



# Factors associated with health-related quality of life among employed individuals with chronic obstructive pulmonary disease: A correlational study in China

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## Abstract

**Background:** The rising prevalence of chronic obstructive pulmonary disease (COPD) in China has led to a decline in the health-related quality of life (HRQOL) of employed individuals with the condition. Consequently, healthcare providers play a crucial role in identifying the factors associated with HRQOL in this population.

**Objectives:** This study aimed to describe the HRQOL of employed individuals with COPD and determine the relationships between symptom burden, functional performance, social support, and HRQOL.

**Methods:** A cross-sectional correlational research design was employed for this study. A total of 130 employed individuals with COPD who visited the respiratory outpatient department at the Second Affiliated Hospital of Wenzhou Medical University were selected through simple random sampling. Data were collected between August and September 2021 using a demographic questionnaire and four scales. Descriptive statistics and Pearson correlation were used for data analysis.

**Results:** The study findings revealed that the mean HRQOL score among the participants was in the moderate range ( $M = 69.46$ ,  $SD = 16.82$ ). The correlation analysis revealed a significant negative association between symptom burden and HRQOL ( $r = -0.80$ ,  $p < 0.001$ ). On the other hand, a positive relationship was observed between functional performance and HRQOL ( $r = 0.56$ ,  $p < 0.001$ ), while social support did not show a significant relationship with HRQOL ( $r = 0.04$ ,  $p > 0.05$ ).

**Conclusion:** These findings serve as a foundation for healthcare service providers and policymakers in developing targeted nursing interventions and comprehensive management approaches for employed individuals with COPD. By addressing the symptom burden and promoting functional performance, nurses can strive to enhance the HRQOL of this population. Moreover, strategies to improve social support networks and facilitate access to emotional and practical assistance may further contribute to improving the overall well-being and satisfaction among employed individuals with COPD.

## Keywords


health-related quality of life; COPD; employment; symptom burden; functional performance; social support

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## Background

COPD, chronic obstructive pulmonary disease, has emerged as a significant public health threat. From 1990 to 2015, the global prevalence of COPD increased by 44% (Gagné et al., 2020). A comprehensive survey conducted in China from 2014 to 2015 revealed that the national prevalence of COPD was 8.2%, rising to 13.6% among individuals aged 40 and above (Fang et al., 2018). In Yong Jia County, situated in the northern mountainous region of Wenzhou, the prevalence rate of COPD stands at 14.53%, surpassing the national average (Yang et

al., 2016). Therefore, COPD continues to be a significant health concern in Wenzhou, China.

Despite the advancements in modern medical technology, COPD remains an incurable and irreversible disease. Once diagnosed, patients require long-term treatment and daily management (Yang et al., 2019). There is a common misconception that COPD primarily affects older individuals. However, a systematic study conducted across Europe, some Asian countries, and the United States of America (USA) revealed that half of COPD patients are employed (Igarashi et al., 2018). Furthermore, a study conducted in the USA

specifically focused on employed individuals aged 40 and above and found that COPD was associated with adverse health outcomes, including reduced work productivity and lower health-related quality of life (HRQOL) (Dhamane et al., 2016).

While many studies have investigated HRQOL factors among older adults with COPD, little attention has been given to employed individuals with the condition. Over 60% of COPD patients in China continue working, often in factories or farms (Gong et al., 2020). A study conducted on working-age patients reported a reduction in productivity among 53.4% of participants (Kamusheva et al., 2017). Another study in rural Yunnan found that COPD patients were absent from work for approximately 150 days per year (Zhu et al., 2018).

Moreover, studies focusing on HRQOL among COPD patients have shown that younger individuals tend to have poorer scores than older adults, regardless of lung function. This suggests that younger people may have a more negative perception of their health (Martinez et al., 2016). Those who develop COPD at a younger age may face challenges related to their careers and family support (Holm et al., 2014). In China, employed individuals are expected to fulfill important family and social responsibilities, such as caring for their parents and children and providing financial support. These individuals often hold "pillar" roles within their families (Ni et al., 2020), which can lead to negative psychological states and emotions. Persistent psychological distress can significantly impact the well-being and HRQOL of COPD patients (Savina & Zaydiner, 2019). Therefore, greater attention should be given to employed individuals with COPD to alleviate their physical and psychological pressures and improve their HRQOL.

