



Prevalence of Pain and Factors Affecting it in Patients with Lung Cancer in Ilam

Elham Bastani¹, Mahsa Rizehbandi¹ and Fariba Shokri^{1,*}

¹Department of Internal Medicine, School of Medicine, Shahid Mostafa Khomaeini Hospital, Ilam University of Medical Sciences, Ilam, Iran

*Corresponding author: Department of Internal Medicine, School of Medicine, Shahid Mostafa Khomaeini Hospital, Ilam University of Medical Sciences, Ilam, Iran. Email: faribashokri2020@yahoo.com

Received 2023 April 04; Revised 2023 August 26; Accepted 2023 August 28.

Abstract

Background: Pain has been known as one of the most common, persistent, and complex symptoms of patients with lung cancer.

Objectives: The aim of this research is to study the relationship between attitude to pain and the prevalence and method of pain control in patients with lung cancer.

Methods: This descriptive cross-sectional study was performed through the census method in patients suffering from lung cancer in Ilam Province. For data collection, while interviewing the patients and studying their files, instruments were used including demographic characteristics form, brief pain inventory, and pain attitude questionnaire. Data analysis was performed by SPSS v.16 through descriptive statistical tests (mean, percentage, and standard deviation) and analytical tests (independent *t*-test, ANOVA, and linear regression).

Results: Considering the severity of pain, 12 (18.8%) patients had mild pain, 43 (67.2%) had moderate pain, and 9 (14.1%) had severe pain, and all of them reported some degree of pain. According to the findings, mean \pm SD of the total score of the questionnaire was 77.15 (3.18), where the minimum and maximum acquired scores were 72 and 85, respectively. Also, no significant relationship was found between any of the dimensions of the attitude to pain questionnaire and the severity of pain. Further the mean \pm SD of attitude to pain was 76.58 (2.81), 77.09 (3.28), and 78.22 (3.23) for mild, moderate, and severe pain, respectively.

Conclusions: In this study, there was no relationship between pain severity and attitude to pain, which may have been due to the small sample size or the specificity of the study in the group of lung cancer patients. Accordingly, conducting further studies in this regard with a larger sample size is suggested.

Keywords: Pain, Lung Cancer, Prevalence

1. Background

Lung cancer is considered an important challenge that led to the death of 1,800,000 new patients in 2018 in addition to the complications related to the disease and lowering the quality of life of these patients (1). Despite the medical advances so far, these patients have poor prognoses and the 5-year survival rate in developed countries has been reported about 15% (2-4).

Considering the advances in the treatment of patients with lung cancer and the development of palliative care, the pain has been known as one of the most challenging symptoms in these patients. The cancer-related pain may develop due to the etiology, tumor growth, progression, or metastasis of the disease, as well as diagnostic-therapeutic methods such as radiotherapy, chemotherapy, and surgery (5). Indeed, pain has been known as one of the most

common, persistent, and complex symptoms of these patients (6). Pain has many complications for patients.

One of the influential factors on the quality of life of patients is pain, which leads to considerable physiological and psychological complications for patients (7-9). Identification of pain prevalence can set the ground for finding suitable palliative interventions including both pharmacological and nonpharmacological interventions (10, 11). For pain mitigation, various methods are used. One of these methods is the use of different types of drugs including morphine, pethidine, methadone, codeine, ibuprofen, indomethacin, dexamethasone, hydrocortisone, prednisolone, and other drugs (12, 13). Palliative and nonpharmacological methods include relaxation techniques, distraction, aromatherapy, music therapy, acupuncture, and nursing interventions for pain

mitigation (14-16).

Despite the availability of effective drugs for pain mitigation, in a considerable group of these patients, pain is not well managed and causes complications for these patients. Indeed, the first stage of proper pain management is assessing the patients' pain, which can be measured through instruments such as behavioral observation of pain in patients, self-reporting of pain, and physiological measurement. One of the proper ways of pain assessment is by investigating the views and experiences of patients regarding pain management (17, 18). For effective pain control, the healthcare team should have the necessary information about the severity as well as the factors affecting its alleviation and, then, take measures to plan for its mitigation based on the instruments required for pain mitigation (12, 19).

2. Objectives

Considering the importance of pain prevalence in patients suffering from lung cancer, the present study was performed on the prevalence of pain and factors affecting it in patients with lung cancer.

