

Article

The mediating effect of distress disclosure and recovery experiences on perceived social support and psychological distress in patients with lung cancer and COPD

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Abstract: Background: This study examines the factors contributing to psychological distress in elderly patients with lung cancer and comorbid COPD, while also investigating the mediating roles of distress disclosure and recovery experience in the relationship between perceived social support and psychological distress. The findings aim to inform clinical interventions for this population. **Methods:** From December 2021 to December 2024, 162 elderly patients diagnosed in our hospital with lung cancer accompanied by COPD were recruited as the research subjects. The general information Questionnaire, Perceived Social Support Scale (PSSS), Distress Disclosure Index (DDI), Recovery Experience Questionnaire (REQ) and Kessler Psychological Scale K10 (Kessler10) were used to conduct a cross-sectional survey. The data were statistically analyzed by chi-square test, binary logistics regression and linear regression, and the mediating effect was tested by Hayes' SPSS-Process program model 6. **Results:** 162 lung cancer patients with COPD were included in this study, of which 98 patients had psychological distress, accounting for 60.5%. The results showed that self-paid medical treatment, advanced cancer, and the presence of complications were the covariates affecting the psychological distress of patients. Results of the correlation analysis demonstrated that patients is perceived social support exhibited a positive correlation with distress disclosure and recovery experience, while showing a negative correlation with psychological distress. Bootstrap mediating effect test demonstrated that the total effect value of perceived social support on psychological distress in COPD patients with lung cancer was -0.890. Distress disclosure and recovery experience had a partial mediating effect between perceived social support and psychological distress, accounting for 19.3% and 22.9% of the mediating effect, respectively. **Conclusion:** Negative psychological problems such as psychological distress are still serious in elderly lung cancer patients with COPD. distress disclosure and recovery experience play a chain mediating role between perceived social support and psychological distress in elderly patients. Therefore, by improving distress disclosure and recovery experience, our efforts can enable them to better recognize the role of social support in relieving psychological distress and ultimately elevate their mental health status.

Keywords: Psychological distress; perceived social support; distress disclosure; recovery experience

1. Introduction

Lung cancer in COPD (chronic obstructive pulmonary disease) patients have a high incidence [1]. Multiple research works have indicated that the risk for these

patients rises, such as age or smoking [2–4]. The International Federation of Lung Cancer also showed that COPD was independently associated with small cell lung cancer (SCLC) after adjusting for older, male and smoking years [5]. Such patients suffer from physical torture such as cancer and breathing difficulties, and tend to develop psychological troubles such as psychological distress. Yoannes et al. [6] revealed that 96 elderly patients with COPD had a much higher occurrence of depression when contrasted with healthy elderly individuals or those elderly with other disabling conditions. Depression affects 20% to 60% of patients with COPD [7,8]. In addition, airway obstruction is highly associated with a higher incidence of generalized anxiety disorder or panic disorder [9]. The psychological problems of cancer and patients have also been relatively clear. Psychological problems are common complications of cancer [10]. These negative emotions can seriously affect patients' quality of life, treatment compliance, cancer survival rate, and treatment costs. Therefore, how to relieve the psychological distress of elderly patients with COPD complicated with lung cancer is an important clinical problem.

Perceived social support is usually defined as an individual's perception of being loved, encouraged and supported by positive emotions and satisfaction. Compared with objective social support, it can show a better effect on mental health [11], and is one of the most powerful psychosocial predictors of physical health outcomes [12]. A meta-analysis by Holt-Lunstad founds that individuals with higher perceived support and higher social integration had significantly lower mortality [13]. A study has shown that mental health is closely related to perceived social support, and the stronger the ability, the lighter the negative emotions of patients, and the more ideal the compliance behavior [14]. Therefore, improving patients' perceived social support level is an ideal way to improve patients' psychological distress and prognosis.

