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Assessment of lung cancer patient's satisfaction with universal health insurance at Port Said Governorate

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Abstract---Background: Lung cancer is a type of cancer that begins in the lung. Assessing the level of satisfaction provides actionable insights to improve the healthcare system. Egypt is embarking on a new Universal Health Insurance system (UHIS) to cover all Egyptians by 2032. Aim of the study: The present study aimed to assess lung cancer patient's satisfaction with universal health Insurance at Port Said Governorate. Design: A descriptive research design was utilized to conduct this study. Sample: A purposive sample used in this study. Sample size: 136 lung cancer patients. Setting: Study conducted at oncology outpatient clinic El Tadamon Specialized Hospital at Port Said Governorate. Tool: An interviewing questionnaire tool divided to two parts, Part I: Consists of A- Socio-demographic characteristics of lung cancer patients, B- Universal health insurance utilization of lung cancer patients, Part II: Patients' satisfaction adopted tool which contain 7 domains obtained from (Phaswana et al.,2011). Results: The study results revealed that 48.5% of studied lung cancer patients were had moderate level of satisfaction related to their total patient satisfaction. While, 33.8% of them were had high level of satisfaction & 17.7% of studied sample were had low level of satisfaction related their total patient satisfaction. Conclusion: The study shows, there was highly significant relations with age, education level and marital status and there was highly statistically positive correlation between total seven satisfaction domains of the studied patients and their total satisfaction. Recommendations: Continuous health education program for health care team about lung cancer patient's satisfaction.

Keywords---lung cancer, patient satisfaction, universal health insurance.

Introduction

Lung cancer disease is characterized by uncontrolled growth of cells in the lungs. Lung cancer was first described by doctors in the mid-19th century. In the early 20th century it was considered relatively rare, but by the end of the century, the leading cause of cancer-related death among men in more than 25 developed countries. In the 21st century lung cancer emerged as the leading cause of cancer deaths (Braile et al., 2021).

Worldwide in 2020, lung cancer occurred in 2.2 million people and resulted in 1.8 million deaths. It is the most common cause of cancer-related death in both men and women. The most common age at diagnosis is 70 years. In most countries the five-year survival rate is around 10 to 20%, while, in Japan it is 33%, in Israel 27%, and in the Republic of Korea 25%. Outcomes typically are worse in the developing world (Bray & May, 2021).

Patient satisfaction assessment is an important administrative tool in a patient policy perspective to support health care in preserving the legal obligations and rights in the formulation and management of healthcare policies. The fact that patient satisfaction is positively related to nursing care has impacted organizations to offer respective nursing care (Hosseini Motlagh et al., 2020 and Almomani et al., 2020).

Egypt is embarking on a new Universal Health Insurance system (UHS) to cover all Egyptians by 2032, in line with the UHI law. The implementation of the first phase started in Port Said in 2019 with gradual geographic expansion to follow. The total cost of implementing the system in the governorate is 7.605 billion Egyptian Pounds. The number of citizens who have registered in the system is more than 659 thousand. The percentage of registered citizens of the total population of the governorate is 82 percent. 9 hospitals included in the system were operated in the governorate. 35 units and family health centers included in the system in Port Said (Dhanasekaran, 2020 and <http://www.egypttoday.com/Article2022>).

Medical services provided in the new system are open-heart surgery, bone-marrow transplants, kidney and liver specialities, neurology and micro-surgery. The new system's second phase will start from 2021 to 2023 in Luxor, Matrouh, Red Sea, Qena and Aswan Governorates. The third phase, from 2024 to 2026, will be in Alexandria, Beheira, Damietta, Sohag and Kafr El-Sheikh Governorates. The fourth, from 2026 to 2028, will be in the Beni Sweif, Assiut, Minya, New Valley and Fayoum Governorates. The fifth phase will start from 2029 to 2030 in Daqahliya, Sharqiya, Gharbiya and Menoufiya Governorates. The last phase will be from 2031 to 2032 in Cairo, Giza and Qalioubiya Governorates (Mathauer et al., 2019).