HRQOL, which refers to the perceived mental and physical health state of individuals or groups over time (Hayes et al., 2011), is now a key focus in COPD management, with the aim of improving HRQOL and reducing hospital admissions (Newham et al., 2017). In order to assist employed individuals with COPD in addressing the issue of poor HRQOL, it is essential to identify and understand the factors that contribute to it. Previous studies have identified several factors associated with HRQOL in COPD patients, including age, gender, level of education, COPD stage, symptoms, and sleep disorders (Milanowska et al., 2017).

According to the Symptoms Management Theory (SMT), HRQOL has been identified as an essential indicator for assessing health outcomes in patients. The term "symptom burden" refers to the subjective experience, frequency, prevalence, and intensity of symptoms that physically burden patients, leading to various adverse emotional and physical reactions (Wiggenraad et al., 2020). Symptom burden falls within the domain of the symptom experience, which is closely linked to health outcomes (Choate et al., 2020). The severity of COPD symptoms can vary among patients, resulting in differing levels of symptom burden. COPD patients contend with a range of symptoms that limit their daily activities and have a detrimental impact on their HRQOL (Cook et al., 2019). A study conducted among COPD patients in China demonstrated a negative correlation between each dimension of symptom burden and HRQOL ( $r = -0.43 \sim -0.61, p < 0.05$ ) (Shen et al., 2018).

Functional performance refers to the physical, psychological, social, occupational, and spiritual activities individuals engage in to meet their basic needs (Sreedevi et al., 2020). It is a physiological variable within the realm of the person dimension, and it directly and indirectly, impacts HRQOL, which is the ultimate outcome. In the case of COPD patients, their functional performance tends to decline, resulting in a deterioration of their health status (Tudorache et al., 2017). Studies have shown a moderate correlation between functional capacity and health status ( $r = 0.481, p < 0.05$ ) (van Dam van Isselt et al., 2014). Additionally, physical activity is associated with QOL ( $r = 0.25, p < 0.05$ ) (Tao, 2017).

Social support is an essential aspect within the social environment domain, influencing the selection of management strategies and health outcomes. It involves the perception of being cared for, loved, and respected and entails the provision of information and mutual obligations within a network of individuals (Hu et al., 2020). By providing emotional, social, educational, and practical assistance and coping mechanisms for illness-related stress, social support can help patients feel less isolated and stigmatized (Zhao et al., 2020). Some studies have indicated a positive relationship between social support and QOL (Wang, 2015). However, in the context of COPD patients hospitalized in respiratory departments, a study found that social support did not significantly impact QOL ( $r = -0.081, p > 0.05$ ) (Guo et al., 2015). Furthermore, there is inconsistent evidence regarding the correlation between perceived social support and QOL among COPD patients (Barton et al., 2015).

In conclusion, it is crucial to recognize that existing research findings may not directly apply to employed individuals with COPD. According to the Symptoms Management Theory (SMT), the domains of person, health/illness, and environment play significant roles in the symptom management process, encompassing symptom experience, symptom management strategies, and outcomes (Dodd et al., 2001). Effective management of COPD symptoms requires a comprehensive understanding of all three domains to enhance HRQOL. Therefore, our study aimed to investigate the relationship between HRQOL and factors such as symptom burden, functional performance, and social support, specifically among employed individuals with COPD. These research findings will serve as valuable information for nurses to develop appropriate nursing interventions that strengthen symptom management and improve the HRQOL of employed individuals with COPD.

## Methods

### Study Design

This study employed a cross-sectional, descriptive correlational research design.

### Samples/Participants

The study included employed individuals with COPD who visited the Respiratory Outpatient Department (ROD) of the Second Affiliated Hospital of Wenzhou Medical University for regular follow-up appointments. A simple random sampling technique was employed to select participants who met the inclusion criteria. The inclusion criteria for this study were as follows: 1) a diagnosis of COPD for at least one year, 2) age of at least 40 years, 3) no diagnosed mental illness based on

an assessment by a psychiatrist, 4) the ability to read, write, and understand Chinese as self-reported by the participants, and 5) absence of comorbidities such as hypertension, heart disease, and cerebrovascular diseases as indicated in the medical notes by the physician. In addition, participants who experienced acute respiratory symptoms or discomfort during the research were excluded.

