Discrepancy in perception of symptoms among patients and medical staff after lung cancer surgery

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Abstract

Context:

Patients undergoing surgery for lung cancer experience a variety of symptoms such as pain and coughing, which interfere patients' daily function after surgery. However, there may be some differences between the perception of symptoms by medical staff and the actual situation of patients.

Objectives

This study aimed to investigate patient's experiences after lung cancer surgery and analyze whether the perception of postoperative symptoms by the medical staff differed from that reported by patients.

Methods

Semi-structured qualitative interviews concerning in-hospital experiences were conducted from June 2018 to October 2019 in 39 patients undergoing lung cancer surgery at the Sichuan Cancer Hospital. Moreover, 22 thoracic medical staff were instructed to answer open questions about their perception of symptoms related to the lung cancer surgery. Types and frequencies of symptoms from patients and medical staff were compared.

Results

Thirty-nine patients were interviewed, and 22 medical staff from the Department of Thoracic Surgery were investigated. The most frequent patient-reported symptoms were pain (967 times, 39 patients, 100%), coughing (904 times, 37 patients, 94.87%), shortness of breath (491 times, 35 patients, 89.74%), disturbed sleep (412 times, 34 patients, 87.18%), and interference with walking (347 times, 36 patients, 92.31%). Of the above symptoms, four were perceived by medical staff, whereas interference with walking was replaced by fatigue.

Conclusion

Although the medical staff and patients had a certain consensus on main symptoms, differences in perception still exist. Medical staff need to pay more attention to postoperative interference with walking.

Introduction

Lung cancer is a malignant tumor with the highest morbidity and mortality globally. The incidence rate and mortality rate of lung cancer ranked the first in 2015, with 610,000 deaths reported, accounting for 37.5% of the total deaths worldwide. The overall 5-year survival rate of lung cancer is only 18.1% [1]. Globally, a major problem concerning lung cancer is the development of viable solutions to improve the survival rate of patients with lung cancer. Surgery is the most common treatment for lung cancer, and more than 100,000 patients with lung cancer undergo surgical treatment annually in China [2]. The survival rate of patients with lung cancer is significantly associated with the speed and quality of postoperative rehabilitation and whether adjuvant treatment (return to intended oncologic therapy) can be initiated and completed on time [3, 4]. Severe symptom burdens lead to increased emergency department visits for patients with lung cancer [5] and have a negative impact on patient outcomes, including survival [6].

Perioperative recovery management based on traditional "treatment" usually evaluates the effect of medical programs with indicators such as length of stay, postoperative complications, and readmission rate. It does not cover the expectation of patients for "rehabilitation" and cannot be used to monitor the whole process of postoperative rehabilitation of modern tumor

surgery [7, 8]. Clinicians are often unaware of patients' symptoms [9, 10, 11, 12], and a previous study has indicated that ward nurses fail to identify 80% of these symptoms [13]. Even when symptoms are recognized, they may be under-documented and under-treated, and medical staff may underestimate patient experiences [14]. The discrepancy in symptom perception between patients and medical staff leads to poor symptom control [15, 16].

When compared with biological and other clinical outcome indicators, symptoms and function status reported by patients were more accurate [17]. Patient-reported outcome (PRO) is directly derived from patients' subjective evaluation of their own health status and treatment results without explanation from medical professionals [18]. As one of the new clinical outcome assessments recommended by US FDA [19], PRO has been used in clinical research, drug approval, and medical service quality evaluation in Europe [20] and America because of its reliability, sensitivity, and feasibility in measuring patients' symptoms and daily functions [21]. The latest large-scale clinical trials show that the application of PRO symptom monitoring and early warning in patients with advanced cancer can not only improve the quality of life (QOL) but also significantly prolong the survival of patients [22]. At present, the domestic and foreign cancer perioperative rehabilitation management is still based on the traditional "treatment" theory. Although some PRO indicators such as QOL are introduced, there is no systematic method to standardize the evaluation of "comprehensive rehabilitation" combined with patients' expectation.

Our study aimed to demonstrate the experiences of patients with lung cancer during the perioperative hospital stay and to investigate if the medical staff's perception was different from that of patients. Simultaneously, the study aimed to reduce the differences concerning symptom perception between the patients and the medical staff to enable the medical staff to manage symptoms more accurately and to ensure that patients achieve better perioperative medical experience and a better prognosis.

Methods

Participants

The study was approved by the Ethics Committee of Sichuan Cancer Hospital (No. SCCHEC-02-2018-043) prior to its initiation. The inclusion criteria for patients were as follows: patients aged ≥ 18 years, patients who were pathologically diagnosed with lung cancer, patients undergoing either video-assisted thoracic surgery (VATS) or thoracotomy surgery, and patients who can understand the content of the study. Before being recruited, each participant was informed of the purpose, method, and content of the study and could voluntarily participate in the study. Each recruited patient signed the paper version of the informed consent before being interviewed.

