in subscales of QoL. As can be seen from the rates, patients experienced mild levels of symptoms and their QoL were in moderate levels. Also the vast majority of the patients (n=55, 75.3%) had total score in CES-depression higher than 16 and 24.7% (n=18) had less than 16.

The most frequently observed symptoms using the ESAS scale were tiredness (4.16 ± 3.67), shortness of breath (3.53 ± 4.07), anxiety (5.33 ± 3.63) and well-being (4.56 ± 3.19). Comparisons between demographic, clinical characteristics and the two subscales of ESAS – revised (r) showed

that there was no statistical difference across these variables. Only the type of residence affected the ESAS-r emotional score (Kruskal-Wallis test=9.219, p=0.010). Also, comparisons between demographic and clinical characteristics and the CES depression score respectively, have shown that gender affected the level of depression (t=-2.534, p=0.014) and the type of lung cancer affected the depression (t=2.212, p=0.036).

Table 3 presents the comparisons across demographics, clinical characteristics and QoL subscales, which revealed that gender affected emotional functioning (z=-4.266, p<0.001) and social functioning (z=-2.084, p<0.001). The type of cancer affected

Table 2. Means and standard deviation of EORTC- QLQ-C30 and ESAS-r

	Means and standard deviation of EORTC- QLQ-C30				
	Mean	*Standard deviation*	*Minimum*	*Maximum*	*Median*
Global health status/QoL	59.6065	28.75412	0	100	66.6667
Physical functioning	50.6185	32.12361	0	100	46.667
Role functioning	33.5648	38.70892	0	100	25
Emotional functioning	62.7697	31.68432	0	100	66.6667
Cognitive functioning	75	26.97591	0	100	83.333
Social functioning	50.9259	41.57397	0	100	41.6667
Symptoms	33.6126	22.21477	0	89.58	32.6389
QLQ_Overall	61.8445	21.09678	19.36	98.72	60.0739
	Means and standard deviation of overall ESAS-r				
	Mean	*Standard deviation*	*Minimum*	*Maximum*	*Median*
Physical score	14.9041	13.58018	0	53	13
Emotional score	7.8630	5.83825	0	20	7
Overall score	27.3271	16.99804	0	72	25
	Means and standard deviation of symptoms ESAS-r				
	Mean	*Standard deviation*	*Minimum*	*Maximum*	*Median*
Pain	1.75	3.040	0	10	0
Tiredness	4.16	3.671	0	10	5
Drowsiness	2.34	3.392	0	10	0
Nausea	0.75	2.120	0	10	0
Lack of appetite	2.36	3.194	0	10	0
Shortness of breath	3.53	4.079	0	10	2
Depression	2.53	2.971	0	10	1
Anxiety	5.33	3.633	0	10	5

Table 3. Comparisons between subscales score of EORTC QLQ30 and demographic and clinical characteristics

EORTC subscales	*Gender*		*Type of lung cancer*		*Type of insurance*		*Occupational status*		*Type of treatment*		*Educational status*	
Global health Status/QoL	Z=-0.525	0.599	T=-1.776	0.088	Z=2.041	**0.041**	H=0.441	0.802	H=12.194	**0.007**	H=0.644	0.718
Physical functioning	-0.518	0.605	Z=2.147	**0.031**	-0.671	0.502	H=2.492	0.288	2.894	0.408	H=1.657	0.437
Role functioning	-0.186	**0.852**	Z=0.261	0.309	-0.441	0.659	H=4.089	0.129	8.831	0.032	H=2.045	0.360
Emotional functioning	Z=-4.266	**<0.001**	Z=0.710	0.505	0.162	0.871	H=2.253	0.324	1.087	0.780	H=8.415	**0.015**
Cognitive functioning	Z=-1.060	**0.289**	Z=1.704	0.103	0.134	0.893	H= 7.311	**0.026**	4.949	0.176	H=3.087	0.214
Social functioning	**Z=-2.084**	**<0.001**	Z=1.992	0.052	-0.774	0.436	H=1.985	0.371	**9.419**	**0.024**	H=2.990	0.224
Symptoms	**t=-3.656**	**0.001**	t=1.524	0.140	T= 0.501	0.618	F=1.379	0.259	H=4.502	0.168	F=0.639	0.531
QLQ_Overall	t= 3.585	**0.001**	t=-2.347	**0.027**	T=-0.148	0.882	F=2.693	0.075	H=6.179	0.103	F=0.614	0.544