A list of patients who visited the ROD for follow-up on the day of data collection was compiled. The eligible patients were divided into two groups based on their visit number: odd and even. The researchers selected the even-numbered group on Monday, Wednesday, Friday, and Sunday, while the odd-numbered group was chosen on Tuesday, Thursday, and Saturday. For this correlational study, the sample size was determined using the G\*Power 3.1.9.2 software. Based on the effect size reported in the literature, which ranged from 0.24 (Liu, 2020) to 0.29 (Zheng et al., 2015), the bivariate normal model for correlation was selected as the statistical test type. In addition, an estimated median effect size of 0.26, a statistical power of 0.90, and a significance level of 0.05 were considered. Using these parameters, the required sample size for the correlational analysis was determined to be at least 123 participants. However, 130 participants were selected for the study for a more robust analysis.

### Instruments

A total of five instruments were utilized in the study, with the exception of the demographic questionnaire, which was the only instrument not used with permission from the original authors.

First, a demographic questionnaire that researchers developed consisting of two parts. The first part focused on gathering general information, including age, gender, marital status, education, living arrangements, monthly personal income, payment for medical expenses, occupation, time spent working per day, and average number of days worked per week. The second part of the questionnaire collected health-related information from patient records. This section included variables such as body mass index (BMI), smoking history, duration of COPD diagnosis, percentage predicted forced expiratory volume in one second (FEV1%), respiratory symptoms experienced, the impact of respiratory symptoms on daily life, the main strategies employed to manage respiratory symptoms, number of COPD-related hospitalizations in the previous year, and participants' self-reported perception of their overall health.

Second, the HRQOL was assessed using the COPD-specific version of the St. George Respiratory Questionnaire (SGRQ-C), which was developed by Meguro et al. (2007). For this study, the Chinese version of the SGRQ-C, developed by the MAPI Research Institute (Jones, 2012), was utilized. The SGRQ-C consists of 40 items and is divided into three components: symptoms (assessing the distress caused by respiratory symptoms), activity (examining the impact on mobility and physical activity), and impact (considering the psychological effects of the illness). The total score for the questionnaire was calculated by multiplying it by one hundred. It is worth noting that in the original version of the SGRQ, the scale measures the extent of poor health rather than how well patients feel. Consequently, a lower score corresponds to a better health state (Meguro et al., 2007). However, in this

study, the aim was to assess HRQOL specifically. To achieve this, the researchers calculated the SGRQ-C scores in the usual manner and then subtracted the scores from 100. Therefore, a higher score indicates better HRQOL (Paul Jones, personal communication, October 19, 2021). The internal consistency of the SGRQ-C in this study, as assessed by Cronbach's alpha, was 0.91.

Third, the symptom burden was assessed using the COPD Assessment Test (CAT). The CAT scale was developed by Jones et al. (2009) to measure the severity of COPD symptoms. In this study, the Chinese version of the CAT, developed by Wiklund et al. (2010), was employed. The CAT consists of eight items that evaluate various symptoms associated with COPD, including cough, phlegm, chest tightness, breathlessness when climbing hills or stairs, activity limitation at home, confidence when leaving home, sleep quality, and energy level. Each item is rated on a 6-point scale, ranging from no symptom (0) to the most severe symptom condition (5). The overall CAT score has a potential range of 0 to 40, with higher scores indicating a higher symptom burden (Jones et al., 2009). The following categories were used to describe the level of symptom burden: mild (scores between 0 and 10), moderate (between 11 and 20), severe (between 21 and 30), and very severe (between 31 and 40) (GlaxoSmithKline, 2018). In this study, the internal consistency of the CAT, as assessed by Cronbach's alpha, was found to be 0.80.

