Current Status and Influencing Factors of Post-traumatic Stress Disorder in Family Caregivers of Lung Cancer Patients

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Abstract

Objective To understand the current status of post-traumatic stress disorder (PTSD) among family caregivers of lung cancer patients and analyze its influencing factors, so as to provide a reference basis for targeted nursing interventions. Methods A questionnaire survey was conducted on 150 family caregivers of lung cancer patients using a general information questionnaire, the PTSD Checklist-Civilian Version (PCL-C), and the Family Hardiness Index (FHI). Univariate analysis and correlation analysis were employed to screen out statistically significant variables, followed by multiple linear regression analysis to identify the influencing factors of PTSD in family caregivers of lung cancer patients. Results The PTSD score of family caregivers of lung cancer patients was (43.73$±$13.75) points. PTSD level was negatively correlated with family resilience level (P<0.01). Multiple linear regression analysis showed that being female, unemployed, and being a spouse or parent of the patient were risk factors for PTSD in family caregivers of lung cancer patients, while family caregivers with higher education levels and higher family resilience levels had lower PTSD levels. Conclusion The PTSD level of family caregivers of lung cancer patients is at a moderate-to-high level and is affected by multiple factors. Nursing staff can explore family-based intervention measures to enhance the family resilience of family caregivers, reduce the occurrence of PTSD in family caregivers of lung cancer patients, and improve their quality of life.

Full Text

A Study on the Status and Influencing Factors of Post-Traumatic Stress Disorder Among Family Caregivers of Lung Cancer Patients

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Abstract

Objective: To investigate the current status of post-traumatic stress disorder (PTSD) among family caregivers of lung cancer patients and analyze its influencing factors, thereby providing a reference basis for targeted nursing interventions. **Methods:** A total of 150 family caregivers of lung cancer patients were surveyed using a General Information Questionnaire, the PTSD Checklist-Civilian Version (PCL-C), and the Family Hardiness Index (FHI). Variables with statistical significance were screened through univariate analysis and correlation analysis, followed by multiple linear regression analysis to identify influencing factors of PTSD. **Results:** The PTSD score among family caregivers was (43.73$±$13.75). PTSD level was negatively correlated with family resilience level (P<0.01). Multiple linear regression analysis revealed that being female, unemployed, and being a spouse or parent of the patient were risk factors for PTSD, while higher education level and higher family resilience level were associated with lower PTSD levels. **Conclusion:** PTSD among family caregivers of lung cancer patients is above moderate level and influenced by multiple factors. Nursing staff can explore family-based interventions to enhance family resilience, reduce PTSD occurrence, and improve caregivers' quality of life.

Keywords: lung cancer; family caregivers; PTSD; family resilience; influencing factors

Introduction

Lung cancer is one of the malignant tumors with the highest incidence and mortality rates in China[1]. Most patients are already in middle or advanced stages at diagnosis[2], with difficult treatment and poor prognosis, causing significant negative psychological impact on both patients and their family caregivers. Post-traumatic stress disorder (PTSD) refers to a delayed, long-term, and persistent mental disorder caused by unusual threatening or catastrophic psychological trauma, mainly manifested as recurrent intrusive traumatic experiences, sustained hypervigilance, and avoidance[3]. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), cancer can be considered a traumatic experience for both patients and family caregivers, leading to PTSD development[4].

Family caregivers refer to family members who live with the patient, provide the

longest care duration, undertake the most caregiving tasks, and bear primary caregiving responsibilities, including the patient's spouse, children, parents, siblings, etc.[5]. They play a crucial role in supporting cancer patients' treatment. Studies have shown that family caregivers may experience PTSD symptoms of equal or even greater severity than patients themselves, affecting their quality of life and social functioning[6]. Therefore, PTSD symptoms in family caregivers of lung cancer patients urgently require medical attention. However, current research on these caregivers both domestically and internationally has mainly focused on caregiver burden[7]. Thus, this study aims to investigate the current status of PTSD among family caregivers of lung cancer patients and analyze its influencing factors to provide a theoretical basis for intervention strategies promoting caregivers' physical and mental health.

Methods

Subjects

Using convenience sampling, 150 family caregivers of lung cancer patients treated in two tertiary grade-A hospitals in Wuhan from December 2022 to December 2023 were selected as participants. This study involved 16 variables (10 items in the general information questionnaire, 3 dimensions in the PTSD scale, and 3 dimensions in the family resilience scale). Using Kendall's sample size estimation method[8], the sample size was set at 5-10 times the number of variables, with an additional 10%-20% to account for invalid or missing questionnaires, resulting in N=16$\times$5$\times$$(1+0.1)=88. Therefore, this study required a minimum sample size of 88 participants.

Inclusion criteria: (1) relatives or spouses living with the lung cancer patient, providing the longest care duration, undertaking the most caregiving tasks, and bearing primary responsibility; (2) aged 18 years or older; (3) signed informed consent; (4) able to understand the research purpose and complete the questionnaire.