Bold numbers denote statistical significance

physical functioning (z=2.147, p=0.031), insurance type influenced global health status (z=2.041, p=0.041) and occupational status affected cognitive functioning (H=7.31, p=0.026). Further analysis between the samples revealed that the score of cognitive functioning in retired patients differed significantly among unemployed, housekeepers or people with other occupational statuses (p=0.010).

The type of residence affected emotional functioning (H=9.219, p=0.010) and further analysis revealed that there was statistically significant difference between urban and rural type of residence (p=0.002). In addition, the type of treatment influenced the score of global health status (H=12.194, p=0.007), the role functioning (H=8.831, p=0.032) and social functioning (H=9.419, p=0.024). Global health status pairwise comparisons revealed statistically significant difference (p=0.011) between patients undergoing chemotherapy to those with immunotherapy. Similarly, statistical significance was observed between chemotherapy and combination of chemotherapy and immunotherapy (p=0.029).

Social functioning pairwise comparison showed that there was statistically significant difference between patients receiving chemotherapy and patients receiving other types of treatment (p=0.016). This means that patients who were administered chemotherapy and immunotherapy (combination) or other types of treatment had better global health status and social functioning than patients receiving chemotherapy alone. Also, patients who were administered only chemotherapy had better QoL than those with immunotherapy alone.

In Tables 4 and 5 presented are the differences between total score of EORTC QLQ C30, total score of CES-D and the severity of symptoms of ESAS.

Correlations between the overall scores of instruments showed that there was a mild negative correlation between overall score QLQ-C30 and overall score of ESAS (Spearman r =-0.661, p<0.001) and mild positive correlation between overall score of CES-depression and overall score of ESAS (r=0.659, p<0.001).

Table 4. Symptoms of ESAS and overall quality of life

Symptoms of ESAS	*Z or t*	*Sig*
Pain	z =-4.897	**<0.001**
Drowsiness	z =-2.305	**0.021**
Lack of appetite	z= -2.492	**0.013**
Shortness of breath	z= -5.056	**<0.001**
Depression	z =-2.520	**0.012**
Tiredness	t (70)= 3.915	**<0.001**
Nausea	t (70)= 3.243	**0.002**
Anxiety	t (70)= 1.514	0.135

Bold numbers denote statistical significance

Table 5. Symptoms of ESAS and depression (CES-D)

Symptoms of ESAS	*Z or t*	*Sig*
Pain	Z =3.756	**<0.001**
Tiredness	Z= 3.097	**0.002**
Drowsiness	Z =1.037	0.300
Nausea	T(71)= -2.233	**0.029**
Lack of appetite	T(71)= -4.444	**<0.001**
Shortness of breath	T(71)= -5.490	**<0.001**
Depression	T(71)= -4.569	**<0.001**
Anxiety	T(71)=-3.066	**0.003**

Bold numbers denote statistical significance

Table 6. Predicting factors for overall quality of life (first model)

Model	*Unstandardized coefficients*		*t*	*Sig.*	*CI(95%) for Beta*		*Collinearity statistics*	
	Beta	*Standard error*			*Lower bound*	*Upper bound*	*Tolerance*	*VIF*
Constant	83.943	4.940	16.993	**<0.001**	73.748	94.138		
ESAS_Overall	-0.833	0.129	-6.442	**<0.001**	-0.101	-0.566	1.000	1.000