Fourth, functional performance was assessed using the Functional Performance Inventory Short Form (FPI-SF). The FPI-SF was originally developed by Leidy and Knebel (2010). This study utilized the Chinese version of the FPI-SF, known as the FPI-SF-C, translated by Guo et al. (2011). The FPI-SF-C consists of 32 items that measure functional performance across six dimensions: body care (5 items), household maintenance (8 items), physical exercises (5 items), recreation (5 items), spiritual activities (4 items), and social activities (5 items). Participants were asked to rate the difficulty level of each task on a scale ranging from "no difficulty" (score of 3) to "some difficulty" (score of 2) or "much difficulty" (score of 1). If respondents indicated that they did not perform an activity due to health reasons or personal choice, they were assigned a score of 0. The total score for each participant ranged from 0 to 3, with higher scores indicating a better level of functional performance. Mean values for the total scores and subscales were calculated to provide an overview of functional performance (Guo et al., 2011). In this study, the internal consistency of the FPI-SF-C, measured by Cronbach's alpha, was found to be 0.82.

Fifth, the Multidimensional Scale of Perceived Social Support (MSPSS) was originally developed by Zimet et al. (1988). In this study, the Chinese version of the MSPSS, developed by Jiang (1996), was used to assess social support among employed individuals with COPD. The MSPSS comprises 12 items that participants rated on a 7-point scale, ranging from "very strongly disagree" (1) to "very strongly agree" (7). The overall score for the MSPSS ranged from 1 to 7, with higher scores indicating higher levels of perceived social support. Mean scores were calculated to determine the total score. To describe the perceived level of social support, average scores were categorized as follows: a score of 1-2.9 indicated low social support, a score of 3-5 indicated moderate

social support, and a score of 5.1-7 indicated high social support (Dahlem et al., 1991). In this study, the internal consistency of the MSPSS, measured using Cronbach's alpha, was found to be 0.91.

### Data Collection

The data collection for this study took place between August and September 2021. The researchers randomly selected individuals who met the inclusion criteria and collected 2 to 5 samples per day over two months. Each participant was provided with a private room and given sufficient time to complete the survey voluntarily. On average, participants took approximately thirty to forty minutes to complete the survey. All the necessary information was obtained from the participant's medical records and through direct interaction with the individuals. Due to the ongoing COVID-19 pandemic, the researchers and participants adhered to safety protocols by correctly wearing masks throughout data collection.

### Data Analysis

The data analysis was conducted using SPSS version 23.0. Before performing the analyses, distribution plots were examined for each variable to assess their normality. The analysis confirmed that all the variables studied followed a normal distribution, satisfying the normality assumption. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated to summarize the characteristics of the independent and dependent variables. These statistics provided an overview of the data and allowed a better understanding of the variables under investigation. Pearson's correlation test was employed to examine the associations between symptom burden, functional performance, social support, and HRQOL. A p-value of less than 0.05 was considered statistically significant, indicating a significant association between the variables. This test helped determine the strength and direction of the relationships between the variables and provided insights into the factors influencing HRQOL in this population.

### Ethical Considerations

This research received ethical approval from the ethics committee of Burapha University (G-HS042/2564) and the Second Affiliated Hospital of Wenzhou Medical University (2021-K-46-01). Before participating in the study, all participants had to sign a consent form, which consisted of detailed information about the objectives, procedures, and study rights, including the participants' right to withdraw their participation until data analysis was begun without any negative impact on the quality of service they received. Throughout the study, strict measures were implemented to ensure the confidentiality and anonymity of the participants.

## Results

### Participant Demographic Information

Table 1 shows that the majority of participants fell into the age groups of 50-59 years old (47.7%) and 60-66 years old (45.4%). The male participants accounted for more than half of the total (77.7%). Regarding marital status, most participants were married (90.8%) and lived with their family or others (92.3%). Regarding education, a significant proportion

of participants had completed primary school (78.5%). The majority of participants (57.7%) reported a monthly personal income ranging from 1000-5000 CHY (approximately 147.39-736.97 USD). Nearly all participants had medical insurance coverage (97.7%). The occupation distribution showed that the majority of participants were engaged in farming (63.8%). As for working hours, most participants worked between 7 to 10 hours per day (73.1%) and had an average of 6-7 working days per week (76.2%).

