

## Original Article

## The Effect of Physical Activity Level on Positive Mental Health of Chronic Obstructive Pulmonary Patients

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### Abstract

This study was planned to examine the relationship between physical activity level and positive mental health in chronic obstructive pulmonary patients. This study was planned as a descriptive relational study. The mean age of the participants was  $67.93 \pm 11.14$ , 72.4% male, 27.6% female, 79% secondary school graduate, 77.1% married, 38.1% It was determined that 44.8% of them did not work in any job and their income was between 2501-3500 TL. The mean physical activity score of the participants was  $227 \pm 108.18$ , and the mean score of the positive mental health scale was  $68.12 \pm 12.57$ . A high positive correlation was observed between physical activity level and positive mental health. When the results of the study were evaluated, married and poor financial situation were in the risk group. In addition, it has been observed that individuals have a more positive mental health as the level of physical activity increases.

### 1. Introduction

Chronic Obstructive Pulmonary Disease (COPD): It is a common, preventable and treatable systemic disease characterized by airflow limitation in the airways and/or alveoli associated with a chronic inflammatory response, usually caused by exposure of the airways and lungs to harmful particles (Caramori et al., 2016). Patients with COPD have difficulty in performing simple activities due to exertional dyspnea during simple activities of daily living, and symptoms such as muscle fatigue lead to exercise intolerance. It triggers physical inactivity, which is one of the important behavioral problems of COPD. As a result of all these, sick individuals adopt a sedentary lifestyle due to the fear of movement (Coventry et al

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2013, Troosters et al., 2013). Weakness in the lower extremity muscles in patients with chronic respiratory system is one of the most important factors that limit physical activity and cause a decrease in walking distance (Gloeckl et al., 2013). Physical activity, which is a form of health-related behavior; It is of great importance in the rehabilitation, recovery and prevention of chronic diseases (Soyuer & Soyuer 2008). Pulmonary rehabilitation is accepted as a basic method in the disease management of individuals with chronic respiratory disease. It has been determined that pulmonary rehabilitation increases the level of exercise capacity, reduces the degree of dyspnea and increases the quality of life (Spruit et al., 2013). The aim of PR is to increase the quality of life and daily physical activity level of sick individuals, to minimize the symptoms and attacks of the person, and to minimize the admission to the hospital (Gosselink, Troosters, & Decramer, 2000, Lluch-Canut, Puig-Llobet, Sánchez-Ortega, Roldán-Merino, & Ferré-Grau, 2013; Chen, Mortensen, & Bloodworth, 2014). Man's ability to move, the quality of this ability has a significant impact on human life cycle, prevention and treatment of diseases. In line with the studies examined, it has been observed that regular physical activities have positive effects on many systemic functions (Ölçücü, Vatansever, Özcan, & Çelik, 2015). The level of activity of sick individuals is a measure of how willing or able to participate in the management of their health conditions (Yadav, Hosseinzadeh, & Baral, 2018). Determining the level of activity gains importance, as sick individuals are required to take an active role in disease management skills. The information about individuals with COPD assimilation of their disease, the responsibilities they should take and the responsibilities they take aim to reach a more positive level of health. The desired result can be achieved by creating a plan within the framework of the targeted activity level (Koşar & Besen 2015). Positive psychology is based on the discovery of positive aspects in human nature and the development and improvement of these positive aspects (Eryılmaz, 2013). Factors such as coping strategies and thoughts about the disease can make it difficult to live with COPD and perform activities of daily living (Bonsaksen, Haukeland-Parker, Lerdal, & Fagermoen, 2014). By changing the perception of the disease in a positive way, the quality of life of individuals with chronic diseases will be increased by enabling them to cope with the emotional phenomenon brought by the disease and to overcome and cope with the daily stress associated with the disease (Yorulmaz, Tatar, Saltukoğlu, & Soyulu, 2013).

## **2. Material and methods**

### *Purpose of research and questions of the research*

This research was conducted to examine the relationship between the physical activity level of individuals with chronic Obstructive Pulmonary Disease and positive mental health.

### *Research Questions*

1. What is the physical activity and positive mental health scale mean score of the patients?

2. Do the mean scores of the positive mental health scale change according to the sociodemographic characteristics of the patients?

3. Is there a relationship between the physical activity level of the patients and the positive mental health level?

*Type of research*

It is of descriptive and correlational type.

*The place and features of the research*

The research was carried out in Konya City Hospital and Selcuk Medical Faculty Hospital in Konya.

*Study group of the research*

The sample was calculated as 108 patients.