Under the UHI law, all Egyptians have the right to coverage, obtained by directly registering in the system using their national identification card according to their geographical location. In practice, however, workers in the informal sector are likely

to face challenges. Some workers in this group will be able to pay and others can't able to pay. While, the UHI law provides exemptions for those who cannot pay, informality makes it difficult to accurately determine eligibility for exemptions. Certain groups in the informal sector might be at risk of exclusion if the informal sectors are not eligible for exemption and are obliged to pay the mandatory contributions (UHI law Article 2, 2018).

Community Health Nurses can play a key role in improving patient outcomes by screening and identifying patients not just those at high risk for lung cancer but also those with few or no risk factors. Recognizing signs and symptoms regardless of smoking status and expediting the initial workup through appropriate diagnostic tests and referrals help ensure a prompt diagnosis and may improve prognosis (Lizama et al., 2018).

Significance of the study

According to the latest data published in 2020 by World Health Organization (WHO): Lung cancers deaths in Egypt reached 5.677% or 1.06% of total deaths. The age adjusted death rate is 8.02 per 100.000 of population ranks Egypt #115 in the world (WHO, 2020).

Zaghloul & Bishr, 2018 said that lung cancer patients in Egypt receive their treatment in health insurance hospitals, general hospital or university hospitals with the authority of government's expense, or in the private sector at their own expense or with personal insurance coverage. Nongovernmental organizations also help patients with cancer in different ways, supporting governmental hospitals, providing treatment services in their facilities, or providing emotional support to patients directly.

Nursing care for lung cancer patient revolve around comprehensive supportive care, pain and anxiety alleviation, ensuring effective gas exchange and patient teaching to minimize complications from surgery radiation or chemotherapy. Supportive care is a multi-disciplinary concept and it includes other aspects such as symptoms management, psychosocial aspects, coping strategies, issues regarding quality of life, improving patient-reported outcomes and service delivery. Community health nurses assessing a patient for possible lung cancer, be sure to take a thorough medical history, family history, environmental exposure history, and social history. These may reveal risk factors that clinicians might otherwise overlook (Ajua , & Zhou, 2018).

Through the work as a delegate in the Universal Health Insurance hospitals in Port Said, the investigator noticed that lung cancer patients flow to oncology clinics in the year 2020 reached 312 cases. The investigator thought that it was the duty as a nurse to take care of these patients and assess their level of satisfaction with the UHI system.

Aim of the Study

The aim of this study was to assess lung cancer patient's satisfaction with Universal Health Insurance at port Said Governorate.

Research questions

1. What is the satisfaction level of lung cancer patients with Universal Health Insurance at Port Said Governorate?
2. Is there a relation between satisfaction level and socio demographic characteristics of lung cancer patients with Universal Health Insurance at Port Said Governorate?

Subjects and Methods

The subject and methods of the current study were designed under the following main four designs:

- I. Technical item
- II. Operational item
- III. Administrative item
- IV. Statistical item

Technical item

The technical item includes (research design, study setting, subject and tool for data collection).

Research Design

A descriptive research design was applied to achieve the aim of this study.

Setting

The study will be conducted in oncology outpatient clinic El Tadamon Hospital at Port Said Governorate, which provided care for oncology out patients at 6 days per week.

The oncology outpatient clinic includes one room for nurses, another room contains 5 beds for patient's observation, one room for medical examination, the examination room was with three doctors' offices, a bed for examining patients, a scale, a nursing registration office, a window, a bathroom, and a basin for washing hands. All personal protective equipment are available to combat infection. There is an administrative room for patients' registration, where all patients' files are located. There is a waiting area for patients with chairs and a bathroom.

Sampling

A purposive sample was used to achieve the aim of the study. The study sample including 136 lung cancer patients who attended at oncology outpatient clinic at El Tadamon Hospital with universal health insurance at Port Said Governorate. The criteria of purposive sample included patient diagnosed with lung cancer and lung cancer patient able to communicate.