**Table 1** Participant demographic information (N = 130)

Characteristics	n	%
<b>Age</b>		
40 to 49 years	9	6.9
50 to 59 years	62	47.7
60 to 66 years	59	45.4
(M = 57.67, SD = 5.12, Min = 40, Max = 66)		
<b>Gender</b>		
Male	101	77.7
Female	29	22.3
<b>Marital Status</b>		
Single	2	1.5
Married	118	90.8
Divorced	2	1.5
Widowed	8	6.2
<b>Education</b>		
Primary school	102	78.5
Secondary	20	15.3
High school	4	3.1
College and higher	4	3.1
<b>Living Arrangements</b>		
Living alone	10	7.7
Living with family or others	120	92.3
<b>Monthly Personal Income</b>		
1000-5000 CHY	75	57.7
5001-10000 CHY	48	36.9
More than 10000 CHY	7	5.4
<b>Payment for Medical Expenses</b>		
Medical insurance	127	97.7
At one's own expense	3	2.3
<b>Occupation</b>		
Farmers	83	63.8
Machine operators	24	18.5
Service Providers	10	7.9
Managers	9	6.9
Professionals	4	3.1
<b>Time Per Day for Working</b>		
2 to 6 hours	22	16.9
7 to 10 hours	95	73.1
More than 10 hours	13	10.0
<b>Average Days a Week for Working</b>		
3-5 days	31	23.8
6-7 days	99	76.2

CHY =Chinese yuan, Medical insurance: According to the health insurance system, the government affords 30% of the cost and 70% of the cost paid by patients

### Participants' Health Information

Table 2 presents the health information of the participants. The findings indicate that the majority of participants had normal body weight (70.8%). A small proportion of participants reported being current smokers (6.2%), while a larger percentage had quit smoking (62.3%). The duration of COPD diagnosis ranged from 1 year to 20 years, with an average duration of 7.25 years (SD = 4.67). Nearly all participants experienced moderate airway restriction (98.5%). The most prevalent symptom among the participants was cough

(91.5%). Regarding the frequency of respiratory symptoms, 41.5% of participants experienced symptoms several days a month, while 34.6% experienced symptoms on a daily basis. The majority of participants preferred to seek medical care to manage their respiratory symptoms (50.8%). Regarding COPD-related hospitalizations in the previous year, most participants (61.6%) had no hospitalizations, while 33.8% had been hospitalized no more than three times. When asked about their overall health status, almost half of the participants rated their health as fair (49.2%), while a small percentage (2.3%) considered their health to be very poor.

**Table 2** Participants' health information (N = 130)

Characteristics	n	%
<b>BMI</b>		
Underweight (<18.5)	21	16.2
Normal weight (18.5-24.9)	92	70.8
Overweight (25-27.9)	14	10.8
Obesity (≥28)	3	2.2
(M = 21.61, SD = 3.04, Min = 15.18, Max = 29.64)		
<b>History of Smoking</b>		
Current smoking	8	6.2
Quit smoking	81	62.3
No history	41	31.5
<b>Diagnosis Duration</b>		
1 to 3 years	36	27.7
4 to 6 years	37	28.4
7 to 9 years	21	16.2
10 years and more	36	27.7
(M = 7.25, SD = 4.67, Min = 1, Max = 20)		
<b>FEV1 %</b>		
Mild (≥80)	2	1.5
Moderate (50-80)	128	98.5
<b>Respiratory Symptoms</b>		
No	0	0.0
Yes	130	100.0
Dyspnea	105	80.8
Wheezing	102	78.5
Cough	119	91.5
Expectoration	111	85.4
<b>How Respiratory Symptoms Affect Patients</b>		
Not at all	12	9.3
Several days a month	54	41.5
Several days a week	19	14.6
Every day	45	34.6
<b>The Main Strategies Used to Manage Respiratory Symptoms</b>		
Take medicine by themselves	64	49.2
Go to see the doctor	66	50.8
<b>COPD-Related Hospitalizations During the Previous Year</b>		
None	80	61.6
1-3 times	44	33.8
4-5 times	6	4.6
<b>Health Perception</b>		
Very good	24	18.5
Good	21	16.2
Fair	64	49.2
Poor	18	13.8
Very poor	3	2.3

BMI= body mass index, FEV1 % = percentage predicted forced expiratory volume in one second, Yes: one or several symptoms can be answered by participants, COPD = chronic obstructive pulmonary disease

**Description of HRQOL**

Table 3 displays that the overall scores of HRQOL ranged from 22.64 to 98.18, with a mean score of 69.46 (SD = 16.82).