The recovery experience proposed by Sonnentag and Fritz contains four main aspects related to the recovery process. These four aspects are psychological alienation, relaxation, mastery and control [15]. Correlational studies provide sufficient evidence that all four recovery experiences are negatively associated with stress-related health problems, and positively associated with mental and physical health and performance [16]. As a positive psychological experience, recovery experience is a strategy for individuals to improve their emotional state under the action of negative factors. In addition, pain disclosure also has positive significance for the recovery of individual resource system in negative emotional recovery. Pain disclosure is a way for individuals to deal with emotions. Distress disclosure can activate brain regions related to reward and brain regions related to social cognition. Particularly those concerning psychological internalization and perspective-taking, this suggests that distress disclosure is a fulfilling behavior that holds inherent value for the individual. [17]. Within the realm of chronic illnesses, multiple research efforts have indicated that enhancing distress disclosure can lead to the attainment of a high-quality life. [18,19]. Research findings indicate that the distress disclosure serves as an intermediary variable linking social support and subjective well-being. Therefore, this study aims to investigate the current status of psychological distress in elderly lung cancer patients with COPD, so as to deeply explore the interaction mechanism among perceived social support, recovery experience, pain disclosure and psychological distress, and provide theoretical basis and practical guidance for

alleviating patients' psychological distress and improving their life quality.

2. Methods

2.1. Materials and methods

162 patients with lung cancer combined with COPD who were diagnosed pathologically and clinically in The Affiliated Wuxi People's Hospital from December 2021 to December 2024 were included in this study.

Inclusion criteria: (1) Patients with primary lung cancer diagnosed pathologically according to the "Guidelines for Diagnosis and Treatment of Primary Lung Cancer (2018 Edition)"; (2) Meet the COPD diagnostic criteria in the Guidelines for the Diagnosis and Treatment of Chronic Obstructive Pulmonary Disease (2013 Revision); (3) Age ≥ 60 years old; (4) Complete case data, no mental illness, can cooperate with treatment.

Exclusion criteria: (1) Presence of other primary tumors; (2) People with unstable vital signs or impaired consciousness; (3) Patients with missing case data and unable to cooperate with treatment.

This study is a cross-sectional survey. Referencing previous research endeavors and related literature records, the incidence of psychological distress in patients with lung cancer complicated with COPD is about 60%. The α is set at 5% and the confidence is 0.90. The sample size to be investigated is calculated by using PASS 15 software, $N1 = N2 = 73$ cases. Therefore, 162 patients were included in this study.

2.2. General information questionnaire

It included demographic data (such as gender, age, education level, place of residence, marital status, children, income, payment method) and clinical data (smoking history, drinking history, tumor type, TNM (Tumor Node Metastasis) stage, metastasis, complications, etc.). Complications include but are not limited to pleural effusion, pulmonary embolism, pneumonia, pulmonary encephalopathy, pericardial effusion, emaciation, infection, etc.

2.3. Perceived social support scale (PSSS)

This part uses the scale [20] compiled by Zimet et al. [21]. This scale is structured around three dimensions: family, friends, and others. It employs a 7 grades system ranging from 1 to 7. The overall score can vary from 12 to 84. A higher score indicates a greater level of perceived social support derived from all three sources. In the present study, the Cronbach's α coefficient of this scale was measured at 0.757.

2.4. The Kessler psychological distress scale K10

It was compiled by Kessler et al, University of Michigan, and the reliability. Kessler10 [22] contains a total of 10 items to assess the degree of psychological distress, each item is 1–5 points, the total score is 10–50 points, the score is proportional to the degree of psychological distress, ≤ 15 is divided into basically no psychological distress, >15 is divided into different degrees of psychological distress. Cronbach's α coefficient in this study was 0.860.

2.5. The recovery experiences questionnaire (REQ)

This is a 16-item instrument [23] measuring stress recovery capacity across four dimensions: psychological detachment, relaxation, mastery, and control (4 items each). Responses are recorded on a 5-point Likert scale (1 = “never” to 5 = “always”), yielding total scores between 16–80, where elevated scores reflect greater recovery ability. In the current investigation, the scale demonstrated excellent internal consistency ($\alpha = 0.904$).