Sample size

A purposive sample was estimated sample size is at least 136 lung cancer patients at confidence level 95% and precision rate at 0.05 by using Steven equation, 2012. Since the total flow number was 321 lung cancer patients in year 2020.

$$n = \frac{N \times p(1-p)}{\left[\left[N-1 \times \left(d^2 \div z^2 \right) \right] + p(1-p) \right]}$$

While;

P= 0.5

N= Total population

Z= Z value "1.96"

D= Standard Error

n= sample size

Tool of data collection

Structured Interviewing Questionnaire

It was developed by the investigator after reviewing related national and international literature to collect the required data. It was written in simple Arabic language and it consists of three parts:

Part I: Socio-demographic characteristics of lung cancer patients included data about age, gender, educational levels, marital status, occupation, income, place of residence and universal health insurance utilization of lung cancer patients included: number of hospital visits / month, number of clinic visits / month, number of private doctor visits / month, main reason for visiting hospital, and with whom do you come to the hospital.

Part II: Patient satisfaction:

Patient satisfaction adopted from Phaswana (2011): second part used to assess Lung cancer patient's satisfaction which included seven domains

Scoring system

Each statement was assigned a score according to patient's satisfaction. Each item scored as Always(2), Sometimes(1) and Never(0), the scores of the items was summed up and totally converted into a percentage score. It was classified into 3 categories:

- High satisfaction if score > 70% =108.
- Moderate satisfaction if score from 50 - 70% =72.
- Low Satisfaction if score <50%.

Validity

The revision of the tool for clarity, relevance, comprehensiveness, understanding and applicability was done by a panel of three experts from the community health nursing faculty of Nursing Helwan -university to measure the content validity of the tool and the necessary modification was done.

Reliability

Reliability analysis by measuring of internal consistency of the tool through Cronbach's Alpha test, 0.877 "good reliability".

Operational items

It included operational items for this study consisted of four phases, namely preparatory phase, ethical considerations, pilot study and fieldwork.

Preparatory Phase

A review of the past and current literature covering all aspects helpful in designing and processing of data collection tools were available books, Journals, Internet and article.

Ethical Considerations

An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee. Participation in the study is voluntary and subjects was given complete full information about the study and their role before signing the informed consent. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it was not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs will be respected. The investigator was assuring maintaining anonymity and confidentiality of subjects' data included in the study. The patients were informed that allowed to choose to participate or not in the study and have the right to withdrawal from the study at any time.

Pilot Study

Pilot study has been conducted to test the clarity, applicability and understandability of the tool. It has been conducted on 10% 13 of lung cancer patients. Lung cancer patients have been selected from oncology outpatient clinic El Tadamon Specialized Hospital at Port Said Governorate . The results of the pilot helped in refining the interview questionnaire and to schedule the time framework. The participants of the pilot were included in the main study sample.

Fieldwork

Data of the current study were collected from the beginning of March 2021 to the end of August 2021. A total number of 136 lung cancer patient who fulfilled were

recruited into the present study. The investigator collected data 2 day per week Sunday and Wednesday during working time of oncology outpatient clinic from 9 am-2 pm. Lung cancer patients accepted to participate in the study were interviewed. The investigator took formal consent from lung cancer patient who accepted to participate in the study. At the beginning of the interview, the investigator introduced herself and explained the aim of the study. From the first contact with the lung cancer patients the interviewing questionnaire was filled. The investigator collected about 2 – 3 lung cancer patients per day.

The interviewing questionnaire takes about 20 minutes to be fully filled according to lung cancer patients' tolerance and every lung cancer patient was allowed to ask any question to clear any misunderstanding. Regarding the interviewing questionnaire, every interviewing questionnaire was given to the lung cancer patients at the beginning of the work after explanation of the purpose of this interviewing questionnaire and gave them time to answer these questions. For illiterate lung cancer patients, the investigator read and illustrated the interviewing questionnaire then checked the accurate answer.