The medical staff involved in the study included doctors and nurses from the Department of Thoracic Surgery. Prior to conducting the study, all participating medical staff were informed about the study and signed the written informed consent form.

Data collection of patients

Patients were recruited and interviewed from November 2018 to October 2019. Each patient was interviewed by a medical staff who was trained with qualitative interviewing methods. Before the interview, patients' basic clinical characteristics such as age, sex, body mass index, educational level, medical insurance type, smoking status, drinking history, American Society of Anesthesiologists classification score, and surgical history were collected by asking patients and consulting patients' medical records. Qualitative one-to-one or one-to-many (including families) interviews were conducted by the trained medical staff in the doctor's private office. The duration of the interview was 20–30 minutes per patient, and it was conducted while following semi-structured interview guidelines, mostly a day before the patients were discharged from the hospital. Interviewers used the interview outline (Appendix 1 details the questions for qualitative semi-structured interviews) to ask patients to describe their perioperative experience, including their symptoms, interference of daily function, worries, and anything else they want to share. The interviewers may ask additional probe questions as needed to elicit clear descriptions of the patient experience. At the end of the interview, patients were offered the opportunity to discuss any symptoms they have forgotten to mention. All qualitative interviews were recorded in an audio form for further analysis.

Investigation of medical staff

From February 2020 to March 2020, participating medical staff who had more than 1-year work experience were investigated to list the symptoms of lung cancer surgery based on their own experience and perception. There was no overlap between the investigated medical staff and the medical staff who interviewed the patients, to ensure the results are not affected by bias.

The investigated medical staff signed the informed consent form, and their interviews comprised two parts. Part I included a basic information survey of the medical staff's sex, age, occupation, highest educational level, number of years of thoracic surgery experience (from the date of internship), and professional title. Part II of the interview involved symptom investigation, wherein the interviewees were instructed to write down in order by severity what they thought were the five most frequently observed symptoms in patients undergoing surgery for lung cancer during postoperative hospitalization and within 3 months after discharge, respectively.

Data analysis

The audiotaped patient interviews were professionally transcribed into text by a third-party transcription vendor, and the transcripts were verified by manual verbatim with two researchers. The transcript text were then coded by two researchers independently. A and B coded the same transcripts (two transcripts in all) using the developed codebook. Inter-rater reliability tests were performed using NVivo 12 (QSR International. 2020. http://www.qsrinternational.com), and the established Cohen's κ coefficient among the three coders ranged from 0.74 to 0.78. The two authors then coded the remaining transcripts independently. If the codes from two researchers were inconsistent, they discussed with a third researcher and reached a consensus. The frequency and numbers of occurred items and number of covered patients were extracted from the text information. Finally, a comprehensive list of items obtained by qualitative interviews related to designated patients was generated. Qualitative data were analyzed using qualitative software, NVivo 12. We used the grounded theory approach to analyze the data [23]. We chose this approach to generate a theorical framework of the perceived impact of mindful leadership in clinical practice. The grounded theory approach uses machined and manual coding (judgment, labeling, and categorizing). Clinician's perceptions of the top five symptoms were described using the frequencies (%) for categorical variables. All data analyses were performed using the statistical software Statistical Analysis System (version 9.4).

Results

Baseline demographic

All patients received surgical treatment and were pathologically diagnosed with lung cancer. Among them, 34 (87.18%) patients underwent VATS, three (7.7%) underwent thoracotomy surgery, and two (5.1%) underwent VATS converted to thoracotomy. There were eight (20.5%) and six patients who underwent segmentectomy and sleeve resection, respectively. After lung cancer surgery, 39 patients, including 24 (61.5%) females and 15 (38.5%) males, aged between 42 and 82 years underwent semi-structured interviews about their experience and related events in the hospital. A total of 22 medical staff (10 [45.5%] male surgeons and 12 [54.5%] female nurses) aged between 21 and 50 years with ≥ 1 year of experience in the Department of Thoracic Surgery filled out the survey forms based on their daily observations and perception of lung cancer surgery-related symptoms. Table 1 details the baseline demographic of interviewed patients and the investigated medical staff.