2.6. The distress disclosure index

Developed by Kahn et al. [24], the Distress Disclosure Index (DDI) is a concise self-administered instrument designed to assess an individual’s inclination to reveal personal distressing experiences [25]. Comprising 12 items, this scale utilizes a 5-point Likert scoring system, with each item scored from 1 to 5. Notably, items 2, 4, 5, 8, 9, and 10 are negatively worded and require reverse scoring. The total score can range from 12 to 60, where higher scores reflect a stronger propensity for self-disclosure. Scores between 12 and 29 are categorized as low, 30–44 as moderate, and 45–60 as high. In the current study, the scale demonstrated a Cronbach’s α coefficient of 0.867, indicating good internal consistency.

2.7. Statistical analysis

SPSS 28 (IBM SPSS, USA) was used for statistical analysis. Measurement data were presented as the mean and standard deviation, while enumeration data were described using frequencies and percentages. Statistical analysis between groups was carried out using the chi-square test. Correlation analysis was performed using Spearman’s correlation method. The analysis of binary logistics regression and linear regression adopts the sequential test method to analyze the mediating role of social support, distress disclosure, recovery experience and psychological distress on the basis of controlling general data. The mediating effect was examined via the bias-corrected percentile Bootstrap approach implemented through the Process plug-in. Two-side P value <0.05 was considered statistically significant.

3. Results

3.1. Baseline data and scores on each scale

162 patients with lung cancer combined with COPD were included in this study. According to The Kessler Psychological Distress Scale K10 score, 98 patients, accounting for 60.5%, had psychological distress. There were 64 cases of non-psychological distress, accounting for 39.5%. Of all the patients, 91 were male and 71 were female. There was no significant difference in sex, age, monthly family income, marriage, place of residence, smoking history and tumor type between the two groups ($p > 0.05$). There were significant differences in education level, payment method of medical expenses, TNM stage, lymph node metastasis and complications between the two groups ($p < 0.05$). The education level of the patients with psychological distress was significantly higher than that of the other group. Patients with self-financing for treatment, patients with tumor stage III to IV, patients with lymph node metastasis, and

patients with complications were more likely to have psychological distress, as shown in **Table 1**. In this study, all patients had social support scores ranging from 18 to 76, Recovery Experiences scores ranging from 19 to 74, DDI scores ranging from 14 to 55, and Kessler10 scores ranging from 12 to 45. The maximum value and quartile of each scale are detailed in **Table 2**.

Table 1. Baseline data of two groups.

Item N (%)	Psychological distress group	Non-psychological distress group	t/X ²	P
Sex				
Female	40 (49.0)	31 (48.4)	0.132	0.716
Male	58 (51.0)	33 (51.6)		
Age(year)	67.15±6.56	68.54±7.03	1.035	0.526
Fertility or not				
Have children	89 (90.8)	58 (90.6)	0.002	0.967
No children	9 (9.2)	6 (9.4)		
Spouse or not				
Have spouse	80 (81.6)	50 (78.1)	0.301	0.584
No spouse or spouse death or divorce	18 (18.4)	14 (11.9)		
Education level				
High School and below	35 (35.7)	34 (53.1)	4.800	0.028
High School or above	63 (64.3)	30 (46.9)		
Address				
Countryside	30 (30.6)	24 (37.5)	0.927	0.363
City	68 (69.7)	40 (62.5)		
Monthly household income (yuan)				
<5000	48 (49.0)	29 (45.3)	0.209	0.648
≥5000	50 (51.0)	35 (54.7)		
Fee payment method				
Medical insurance	76 (77.6)	60 (93.8)	7.540	0.006
Self-financing	22 (22.4)	4 (6.2)		
Smoking history				
Yes	62 (63.3)	39 (60.9)	0.089	0.756
No	36 (36.7)	25 (39.1)		
Drinking history				
Yes	20 (20.4)	15 (23.4)	0.210	0.647
No	78 (79.6)	49 (72.6)		
Tumor type				
NSCLC	79 (80.6)	48 (75.0)	0.720	0.396
SCLC	19 (19.4)	16 (25.0)		
TNM staging				
I~II	63 (64.3)	51 (80.7)	4.405	0.036
III~IV	35 (35.7)	13 (20.3)		

Table 1. (Continued).

