

Original Article

Quality of Life Determinants among Lung Cancer Patients near the End of Life

Huthaifah1 Ibrahim. Khrais1, RN, MSN, PhD

Lecturer Assistant, Faculty of Nursing, Zarqa University, Zarqa, Jordan

Correspondence: Huthaifah1 Ibrahim. Khrais1, RN, MSN, PhD, Lecturer Assistant, Faculty of Nursing, Zarqa University, Zarqa 13132- Jordan E mail: h_khrais91@yahoo.com

Abstract

Background: Quality of life is a concepts reflect the degree of excellence of different aspects within human life. Today, the concept of quality of life is relevant with nursing care. The nurses in general and the oncology nurses in specific are spent most of their time with patients. Therefore, more responsibilities are held by nurses to improve patient's quality of life. These responsibilities and roles became more critical when the patients became near the end of life.

Objective: The aim of this study was to investigate the quality of life predictors for lung cancer patients when they are near the end of life.

Method: A quantitative descriptive cross-sectional study using survey was used. The survey measured lung cancer patients' quality of life, symptoms severity, depression and anxiety, and functional status levels.

Results: 120 lung cancer patients from five Jordanian hospitals were participated in this study. Results indicated to a high level of quality of life for patients ($M = 81.1$, $SD = 12.1$). In addition to patient's demographics, symptoms severity, anxiety, depression, and functional abilities are significant predictors for their quality of life.

Conclusion: Many aspects for lung cancer patients need to be addressed. Addressing patients' physical, psychological, and social issues became more serious when they are near the end of life. In Jordan, lung cancer patients have a reasonable level of quality of life. That is might be related to the advancements in cancer treatments, social connectedness, and some religious believes.

Keywords: Lung Cancer; Quality of Life; End of Life; Nursing; Jordan.

Introduction and Background

Lung cancer is one of the most common form of cancer worldwide and it considered as the most common cause of cancer-related death in the world (McGuire, 2016). In Jordan, according to the latest issued statistics, 6,820 Jordanians and non-Jordanians were diagnosed with cancer in 2010. Of these, 4,921 new cancer cases were registered among Jordanians and 1,899 cancer cases were reported among non-Jordanians. In 2014, the number of new cancer cases among Jordanians increased by 123 cases, compared to 4,798 cases in 2012 (Tarawneh, 2015). Particularly, there were 299 cases of lung cancer accounting for (6.2 %) of all newly diagnosed cancer cases in 2014. Lung cancer affected 256 (11.2 %) males and 43 (1.7%) females, with male to female ratio of 6:1. However, In Jordan, the lung cancer is ranked as the second among males

after colorectal cancer (Ministry of Health, 2015). These rising numbers of new cases mean that the standard of care for cancer patients is becoming even more important and more efforts should be established to provide optimum care for lung cancer patients (Wang et al., 2018).

Quality of Life (QOL) is a condition in which the practical, economical, psychosocial and emotional aspects of a patient's life are deteriorated (Olling, Nyeng, & Wee, 2018). Also its a central issue for oncology nurses whether they care for individuals undergoing radiation, surgery, chemotherapy, biotherapy, hematopoietic stem cell transplantation, palliative care, or end-of-life care because all these treatment are affected in different ways on quality of life of patients and families (Serena, Dwyer, Peters, & Eicher, 2017).

When the cancer patients became at the end stage of the disease, they need a palliative care. The management near end of life focused on patient's quality of life (Miladinia, Baraz, Shariati, & Malehi, 2017). End of life (EOL) is a period of time that characterized by severe deterioration in physical or/and psychological statuses of patients resulting from underlining irreversible disease which require comprehensive care, and may lead to death (Lindson-Hawley, Thompson, & Begh, 2017). The EOL term may use interchangeably with other related terms such as terminal stage, palliative care and hospice care, the specific meaning of each concept is different but all these terms are reflect the end of life period. There are many predictors or determinants for quality of life, the following determinants are considered in this study; symptoms severity, anxiety, depression, and functional abilities. Therefore, the aim of this study was to predict QOL determinants for lung cancer patients near the EOL.

Research Design and Sampling

A quantitative descriptive cross-sectional study using survey was used to determine the quality of life factors near the end of life. Also, using convenience sampling techniques, 120 Jordanian patients, diagnosed with lung cancer, above 55 years old, in stage three or four of disease, and able to complete the survey are recruited for this study. Participants are recruited from five major hospitals in Jordan, all these hospitals are treating lung cancer patients.