3. Methods

3.1. Study Design

This descriptive cross-sectional study was performed through the census method in patients suffering from lung cancer in Ilam Province.

3.2. Inclusion and Exclusion Criteria

All patients suffering from lung cancer (with a history of at least 6 months), who were referred to the hospitals and specialist offices in Ilam Province were included through the census method. Also, patients were included in the study if there was informed consent and the ability to communicate verbally to answer the questions. If the patients suffered from another chronic disease that affects the pain condition, they would be excluded from the study.

3.3. Data Gathering

For data collection, while interviewing the patients and studying their files, instruments were used including demographic characteristics form, brief pain inventory, and pain attitude questionnaire.

3.3.1. Brief Pain Inventory (BPI) Short Form

This instrument (with Cronbach's alpha = 0.91) is used for measuring the pain status in patients suffering from cancer and other types of patients with chronic pain. It consists of 2 main parts measuring the pain severity and extent of interference in daily activities. In this questionnaire, by answering questions regarding the pain severity and its impact on life activities, the patients receive some scores: scores 1 to 4 represent mild pain, 4 to 7 show moderate pain, and 7 to 10 reflect severe pain (20-22).

3.3.2. Pain Attitude Questionnaire

This instrument (with Cronbach's alpha = 0.85) has 31 items, whereby the patients report their opinions about each of the relevant statements on a 5-point Likert scale ranging from absolutely agree with a score of 1 to absolutely disagree with a score of 5. This instrument has 6 areas including tendency to pain tolerance (9 items), attitude to physical dimensions of pain (6 items), attitude to psychological dimensions of pain (8 items), additivity of painkillers (3 items), perceived control over pain (3 items), and fear of injection (2 items) (5).

3.4. Method of Research

In Ilam Province, Shahid Mostafa Khomeini Hospital is the only hospital for patients with cancer, and all patients are referred to this center. All patients with lung cancer (n = 64), who met the criteria for entering the study were examined. After acquiring the necessary permissions, by referring to the office of internists, oncologists, and lung subspecialists, as well as Shahid Mostafa Khomeini Hospital in Ilam (the only hospital for cancer patients), which is the only specialized center for patients with cancer, the patients suffering from lung cancer were identified. While explaining the research objectives and the point that regardless of cooperation or lack of cooperation of patients in this research they would receive all healthcare services in the best way, interviews were performed. Data were collected in 2023 and considering that most of the patients were illiterate, the information was completed by interview method.

3.5. Ethical Consideration

In case of consent and by observing healthy protocols for preventing COVID-19 disease, the researcher initiated the survey. The study was performed under the ethics code (IR.MEDILAM.REC.1401.246), and all patients who had lung cancer based on the diagnosis made by the physician and diagnostic findings and consented to participate in this study were included. Participation in the study was completely voluntary, all patient information was confidential, and the data were reported in general.

3.6. Data Analysis

Data analysis was performed by SPSSv.16 through descriptive statistical tests (mean, percentage, and standard deviation) and analytical tests (independent *t*-test, ANOVA, and linear regression) as well as multiple regression tests. The significance level was considered lower than 0.05.

4. Results

The findings of 64 patients were analyzed and the mean \pm SD age of the patients was 75.73 (9.99). Also, 38 (59.4%) of patients lived in villages and 26 (40.6%) were city residents. Regarding the education status, 16 (25%) of the patients were illiterate, 40 (62.5%) had diploma, and 8 (12.5%) had university education. Considering the severity of pain, 12 (18.8%) of the patients had mild pain, 43 (67.2%) had moderate pain, 9 (14.1%) had severe pain, and all of them reported some degree of pain. According to the findings, the mean \pm SD of the total score of the questionnaire was 77.15 (3.18), where the minimum and maximum acquired scores were 72 and 85, respectively (Table 1).