Item N (%)	Psychological distress group	Non-psychological distress group	t/X ²	P
Lymph node metastasis				
Yes	38 (38.8)	14 (21.9)	5.074	0.024
No	60 (61.2)	50 (78.1)		
With complications				
Yes	30 (30.6)	10 (15.6)	6.516	0.011
No	58 (69.4)	54 (84.4)		

NSCLC, Non-Small Cell Lung Cance; SCLC, Small Cell Lung Cancer; TNM, Tumor Node Metastasis.

Table 2. Patients' perceived social support, recovery experiences, DDI, and Kessler10 scores.

Item	Minimum value	Maximum value	Median (P25, P75)
Perceived social support	18.00	76.00	45.00 (27.00, 61.00)
Family support	6.00	20.00	12.00 (8.00, 17.00)
Friend support	4.00	18.00	11.00 (7.00, 16.00)
Other support	5.00	22.00	15.00(7.50, 19.50)
Recovery experiences	19.00	74.00	51.00 (31.00, 67.00)
Psychological detachment	4.00	17.00	10.00 (7.00, 14.00)
Relaxation	5.00	19.00	10.00 (7.00, 16.00)
Mastery	4.00	17.00	11.00 (6.50, 15.00)
Control	6.00	18.00	12.00 (8.00, 15.00)
DDI	14.00	55.00	37.00 (19.50, 48.00)
Kessler10	12.00	45.00	30.00 (19.00, 38.00)

DDI, Distress Disclosure Index; Kessler10, The Kessler psychological distress scale K10.

3.2. Correlation of the main study variables

According to the correlation analysis test, the results showed that the patients' perceived social support was positively correlated with distress disclosure and recovery experience, and negatively correlated with psychological distress ($p < 0.05$), as shown in **Table 3**.

Table 3. The main research variables and the correlation analysis of each dimension.

Item	Perceived social support	Family support	Friend support	Other support	Recovery experiences	Psychological detachment	Relaxation	Mastery	Control	DDI	Kessler10
Perceived Social Support	1.000	-	-	-	-	-	-	-	-	-	-
Family Support	0.827**	1.000	-	-	-	-	-	-	-	-	-
Friend Support	0.765**	0.318**	1.000	-	-	-	-	-	-	-	-
Other Support	0.723**	0.421**	0.353**	1.000	-	-	-	-	-	-	-
Recovery Experiences	0.668**	0.414**	0.492**	0.398**	1.000	-	-	-	-	-	-

Table 3. (Continued).

Item	Perceived social support	Family support	Friend support	Other support	Recovery experiences	Psychological detachment	Relaxation	Mastery	Control	DDI	Kessler10
psychological detachment	0.541**	0.339**	0.426**	0.271**	0.706**	1.000					
Relaxation	0.524**	0.313**	0.407**	0.378**	0.779**	0.265**	1.000	-	-	-	-
mastery	0.471**	0.411**	0.213**	0.358**	0.602**	0.113	0.209**	1.000	-	-	-
control	0.252*	0.220*	0.129	0.105	0.653*	0.134	0.262*	0.557**	1.000	-	-
DDI	0.724**	0.401**	0.552*	0.364**	0.064	0.039	0.047	0.028	-0.093	1.000	-
Kessler10	-0.724**	-0.477**	-0.594**	-0.426**	-0.510**	-0.302*	-0.210**	-0.394**	-0.351**	-0.652**	1.000

DDI, Distress Disclosure Index; Kessler10, The Kessler Psychological Distress Scale K10;
Note: - : Blank item; *: $P < 0.05$; **: $P < 0.01$.