Bold numbers denote statistical significance

Table 7. Predicting factors for overall quality of life (second model)

Model	*Unstandardized coefficients*		*t*	*Sig.*	*CI(95%) for Beta*		*Collinearity statistics*	
	Beta	*Standard error*			*Lower bound*	*Upper bound*	*Tolerance*	*VIF*
Constant	80.787	4.281	18.873	**<0.001**	71.932	89.642		
Pain	-2.671	0.806	-3.316	**<0.001**	-4.338	-1.005	0.763	1.310
Tiredness	-3.160	0.753	-4.199	**0.003**	-4.717	-1.603	0.763	1.310

Bold numbers denote statistical significance

Table 8. Predicting factors for CES-depression

Model	*Unstandardized coefficients*		*t*	*Sig.*	*CI(95%) for Beta*		*Ccollinearity statistics*	
	Beta	*Standard error*			*Lower bound*	*Upper bound*	*Tolerance*	*VIF*
Constant	16.877	2.362	6.569	**<0.001**	12.965	22.789		
Depression	2.351	0.366	6.415	**<0.001**	1.589	3.113	0.940	1.064
Type of lung cancer	-6.539	2.516	-2.996	**0.007**	-12.772	-2.306	0.909	1.100
Type of insurance	11.082	4.758	2.421	**0.025**	1.561	20.603	0.916	1.092
Type of treatment	9.613	4.416	2.177	**0.041**	0.430	18.797	0.984	1.016

Bold numbers denote statistical significance

Multivariate regression analysis was conducted to identify the predictors of overall QoL. In the first model (Table 6) variables were included in the regression analysis consisting of ESAS overall score and demographic and clinical characteristics. In the second model the variables included the separate symptoms of ESAS scale. As can be seen from the Tables, in the first model, the only statistically significant factor was overall ESAS ($p<0.001$) and in the second model (Table 7) the statistically significant factors were pain ($p<0.001$) and tiredness ($p=0.003$).

Furthermore, multivariate regression analysis was conducted to identify the predictors of CES depression (Table 8). The statistically significant factors were depression from ESAS scale ($p<0.001$), type of lung cancer ($p<0.007$), type of insurance ($p<0.025$) and type of treatment (combination of chemotherapy and immunotherapy) ($p<0.041$).

Discussion

This study investigated depression, perceived symptoms and QoL in Greek lung cancer patients undergoing chemotherapy and contributed to the growing body of evidence regarding these symptoms providing important information for Greek oncology health professionals.

In this study, we found that the advanced lung cancer patients undergoing chemotherapy experienced mild levels of symptoms and their QoL was at a moderate level. This is consistent with the results of another study [8]. Assessment of QoL can provide insights into how patients perceive their medical condition. There are many components that can affect the way patients report the QoL, depending on the type of cancer and treatment as well as age and gender [16].

In this sample the most prevalent symptoms were tiredness, shortness of breath, anxiety and well-being. This is partially consistent with the findings of other studies, which have shown that in advanced lung cancer patients the most frequent symptoms were insomnia, fatigue, coughing, dyspnoea and pain [6,9]. This might be explained by the fact that in the present study used were different questionnaires from other studies. Further studies are required to make clear this issue in advanced lung cancer patients receiving chemotherapy in Greece.

In the present study it was concluded that gender affects the level of depression. One study with 82 advanced non-small lung cancer patients found that depression was associated with female gender [3]. Univariate analysis of 1,439 patients with different types of advanced cancer found that female patients with primary lung tumors were more likely to report depression [17].

We found that the type of lung cancer affects depression as well. This is consistent with the findings of a study which showed that patients with small cell carcinoma (SCLC) had a 3-fold higher prevalence of depression than patients with non-small cell carcinoma [18].