*Data Collection Techniques and Tools*

In the collection of data; The information form questioning the sociodemographic information of the individuals, the "International Physical Activity Questionnaire" evaluating the physical activity levels of the elderly and the "Positive Mental Health Questionnaire" evaluating the positive mental health of the individuals were used. The data of the research were collected by the researcher in the form of an online questionnaire. In the research, the introductory information form developed by the researchers in line with the literature will be used with the 'International Physical Activity Questionnaire Short Form' and the 'Positive Mental Health Questionnaire Form'.

*Information Form:* The form developed in line with the literature consists of 7 questions regarding the basic characteristics of chronic obstructive pulmonary patients (age, gender, educational status, marital status, employment status, financial income, and how many years they have had the disease).

*International Physical Activity Questionnaire:* UFAA Craig et al. (1997 and 1998) and the Turkish adaptation study was carried out by Öztürk (2005). The correlation coefficient for the short form was  $r=0.69$ . International Physical Activity Questionnaire Short form (7 questions); It provides information on time spent walking, moderate and vigorous activities, and time spent sitting. In UFAA, physical activities should be performed for at least 10 minutes at a time. Calculation of the total score of the short form includes the sum of the duration (minutes) and frequency (days) of walking, moderate-intensity activity, and vigorous activity. The energy required for the activities is calculated with the MET-minute score (Öztürk 2006).

*Positive Mental Health Scale (PRSS):* It was developed by Lluh (1999) to define the conceptual model of positive mental health and evaluate positive mental health, based on the positive mental health research created by Jahoda (1958), and it was validated in our country by Teke and Baysan Arabacı (2018). and reliability has been established. The scale consists of six factors: Personal Satisfaction, Prosocial Attitude, Self-Control, Autonomy, Problem Solving and Self-Actualization, Interpersonal Relationship Skills. The PRSQ consists of 39 items that are unevenly distributed within six factors. Items receive a score ranging from "1" to "4" according to how often they are: "always or almost always", "often",

“sometimes” or “never or rarely”. Since items 1, 2, 3, 6, 7, 8, 9, 10, 12, 13, 14, 19, 24, 30, 31, 33, 34, 38, and 39 in the original scale were reverse items, the scores for these items reverse scored. The range of points to be taken from the scale is 39-156. The scale does not have a cut-off score, and a low score indicates positive mental health. The Cronbach alpha reliability coefficient for the whole scale was 0.928; 0.933 was found for this sample group (Teke & Baysan Arabacı 2018).

#### *Data Evaluation*

The data of the study were evaluated using the statistical package program SPSS for Windows 22.0 (Statistical Package for Social Science). As summary statistics, the number of units (n), percent (%), mean±standard deviation (mean (SD)) values were calculated.

The normal distribution of the data was evaluated with the Kolmogorov–Smirnov test and the Q-Q graph, and it was observed that the data did not show normal distribution. Mann Whitney U test and Kruskal Wallis test were used to evaluate the relationship between sociodemographic characteristics and positive mental health.

Pearson correlation analysis was used to evaluate the relationship between age, duration of illness, physical activity, and positive mental health. The results were evaluated at 95% confidence interval and  $p < 0.05$  significance level.

#### *Ethical Procedure*

Before starting the research, permission was obtained from the Ethics Committee of the Faculty of Sport Sciences (Meeting date: 3.12.2021/ Decision Number: 155). In addition, written consent was obtained from the individuals.

### **3. Results and Discussions**

The mean age of the participants was  $67.93 \pm 11.14$ , 72.4% were male, 27.6% were female, 79% were secondary school graduates, 77.1% were married, 38.1% had any It was determined that 44.8% of them did not work in a job and their income was between 2501-3500 TL. In addition, it was observed that the participants had a diagnosis of COPD for  $8.34 \pm 3.12$  (years).

The distribution of physical activity levels and positive mental health scale mean scores of the participants is presented in Table 1. The mean physical activity score of the participants was  $227 \pm 108.18$ , and the mean score of the positive mental health scale was  $68.12 \pm 12.57$ .

**Table 1.** *Distribution of Participants' Physical Activity Level and Positive Mental Health Scale Mean Scores*

Scales	Mean±SD	Min-Max
Physical Activity Total Score	227±108,18	56-330
Positive Mental Health Scale Total Score	68,12±12,57	38-97

When the sociodemographic characteristics of the participants and the distribution of positive mental health mean scores were evaluated, it was found that the positive mental health score average of those who graduated from secondary education was higher than those who graduated from high school, and the difference was found to be statistically significant ( $p < 0.05$ ). The mean positive mental health score of the singles was higher than the married ones, and the difference was statistically significant ( $p < 0.05$ ).

A statistically significant difference was found between the financial situation and the mean score of positive mental health, and it was seen that the difference was due to those whose financial situation was 0-1000 TL ( $p < 0.05$ ). There was no statistical difference between the gender and working status of the participants and their positive mental health score averages. ( $p > 0.05$ ) (Table 2).