3.3. Regression analysis

After controlling for covariates, perceived social support significantly negatively predicted psychological distress scores ($OR = 0.296, p = 0.025$), as shown in **Table 4**. Perceived social support significantly positively predicted the scores of distress disclosure and recovery experience ($B = 0.291, t = 6.319, p < 0.001$; $B = 0.751, t = 6.462, p < 0.001$), as shown in **Tables 5** and **6**. As shown in **Table 7**, perceived social support, distress disclosure, recovery experience, advanced tumor, complications and self-paid medical treatment were the main influencing factors of psychological distress in patients ($p < 0.05$). After including distress disclosure and recovery experience, the regression coefficient of perceived social support on psychological distress decreased, indicating that distress disclosure and recovery experience had a mediating effect between perceived social support and psychological distress.

Table 4. Binary logistics regression of perceived social support to psychological distress.

Related factor	B	SE	Wald	P	OR	95%CI	
						Upper	Lower
Perceived social support	-2.035	0.965	4.879	0.025	0.296	0.863	0.102
Education level	-1.913	0.876	4.345	0.030	0.178	0.926	0.064
Fee payment method	0.517	0.407	2.637	0.204	1.254	3.148	0.856
TNM staging	1.727	0.612	8.753	0.001	0.181	0.486	0.070
Lymph node metastasis	2.341	0.754	9.120	0.002	8.768	24.158	3.865
With complications	0.194	0.220	2.374	0.113	1.205	1.624	0.913

SE, standard error; OR, odds ratio; CI, confidence interval.

Table 5. Multiple linear regression of perceived social support to DDI.

Item	B	Standard error	t	p	β
Education level	-1.543	0.617	-2.472	0.018	-0.101
Fee payment method	-2.706	0.899	-3.093	0.006	-0.187
TNM staging	-1.512	1.239	-1.982	0.043	-0.085
Lymph node metastasis	-0.851	0.842	-0.916	0.412	-0.059
With complications	-1.734	1.421	-2.164	0.036	-0.093

Table 5. (Continued).

Item	<i>B</i>	Standard error	<i>t</i>	<i>p</i>	β
Perceived social support	0.291	0.056	6.319	0.000	0.486
<i>R</i> ²	0.389				
Adjust <i>R</i> ²	0.376				
<i>F</i>	<i>F</i> = 15.263, <i>P</i> < 0.001				

DDI, Distress Disclosure Index;
Note: -: Blank it;

Table 6. Multiple linear regression of perceived social support to recovery experiences.

Item	<i>B</i>	Standard error	<i>t</i>	<i>p</i>	β
Education level	-2.015	1.993	-1.993	0.041	-0.079
Fee payment method	-2.427	2.034	-2.187	0.031	-0.132
TNM staging	-1.453	1.725	-1.045	0.312	-0.079
Lymph node metastasis	-1.912	1.914	-1.271	0.205	-0.093
With complications	-2.394	2.018	-2.093	0.038	-0.066
Perceived social support	0.751	0.135	6.462	0.000	0.459
<i>R</i> ²	0.412				
Adjust <i>R</i> ²	0.408				
<i>F</i>	<i>F</i> = 18.471, <i>P</i> < 0.001				

Note: -: Blank it;

Table 7. Binary logistics regression of primary study variable to psychological distress.

Related factor	95%CI						
	<i>B</i>	SE	Wald	<i>P</i>	OR	Upper	Lower
Perceived social support	-1.813	0.836	4.463	0.036	0.182	0.926	0.038
DDI	-1.643	0.782	4.204	0.040	0.243	0.986	0.052
Recovery experiences	-0.106	0.036	10.058	0.002	1.083	1.214	1.036
Education level	-0.265	0.175	2.934	0.089	1.245	1.687	0.982
Fee payment method	0.375	0.162	4.425	0.044	1.385	1.925	1.011
TNM staging	0.251	0.143	4.864	0.035	0.804	0.994	0.541
Lymph node metastasis	0.157	0.204	2.156	0.158	0.897	1.146	0.784
With complications	2.156	0.836	6.623	0.028	3.713	8.467	1.756

DDI, Distress Disclosure Index; SE, standard error; OR, odds ratio; CI, confidence interval.

3.4. The mediating effect of distress disclosure and recovery experiences

In order to further verify the mediating effect of distress disclosure and recovery experience, the Bootstrap method in the SPSS Process macro was used to conduct 5000 repeated samples.