Administrative items

An official permission was obtained by submission of a formal letter issued from the Dean of faculty of nursing, Helwan University to the director of oncology outpatient clinic El Tadamon Hospital at Port Said Governorate. Collect the necessary data for current study after a brief explanation of the purpose of the study and its expected outcomes. Using proper channels of communication from authorized personnel

Statistical Analysis

Data collected from the studied sample was revised, coded and entered using Personal Computer (P). Computerized data entry and statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS) version 24. Data were presented using descriptive statistics in the form of frequencies, percentages. Chi-square test (X^2) was used for comparisons between qualitative variables. Spearman correlation measures the strength and direction of association between four ranked variables (Suresh, K., & Chandrashekhara, S, 2012).

Significance of the results

- Highly significant at p-value < 0.01.
- Statistically significant was considered at p-value < 0.05
- Non-significant at p-value \geq 0.0

Results

Table (1): Demonstrates that the mean age of studied lung cancer patients is 40.56 ± 6.99 years, 80.2% of them were male and 22.8% of them had bachelor. Also, this table shows that 62.5% of them are married, 67.6% are employee, 72.0% income not enough and 55.9% live in rural area. Figure (1): Illustrates that 48.5% of studied lung cancer patients were had moderate level related their total

satisfaction with universal health insurance. While 33.8% & 17.7% of them were high and low level related their total satisfaction, respectively.

Table (2): Reveals that there were highly significant relations between total lung cancer Patients' satisfaction of studied patients and income at ($P = < 0.01$). While, there were significant relation with age, education level and marital status at ($P = < 0.05$). But there is no significant relation with gender, occupation and residence at ($P = > 0.05$). Table (3): Sets that there is highly statistically positive correlation between total satisfaction domains of the studied patients and their total satisfaction at ($P = < 0.01$).

Table (1): Number and percentage distribution of the studied patients according to their socio -demographic characteristics, (N=136).

Items	No	%
Age		
<25	9	6.6
25 - <35	27	19.8
35 - <45	49	36.1
45 -	51	37.5
Mean \pm SD 40.56 \pm 6.99		
Gender		
Male	109	80.2
Female	27	19.8
Education level		
Not read & write	11	8.1
Read and write	23	16.9
Primary school	19	13.9
Preparatory	24	17.7
Secondary	28	20.6
Bachelor	31	22.8
Marital status		
Married	85	62.5
Un married	51	37.5
Occupation		
Employee	92	67.6
Not employee	44	32.4
Income		
Enough and save	15	11.1
Enough	23	16.9
Not enough	98	72.0
Residence		
Rural	76	55.9
Urban	60	44.1

Figure (1): Percentage distribution of studied lung cancer patient's satisfaction related to their total satisfaction with universal health insurance (N= 136).