Exclusion criteria: (1) family caregivers who experienced other major traumatic events such as accidents or assaults in the past year, or had a history of mental or neurological problems; (2) paid caregivers.

Survey Instruments

General Information Questionnaire Designed by the research team after literature review, this questionnaire included the primary caregiver's age, gender, occupational status, education level, religious belief, monthly household income per capita, medical expense payment method, time elapsed since patient diagnosis, duration of caregiving, and relationship to the patient.

PTSD Checklist-Civilian Version (PCL-C) Developed by the U.S. National Center for PTSD in 1994[9], this study used the Chinese version translated

and revised by Zheng Huichun et al.[10]. The scale includes three dimensions: re-experiencing (5 items), avoidance/numbing (7 items), and hyperarousal (5 items), totaling 17 items. Each item uses a 5-point Likert scale scored from 1 (not at all) to 5 (extremely), with higher scores indicating more severe PTSD. Total scores range from 17 to 85, where 17-37 represents no obvious PTSD symptoms, 38-49 represents some degree of PTSD symptoms, and $ $50 indicates PTSD-positive. In this study, the scale's Cronbach's α coefficient was 0.955, with subscale coefficients of 0.858, 0.915, and 0.895 respectively.

Family Hardiness Index (FHI) Developed by McCubbin et al.[11], this internationally authoritative and widely used scale has been employed as a direct measurement tool for family resilience in some studies[12]. This study used the Chinese version translated by Liu Yang et al.[13] to assess family resilience level. The scale includes three dimensions—control, commitment, and challenge—with 20 items total. Using a 4-point Likert scale (1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree), items 1, 2, 3, 8, 10, 14, 16, 19, and 20 are reverse-scored while the rest are positively scored, with higher total scores indicating better family hardiness. In this study, the scale's Cronbach's α coefficient was 0.959, with subscale coefficients of 0.875, 0.927, and 0.862 respectively.

Survey Method

Using convenience sampling, the survey was conducted during patients' hospitalization. All questionnaires were administered by uniformly trained research team members who guided family caregivers to scan a Wenjuanxing QR code to complete the survey. Unified instructions introduced the survey's purpose, significance, and confidentiality principles, and caregivers were asked to complete the questionnaire independently. If caregivers could not complete it independently, the researcher would ask questions and the caregiver would make selections under guidance. Each mobile phone could only be used once, and questionnaires completed in less than 3 minutes or with identical responses were considered invalid. A total of 162 questionnaires were submitted, with 150 valid questionnaires, yielding an effective response rate of 92.6%.

Statistical Methods

SPSS 26.0 statistical software was used for data entry and analysis. Measurement data were expressed as mean±standard deviation, and count data as frequency and percentage. PTSD scores followed a normal distribution. T-tests and ANOVA were used to compare PTSD levels among caregivers with different characteristics, Pearson correlation analysis examined the correlation between PTSD and family resilience, and multiple linear regression analysis identified PTSD influencing factors.

Results

General Information

This study surveyed 150 family caregivers of lung cancer patients, with spouses being the primary caregivers. General information is presented in Table 1 .

Univariate Analysis

Statistically significant differences in PTSD scores were found among family caregivers across different age groups, genders, occupational statuses, education levels, religious beliefs, monthly household income per capita, medical expense payment methods, time elapsed since patient diagnosis, duration of caregiving, and relationship to the patient ($P<0.01$). See Table 2 .

PTSD and Family Resilience Status

The PTSD score among the 150 family caregivers was (43.73$±13.75), $and the family resilience score was (51.59±$ Details are presented in Table 3 .

Correlation Analysis

All dimensions and total scores of PTSD were negatively correlated with all dimensions and total scores of family resilience ($P<0.01$). See Table 4 .

Multiple Linear Regression Analysis

Using PTSD as the dependent variable, variables with statistically significant differences in univariate analysis (including age, gender, occupational status, education level, religious belief, monthly household income per capita, medical expense payment method, time elapsed since patient diagnosis, duration of caregiving, and relationship to the patient) and the total family resilience score from correlation analysis were entered as independent variables (see Table 5 for variable assignments). Multiple linear regression analysis was conducted. The variance inflation factor (VIF) ranged from 1.560 to 14.772, with tolerance values of 0.068 to 0.641, indicating no multicollinearity. Regression analysis revealed that gender, occupational status, education level, relationship to the patient, and family resilience could explain 75.9% of the total variance in PTSD (see Table 6).

Discussion

PTSD Level Among Family Caregivers

This study found that PTSD among family caregivers of lung cancer patients was above moderate level (43.73$±$13.75), with 21.33% showing some degree of PTSD symptoms and 33.33% being PTSD-positive, consistent with Bennett et al.[14]. The PTSD positive rate is similar to the 34%-35% prevalence among

family members of ICU patients[15]. The average PTSD dimension scores, from highest to lowest, were avoidance, hyperarousal, and re-experiencing. Family caregivers of lung cancer patients showed denial and avoidance of the diagnosis, consistent with general psychological reactions of cancer patients[16].