Study Instrumentation

The author of the study intended to study the relationship between lung cancer patients' QOL and their symptoms severity, anxiety, depression, and functional abilities. That is, to measure patients' QOL, Quality of Life Questionnaire for Cancer Patients Treated with Anti-Cancer Drugs (Matsumoto et al., 2002) used in the study. The tool contain a 22-item self-report instrument that measures the following broad domains: daily activities, physical condition, social activities, mental and psychological status. Each item has a numeric rating scale (1–5). A higher score indicating higher QOL.

To measure symptoms severity, the Modified Edmonton Symptom Assessment System selected (Philip, Smith, Craft, & Lickiss, 1998). It is a simple, and widely used tool for measuring physical and psychological symptom distress for

cancer patients. The tool consists of nine visual analogue scales, with a superimposed 0–10 scale for pain, activity, nausea, depression, anxiety, drowsiness, appetite, well-being, and shortness of breath. The scale for each symptom is anchored by the words 'No' and 'Severe' at 0 and 10, respectively. Validity has been supported by high correlations with clinical status and QOL measures.

The Hospital Anxiety and Depression Scale used to assess anxiety and depression (Zigmond & Snaith, 1983). It is a 14-item self-report scale was designed to measure depression (seven items) and anxiety (seven items) in patients with physical illness and has been used in studies of patients with advanced lung cancer (Moorey et al., 1991). High levels of reliability and validity have been reported, as well as support for the scale's ability to measure anxiety and depression as two distinct emotional disturbances.

Lastly, the Karnofsky Performance Status was used to assess functional status scale (Schag, Heinrich, & Ganz, 1984). Information on ability to function at work and home, symptom severity, and the need for personal and medical care was used to score patients from 100 (asymptomatic, normal function) to 0 (equivalent to being dead). The scale has been found to be a valid and reliable tool to assess functional status in patients with advanced cancer (Yates, Chalmer, & McKegney, 1980).

Procedures of Data Collection

First of all, an agreement about research proposal was acquired from Institutional Research Board (IRB) from all targeted hospitals. Then, the nursing directors of each selected hospital was approached to explain the study aims and procedures, and seek their cooperation in distributing the questionnaires. Patients who are eligible to participate in the study approached by the primary investigator or a trained data collector and invited to participate in the study by a word of mouth. The data collector introduce her/himself to participants in the oncology units in each hospital, and give them a cover letter explaining the purpose of the study, risks and benefits, assurance of keeping their information confidential, and contact information of the researcher. Once the participant has been given time to read the information on cover letter and no questions or clarification were asked, patients signed the consent form, and the study questionnaire as well as coded envelope given to

the participants. Each participant interviewed by data collector for no more than 10-15 minutes. The questionnaires coded to be easily traced and didn't carry any identified information about the institution or the patients.

Data Analyses

The SPSS software Inc (1994) version 21 used to generate descriptive and inferential statistics at a significance level of .05. Means, standard deviations, and frequencies are reported for sample's variables. Correlations, independent t-test, and regressions are performed in this study. Also, tables produced to show the descriptive statistics of demographics and relationship between QOL and EOL determinants.

Results

The current study aimed to investigate the association between lung cancer patients' QOL and their symptoms severity, anxiety, depression,

and functional abilities when they are near the EOL. Table (1) presents demographic characteristics of the study sample for all participants. As shown in Table (1), the majority of the participants are males, their ages ranged between 50 and 60 years, and married. More than half of the lung cancer patients are in stage 4 of diagnosis (51.6%). About 52 % of the participants are under an active treatment, the supportive care of 50.8% is the home care, and half of them are treated by chemotherapy.

The mean scores of patients' QOL, symptoms severity, anxiety, depression, and functional abilities are presented in Table (2). These scores suggest that patients perceived a high level of QOL ($M = 81.1$, $SD = 12.1$), moderate level of symptoms severity ($M = 54.1$, $SD = 18.4$), anxiety ($M = 9.1$, $SD = 9.2$), depression ($M = 8.1$, $SD = 6.2$), and a relatively normal functional abilities ($M = 82.3$, $SD = 69$).