Table 1. Status of Mean \pm SD Scores of Attitude Questionnaire Towards Pain Relief in the Investigated Dimensions

| Questionnaire Dimensions | Mean \pm SD | Min | Max |
|--|------------------|-----|-----|
| Tendency to pain tolerance | 27.03 \pm 2.41 | 21 | 32 |
| Attitude to physical dimensions of pain | 9.29 \pm 1.38 | 7 | 12 |
| Attitude to psychological dimensions of pain | 21.90 \pm 2.17 | 17 | 26 |
| Additivity of painkillers | 8.40 \pm 1.13 | 5 | 11 |
| Perceived control over pain | 6.79 \pm 1.34 | 4 | 10 |
| Fear of injection | 3.71 \pm 0.99 | 2 | 6 |
| Overall score | 77.15 \pm 3.18 | 72 | 85 |

According to Table 2, no significant relationship was found between any of the dimensions of the attitude to pain questionnaire and the severity of pain. Further mean \pm SD of attitude to pain was 76.58 (2.81), 77.09 (3.28), and 78.22 (3.23) for mild, moderate, and severe pain, respectively (Tables 2 and 3).

5. Discussion

Chronic diseases cause different complications in the patients (23-25). Cancer is one of the chronic diseases that affects all aspects of the patient's life (26-28). In the present study, the mean age of patients was 68.23 and most of them were male. In the study by Di Maio et al., the mean age

of patients suffering from lung cancer was 72 years and most of them were male (29). In the study by Nishiura et al. mean \pm SD of patients age was 71.8 (3.5) and most patients were male (30). In the study by Kawaguchi et al., the mean age was 68 years (31), in a study by Hoffman et al., it was 63 years, and 44 (55%) of them were male (32). In the study by Wang et al., the mean \pm SD of patients' age was 66.36 (9.979) and 138 (62.2%), where patients were male (33). In the study by Kiatpanabhikul and Bunyayothin 51.6% of patients were older than 65 years and 96 (57.5%) were male (34). The results of the mentioned studies are in line with the present research regarding the higher prevalence of lung cancer in men compared to women, as well as the high prevalence of this type of cancer in older patients.

According to the findings, 67.2% of patients had moderate pain, 18.8% had mild pain, and 14.1% experienced severe pain. In the study by Di Maio et al. on patients with lung cancer, the level of pain reported was as follows: 42% mild pain, 7% severe pain, and 25% moderate pain (29). In the study by Nishiura et al. (30), in the group of patients suffering from lung cancer, mean \pm SD of pain severity in patients with sleep insomnia was 27.2 (26.2), while in the group without sleep insomnia, it was 8.7 (15.8); in the study by Hoffman et al. (32), 55 (69%) of 80 examined patients had pain; in the study by Zhang et al. on patients suffering from lung cancer, 242 (45.4%) had experienced pain along their cancer, and 129 (24.2%) had reported pain over the past 24 hours. Furthermore, according to the classification of the BPI-SF questionnaire, 76 (58.9%) of patients had mild pain, 46 (35.7%) experienced moderate pain, and 7 (5.4%) reported severe pain (35). The results of the mentioned studies have concurred with the present research regarding the existence of pain in patients with lung cancer.

In the present study, no relationship was found between any dimensions of the attitude to pain questionnaire and severity of pain. However, in the study by Najafi Ghezalje and Hosseini there was a relationship between perceived control over pain and attitude to pain (5). Further, in the qualitative study of Orujlu et al., managerial obstacles of patient pain with cancer included acceptance and tolerance of pain, low awareness of patients about pain management methods, negative attitude to painkillers, as well as neglecting pain management (36). In the study by Sukrueangkul et al., the patients who demanded to use painkillers believed that these drugs could help mitigate the symptoms, reducing the complications, and prolonging the patient's life (37). The differences between this study and the mentioned ones can be assigned to the diversity in the number and cultural status of the examined societies, which may affect the pain severity.

Table 2. Status of Mean \pm SD Questionnaire Scores of Attitude Towards Pain Relief According to Pain Intensity

| Questionnaire Dimensions | Mild (0 - 4) | Medium (4 - 7) | Intense (7 -10) | P-Value | F |
|--|------------------|------------------|------------------|---------|------|
| Tendency to pain tolerance | 27.75 \pm 2.22 | 26.90 \pm 2.49 | 26.66 \pm 2.29 | 0.62 | 0.23 |
| Attitude to physical dimensions of pain | 9.33 \pm 1.55 | 9.23 \pm 1.32 | 9.55 \pm 1.58 | 0.55 | 0.36 |
| Attitude to psychological dimensions of pain | 20.75 \pm 1.65 | 22.02 \pm 2.19 | 22.88 \pm 2.20 | 0.14 | 2.18 |
| Additivity of painkillers | 8.33 \pm 1.49 | 8.44 \pm 0.90 | 8.33 \pm 1.65 | 0.83 | 0.04 |
| Perceived control over pain | 6.83 \pm 1.33 | 6.83 \pm 1.30 | 6.55 \pm 1.66 | 0.56 | 0.32 |
| Fear of injection | 3.58 \pm 0.9 | 3.65 \pm 1.02 | 4.22 \pm 0.97 | 0.10 | 2.73 |
| Overall score | 76.58 \pm 2.81 | 77.09 \pm 3.28 | 78.22 \pm 3.23 | 0.28 | 1.17 |