Table 1
Sample demographic characteristics

Characteristics	
Patients (n = 39)	
Age (years), median (IQR)	57.03 (42.29–82.26)
Sex	24 (61.5%)
Male	15 (38.5%)
Female	
BMI (kg/m^2), median (IQR)	22.60 (18.20–34.10)
Educational level	20 (51.3%)
Middle school graduate or below	16 (41.2%)
Above middle school graduate	3 (7.7%)
Unknown	
Medical insurance type	20 (51.3%)
Employee medical insurance	9 (23.1%)
Resident medical insurance	7 (17.9%)
Rural medical insurance	3 (7.7%)
Unknown	
Smoking status	21 (53.8%)
Never smoker	13 (33.3%)
Current smoker	5 (12.8%)
Former smoker	
Drinking history	27 (69.2%)
No	12 (30.8%)
Yes	
ASA classification	11 (28.9%)
I	25 (65.8%)
II	2 (5.3%)
III	
Surgical history	37 (94.9%)
No	2 (5.1%)
Yes	
Medical staff who filled out the questionnaires (n = 22)	

BMI, body mass index

ASA, American Society of Anesthesiologists

Characteristics	
Sex	10 (45.5%)
Male	12 (54.5%)
Female	
Age	5 (22.7%)
18 ~ 25	10 (45.5%)
26 ~ 30	3 (13.6%)
31 ~ 40	4 (18.2%)
40 ~ 50	0 (0%)
50	
Occupation	10 (45.5%)
Surgeon	12 (54.5%)
Nurse	
Highest educational level	13(59.1%)
College	3(13.6%)
Master	5(22.7%)
Doctor	1(4.5%)
Missing	
Years of work experience	4(18.2%)
1–5	6(27.3%)
5–8	3(13.6%)
8–10	3(13.6%)
10–15	6(27.3%)
Over 15	
Professional titles	2(9.1%)
Senior	1(4.5%)
Deputy senior	11(50.0%)
Intermediate	7(31.8%)
Primary	1(4.5%)
None	
BMI, body mass index	
ASA, American Society of Anesthesiologists	

Symptoms reported by the patient

Twenty-seven types of postoperative lung cancer-related symptoms were reported by patients in semi-structured interviews, of which 10 (10/27, 37.04%) were mentioned by more than half of the patients. The top five most frequently mentioned symptoms included pain (967 times, 39 patients, 100%), coughing (904 times, 37 patients, 94.87%), shortness of breath (491

times, 35 patients, 89.74%), disturbed sleep (412 times, 34 patients, 87.18%), and interference with walking (347 times, 36 patients, 92.31%).Table 2 **and** Fig. 1 present the symptoms experienced by interviewed patients.

Table 2
Symptom frequency and number of patients who reported a symptom

Symptoms	Frequency (times)	Mentioned patients (n)	Mentioned patients (%)
Pain	967	39	100.00
Coughing	904	37	94.87
Shortness of breath	491	35	89.74
Disturbed sleep	412	34	87.18
Walking	347	36	92.31
Lack of appetite	310	31	79.49
Constipation	306	29	74.36
Anxiety	199	24	61.54
Fatigue	177	30	76.92
Dry mouth	135	16	41.03
Fever	104	12	30.77
Drowsiness	86	20	51.28
Night sweating	75	12	30.77
Hoarseness	69	10	25.64
Dizziness	62	10	25.64
Distress	61	15	38.46
Abdominal distention	56	13	33.33
Swollen wound	39	2	5.13
Hemoptysis	38	6	15.38
Diarrhea	35	3	7.69
Dyspnea	23	7	17.95
Nausea	18	5	12.82
Itchy throat	17	9	23.08
Vomiting	12	3	7.69
Air leakage	10	3	7.69
Atrial fibrillation	10	2	5.13
Remembering things	7	4	10.26

Postoperative pain

Pain was a symptom mentioned by all interviewed patients and had the highest frequency among all the symptoms. As shown in indicative quotations in **Table S1**, according to the patients, the pain they experienced was related to surgical wounds. Pain

was among the most influential symptom experienced by patients after operation. Although we performed more individualized pain management based on routine intervention, there were significant differences in the severity of pain reported by different patients.

Some patients did not feel much pain after the operation (e.g., patient nos. 22, 31, 39 in **Table S1**), whereas others (e.g., patient nos. 6, 16 in **Table S1**) reported that the pain was significantly severe that it was unbearable even with the administration of analgesic pumps and painkillers. Some patients reported that pain was significantly relieved after the removal of the thoracic drainage tube (e.g., patient no. 22 in **Table S1**), but others reported that there was no significant difference in the degree of pain before and after the removal of the chest drainage tube (e.g., patient no. 31 in **Table S1**). The severity of patients' pain was also related to the time during the day. Some patients stated that the pain they experienced was more evident in the afternoon until nighttime (e.g., patient no. 22 in **Table S1**), and some patients reported that it was most evident during the fourth or fifth day after the operation (e.g., patient no. 39 in **Table S1**).