Table 1: Sample Characteristics (N = 120)

Variable	Category	Frequency (Percent)
Age	50-60	66 (55%)
	Above 61	54 (45%)
Gender	Male	72 (60%)
	Female	48 (40%)
Marital Status	Married	92 (76.7%)
	Not Married	28 (23.3%)
Lung Cancer Stage	Stage 3	58 (48.3%)
	Stage 4	62 (51.6%)
Treatment Stage	Active Treatment	64 (52%)
	Palliation	58 (48%)
Current Treatment	Radiation	60 (50%)
	Chemotherapy	60 (50%)
Supportive Care	Hospice Care	59 (49.2%)
	Home Care	61 (50.8%)

Table 2: Mean Scores of QOL, Symptoms Severity, Anxiety, Depression, and Functional Abilities among Study Participants (N = 120)

Variable	Mean (SD)
Quality of Life	81.1 (12.1)
Symptoms Severity	54.1 (18.4)
Anxiety	9.1 (9.2)
Depression	8.1 (6.2)
Functional Abilities	82.3 (6.9)

Table 3: Pearson's Correlation between Patients' QOL and EOL Determinants (N = 120)

Variable	Quality of Life
Symptoms Severity	-0.53**
Anxiety	-0.21*
Depression	-0.30*
Functional Abilities	0.31*

* $p < 0.05$, ** $p < 0.01$.

Table 4: Independent Samples t-test for Differences in Patients Quality of Life Based on Sample Characteristics (N = 120)

Sample Characteristics	Category	Patients' QOL Mean (SD)	T Value
Age	50-60	85.25 (12.7)	1.15**
	Above 61	83.72 (15.3)	
Gender	Male	88.35 (14.1)	1.23*
	Female	84.98 (14.3)	
Marital Status	Married	83.41 (13.2)	1.72**
	Not Married	77.01 (12.7)	
Lung Cancer Stage	Stage 3	84.20 (14.3)	0.30**
	Stage 4	72.96 (14.2)	
Treatment Stage	Active treatment	80.65 (11.3)	0.62
	Palliation	78.83 (12.3)	
Current Treatment	Radiation	84.72 (10.4)	1.70**
	Chemotherapy	90.14 (8.3)	
Supportive Care	Hospice Care	73.56 (9.2)	1.13*
	Home Care	85.77 (13.7)	

* $p < 0.05$, ** $p < 0.01$.

Table 5: Results of the Second Step of Hierarchical Multiple Regression Analysis (N = 120)

Patients' Determinants	B	SE of B	Beta	T	R ²	F
Step One						
Age	0.07	0.02	0.18	1.92**	0.12	2.67**
Gender	0.21	0.27	0.04	0.55*		
Marital Status	-0.58	0.31	-0.29	-1.29*		
Lung Cancer Stage	0.01	0.29	0.28	1.66**		
Treatment Stage	0.13	0.65	0.19	0.33		
Current Treatment	-0.91	0.89	-0.12	-1.64*		
Supportive Care	0.43	0.29	0.32	5.47**		
Step Two						
Age	0.06	0.03	0.17	1.97**	0.19	10.49***
Gender	0.31	0.47	0.05	0.65*		
Marital Status	-0.61	0.51	-0.09	-1.19*		
Lung Cancer Stage	0.04	0.09	0.08	1.56**		
Current Treatment	0.10	0.45	0.16	0.13*		
Supportive Care	-0.71	0.49	-0.10	-1.46		
Symptoms Severity	0.83	0.29	0.54	3.25*		
Anxiety	0.14	0.10	0.24	1.84**		
Depression	0.45	0.32	0.11	0.95*		
Functional Abilities	0.62	0.41	0.08	0.63*		

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Pearson correlations were performed to assess whether the patient's QOL is correlated with the other variables (symptoms severity, anxiety, depression, and functional abilities). As shown in Table (3), all predictors are significantly correlated with patient's QOL. Actually, for symptoms severity the Pearson correlation is the highest with $r(118) = -0.53$, $p < .01$. This indicated that patients' who perceive low level of symptoms severity perceive higher QOL level.

Independent samples t-test was conducted to examine if there was a significant difference in patients' QOL based on selected sample characteristics. As indicated in Table (4), lung cancer patients demonstrated significant difference in QOL based on all sample characteristics excepting treatment stage $t(118) = 0.62$, $P > .05$.

Table (5) presents the results of hierarchical multiple regression analysis to explore the predictors of patients' QOL. The regression analysis was conducted in two steps. In the first step, all the demographical variables were included in the model as predictors of QOL. However, in the second step, the patients' symptoms severity, anxiety, depression, and

functional abilities were added to the previous model.

In the first step, results indicated that the patients' age, gender, marital status, lung cancer stage, current treatment, and supportive care, had significantly correlated with patients' QOL, $F(7, 122) = 2.67$, $p < 0.01$. Together, these variables accounted for 13 % of the variance in QOL.