Table 3. Comparison of Intensity Scores and Attitude Toward Pain According to Demographic Characteristics ^a

| Questionnaire Dimensions | Gender | | Education | | |
|--|------------------|------------------|------------------|------------------|----------------------|
| | Male | Female | Illiterate | Diploma | University Education |
| Tendency to pain tolerance | 26.41 \pm 2.41 | 27.60 \pm 2.29 | 28 \pm 2.0 | 27.5 \pm 2.52 | 27 \pm 0.0 |
| F | 0.3 | | | 0.21 | |
| P-value ^b | 0.04 | | | 0.8 | |
| Attitude to physical dimensions of pain | 9.35 \pm 1.47 | 9.24 \pm 1.32 | 9.44 \pm 0.088 | 9.31 \pm 1.42 | 7.5 \pm 0.7 |
| F | 1.2 | | | 1.99 | |
| P-value | 0.74 | | | 0.15 | |
| Attitude to psychological dimensions of pain | 21.51 \pm 2.36 | 22.27 \pm 1.94 | 22.66 \pm 1.41 | 22.22 \pm 2.18 | 21 \pm 0.0 |
| F | 1.9 | | | 0.6 | |
| P-value | 0.16 | | | 0.55 | |
| Additivity of painkillers | 8.38 \pm 1.22 | 8.42 \pm 1.06 | 8.1 \pm 1.16 | 8.5 \pm 1.05 | 9 \pm 0.0 |
| F | 0.35 | | | 0.72 | |
| P-value | 0.89 | | | 0.49 | |
| Perceived control over pain | 6.41 \pm 1.33 | 7.15 \pm 1.27 | 7.44 \pm 1.42 | 7.04 \pm 1.25 | 7 \pm 1.41 |
| F | 0.22 | | | 0.31 | |
| P-value | 0.02 | | | 0.73 | |
| Fear of injection | 3.64 \pm 0.95 | 3.78 \pm 1.05 | 3.66 \pm 1.5 | 3.90 \pm 0.81 | 3 \pm 1.41 |
| F | 0.25 | | | 0.75 | |
| P-value | 0.57 | | | 0.48 | |
| Overall score | 75.74 \pm 2.3 | 78.48 \pm 3.34 | 79.33 \pm 2.50 | 78.5 \pm 3.5 | 74.5 \pm 3.53 |
| F | 5.3 | | | 1.79 | |
| P-value | 0.000 | | | 0.18 | |

^a Values are expressed as mean \pm SD.^b Results showed a difference between the attitude of pain in men and women (F = 5.3, P = 0.000).

5.1. Conclusions

In this study, there was no relationship between pain severity and attitude to pain, which may have been due to the small sample size or the specificity of the study in the group of patients with lung cancer. Accordingly, conducting further studies in this regard with a larger sample size is suggested.

Acknowledgments

We thank Ilam University of Medical Sciences.

Footnotes

Authors' Contribution: All authors contributed to the study's concept and design.

Conflict of Interests: One of the authors (FSH) collaborates as a reviewer in the journal.

Data Availability: The dataset presented in the study is available on request from the corresponding author during submission or after publication. The data are not publicly available due to confidentiality.

Ethical Approval: The study was conducted after approval by the Ethics Committee under the ethical code of IR.MEDILAM.REC.1401.246.

Funding/Support: This study was supported by grant 2048 from Ilam University of Medical Sciences (Dr. Fariba Shokri).

Informed Consent: Informed written consent from the patient or their guardians was obtained.