Coughing

Postoperative coughing was also one of the most common postoperative symptoms. **Table S2** shows some indicative quotations about coughing. Some patients even considered coughing to be the most influential postoperative symptom during their stay in the hospital (e.g., patient no. 29 in **Table S2**). Some patients reported stimulating dry cough (e.g., patient nos. 1, 29 in **Table S2**), while others reported coughing with expectoration (e.g., patient no. 8 in **Table S2**).

A few patients believed that increased sputum after the operation may be related to long-term smoking (e.g., patient no. 8 in **Table S2**). The time period during which the patients experienced the most severe cough differed. Some patients reported that the severity of cough they experienced after the operation gradually reduced over time (e.g., patient no. 13 in **Table S2**), whereas other patients stated that they experienced severe cough for few days after the operation (e.g., patient no. 1, 19 in **Table S2**), accompanied by increased body temperature and lung infection (e.g., patient no. 19 in **Table S2**). Additionally, concerning the time during the day, some patients reported that their cough was particularly severe at night (e.g., patient no. 1 in **Table S2**), whereas others reported that they coughed mainly during the day and did not cough at all at night (e.g., patient no. 29 in **Table S2**). More than one patient mentioned the association between their cough and body posture. According to them, cough was significantly associated with a particular position. Some patients reported that coughing was more evident when they were lying down (e.g., patient no. 8 in **Table S2**), whereas others mentioned that coughing was more evident when they lay on their side (e.g., patient no. 29 in **Table S2**).

Shortness of breath

Many patients reported shortness of breath after surgery. **Table S3** shows the quotations about disturbed sleep from some patients. Shortness of breath was the third most mentioned symptom after pain and coughing. According to the patients, shortness of breath began to appear in different situations. Some patients had shortness of breath while lying in bed after surgery (e.g., patient nos. 2, 18, 26 in **Table S3**), whereas others did not feel shortness of breath until they walked around (e.g., patient nos. 13, 34 in **Table S3**). Some patients reported that raising their upper body could help relieve shortness of breath (e.g., patient no. 2 in **Table S3**), whereas others stated that effective expectoration relieved shortness of breath (e.g., patient no. 18 in **Table S3**). Shortness of breath significantly affected patient's performance after surgery, and some patients considered shortness of breath to be the most serious symptom during their postoperative recovery (e.g., patient no. 26 in **Table S3**). According to the patients, shortness of breath was particularly disruptive during sleeping (e.g., patient nos. 2, 18 in **Table S3**) and walking after surgery (e.g., patient no. 13 in **Table S3**, patient no. 36 in **Table S5**).

Disturbed sleep

According to our interviews with patients before discharge, most patients experienced disturbed sleep to varying degrees post-surgery. According to the patients, postoperative pain (e.g., patient no. 6 in **Table S1**, patient no. 3 in **Table S4**), coughing (e.g., patient no. 8 in **Table S2**, patient nos. 3, 20 in **Table S4**), shortness of breath (e.g., patient no. 18 in **Table S3**), worries about their own condition (e.g., patient no. 33 in **Table S4**), and other worries (e.g., patient no. 3 in **Table S4**) all disturbed sleep to varying degrees, among which pain, coughing, and shortness of breath were most commonly mentioned. Simultaneously,

some patients (e.g., patient no. 20 in **Table S4**) suspected that anesthesia during surgery was a factor affecting poor sleep management after surgery. Moreover, it is worth mentioning that a small number of patients (e.g., patient no. 33 in **Table S4**) believed that the surgery treated their disease, removed their worries, and reduced their psychological burden, so they actually slept better after the surgery. **Table S4** shows the quotations from some patients about disturbed sleep.

Interference with walking

During the interview, patients frequently mentioned the effects of thoracic drainage tubes on walking and mentioned that removal of the tubes increased their pace while walking and helped them cover longer distances (e.g., patient nos. 36, 37 in **Table S5**). Patients reported that chest drainage tubes often affected their convenience of moving around (e.g., patient no. 37 in **Table S5**). Additionally, pain was another factor that affected walking. Patients were reluctant to move or walk slowly because of pain (e.g., patient no. 27 in **Table S5**). Shortness of breath was also a factor leading to interference while walking; some patients stopped to rest because they felt shortness of breath during walking (e.g., patient no.34 in **Table S3**). **Table S5** shows some of the quotations from patients concerning interferences while walking.