Table 8. Test of the direct and mediating effects of perceived social support on psychological distress.

Item	Path	β	Standard error	95%CI	Relative effect size (%)
Direct effect	Perceived Social support → Psychological distress	-0.514	0.046	(-0.358, -0.673)	57.8%

Table 8. (Continued).

Item	Path	β	Standard error	95%CI	Relative effect size (%)
Indirect effect 1	Perceived Social support → DDI → Psychological distress	-0.172	0.021	(-0.019, -0.314)	19.3%
Indirect effect 2	Perceived Social support → Recovery Experiences → Psychological distress	-0.204	0.028	(-0.060, -0.345)	22.9%
Total effect	-	-0.890	0.033	(-0.769, -0.961)	100%

DDI, Distress Disclosure Index; CI, confidence interval

Note: -: Blank item

The analysis results were shown in **Table 8**. The total effect value of perceptive social support on psychological distress in patients was -0.890 , and the confidence interval was $(-0.769, -0.961)$, excluding 0, indicating that the mediating effect of distress disclosure and recovery experience on perceived social support and psychological distress in COPD patients with lung cancer was statistically significant. Both the indirect effect and the direct effect were negative, indicating that the relationship between perceived social support and psychological distress was partially mediated by distress disclosure and recovery experience, and the proportions of the mediating effects were 19.3% and 22.9%, respectively (**Figure 1**).

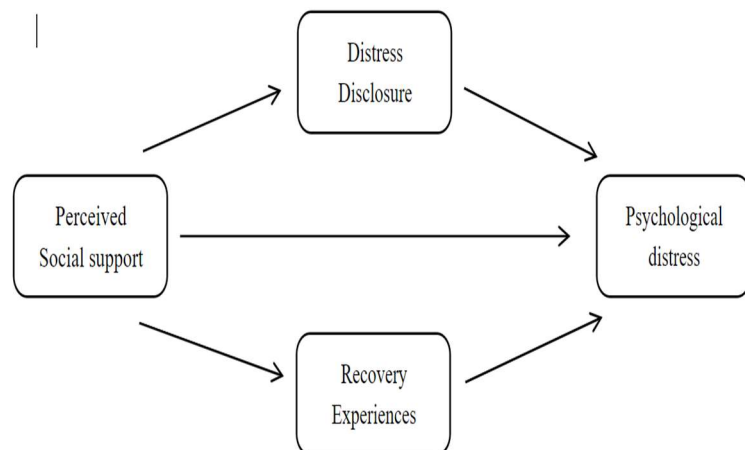


Figure 1. Mediation effect model.

4. Discussion

In the realm of global health, chronic obstructive pulmonary disease and lung cancer rank as the two respiratory diseases with the highest fatality rates [26]. There is a significant-comorbidities between COPD and lung cancer. The superposition of disease symptoms (such as dyspnea) and treatment contradictions (such as poor tolerance to surgery) in these patients will significantly exacerbate psychological problems. Meanwhile, such patients face the double psychological impact of chronic disease management and cancer survival, but the existing support measures are insufficient. Studying the mechanism of psychological distress and intervention strategies can not only fill the gap in comorbidity research, but also optimize clinical management, improve prognosis and reduce medical burden. Therefore, this study is based on the clinical status of the psychological distress of cancer patients, to explore the relevant mechanisms behind it and the relevant measures that clinicians

can take, as reported below.