In the second step, the regression examining whether QOL was significantly correlated and predicted by patients' symptoms severity, anxiety, depression, and functional abilities, after controlling patients' age, gender, marital status, lung cancer stage, current treatment, and supportive care. Actually, the symptoms severity, anxiety, depression, and functional abilities added 19% additional variance above and beyond the 13% accounted for by all other predictors, $F(10, 109) = 10.49$, $p < 0.001$.

Discussion

In this paper, author described the quality of life determinates for Jordanian lung cancer patients near the end of life. Quality of life is a multidimensional property that includes, but is not limited to, the patient's health status,

psychological well-being, social and cognitive functioning and the impact of illness and treatment on the patient's experience of life. The survival in lung cancer patients is poor, quality of life is considered to be an important outcome in patients who develop the lung cancer (Coates, Bennett, Magee, Sarkar, & Tod, 2017; Fan, Ping, & Zhang, 2017).

The results indicated that patients have perceived a high level of QOL, moderate level of symptoms severity, anxiety, depression, and a relatively normal functional abilities. These results are congruent with studies of Brimacombe and Ball (2017), Ayabe, Tomita, Nose, Asada, and Nakamura (2017), and Skadhauge, Holst, and Grønkjær (2016). These studies found that cancer patients had adaptable levels of QOL and physical activities during their late stages of cancer. However, Wei, Gaohua, Xiao, and Ling (2015) found that cancer patients are suffering from severe deterioration in their QOL when they are near the EOL. In Jordan, healthcare providers are carefully and continuously assess symptoms and side effects that affect QOL of patients with lung cancer. They determine what self-care strategies and adaptations activities that might manage the deterioration in QOL. Also, the families play an important role to maintaining or enhancing the patient's abilities to improving their quality of life. The Jordanian social system is highly connected and that provide a perfect supportive environment for ill patients. More cultural and Islamic issues emerge regarding the concept of ill and well, there is a community's belief that patience to the disease a basic Islamic principle.

In order to predict factors that affecting patients' QOL, this study confirmed that all patients' demographic (excepting treatment stage) are significantly determine their QOL level. Many studies confirmed that patients demographic are directly predicting their QOL. Age and gender are the most reported factors, male and young cancer patients have demonstrating a moderate to high QOL (Bendixen, Jørgensen, Kronborg, Andersen, & Licht, 2016; Crinò et al., 2016; Maguire et al., 2015). Nurses need to pay more attention for patients' demographics which, if considered, will significantly alleviate symptoms severity.

After controlling all demographical factors lung cancer patients, the symptoms severity, anxiety, depression, and functional abilities were

significant predictors of QOL. This finding is parallel with studies of Evans, McPhillips, and Esche (2016) and Kim et al. (2015), in which patients reported the symptoms severity and physical abilities are a major factors for a low QOL. Hence, for patients with metastatic, extensive stage, or locally recurrent lung cancer, life expectancy is limited and symptoms negatively impact their remaining time. Therefore, palliation remains an essential goal in this setting. Further, depression and anxiety are generally considered to be the most important psychopathological comorbidities of cancer patients (Geater et al., 2015). Psychological distresses an essential element of the QOL of cancer patients, thus, like fear of death, changes in life plans, changes in body image and self-esteem, changes in day to day living, money and legal concerns are need to be addressed by oncology nurses. Although a study revealed that medical staff are poor at detecting emotionally distressed or depressed cancer patients (Boucher, Lucca, Hooper, Pedulla, & Berry, 2015; Kim et al., 2015).

Regarding functional activities, many studies have examined the association between functional activity and QOL. Some studies have shown an association, whereas others have reported no association (Geater et al., 2015; Lathan et al., 2016; Maguire et al., 2015). Evaluation of functional status provides information that can predict outcomes and may provide information that can be utilized to improve function. Functional status evaluation can be useful throughout the patient's illness, at the initial diagnostic evaluation, for determining appropriate therapies, for the monitoring of therapeutic effect and finally in the palliative phase (Temel et al., 2010). The current findings suggest that nursing staff should consider the most appropriate and preferred adaptive activity according to the lung cancer patients' characteristics, especially age and gender, and that an active engagement with patients contributes to achieving a good death for patients, especially elderly adults.