Symptoms mentioned by 22 interviewed medical staff

Table 3 shows the frequency of symptoms mentioned by 22 medical staff and the corresponding number of medical staff. During hospitalization, the top five commonly mentioned symptoms were pain (22 times), shortness of breath (17 times), coughing (18 times), chest tightness (11 times), and fatigue (8 times), similar with disturbed sleep (8 times). Within 3 months after discharge, the top five symptoms were shortness of breath (18 times), coughing (17 times), fatigue (17 times), pain (16 times), and disturbed sleep (14 times). In the survey of medical staff, interference with walking was not mentioned once during the hospital stay and was mentioned only twice within 3 months after discharge (Table 3, Fig. 2, Fig. 3**)**.

Table 3
Symptom frequencies of the 22 medical staff who were investigated

Symptoms	Frequency (times)			Number of involved medical staff		
	Hospitalization	Within 3 months after discharge	Overall	Hospitalization	Within 3 months after discharge	Overall
Pain	22	16	38	22	16	22
Shortness of breath	17	18	35	17	17	19
Coughing	18	17	35	18	17	20
Fatigue	8	17	25	8	17	19
Disturbed sleep	8	14	22	8	14	14
Chest tightness	11	9	20	11	9	14
Anxiety	3	9	12	3	9	9
Lack of appetite	3	5	8	3	5	7
Constipation	4	1	5	4	1	4
Hemoptysis	4	0	4	4	0	4
Dyspnea	3	0	3	3	0	3
Abdominal distention	3	0	3	3	0	3
Walking	0	2	2	0	2	2
Dry mouth	2	0	2	2	0	2
Sore throat	1	0	1	1	0	1
Palpitations	1	1	2	1	1	2
Fever	1	0	1	1	0	1
Diarrhea	1	0	1	1	0	1

Discussion

In this study, 27 items of symptom burden and interference during daily functions of patients after lung cancer surgery were generated through a semi-structured qualitative interview. The study interviewed doctors and nurses on their perception of patients' symptoms through interviews. Among the top five symptoms reported by the patients in the hospital, four were perceived by medical staff. The result of the present study is inconsistent with those of previous studies demonstrating that medical staff were often unaware of patients' symptoms [9, 10, 11, 12] and ward nurses failed to identify 80% of these symptoms [18]. This study may indicate that the perception difference between medical staff and patients is reduced. However, the discrepancy on "ability to walk" suggested that clinicians should pay more attention to patients' returning to normal life after surgery for a better QOL as survival time of patients with cancer has been significantly improved [24].

We found out that there was a difference in the perception of postoperative symptoms between the medical staff and patients. Patients frequently mentioned disturbed sleep and interference with walking in the interview, but the investigated medical staff did not pay sufficient attention to interference with walking. This suggests that the medical staff may have underestimated the recovery of patients' daily functions, whereas from the patient's perspective, recovery was defined as the return to normal life [25].

Additionally, interference with patients' daily functioning is associated with symptom burden, and severe symptom burdens can lead to impaired daily functioning. Simultaneously, the disturbance of symptom burden and daily function of patients is intense and rapid and is associated with several factors such as surgical approaches [26, 27].

Based on the interviews, it can be concluded that the time, severity, and influencing factors of postoperative pain are highly different among patients. Bendixen et al. have suggested that VATS is associated with less postoperative pain and better QOL than anterolateral thoracotomy for the first year after surgery [27], whereas another study has reported postoperative pain scores did not differ between the two different modalities in surgery for non-small cell lung cancer (NSCLC) [28]. The management and intervention of postoperative pain should also be more individualized, so that the process of postoperative recovery of patients is more stable. Although almost 90% of patients were satisfied with their painkiller treatment, nearly 25% of patients experienced adverse reactions [29].

In addition to pain, cough is another common pain reported by patients after lung cancer surgery. Frequent and persistent cough will not only cause wound pain and affect sleep but also further aggravate patients' psychological burden. Lin's study has shown that female sex, duration of anesthesia over 164 minutes, lower paratracheal node resection, and subcarinal node resection were independent risk factors associated with cough in patients with NSCLC after VATS [30]. The surgeon's control of the patient's procedure during operation is significantly important to reduce the burden of cough symptoms after surgery. Patients undergoing lung cancer surgery often experience a dry, hacking cough, which is usually refractory to opioid cough suppressors such as codeine. Treatment with an inhaled corticosteroid plus β2 agonist appeared to be highly effective in the treatment of persistent cough experienced after pulmonary resection and had no adverse effects [31]. Moreover, some traditional Chinese medicine such as Maekmoondong-tang are also reported to have immunomodulatory and antitussive effects and are widely used in East Asian countries to treat chronic dry cough [32].

Shortness of breath is a manifestation of impaired lung function; however, shortness of breath is not a specific symptom. Asthma, heart failure and myocardial ischemia, chronic obstructive pulmonary disease, interstitial lung disease, pneumonia, or psychogenic disorders can also cause shortness of breath [33]. For elderly patients after lung cancer surgery, when patients repeatedly experience more serious chest sulking and shortness of breath, especially when combined with chest pain, doctors should be alert and pay attention to the screening of heart-related diseases.