This study reported that the incidence of psychological distress in lung cancer patients with COPD was as high as 60.5%. The study of Rades et al. [27] also showed that psychological distress of lung cancer patients is a common situation. It coincides with the results yielded by this study. Such a high incidence is also closely related to the occurrence of adverse outcomes, such as affecting the treatment effect and affecting the prognosis. The research results of Hamer et al. [28] showed a significant correlation between psychological distress and lung cancer. Psychological distress also predicted a worse prognosis for those with a previous cancer diagnosis. In addition, this study revealed a significant inverse relationship between perceived social support—defined as an individual's sense of being valued, assisted, and emotionally understood—and levels of psychological distress. For cancer patients, the higher the level of perceived social support, the easier it is to seek help from family and society and actively cope with stressful events [29]. The higher the level of perceived social support, the easier it is to use social support to self-regulate in the face of adverse events, and the easier it is to solve problems and control the impact of negative events, thus improving the quality of life. This study also found that distress disclosure and recovery experience partially mediated the perceived social support and psychological distress, and both were negatively correlated with psychological distress. This means that when patients are more open about their pain, their levels of psychological distress may decrease. Therefore, based on the above conclusions, clinical medical staff can establish a trust relationship with patients [30], strengthen listening and understanding, and enable patients to express their feelings and expectations more, so as to reduce the patients' psychological distress. On the other hand, recovery experience is also an important factor in the mediation effect. Patients can recover physically and mentally from disease stress and stress by adopting different recovery strategies and methods, such as music therapy, case therapy, and exercise therapy [31]. The study of Ding et al. [32] found that restoration experience improved sleep disorders and thus alleviated negative emotions. It can be seen that recovery experience can help improve individual psychological state and alleviate psychological distress by enhancing positive emotions. Finally, this study also found that self-funded medical treatment, advanced tumor, and the presence of complications were covariables affecting patients' psychological distress. Different patients need to face not only the pressure brought by the disease itself, but also the pressure of medical economy. Especially for elderly patients who are widowed or have no children, medical insurance can significantly reduce the economic burden of patients [33] and reduce the psychological pressure of patients. However, patients with advanced tumors or complications usually show significant clinical symptoms, and some patients have significant adverse reactions brought by radiotherapy and chemotherapy, which leads to patients becoming increasingly weak, aggravating patients' psychological distress, and even producing anxiety and depression. Consequently, clinicians should prioritize monitoring the psychological well-being of patients. For example, through cognitive reconstruction, the patient's rich thinking mode can be adjusted to reduce anxiety and depression; By providing successful treatment cases, it brings positive beliefs to patients and maintains hope. We should also respect patients' wishes, increase patients' sense of autonomy, and enhance their sense of control over the life.

In summary, the incidence of psychological distress in lung cancer patients with CODP is still high. Clinical attention should be paid to the mental health of patients, and corresponding measures should be taken, such as providing social support for patients, psychological counseling, and encouraging patients to express their difficulties. For patients with psychological distress and even affect the therapeutic effect, the incidence of psychological distress can be reduced by comprehensively evaluating the psychological status of patients, establishing trust relationship, providing emotional support and conducting relaxation training, so as to improve patients' prognosis. The results of this study show that perceived social support has a direct effect on psychological distress, and distress disclosure and recovery experience have a partial mediating effect between perceived social support and psychological distress. In addition to the main study factors of appeal, self-funded medical treatment, advanced tumor and complications were the main influencing factors of postoperative psychological distress. This study provides a new focus for clinicians to care for psychological distress in patients with lung cancer complicated with COPD. However, several constraints should be considered when interpreting these findings. For example, the included data were only for the investigation of patients in our hospital, which may have problems such as single sample size, small sample size, regional differences, and single race. Future multi-center and longitudinal studies are recommended to make the findings more broadly applicable.

5. Conclusion

Elderly lung cancer patients with COPD continue to face significant mental health challenges, particularly psychological distress. Research reveals that perceived social support influences emotional well-being through a sequential mediation process involving both distress disclosure and recovery experiences. These findings suggest that enhancing patients' ability to express distress and process recovery may strengthen their awareness of how social support mitigates psychological distress, ultimately leading to improved mental health outcomes.

Author contributions: Designed the research study, QL; performed the primary literature review, data extraction, QL, JZ, XZ, JX, QM and XS; analyzed the data, wrote the manuscript, QL, JZ, ZJ, XQ, QM and XS; responsible for revising the manuscript for important intellectual content, QL. All authors have read and agreed to the published version of the manuscript.

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Informed consent statement: Informed consent was obtained from all subjects involved in the study.

Conflict of interest: The authors declare no conflict of interest.

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