The psychosocial impact component had the highest mean score of 75.23 (SD = 18.53), followed by the activity component with a mean score of 67.44 (SD = 21.27). The symptoms component had the lowest mean score of 56.16 (SD = 18.52).

**Table 3** HRQOL among the participants (N = 130)

HRQOL	Range		M	SD
	Possible Score	Actual Score		
<b>Overall score</b>	0-100	22.64-98.18	69.46	16.82
Symptoms component	0-100	10.03-89.70	56.16	18.52
Activity component	0-100	24.87-100.00	67.44	21.27
Psychosocial impact component	0-100	21.15-100.00	75.23	18.53

**Factors Related to HRQOL**

Table 4 shows that the symptom burden ranged from 1 to 33, with a mean of 11.01 (SD = 6.50), indicating a moderate symptom burden. The functional performance had a mean score of 1.91 (SD = 0.37), ranging from 1.31 to 3, indicating a relatively good level of functional performance. The social support scale ranged from 2.83 to 7, with a mean of 5.52 (SD = 0.92), indicating high levels of social support.

**Table 4** Symptom burden, functional performance, and social support among the participants (N = 130)

Factors	Range		M	SD	Meaning
	Possible score	Actual score			
<b>Symptom Burden</b>	0-40	1.00-33	11.01	6.50	Moderate
<b>Functional Performance</b>	0-3	1.31-3	1.91	0.37	
Body care	0-3	2.80-3	2.99	0.05	
Maintaining the household	0-3	0.75-3	2.07	0.74	
Physical exercise	0-3	1.60-3	2.43	0.44	
Recreation	0-3	0.60-3	1.60	0.57	
Spiritual activities	0-3	0-3	0.57	1.17	
Social Interaction	0-3	0.60-3	1.80	0.54	
<b>Social Support</b>	1-7	2.83-7	5.52	0.92	High
Family subscale	1-7	1.50-7	6.17	1.07	High
Friends subscale	1-7	1.75-7	4.85	1.16	Moderate
Significant other subscale	1-7	2-7	5.53	1.02	High

As shown in Table 5, there was a significant inverse correlation between symptom burden and HRQOL (r = -0.80, p < 0.001). Functional performance and HRQOL demonstrated a positive association (r = 0.56, p < 0.001). However, there was no significant correlation between social support and HRQOL (r = 0.04, p > 0.05).

**Table 5** Association between symptom burden, functional performance, social support, and HRQOL (N = 130)

	HRQOL	p-value
Symptom burden	-0.80	<0.001
Functional performance	0.56	<0.001
Social support	0.04	0.67

## Discussion

In this study, the mean score of HRQOL among employed persons with COPD in Wenzhou was 69.46 (SD = 16.82), indicating a relatively high HRQOL for individuals with mild to moderate COPD. Among the HRQOL subscales, the psychological impact component had the highest mean score of 75.23 (SD = 18.53), followed by the activity component with a mean score of 67.44 (SD = 21.27). The symptoms component had the lowest mean score of 56.16 (SD = 18.52). Comparing these mean scores with other studies conducted in China, the HRQOL level in this study was higher. For example, [Liu et al. \(2017\)](#) reported a mean HRQOL score of 30.6 among participants with mild and moderate COPD, with mean scores of 21.9 for psychosocial impact, 39.2 for activity, and 46.4 for symptoms. Another study by [Mei \(2013\)](#) showed a mean HRQOL score of 55.56 among individuals with moderate COPD, with mean scores of 30.74 for psychosocial impact, 63.60 for activity, and 56.08 for symptoms.