References

- Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2018;**68**(6):394–424. [PubMed ID: 30207593]. <https://doi.org/10.3322/caac.21492>.
- Dela Cruz CS, Tanoue LT, Matthay RA. Lung cancer: epidemiology, etiology, and prevention. *Clin Chest Med*. 2011;**32**(4):605–44. [PubMed ID: 22054876]. [PubMed Central ID: PMC3864624]. <https://doi.org/10.1016/j.ccm.2011.09.001>.
- Didkowska J, Wojciechowska U, Manczuk M, Lobaszewski J. Lung cancer epidemiology: contemporary and future challenges worldwide. *Ann Transl Med*. 2016;**4**(8):150. [PubMed ID: 27195268]. [PubMed Central ID: PMC4860480]. <https://doi.org/10.21037/atm.2016.03.11>.
- Chabowski M, Polanski J, Jankowska-Polanska B, Janczak D, Rosinczuk J. Is nutritional status associated with the level of anxiety, depression and pain in patients with lung cancer? *J Thorac Dis*. 2018;**10**(4):2303–10. [PubMed ID: 29850135]. [PubMed Central ID: PMC5949507]. <https://doi.org/10.21037/jtd.2018.03.108>.
- Najafi Ghezeli T, Hosseini AF. [Attitudinal barriers to effective cancer pain management]. *Hayat*. 2012;**18**(1):89–101. Persian.
- Evenepoel M, Haenen V, De Baerdemaeker T, Meeus M, Devoogdt N, Dams L, et al. Pain Prevalence During Cancer Treatment: A Systematic Review and Meta-Analysis. *J Pain Symptom Manage*. 2022;**63**(3):e317–35. [PubMed ID: 34563628]. <https://doi.org/10.1016/j.jpainsymman.2021.09.011>.
- Hatefi M, Komlakh K, Nouri L. Investigating the effect of methylprednisolone pulse on the treatment of back pain. *Roman J Mil Med*. 2022;**125**(2):264. <https://doi.org/10.55453/rjmm.2022.125.2.13>.
- Vasigh A, Tarjoman A, Borji M. Relationship Between Spiritual Health and Pain Self-Efficacy in patients with Chronic Pain: A Cross-Sectional Study in West of Iran. *J Relig Health*. 2020;**59**(2):1115–25. [PubMed ID: 31087227]. <https://doi.org/10.1007/s10943-019-00833-7>.
- Hatefi M, Parvizi R, Borji M, Tarjoman A. Effect of Self-Management Program on Pain and Disability Index in Elderly Men with Osteoarthritis. *Anesth Pain Med*. 2019;**9**(4): e92672. [PubMed ID: 31750095]. [PubMed Central ID: PMC6820295]. <https://doi.org/10.5812/aapm.92672>.
- Salehifar E, Hazeqhpasand R, Keyhanian S, Ala S, Ahangar N. [Evaluating Pain Management among Cancer Patients in a Chemotherapy Center]. *J Mazandaran Univ Med Sci*. 2017;**27**(150):89–97. Persian.
- Puetzler J, Feldmann RJ, Brascher AK, Gerhardt A, Benrath J. Improvements in health-related quality of life by comprehensive cancer pain therapy: a pilot study with breast cancer outpatients under palliative chemotherapy. *Oncol Res Treat*. 2014;**37**(9):456–62. [PubMed ID: 25231685]. <https://doi.org/10.1159/000365537>.
- Kim S, Kang J, Choi J, Kong E. The effects of ketamine on pain control in stage IV cancer patients receiving palliative care. *Kosin Med J*. 2022;**37**(1):37–45. <https://doi.org/10.7180/kmj.21.003>.
- Kenfield M, Zacharias N, Abd-Elseyed A. Intrathecal Drug Delivery for the Treatment of Cancer-Associated Chronic Pain in Children. *Neuromodulation*. 2023;**26**(6):1153–63. [PubMed ID: 34520605]. <https://doi.org/10.1111/ner.13535>.