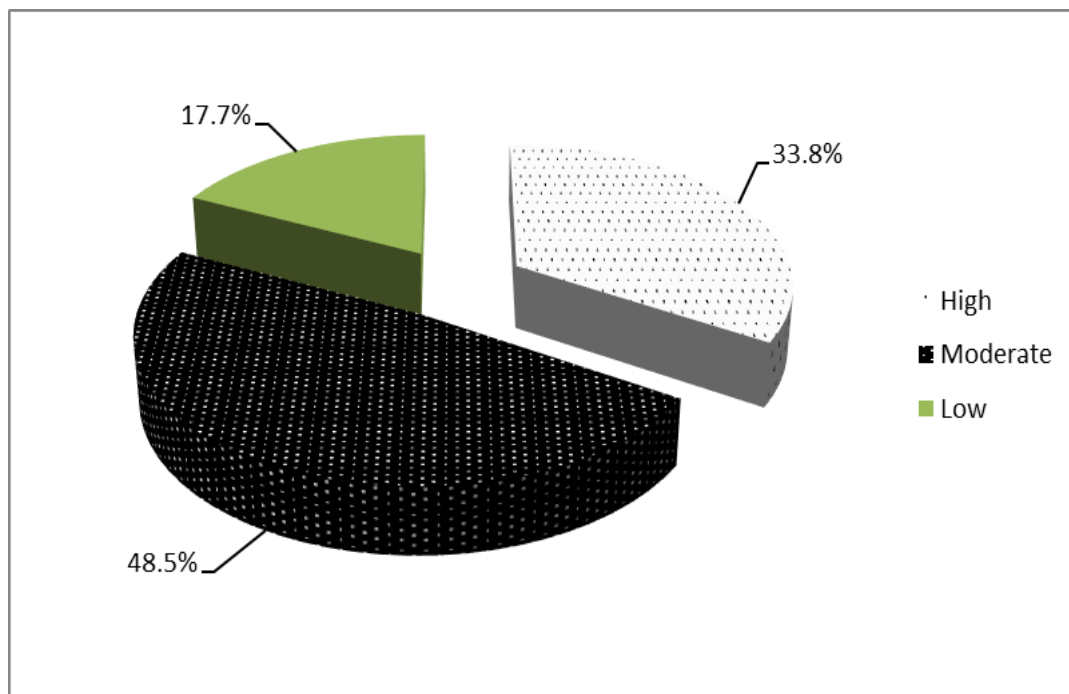


Table (2): Relation between socio demographic characteristics of the studied lung cancer Patients and their total satisfaction, (N=136)

Items		Total Satisfaction						X ₂	P-Value
		High No= 46		Moderate No= 66		Low N= 24			
		No	%	No	%	No	%		
Age	<25	7	15.2	1	1.5	1	4.2	5.160	.034*
	25 - <35	22	47.8	4	6.1	1	4.2		
	35 - < 45	11	23.9	30	45.5	8	33.3		
	45 -	6	13.1	31	46.9	14	58.3		
Gender	Male	36	78.3	54	81.8	19	79.2	2.106	.058
	Female	10	21.7	12	18.2	5	20.8		
Education level	Not read & write	1	2.2	1	1.5	9	37.4	4.001	.047*
	Read and write	1	2.2	16	24.2	6	25.0		
	Primary school	2	4.3	16	24.2	1	4.2		
	Preparatory	5	10.9	18	27.3	1	4.2		
	Secondary	12	26.1	10	15.2	6	25.0		
	Bachelor	25	54.3	5	7.6	1	4.2		
Marital status	Married	40	86.9	43	65.2	2	8.3	4.711	.040*
	Un married	6	13.1	23	34.8	22	91.7		

Occupation	Employee	30	65.2	41	62.1	14	58.3	1.996	.063
	Not employee	16	34.8	25	37.9	10	41.7		
Income	Enough and save	14	30.4	1	1.5	0	0	7.956	.008**
	Enough	20	43.5	2	3.1	1	4.2		
	Not enough	12	26.1	63	95.4	23	95.8		
Residence	Rural	25	54.3	46	69.7	5	20.8	1.567	.071
	Urban	21	45.7	20	30.3	19	79.2		

*significant $p < 0.05$. **highly significant $p < 0.01$.

Table (3): Correlation Matrix between studied variable

		1	2	3	4	5	6	7	8
1- Access to Health Service Domain	r p	1							
2- Empathy Domain	r p	.426 .003**	1						
3- General Satisfaction Domain	r p	.671 .001**	.489 .000**	1					
4- Referral Domain	r p	.512 .001**	.527 .001**	.573 .001**	1				
5- Service standard Domain	r p	.514 .000**	.543 .000**	.580 .000**	.620 .000**	1			
6- Tangibles Domain	r p	.710 .000**	.644 .000**	.465 .002**	.502 .001**	.519 .001**	1		
7- Assurance Domain	r p	.532 .000**	.549 .000**	.549 .000**	.660 .000**	.674 .000**	.683 .000**	1	
8-Total satisfaction	r p	.652 .001**	.675 .000**	.384 .005**	.304 .005**	.508 .004**	.654 .001**	.477 .004**	.801 .000**