Conclusion

Medical staff and patients agreed on the core symptoms after lung cancer surgery including pain, cough, and shortness of breath. However, medical staff has not fully realized the great influence of walking in the postoperative recovery process of patients, which should be fully considered in clinic practice.

Limitations

First, this is a single-center study, and the patients interviewed and the doctors investigated were from Sichuan Cancer Hospital. Since medical staff and patients were from the same department, the symptoms they reported after surgery were similar. However, the results of this study may not be observed in other clinical institutions. Further studies with larger sample sizes and from different cities are required to make the results more generalizable.

Second, long-term follow-up of patients after discharge and collection of symptoms after discharge in this study were not included. The main symptoms of patients after discharge may be different from those during hospitalization.

Implications

This study generated some items of symptom burden and daily function interference of patients after lung cancer surgery through a qualitative interview. The study further proved the necessity for developing a specific assessment instrument for lung cancer surgery.

Declarations

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Conflicts of interest: The authors have no conflicts of interest to declare.

Availability of data and material: We are willing to share data, analytic methods, and study materials related to this article with other researchers. Provided that all of the above will not be used for commercial or profit purposes. Other researchers can contact the corresponding author of this article by email and indicate the required research materials and purpose. We will be glad to provide relevant materials for this study after approval and discussion.

Code availability: Inter-rater reliability tests and Qualitative data were analyzed using NVivo 12 (QSR International. 2020. http://www.qsrinternational.com)

Author's Contributions
Study concept and design: All authors
Acquisition, analysis, or interpretation of data: All authors
Drafting of the abstract: Xing Wei
Revising the article critically for important intellectual content: All authors
Final approval of the version to be published: All authors
Statistical analysis: HongfanYu
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Administrative, technical, or material support: Qiang Li, Qiuling Shi
Study supervision: Qiang Li, Qiuling Shi
Xing Wei and Hongfan Yu had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

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Consent to participate: Written informed consent was obtained from individual participants.

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Appendix

Appendix 1: *Leading questions for qualitative semi-structured interviews*

1. Please recall your symptoms from the day of the operation to today.

If the patient is unable to describe in detail, use the following guide questions:

A. What are the symptoms you experienced after surgery?

B. Do these symptoms occur together or in sequence?

C. Do XX symptoms affect your actions?

D. When did XX's symptoms subside?

E. Which symptom do you think is the most serious? Why is that?

F. What kind of activity limitation after surgery makes you feel most uncomfortable, such as walking, going to the bathroom, and washing?