Conclusions

The lung cancer incidences among Jordanian population are in increasing; and a significant attention should be bring to this subpopulation. Those patients are receiving different types of treatment mainly at late stages, with time, the suffering is developing among the patients due to

the treatments side effects and the disease progress itself. All these factors, together, are extremely effect on patient's quality of life. The suffering became more serious when they are near the end of life. The level of QOL deterioration is extremely vary based on patients demographical and clinical characteristics. Although Jordanian lung cancer patients experiencing an acceptable levels of QOL, their physical, psychological, and social aspects must be continuously assessed. It is important to understand such aspects and make a decision for best practice based on these factors.

On the other hand, sampling method was a limitation in this study. Although the sample size of this study was reasonable and statistically accepted, but the convenience sampling method is a considerable limitation, which lately might affect generalizability of the results. Also, the sample of targeting population didn't cover all Jordan areas especially the southern part of Jordan, even though that the covered hospitals are receiving the patients from all regions still some parts are not covered. Another limitation is that the control strategies of extraneous variables haven't the strength of controlling in comparison with randomization method and thus some source of bias may be emerged.

However, this study might help nurses and all health care providers in their clinical practice to improve the QOL for lung cancer patients. The results could allow nurses to reprioritize patients need, response perfectly with changeable environment, and construct comprehensive care planes for lung cancer patients. Also, it might be a base to develop more studies with different populations. Future research should be conducted for all cancer types and using more rigors research design that provides broader and more accurate representation of Jordanian patients.

Funding. This research is funded by the deanship of research and graduate studies in Zarqa University, Jordan.

Acknowledgment. Authors acknowledge the support from Zarqa University.

References

Ayabe, T., Tomita, M., Nose, N., Asada, T., & Nakamura, K. (2017). Patient-Reported Outcomes of Surgery of Non-Small Cell Lung Cancer: Evaluation Based on the Questionnaires of Anti-Aging Quality of Life and the European Organization for the Research and Treatment of

Cancer Quality of Life Questionnaire. *Surgical Science*, 8(05), 203.

Bendixen, M., Jørgensen, O. D., Kronborg, C., Andersen, C., & Licht, P. B. (2016). Postoperative pain and quality of life after lobectomy via video-assisted thoracoscopic surgery or anterolateral thoracotomy for early stage lung cancer: a randomised controlled trial. *The Lancet Oncology*, 17(6), 836-844.

Boucher, J., Lucca, J., Hooper, C., Pedulla, L., & Berry, D. L. (2015). *A Structured Nursing Intervention to Address Oral Chemotherapy Adherence in Patients With Non-Small Cell Lung Cancer*. Paper presented at the Oncology nursing forum.

Brimacombe, C., & Ball, H. (2017). OA14. 03 Integrating Therapies into a Specialist Lung Cancer Nursing Team: An Evaluation. *Journal of Thoracic Oncology*, 12(1), S298.

Coates, M. G., Bennett, A., Magee, L., Sarkar, N., & Tod, A. (2017). P2. 07-007 Thoracic Oncology Research from Concept to Home-run (TORCH): Building Research Capacity in Lung Cancer Nursing: Topic: Research, Audits. *Journal of Thoracic Oncology*, 12(1), S1106.

Crinò, L., Ahn, M.-J., De Marinis, F., Groen, H. J., Wakelee, H., Hida, T., . . . Nishio, M. (2016). Multicenter phase II study of whole-body and intracranial activity with ceritinib in patients with ALK-rearranged non-small-cell lung cancer previously treated with chemotherapy and crizotinib: results from ASCEND-2. *Journal of Clinical Oncology*, 34(24), 2866-2873.

Evans, R. D., McPhillips, D., & Esche, C. (2016). *across The Pond—a Comparison Of Nursing Roles In A Lung Cancer Service—the Cns Role In The Uk And Nurse Navigator In The Usa: 101*. Paper presented at the Oncology Nursing Forum.

Fan, F., Ping, Y., & Zhang, Y. (2017). Effect of focused nursing model on negative emotions and subjective well-being in patients with lung cancer. *Modern Clinical Nursing*, 16(6), 11-14.

Geater, S. L., Xu, C.-R., Zhou, C., Hu, C.-P., Feng, J., Lu, S., . . . Shi, J. H. (2015). Symptom and quality of life improvement in LUX-Lung 6: An open-label phase III study of afatinib versus cisplatin/gemcitabine in Asian patients with EGFR mutation-positive advanced non-small-cell lung cancer. *Journal of Thoracic Oncology*, 10(6), 883-889.

Inc, S. (1994). *SPSS 6.1 for Windows student version*: Prentice Hall.