Person variables in the Self-Management Theory (SMT) encompass a range of factors, including demographic, psychological, sociological, physiological, and developmental elements ([Dodd et al., 2001](#)). Within this framework, employment status is considered a sociological variable under the person dimension. In the context of employed individuals with COPD, employment status can significantly influence HRQOL. Engaging in paid work is associated with increased physical activity due to the regular work demands. This heightened physical activity can help mitigate the impact of COPD on daily living for patients ([Nyberg et al., 2017](#)). It is worth noting that a majority of the participants in this study were farmers (63.8%), an occupation that typically involves substantial physical activity compared to other occupations. The high level of physical activity among farmers indicates that their lifestyle and working environment are conducive to good health ([Thelin & Holmberg, 2014](#)). This increased physical activity may contribute to a relatively high HRQOL by reducing the impact of symptoms. Furthermore, employed individuals receive support from their families and communities, and their interactions within these social networks can alleviate feelings of loneliness ([Kidd et al., 2016](#)). Being employed allows individuals to provide for themselves and their families, achieving financial independence and gaining access to essential resources such as housing, healthcare, and education, all of which can improve their overall health and HRQOL ([Heikkilä et al., 2021](#)). This aspect of employment can contribute to a relatively high HRQOL by mitigating psychosocial impacts.

Symptom burden has a negative association with HRQOL among employed individuals with COPD. According to the Self-Management Theory (SMT), symptom burden falls under the symptom experience domain, directly impacting outcomes such as HRQOL ([Dodd et al., 2001](#)). Participants with a higher symptom burden are likely to have poorer HRQOL. Patients with COPD commonly report that symptom burden significantly limits their ability to engage in regular physical exercise and can adversely affect their sleep quality ([Miravittles & Ribera, 2017](#)). This finding aligns with a previous study that demonstrated a negative correlation between symptom burden and HRQOL in individuals with COPD ([Shen et al., 2018](#)). In this study, the participants had a moderate

symptom burden. Additionally, 61.6% of the participants had no COPD-related hospitalizations in the previous year, indicating their ability to effectively manage their symptoms in their daily lives, leading to an improvement in HRQOL. However, 41.5% of the participants experienced respiratory symptoms several days a month, indicating the ongoing presence of symptoms. Among the participants, 50.8% sought medical attention when they experienced respiratory symptoms, suggesting that they were taking effective management measures to alleviate the symptom burden associated with COPD. According to the principles of the SMT, symptom management strategies significantly impact outcomes such as HRQOL.

Functional performance significantly impacts health-related quality of life (HRQOL) as an essential outcome indicator. Individuals with good functional performance are more likely to accomplish their daily life goals effectively. Research has shown a positive correlation between high levels of physical activity and HRQOL among COPD patients ([Hurst et al., 2021](#)). A similar finding was reported by [Zeng \(2019\)](#), which aligns closely with the present study. In our study, the mean score for functional performance was 1.91, indicating relatively high functional performance among the participants. The results revealed that participants were able to perform well in various daily activities such as personal care (2.99), household maintenance (2.07), physical exercise (2.43), recreation (1.60), and social interaction (1.80). However, the score for spiritual activities was relatively low (0.57), which may be attributed to the fact that some participants in China do not practice any religion and therefore do not engage in religious activities. It is worth noting that the majority of participants in this study worked between 7 to 10 hours per day (73.1%) and 6 to 7 days a week (76.2%). COPD patients who engage in high levels of physical activity and demonstrate strong functional performance tend to experience symptom relief, reduced risk of exacerbations, and improved HRQOL ([de la Cruz & Cebriño, 2021](#)). Consistent with the study's hypothesis, functional performance positively correlated with HRQOL among employed individuals with COPD. Good functional performance enables individuals to pursue their daily life goals effectively. This finding aligns with the results reported by [Zeng \(2019\)](#) and supports the notion that functional performance plays a vital role in determining HRQOL outcomes.