2. Do you think your feelings during the operation and hospitalization are fully described?

3. Do you have any other feelings that you wish to tell us?

Figures

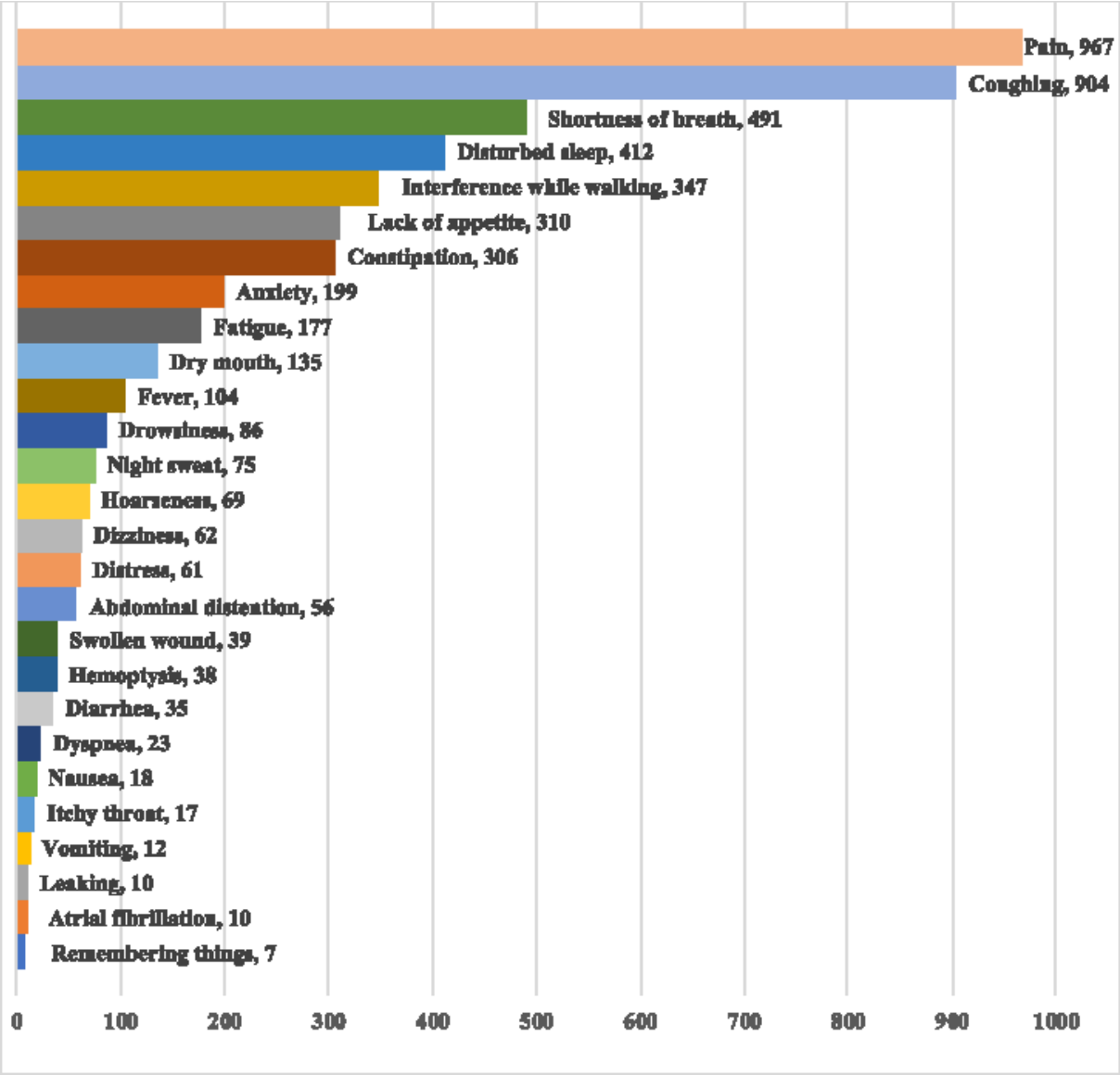

Figure 1

Symptom frequencies of the 39 interviewed patients

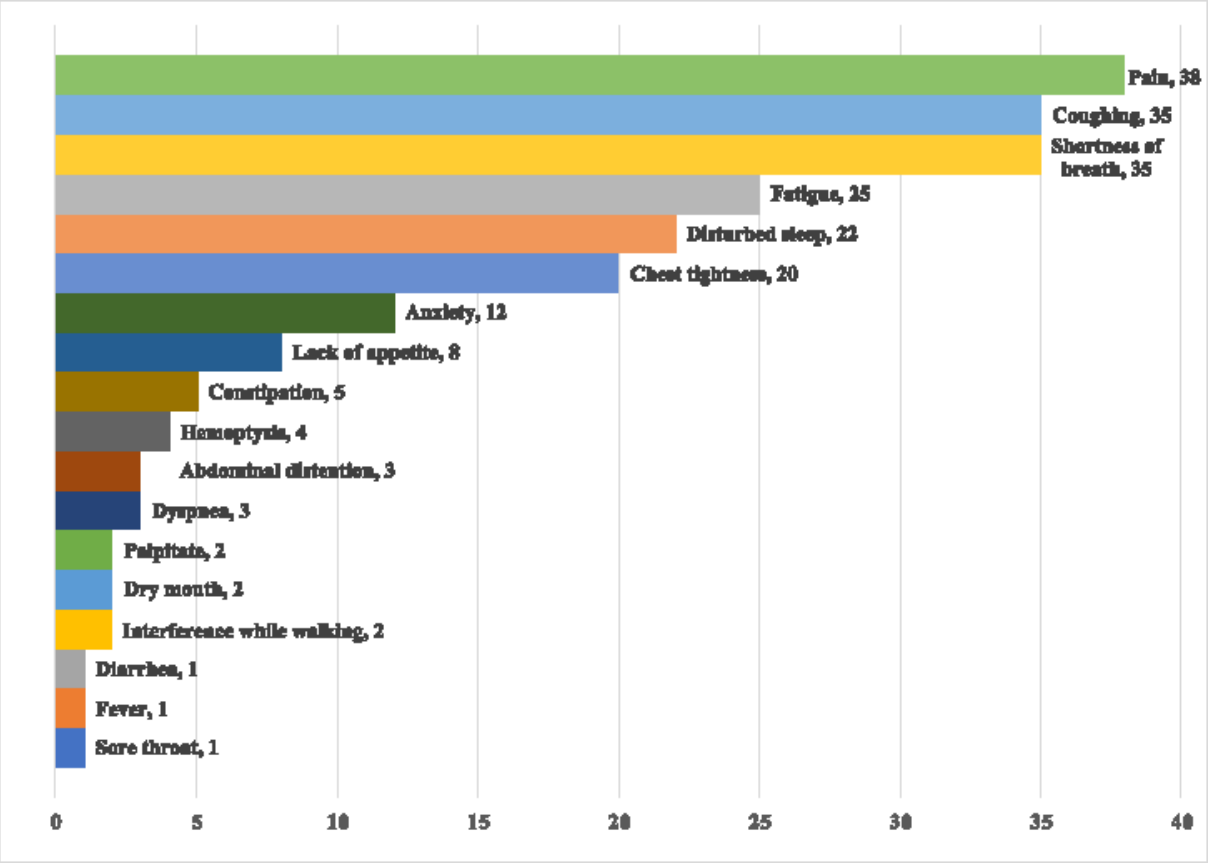

Figure 2