Analysis reveals that avoidance symptoms manifest as denial of the event's meaning and consequences, numbness, blunted feelings, behavioral inhibition, actions against fear, and awareness of emotional numbness. In Chinese family culture, caregivers are typically spouses and children who must endure the blow of a loved one's illness while undertaking heavy caregiving responsibilities and financial burdens, and coordinating their own work and health. As non-professional caregivers, this represents an enormous challenge that creates tremendous pressure, leading to denial and avoidance.

Additionally, due to the long-term nature of lung cancer treatment, the entire caregiving process significantly impacts caregivers' physical health, work, and psychology. The long-term burden can lead to negative emotions such as depression and anxiety[17], causing emotions to become numb and blunted. In clinical practice, we should pay attention to caregivers' emotional needs, provide appropriate psychological support, analyze causes of PTSD, actively seek social work intervention or other social support, and provide targeted assistance.

Gender

Regression analysis showed that female gender is a risk factor for PTSD among family caregivers ($P<0.05$), with female caregivers having higher risk and more severe symptoms. This aligns with Teixeira et al.[18] and previous literature across different populations[19,20], confirming female gender as a major risk factor. This may be because family caregivers are predominantly female, and in Chinese families, as primary caregivers, they must balance family, work, and children's education. Hormonal factors may also make their emotions more susceptible to stressors. Therefore, clinical nursing practice should pay greater attention to female caregivers with timely psychological interventions to prevent PTSD.

Occupational Status

This study found that occupational status influences PTSD ($P<0.05$), with unemployed caregivers being more susceptible and having higher PTSD levels. This is consistent with Bambauer et al.[21], who found that working outside the home is protective against PTSD in head and neck cancer caregivers. Agard et al.[22] also noted employment as protective because work provides additional social and economic support. Working outside the home may provide extra support, enabling caregivers to manage responsibilities while workplace social interactions reduce continuous exposure to the cancer situation, distract attention, decrease potential stressors, and improve mental health.

Education Level

Results showed education level influences PTSD ($P<0.05$), with higher education associated with lower risk and PTSD levels. This matches Dunn et al.[23], who found caregivers' education negatively correlated with PTSD. Higher education provides broader knowledge, more open thinking, proactive disease information seeking, comprehensive medical information access, more effective coping strategies, and better emotional regulation, resulting in lower psychological sensitivity to trauma. Medical staff should provide more disease knowledge to less-educated caregivers using accessible methods and timely psychological nursing. However, Yalug et al.[24] found opposite results in pediatric cancer caregivers, possibly because higher education leads to deeper understanding of diagnosis, treatment, and future difficulties. These discrepancies may stem from different populations and timing, requiring further research.

Relationship to Patient

This study found that caregivers who are spouses or parents have higher risk and more severe PTSD. This aligns with Hartog et al.[25] and Jia et al.[26], who found closer relationships are independent risk factors for PTSD, with spouses and parents having significantly higher PCL-C scores. Caregivers with closer relationships always prioritize the patient and are more sensitive to the suffering caused by lung cancer, resulting in higher PTSD levels.

Family Resilience

Family resilience refers to inherent or learned abilities that represent family adaptation to adversity, comprising family beliefs and strengths that enhance coping capabilities[27]. Research shows family resilience is closely related to PTSD[28]. This study demonstrated that family resilience is an important protective factor, with higher levels associated with lower PTSD risk and severity, consistent with Uddin et al.[29] and other studies[30]. Families with better resilience have good functioning and provide more material and emotional support. Family resources enhance individual coping abilities, while perceived emotional support buffers the impact of cancer stressors on psychological distress, depression, and anxiety, reducing PTSD levels. Nursing staff can develop family-centered, resilience-oriented practices, providing resilience-enhancing training for lung cancer families facing serious challenges to improve resilience, reduce psychological stress, help families actively cope, and enhance quality of life.

Conclusion

PTSD among family caregivers of lung cancer patients is above moderate level. Female gender and unemployment are risk factors, while higher education and family resilience are protective. Spouses and parents have higher PTSD risk than other caregivers. Clinical staff should attend to PTSD symptoms, conduct

comprehensive assessments, develop family resilience-oriented interventions, explore internal family strengths, and implement family-centered nursing models to improve family resilience among lung cancer caregivers in China, reduce PTSD occurrence, and improve caregivers' quality of life. This study is limited by its small, localized sample from two Wuhan hospitals; future research needs multi-center, large-sample surveys to further understand PTSD status and influencing factors for developing targeted interventions.

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Note: Figure translations are in progress. See original paper for figures.