**Table 2.** *Distribution of Positive Mental Health Scale Mean Scores by Sociodemographic Characteristics of the Participants*

<b>Variables</b>	<b>Positive Mental Health Average Score</b>	<b>Test value P value</b>
<b>Gender</b>		
Female	69,86±14,51	U:7,500
Male	67,46±11,79	p:0,50
<b>Educational Status</b>		
Secondary education	72,44±11,88	KW:1,437
High school	64,00±10,30	p:0,02*
<b>Marital status</b>		
The married	63,71±11,25	KW:3,309
Single	73,94±12,08	p:0,03*
<b>Working Status</b>		
Working	67,47±14,30	U:5,000
Not working	68,58±11,70	p:0,37
<b>Financial status</b>		
0-1000 TL	<b>64,22±9,54</b>	KW:0,288
1001-3500 TL	68,26±11,87	p:0,01*
3501 and above	71,55±13,26	

KW: Kruskal Wallis Test, U: Mann Whitney U Test, \* $p < 0,05$

The relationship between the participants' age, duration of illness, physical activity level and positive mental health is evaluated in table 3. There was no significant relationship between age and disease duration, physical activity and positive mental health ( $p > 0.05$ ). A high negative correlation was found between age and physical activity ( $p < 0.05$ ).

A moderate positive correlation was found between the duration of the disease and physical activity ( $p < 0.05$ ). No significant relationship was found

between the duration of illness and positive mental health ( $p>0.05$ ). A high negative correlation was observed between physical activity level and positive mental health ( $r:0.74$ ,  $p:0.01$ ) (Table 3).

**Table 3.** Comparison of Participants' Age, Disease Duration, Physical Activity Level and Positive Mental Health Levels

Variables	Gender	Disease Duration (Years)	Physical Activity	Positive Mental Health
<b>Gender</b>	1,00			
<b>Disease Duration (Years)</b>	r:-323 p:0,74	1,00		
<b>Physical Activity</b>	r:-0,695 p:0,02*	r:0,453 p:0,03*	1,00	
<b>Positive Mental Health</b>	r:-0,621 p:0,34	r:0,471 p:0,79	r:-0,74 p:0,01*	1,00

r:Pearson Correlation Analysis, \* $p<0,05$

In this study, which was conducted to determine the effect of physical activity on positive mental health in patients with COPD, the mean age of the participants was  $67.93\pm 11.14$ . COPD is an age-related disease. Because the cumulative effect of inhaled gases and particles occurs with aging. (Lalley 2013) 72.4% of the patients are male and 27.6% are female. 38.1% of the cases in our study do not work in any job. In the study investigating the effects of chronic obstructive pulmonary diseases on loss of workforce in the USA; It has been stated that there is an inverse correlation between the increase in the severity of COPD and the labor force participation of individuals (Grundy & Sloggett, 2003; Sin, Stafinski, Bell, & Jacobs 2002; Yenilmez, Gürsoy, Evyapan, & Kitiş, 2018). Since COPD affects the muscle strength of the person badly and causes symptoms such as dyspnea, it also causes negative results in participation in activities of daily living and therefore in performance at work. It was determined that the income of 44.8% of the participants was between 2501-3500 TL. It has been reported that inequality in health is more common in respiratory system diseases compared to other system diseases, and the lowest socioeconomic groups have 14 times more respiratory system diseases than the highest socioeconomic groups (Kocabaş et al. 2014).

A positive moderate correlation was found between the duration of the disease and physical activity. Trooster et al. (2010) showed in a multicenter study they conducted that as the severity of COPD increases, the time spent by patients in moderate activities decreases (Troosters et al 2010). The fact that the severity of the disease was not measured in patients with known disease duration caused the lack of comparison, thus constituting the limitation of the study. Compared with the existing data on objectively measured physical activity decline in healthy elderly subjects (32-35) in the study of Waschki et al. . Regular physical activity is

important for patients with COPD in all severity stages. Because consistently low physical activity level over time is associated with accelerated progression of exercise intolerance and muscle wasting.

A high positive correlation was observed between physical activity level and positive mental health. In the study by Tamminen et al. (2020), physical inactivity was associated with lower positive mental health levels. Inactive people were more likely to have low PMH than highly active people. (Tamminen et al 2020)

Because low PMH levels can potentially pose a risk to mental health, it seems vital to communicate and encourage the importance of physical activity once the diagnosis of COPD is made.

#### 4. Conclusions

As a result of the study, in terms of positive mental health, those who graduated from secondary education, married and those with low financial status were included in the risk group. In addition, it has been observed that as the level of physical activity decreases, positive mental health worsens.

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