Contrary to expectations, the findings of this study did not reveal a significant correlation between social support and health-related quality of life (HRQOL). This differs from a previous study that demonstrated a positive relationship between social support and HRQOL among COPD patients ([Turnier et al., 2021](#)). However, another study by [Guo \(2014\)](#) indicated that social support did not significantly affect HRQOL in COPD patients. In our study, the average score on the Multidimensional Scale of Perceived Social Support (MSPSS) was 5.52 (SD = 0.92), indicating a high level of perceived social support among the participants. The family subscale had a particularly high score (6.17), showing strong support from family members, while the friend's subscale had a moderate score (4.85). Notably, most participants (90.8%) were married, and the age group of 50 to 59 accounted for 47.7% of the participants. Additionally, 77.7% of the participants were male. In Chinese culture, middle-aged men

are often seen as the “pillars” of the family, with significant family and social responsibilities (Ni et al., 2020). Furthermore, all participants in this study received regular income and had a sense of self-sufficiency in providing for themselves and their families. This may contribute to the belief that their HRQOL is not solely dependent on others. Married individuals may also benefit from better social support from their children and spouses (Mohammed et al., 2021). These factors might explain the lack of a significant relationship between social support and HRQOL in the current study.

### Implications of this Study for Nursing Practice

The findings of this study have important implications for nursing practice, particularly in enhancing HRQOL among employed individuals with COPD. By focusing on two key factors, namely symptom burden and functional performance, nurses can develop targeted nursing interventions to improve HRQOL in this population.

One of the primary goals for nurses should be to educate individuals with COPD on effective strategies for managing their symptoms. By providing comprehensive information and teaching self-care techniques, nurses can empower employed persons with COPD to take control of their symptoms and minimize their impact on daily functioning. This can improve functional performance, enabling individuals to engage in regular work activities. By effectively managing symptoms, employed persons with COPD are more likely to experience higher levels of HRQOL.

Secondly, nurses can contribute to enhancing HRQOL by promoting physical activity and exercise among employed individuals with COPD. Encouraging patients to engage in regular physical activity within their capabilities can have multiple benefits, including improved functional performance, reduced symptom burden, and enhanced overall well-being. By collaborating with patients to develop personalized exercise plans and providing ongoing support and guidance, nurses can help individuals with COPD achieve higher physical activity levels, improving HRQOL.

Lastly, nursing interventions should also address social support needs among employed individuals with COPD. While the current study did not find a significant correlation between social support and HRQOL, it is still essential for nurses to assess and address patients' social support networks. By identifying potential sources of social support, such as family, friends, or support groups, nurses can facilitate connections and encourage patients to seek and utilize available support systems. Promoting social engagement and providing resources for coping with the psychosocial impact of COPD can contribute to improved HRQOL outcomes.

### Limitations and Recommendations

This correlational study sheds light on the relationship between symptom burden, functional performance, social support, and HRQOL among employed individuals with COPD. However, further research is warranted to understand better how these factors interact and influence HRQOL. Future studies should focus on intervention research to identify and implement effective nursing interventions that can reduce symptom burden, enhance functional performance, and ultimately improve HRQOL for employed individuals with COPD. By conducting intervention studies, nurses can explore

and implement targeted strategies to optimize the well-being and quality of life of this population.

## Conclusion

The study findings indicate that symptom burden was negatively associated with HRQOL among employed individuals with COPD. Conversely, there was a positive correlation between functional performance and HRQOL in this population. However, social support did not show a significant relationship with HRQOL. Based on these results and SMT, it is suggested that tailored nursing intervention programs should be developed to provide education and information to help employed COPD patients better manage their symptoms and enhance their functional performance. Through comprehensive nursing interventions encompassing these aspects, nurses can positively impact the lives of individuals with COPD, empowering them to live fuller and more fulfilling lives despite their condition.

### Declaration of Conflicting Interest

All authors declared no potential conflict of interest in this study.

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### Authors' Contributions

All authors contributed substantially to the conception and design, acquisition of data, or analysis and interpretation of data. In addition, all drafted the manuscript or revised it critically for important intellectual content and provided approval of the final version.

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### Data Availability

The datasets generated during and analyzed during the current study are available from the corresponding author upon reasonable request.

### Declaration of Use of AI in Scientific Writing

Nothing to declare.

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