- Tola YO, Chow KM, Liang W. Effects of non-pharmacological interventions on preoperative anxiety and postoperative pain in patients undergoing breast cancer surgery: A systematic review. *J Clin Nurs*. 2021;**30**(23-24):3369–84. [PubMed ID: 33942405]. <https://doi.org/10.1111/jocn.15827>.
- Yang J, Wahner-Roedler DL, Zhou X, Johnson LA, Do A, Pachman DR, et al. Acupuncture for palliative cancer pain management: systematic review. *BMJ Support Palliat Care*. 2021;**11**(3):264–70. [PubMed ID: 33441387]. [PubMed Central ID: PMC8380897]. <https://doi.org/10.1136/bmjspcare-2020-002638>.
- Oldenmenger WH, Geerling JJ, Mostovaya I, Vissers KCP, de Graeff A, Reyniers AKL, et al. A systematic review of the effectiveness of patient-based educational interventions to improve cancer-related pain. *Cancer Treat Rev*. 2018;**63**:96–103. [PubMed ID: 29272781]. <https://doi.org/10.1016/j.ctrv.2017.12.005>.
- Husebo BS, Achterberg WP, Lobbezoo F, Kunz M, Lautenbacher S, Kappesser J, et al. Pain in patients with dementia: A review of pain assessment and treatment challenges. *Norsk Epidemiologi*. 2012;**22**(2):243–51. <https://doi.org/10.5324/nje.v22i2.1572>.
- Hosseinzadegan F, Shahbaz A, Jasemi M. [Survey of nurse's knowledge, attitude and practice in surgery wards toward assessment and management of patients' pain in teaching hospitals of urmia in 2016]. *Nurs Midwifery J*. 2017;**15**(8):620–9. Persian.
- Balta S, Unal-Ulutatar C, Mirzayeva S, Baskaya MC, Akyuz G. The reliability and validity of the Turkish version of the brief pain inventory-short form in patients with cancer pain. *Turk J Phys Med Rehabil*. 2022;**68**(2):214–21. [PubMed ID: 35989966]. [PubMed Central ID: PMC9366480]. <https://doi.org/10.5606/tftrd.2022.6634>.
- Majedi H, Dehghani SS, Soleyman-Jahi S, Emami Meibodi SA, Mireskandari SM, Hajiaghababaei M, et al. Validation of the Persian Version of the Brief Pain Inventory (BPI-P) in Chronic Pain Patients. *J Pain Symptom Manage*. 2017;**54**(1):132–138 e2. [PubMed ID: 28479416]. <https://doi.org/10.1016/j.jpainsymman.2017.02.017>.
- Rashidi Fakri F, Simbar M, Aghaei Meibodi F, Saei Ghare Naz M, Rashidi Fakri F. Correlation Between Brief Ppain Inventory (BPI) and Pelvic Girdle Questionnaire (PGQ) In Evaluation of Pelvic Girdle in Pregnant Women. *Avicenna J Nurs Midwifery Care*. 2020;**27**(6):415–23. <https://doi.org/10.30699/ajnm.27.6.415>.
- Jelsness-Jorgensen LP, Moum B, Grimstad T, Jahnsen J, Opheim R, Prytz Berset I, et al. Validity, Reliability, and Responsiveness of the Brief Pain Inventory in Inflammatory Bowel Disease. *Can J Gastroenterol Hepatol*. 2016;**2016**:5624261. [PubMed ID: 27446848]. [PubMed Central ID: PMC4930809]. <https://doi.org/10.1155/2016/5624261>.
- Balavandi F, Neystani B, Jamshidbeigi Y, Mozafri A. Comparing the effect of drugs atorvastatin and rosuvastatin on the level of laboratory markers acute coronary syndrome patients. *Eur Chem Commun*. 2022;**4**(9):894–9. <https://doi.org/10.22034/ecc.2022.336608.1399>.
- Mazlominezhad A, Moghadam FA. Evaluation of quality of life and self-efficacy in adolescents with amblyopia. *J Med Life*. 2022;**15**(4):499–503. [PubMed ID: 35646181]. [PubMed Central ID: PMC9126460]. <https://doi.org/10.25122/jml-2020-0035>.