Symptom frequencies reported by the 22 surveyed medical staff

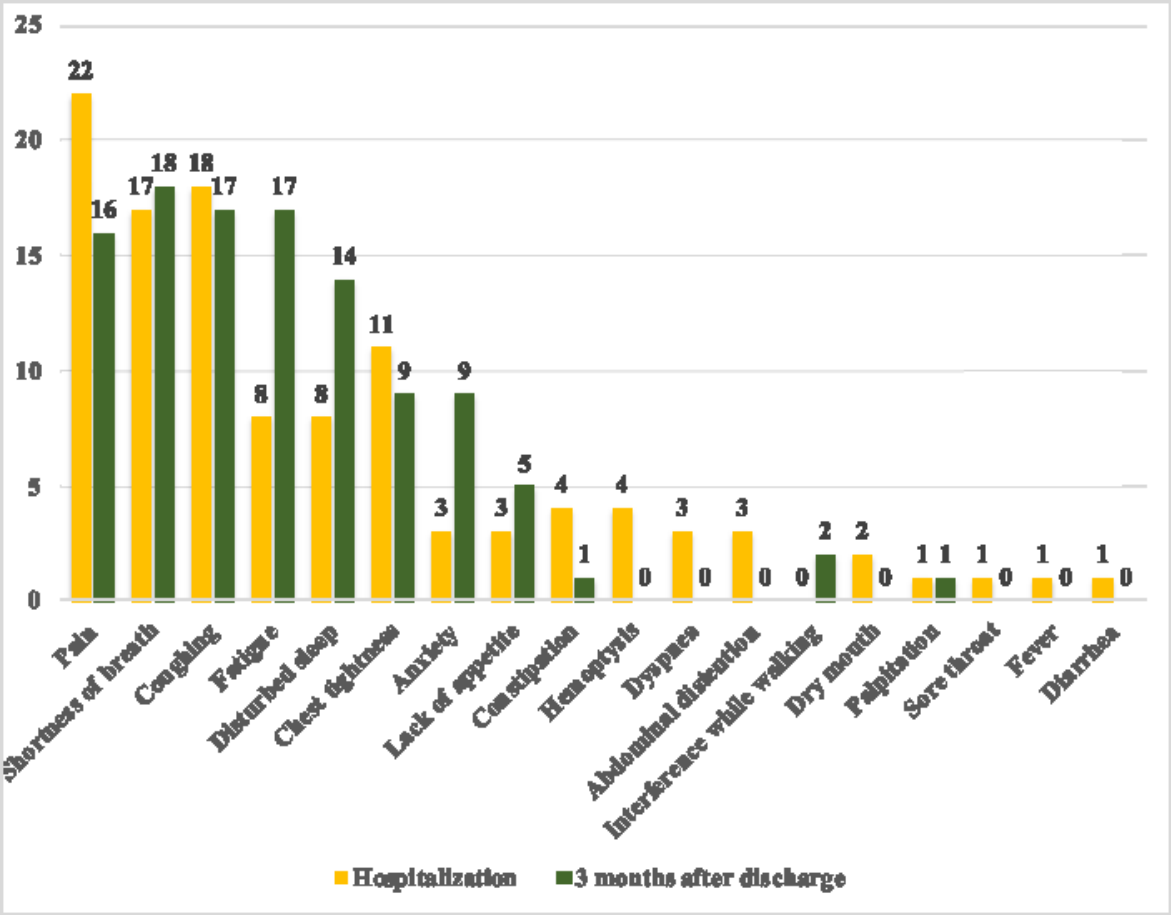

Figure 3

Symptom frequencies as reported by the medical staff during hospitalization and within 3 months after discharge

Supplementary Files

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- 0520210328SupplementaryTables.docx