(**) Statistically significant at $p < 0.01$

Discussion

Lung cancer is a type of cancer that begins in the lungs. Lungs are two spongy organs in chest that take in oxygen when inhale and release carbon dioxide when exhale. Lung cancer is the leading cause of cancer deaths worldwide. People who smoke have the greatest risk of lung cancer, though lung cancer can also occur in people who have never smoked. The risk of lung cancer increases with the length of time and number of cigarettes smoked. If quit smoking, even after smoking for many years, can significantly reduce chances of developing lung cancer (Howlader et al., 2020).

Part I: Socio demographic characteristics of the lung cancer patients. The present study finding revealed that more two third of studied subjects were male and this finding was similar with Hulbert et al., (2021) who conducted published study at Nigeria under title of "Assessment of Lung Cancer Using DNA Promoter

Hypermethylation in Plasma and Sputum at federal medical center Ido-Ekiti, Ekiti state Nigeria" reported that 40% of studied subjects were males.

Concerning age, more than one third 37,5% of studied subjects had 45 years and above, and this finding was in agreement with Ellis& Vandermeer, (2021) who conducted published study at Vietnam entitled as " Delays in the diagnosis of lung cancer, Vietnam " reported that 38 % of studied subjects were above 45 years. From investigator point view, this might be due to some of the lung cancer patients above 45 years had physical problem and need help to go out patients oncology clinics.

The present study finding revealed that less than two thirds 62.5% of studied subjects were married. This result was in accordance with Wirsdörfer et al., (2019) who conducted published study Primary Health Care Centers in Saudi Arabia entitled as " Combining Radiotherapy and Immunotherapy in Lung Cancer" reported that 80% and 6.7% of studied subjects were married and divorce respectively. From investigator point view Port Said Governorate has large number of youth who started their family life early due to working in trading and fishing enable more life welfare.

Concerning the education level of the present study revealed that less than one quarter 22.8% of studied subjects had a university education and this finding was disagreed with Zhang et al., (2020) who conducted a published study entitled as" Minimally invasive (robotic assisted thoracic surgery and video-assisted thoracic surgery) lobectomy for the treatment of locally advanced non-small cell lung cancer " conducted cross-sectional study directed among the diabetic clinic visitors in Primary Health Care Centers in Qatar and founded that 5.6% participants had university education. From investigator point view, Port Said Governorate considered economic Governorate that concerning with trading more than education.

Concerning the income level of the present study revealed more than two third 72% of studied subjects had not enough month income and this finding was in agreement with Liu et al, (2019) who conducted a published study in different areas comprising upper and Lower Egypt as well as delta region entitled as " The Indirect Efficacy Comparison of DNA Methylation in Sputum for Early Screening and Auxiliary Detection of Lung Cancer " stated that 59.3 % of studied subjects were low socioeconomic. From investigator's point of view, lung cancer patients 'treatments are very expensive and lung cancer patients don't have the ability to work and earn.

The present study clarified that relation between characteristics of the studied patients and their total satisfaction regarding lung cancer patients and this finding supported by Han et al. (2022), who reported that there was a significant and direct relation between characteristics of the studied patients and their total satisfaction regarding lung cancer patients. From the investigator's point of view, a targeted assessment was needed to promote social assistance for patients with lung cancer.

Concerning with studied patient's there was highly significant relations between total satisfaction of studied patient's and income and this finding was in agreement with Qian et al., (2022) who published study under title of cancer " Associations of

patient-reported care satisfaction with symptom burden and healthcare use in hospitalized patients with cancer " reported that there were highly significant relations between total satisfaction of studied patient's and income.