25. Sayehmiri F, Starke RM, Eichberg DG, Ghanikolahloo M, Rahmatian A, Fathi M, et al. Comparison of microscopic and endoscopic resection of third-ventricular colloid cysts: A systematic review and meta-analysis. *Clin Neurol Neurosurg.* 2022;**215**:107179. [PubMed ID: 35220036]. <https://doi.org/10.1016/j.clineuro.2022.107179>.
26. Nourmohammadi H, Motaghi M, Borji M, Tarjoman A, Soltany B. The Effects of Reflexology on Fatigue Severity of Patients with Cancer. *Asian Pac J Cancer Prev.* 2019;**20**(2):391–4. [PubMed ID: 30803197]. [PubMed Central ID: PMC6897012]. <https://doi.org/10.31557/APJCP.2019.20.2.391>.
27. Saade LJ, Tfayli A. Pneumonitis in Non-Small Cell Lung Cancer Patients Receiving Atezolizumab Post Chemo-Radiation. *Asian Pac J Cancer Prev.* 2023;**24**(3):737–40. [PubMed ID: 36974525]. [PubMed Central ID: PMC10334090]. <https://doi.org/10.31557/APJCP.2023.24.3.737>.
28. Basim S, Kasim AA. Cytotoxic Activity of the Ethyl Acetate Extract of Iraqi Carica papaya Leaves in Breast and Lung Cancer Cell Lines. *Asian Pac J Cancer Prev.* 2023;**24**(2):581–6. [PubMed ID: 36853308]. [PubMed Central ID: PMC10162622]. <https://doi.org/10.31557/APJCP.2023.24.2.581>.
29. Di Maio M, Gridelli C, Gallo C, Manzione L, Brancaccio L, Barbera S, et al. Prevalence and management of pain in Italian patients with advanced non-small-cell lung cancer. *Br J Cancer.* 2004;**90**(12):2288–96. [PubMed ID: 15162156]. [PubMed Central ID: PMC2409536]. <https://doi.org/10.1038/sj.bjc.6601810>.
30. Nishiura M, Tamura A, Nagai H, Matsushima E. Assessment of sleep disturbance in lung cancer patients: relationship between sleep disturbance and pain, fatigue, quality of life, and psychological distress. *Palliat Support Care.* 2015;**13**(3):575–81. [PubMed ID: 24524428]. <https://doi.org/10.1017/S1478951513001119>.
31. Kawaguchi T, Matsumura A, Fukai S, Tamura A, Saito R, Zell JA, et al. Japanese ethnicity compared with Caucasian ethnicity and never-smoking status are independent favorable prognostic factors for overall survival in non-small cell lung cancer: a collaborative epidemiologic study of the National Hospital Organization Study Group for Lung Cancer (NHSGLC) in Japan and a Southern California Regional Cancer Registry databases. *J Thorac Oncol.* 2010;**5**(7):1001–10. [PubMed ID: 20526205]. <https://doi.org/10.1097/JTO.0b013e3181e2f607>.
32. Hoffman AJ, Given BA, von Eye A, Gift AG, Given CW. Relationships among pain, fatigue, insomnia, and gender in persons with lung cancer. *Oncol Nurs Forum.* 2007;**34**(4):785–92. [PubMed ID: 17723980]. <https://doi.org/10.1188/07.ONF.785-792>.
33. Wang X, Ma X, Yang M, Wang Y, Xie Y, Hou W, et al. Proportion and related factors of depression and anxiety for inpatients with lung cancer in China: a hospital-based cross-sectional study. *Support Care Cancer.* 2022;**30**(6):5539–49. [PubMed ID: 35318530]. [PubMed Central ID: PMC9046329]. <https://doi.org/10.1007/s00520-022-06961-3>.
34. Kiatpanabhikul T, Bunyayothin W. Prevalence and Factors Associated with the Loss of PTEN Expression in Patients with Lung Cancer. *Siriraj Med J.* 2022;**74**(1):48–63. <https://doi.org/10.33192/Smj.2022.7>.
35. Zhang B, Li X, Ma Z, Zhang S, Song X, Gao H, et al. Prevalence and management of pain in lung cancer patients in northern China: A multicenter cross-sectional study. *Thorac Cancer.* 2022;**13**(11):1684–90. [PubMed ID: 35579111]. [PubMed Central ID: PMC9161334]. <https://doi.org/10.1111/t759-7714.14444>.
36. Orujlu S, Hassankhani H, Rahmani A, Sanaat Z, Dadashzadeh A, Allahbakhshian A. Barriers to cancer pain management from the perspective of patients: A qualitative study. *Nurs Open.* 2022;**9**(1):541–9. [PubMed ID: 34657391]. [PubMed Central ID: PMC8685847]. <https://doi.org/10.1002/nop2.1093>.
37. Sukrueangkul A, Phimha S, Panomai N, Laohasiriwong W, Sakphisutthikul C. Attitudes and Beliefs of Cancer Patients Demanding Medical Cannabis Use in North Thailand. *Asian Pac J Cancer Prev.* 2022;**23**(4):1309–14. [PubMed ID: 35485690]. [PubMed Central ID: PMC9375599]. <https://doi.org/10.31557/APJCP.2022.23.4.1309>.