One interesting result was that the vast majority of patients had depression. This is in line with the results of the existing literature [3,7]. Although the authors of these 2 studies used different scale to measure depression, this result underlines that depression is very common in patients with lung cancer in large general hospitals in Greece. It also indicates that health care professionals should be aware of this symptom and intervene with appropriate care plans to alleviate it or prevent lung cancer patients from developing depression. We found that gender, type of cancer, insurance type and type of residence affected the QoL. Gender as a factor influencing the QoL in advanced lung cancer patients was also confirmed in another study [6]. The same is true of the type

and stage of cancer for which studies examining all kinds of cancer [19] and advanced lung cancer patients [6] identified them as factors influencing the QoL.

In 2009 the research of Marlow et al identified a relationship between the type of insurance and the QoL of cancer patients in the sense that uninsured patients do not receive adequate care, thus affecting their QoL [20]. On the other hand, the research of Shahsavari et al (2017) who examined housing as a factor affecting the QoL in breast cancer patients did not identify any correlation [21]. This result might be explained by the small sample size used in the present study but also to the cultural background of each research, i.e. the support that exists in the family context. Further studies are needed to make clear the effect of insurance type and type of residence in lung cancer patients in Greece.

Another interesting result was that the type of treatment affected the QoL. Specifically, the results showed that patients receiving combination therapy (chemotherapy and immunotherapy, chemotherapy and targeted therapy) had better QoL. This could be explained by the argument that immunotherapy improved the QoL and survival in lung cancer patients [22]. There is a need for further research in Greece in order to clarify what kind of treatment affects the QoL and if specific kinds of treatment affect in a better way the QoL in advanced lung cancer patients.

When the impact of severity of symptoms was examined on QoL we found that pain, drowsiness, lack of appetite, shortness of breath, depression, tiredness and nausea had statistically significant impact on QoL. This is an expected outcome since other studies found similar results [9].

Similarly, the severity of symptoms such as pain, tiredness, nausea, lack of appetite, shortness of breath and anxiety influenced depression. This is also an expected outcome and stresses the need of health care to assess depression taking into consideration symptoms and other factors influencing depression.

We found that predictors of the QoL were all the symptoms experienced during chemotherapy, pain and tiredness. This is partially consistent with the findings of another study [8] and might be explained by the fact that in the present study smaller sample size was used. Also the present study and the aforementioned [8] used different methodology research. Further studies are required to make clear the predictors of QoL in lung cancer patients in Greece.

Another interesting result in the predicting factors of depression was the type of lung cancer, type of insurance and type of treatment (combination of chemotherapy and immunotherapy). This is inconsistent with the findings of other studies, which have shown that gender [3] and hope were associated with depression [5]. This discrepancy might be explained by the fact that the studies used different research methods, different questionnaires and different sample sizes. There is a need for further research to clarify this issue in Greek population.

This study has some limitations. It was conducted in one hospital, so the results cannot be generalized to the entire Greek population. Another limitation was that, although the patients had advanced lung cancer, were receiving outpatient treatments, the ECOG PS score was characteristically good, so the severity of symptoms, depression and the association with other characteristics were low. A future study in Greece could provide clearer conclusions in this field.

Although we studied the symptoms, depression and QoL in patients undergoing chemotherapy, the present study did not investigate some other important clinical characteristics, such as the type of chemotherapy regimen. However, the results provide valuable information for the issue at hand and illustrate the great need for further studies in order to draw reliable conclusions. Despite these limitations, our study has one significant strength: to our knowledge, this is the first population-based study to investigate the perceived symptoms, depression and their impact on QoL in advanced lung cancer patients in Greece, where the culture and lifestyle are significantly different from those in western populations.

Conclusions

In the present study the QoL was at a moderate level for patients experiencing mild levels of symptoms. Additionally, demographic and clinical characteristics influenced depression and QoL. ESAS is a significant tool in order to assess the symptoms experienced by the advanced lung cancer patients. These results help health care professionals in daily practice to be aware of symptoms and manage them to best help their patients with advanced lung cancer.

Conflict of interests

The authors declare no conflict of interests.

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