Also, there were no significant relation with gender, occupation and residence and this finding was in agreement with Di et al., (2021) who published study under title of " Satisfaction among Cancer Patients Undergoing Radiotherapy during the COVID-19 Pandemic " reported that there no significant relation with gender, occupation and residence.

Concerning with studied patient's there was highly significant relations between there were significant relation with age, education level and marital status and this finding was in agreement with Marino et al., (2021) who published study under title of cancer " Advance Approval of Outpatient Chemotherapy via Phone Call Optimizes Healthcare Delivery without Compromising Patient Satisfaction with Care " reported that there were highly significant relations between there were significant relation with age, education level and marital status.

Concerning with studied patient's there was highly statistically positive correlation between total satisfaction domains of the studied patients and their total satisfaction and this finding was in agreement with Akin et al., (2019) who published study under title " Quality of life, symptom experience and distress of lung cancer patients undergoing chemotherapy " reported that there was highly statistically positive correlation between total satisfaction domains of the studied patients and their total satisfaction.

Conclusion

On the light of results of the current study and answers of the research questions, it concluded that,48.5% of studied lung cancer patients were had moderate level related to their total satisfaction. While 33.8% had high level of satisfaction & 17.7% of them had low level related to their total satisfaction. This study reveals that there was highly significant relations between total lung cancer Patients' satisfaction of studied patients and income While, there were significant relation with age, education level and marital status. But there is no significant relation with gender, occupation and residence. The study sets that, there was highly statistically positive correlation between total satisfaction domains of the studied patients and their total satisfaction.

Recommendations

On the light of the current study findings, the following recommendations are suggested.

- Continuous health education program for health care team about lung cancer patient's satisfaction.
- Dissemination of posters, brochure and pamphlets about lung cancer on oncology outpatient clinics.
- Further research on a large sample and other setting is needed.

References

- Ajua, A & Zhou, Y (2018): Experiences of lung cancer patients regarding their nursing care A literature Review. Bachelor's thesis. School of Health and Social Service Degree Programme in Nursing. [Online]. Retrieved (2021, April 15) from https://www.theseus.fi/bitstream/handle/10024/151485/Ajua_Ausler___Zhou_Yan.pdf?isAllowed=y&sequence=1
- Akin S, Can G, Aydiner A, (2019): Quality of life, symptom experience and distress of lung cancer patients undergoing chemotherapy. *Eur J Oncol Nurs.* 2019 ;14:400–9. doi:10.1016/j.ejon.2010.01.003. - DOI - PubMed
- Almomani R, Al-Ghdabi R, Banyhamdan K (2020): Patients' satisfaction of health service quality in public hospitals: a PubHosQual analysis. *Manag Sci Lett* 10(8):1803–1812
- Amos CI, Pinney SM, Li Y, (2021): A susceptibility locus on chromosome 6q greatly increases lung cancer risk among light and never smokers. *Cancer Res.* 2021; 70:2389–2397.
- Braille, M., Marcella, S., Marone, G., Galdiero, M. R., Varricchi, G., & Loffredo, S. (2021): The interplay between the immune and the endocannabinoid systems in cancer. *Cells*, 10(6), 1282.
- Bray L, May CM (2021): "Chapter 74: Neoplasms of the lung". In Jameson JL, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J (eds.). *Harrison's Principles of Internal Medicine* 11(4):1387–1395
- Dhanasekaran-Kulawik, J., & Trojnar, A. (2020). Lung cancer in women in 21st century. *Journal of Thoracic Disease*, 12(8), 4398.
- Di Lalla V, Patrick H, Siriani-Ayoub N, Kildea J, Hijal T, Alfieri J. *Curr Oncol.* (2021): Satisfaction among Cancer Patients Undergoing Radiotherapy during the COVID-19 Pandemic: An Institutional Experience. 2021 Apr 10;28(2):1507-1517. doi: 10.3390/currenco128020142. PMID: 33920247 Free PMC article.
- Eldridge L. (2020): Lung Cancer Complications. [Online]. Retrieved (2021, April 10) from <https://www.verywellhealth.com/lung-cancer-complications-and-emerg>
- Charshafian S, & Liang SY. (2018). Rapid fire: Infectious disease emergencies in patients with Cancer. *Emerg Med Clin North Am*; 36(3):493-516. doi:10.1016/j.emc.2018.04.001
- Han KT, Chang J, Choi DW, Kim S, Kim DJ, Chang YJ, Kim SJ. (2022): Association of institutional transition of cancer care with mortality in elderly patients with lung cancer: a retrospective cohort study using national claim data. *BMC Cancer.* 2022 Apr 25;22(1):452. doi: 10.1186/s12885-022-09590-5. PMID: 35468762 Free PMC article.
- Howlader N, Forjaz G, Mooradian MJ, (2020): The effect of advances in lung-cancer treatment on population mortality. *N Engl J Med.* 2020;383(7):640-649.
- Hulbert A, Jusue-Torres I, Stark A, (2021): Early Detection of Lung Cancer Using DNA Promoter Hypermethylation in Plasma and Sputum. *Clin Cancer Res.* 2021;23(8):1998–2005.
- Liu D, Peng H, Sun Q, (2019) :The Indirect Efficacy Comparison of DNA Methylation in Sputum for Early Screening and Auxiliary Detection of Lung Cancer: A Meta-Analysis. *Int J Environ Res Public Health.* 2019;14(7):699.
- Lizama C, Slavova-Azmanova NS, Phillips M, Trevenen ML, Li IW, Johnson CE. (2018): Implementing Endobronchial Ultrasound-Guided (EBUS) for Staging and Diagnosis of Lung Cancer: A Cost Analysis. *Med Sci Monit.* 2018 Jan 29; 24:582-589.