Kim, Y., Van Ryn, M., Jensen, R. E., Griffin, J. M., Potosky, A., & Rowland, J. (2015). Effects of gender and depressive symptoms on quality of life among colorectal and lung cancer patients and their family caregivers. *Psycho-Oncology*, 24(1), 95-105.

Lathan, C. S., Cronin, A., Tucker-Seeley, R., Zafar, S. Y., Ayanian, J. Z., & Schrag, D. (2016).

- Association of financial strain with symptom burden and quality of life for patients with lung or colorectal cancer. *Journal of Clinical Oncology*, 34(15), 1732.
- Lindson-Hawley, N., Thompson, T. P., & Begh, R. (2017). Motivational interviewing for smoking cessation. *Cancer*.
- Maguire, R., Ream, E., Richardson, A., Connaghan, J., Johnston, B., Kotronoulas, G., . . . Smith, A. (2015). Development of a novel remote patient monitoring system: the advanced symptom management system for radiotherapy to improve the symptom experience of patients with lung cancer receiving radiotherapy. *Cancer nursing*, 38(2), E37-E47.
- Matsumoto, T., Ohashi, Y., Morita, S., Kobayashi, K., Shibuya, M., Yamaji, Y., . . . Nishiwaki, Y. (2002). The quality of life questionnaire for cancer patients treated with anticancer drugs (QOL-ACD): validity and reliability in Japanese patients with advanced non-small-cell lung cancer. *Quality of Life Research*, 11(5), 483-493.
- McGuire, S. (2016). World cancer report 2014. Geneva, Switzerland: World Health Organization, international agency for research on cancer, WHO Press, 2015: Oxford University Press.
- Miladinia, M., Baraz, S., Shariati, A., & Malehi, A. S. (2017). Effects of slow-stroke back massage on symptom cluster in adult patients with acute leukemia: Supportive care in cancer nursing. *Cancer nursing*, 40(1), 31-38.
- Moorey, S., Greer, S., Watson, M., Gorman, C., Rowden, L., Tunmore, R., . . . Bliss, J. (1991). The factor structure and factor stability of the hospital anxiety and depression scale in patients with cancer. *The British Journal of Psychiatry*, 158(2), 255-259.
- Olling, K., Nyeng, D. W., & Wee, L. (2018). Predicting acute odynophagia during lung cancer radiotherapy using observations derived from patient-centred nursing care. *Technical Innovations & Patient Support in Radiation Oncology*, 5, 16-20.
- Philip, J., Smith, W., Craft, P., & Lickiss, N. (1998). Concurrent validity of the modified Edmonton symptom assessment system with the Rotterdam symptom checklist and the brief pain inventory. *Supportive Care in Cancer*, 6(6), 539-541.
- Schag, C. C., Heinrich, R. L., & Ganz, P. (1984). Karnofsky performance status revisited: reliability, validity, and guidelines. *Journal of Clinical Oncology*, 2(3), 187-193.
- Serena, A., Dwyer, A., Peters, S., & Eicher, M. (2017). Feasibility of advanced practice nursing in lung cancer consultations during early treatment: A phase II study. *European Journal of Oncology Nursing*, 29, 106-114.
- Skadhauge, L. B., Holst, M., & Grønkjær, M. (2016). *Lung cancer patients' experiences of nutritional nursing care in hospital*. Paper presented at the Sygeplejesymposium.
- Tarawneh, M. (2015). Cancer Incidence in Jordan–2010: Ministry of Health [Internet]. Jordan Cancer Registry.
- Temel, J. S., Greer, J. A., Muzikansky, A., Gallagher, E. R., Admane, S., Jackson, V. A., . . . Pirl, W. F. (2010). Early palliative care for patients with metastatic non-small-cell lung cancer. *New England Journal of Medicine*, 363(8), 733-742.
- Wang, H., Chen, Y., Gu, D., Qian, Y., Shao, F., Shen, Y., & You, Q. (2018). A complex nursing intervention of CAM increase quality of life and satisfaction in lung cancer patients. *Minerva medica*.
- Wei, R., Gaohua, L., Xiao, L., & Ling, G. (2015). Side effects of pemetrexed in the maintenance therapy of nonsmall-cell lung cancer at advanced stage and the nursing measures. *Modern Clinical Nursing*(5), 48-50.
- Yates, J. W., Chalmer, B., & McKegney, F. P. (1980). Evaluation of patients with advanced cancer using the Karnofsky performance status. *Cancer*, 45(8), 2220-2224.
- Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta psychiatrica scandinavica*, 67(6), 361-370.