- Marino P, Touzani R, Seguin L, Moulin JF, Palomares M, Cappiello MA, Provansal M, Vittot M, Dermeche S, Launay S, Goncalves A, Bouhnik AD, Gravis G. (2021): Advance Approval of Outpatient Chemotherapy via Phone Call Optimizes Healthcare Delivery without Compromising Patient Satisfaction with Care. *Cancers (Basel)*. 2021 Mar 16;13(6):1337. doi: 10.3390/cancers13061337. PMID: 33809577 Free PMC article.
- Mathauer J, Malvezzi M, Negri E, Vecchia CL & Boffetta P (2019). Risk factors for lung cancer worldwide. *ERJ Express*. doi: 10.1183/13993003.00359-2019.
- Midthun, DE. (2021). Clinical manifestations of lung cancer. [Online].retrieved (2021, April 9) from <https://www.uptodate.com/contents/clinical-manifestations-of-lung-cancer>
- Qian CL, Kaslow-Zieve ER, Azoba CC, Horick N, Wang I, Van Seventer E, Newcomb R, Cashavelly BJ, Jackson VA, Ryan DP, Greer JA, El-Jawahri A, Temel JS, Nipp RD (2022): Associations of patient-reported care satisfaction with symptom burden and healthcare use in hospitalized patients with cancer. *Support Care Cancer*. 2022 May;30(5):4527-4536. doi: 10.1007/s00520-021-06764-y. Epub 2022 Feb 3. PMID: 35112210
- Wirsdörfer F, de Leve S, Jendrossek V (2019): Combining Radiotherapy and Immunotherapy in Lung Cancer: Can We Expect Limitations Due to Altered Normal Tissue Toxicity? *Int J Mol Sci*. 2019;20(1):24.
- Zaghloul MS, Bishr MK (2018): Radiation oncology in Egypt: A model for Africa. *Int J Radiat Oncol Biol Phys* 100:539-544.
- Zhang Y, Lin Q, Xu T, Deng W, Yu J, Liao Z, Yue J (2020): Out of the darkness and into the light: new strategies for improving treatments for locally advanced non-small cell lung cancer. *Cancer Lett*. 2020; 421:59-62.