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COVID-19 PHOBIA AND PHYSICAL ACTIVITY LEVEL IN PATIENTS WITH NON-CYSTIC FIBROSIS BRONCHIECTASIS DURING COVID-19 PANDEMIC

ORIGINAL ARTICLE

ABSTRACT

Purpose: The COVID-19 pandemic period may affect physical and mental health of non-cystic fibrosis (CF) bronchiectasis patients. The aim of this study was to compare COVID-19 phobia, quality of life, health anxiety, physical activity level and sleep quality during the pandemic between patients with non-CF bronchiectasis and healthy controls.

Methods: Thirty non-CF bronchiectasis patients and 44 healthy controls were included. COVID-19 phobia (Coronavirus 19 Phobia Scale (CP19-S)), quality of life (Nottingham Health Profile (NHP)), health anxiety (Health Anxiety Inventory (HAI)), physical activity level (short form of the International Physical Activity Questionnaire (IPAQ-SF)) and sleep quality (Pittsburgh Sleep Quality Index (PSQI)) were evaluated.

Results: NHP energy, pain, and physical mobility scores and moderate-intensity physical activity levels were significantly lower; PSQI sleep disturbance score was significantly higher in patients compared with controls ($p<0.05$). Total CP19-S and HAI scores were similar between groups ($p>0.05$). The majority of patients and controls did not meet the recommended levels of moderate or high-intensity physical activity per week.

Conclusion: The COVID-19 pandemic has resulted in a decline in quality of life, reduced moderate-intensity physical activity, and increased sleep disturbances among non-CF bronchiectasis patients. Both patients and healthy individuals have experienced coronaphobia and exhibited low levels of physical activity. These results reveal the importance of providing physical activity counseling during the pandemic period.

Key Words: Anxiety, Bronchiectasis, COVID 19, Life quality, Phobia, Physical Activity

COVID-19 PANDEMİSİ SIRASINDA KİSTİK FİBROZİS DIŞI BRONŞEKTAZİ HASTALARINDA COVID-19 FOBİSİ VE FİZİKSEL AKTİVİTE DÜZEYİ

ARAŞTIRMA MAKALESİ

ÖZ

Amaç: COVID-19 pandemi dönemi, akistik fibrozis (KF) dışı bronşektazi hastalarının fiziksel ve mental sağlığını etkileyebilir. Bu çalışmanın amacı, pandemi sırasında COVID-19 fobisi, yaşam kalitesi, sağlık anksiyetesi, fiziksel aktivite düzeyi ve uyku kalitesini KF dışı bronşektazi hastaları ve sağlıklı kontroller arasında karşılaştırmaktır.

Yöntem: Otuz KF dışı bronşektazi hastası ve 44 sağlıklı kontrol dahil edildi. COVID-19 fobisi (Koronavirüs-19 Fobisi Ölçeği (CP19-S)), yaşam kalitesi (Nottingham Sağlık Profili (NHP)), sağlık anksiyetesi (Sağlık Anksiyete Ölçeği (HAI)), fiziksel aktivite (Uluslararası Fiziksel Aktivite Anketi kısa formu (IPAQ-SF)) ve uyku kalitesi (Pittsburgh Uyku Kalitesi İndeksi (PSQI)) değerlendirildi.

Sonuçlar: NHP enerji, ağrı ve fiziksel hareketlilik skorları ve orta şiddette fiziksel aktivite düzeyleri anlamlı olarak daha düşük; PSQI uyku bozukluğu skoru hastalarda kontrollere göre anlamlı olarak daha yüksekti ($p<0,05$). Toplam CP19-S ve HAI skorları gruplar arasında benzerdi ($p>0,05$). Hastaların ve kontrollerin çoğu önerilen haftalık orta veya şiddetli fiziksel aktivite düzeyini karşılamıyordu.

Tartışma: COVID-19 pandemisi, KF dışı bronşektazi hastalarında yaşam kalitesinde düşüşe, orta şiddette fiziksel aktivite düzeyinde azalmaya ve uyku bozukluklarında artışa neden olmuştur. Hem hastalar hem de sağlıklı bireyler koronafobiye ve düşük düzeyde fiziksel aktivite seviyesine sahipti. Bu sonuçlar, pandemi döneminde fiziksel aktivite danışmanlığı verilmesinin önemini ortaya koymaktadır.

Anahtar Kelimeler: Anksiyete, Bronşektazi, COVID 19, Yaşam Kalitesi, Fobi, Fiziksel Aktivite

INTRODUCTION

The first coronavirus disease 2019 (COVID-19) case was recorded in Wuhan, China, in December 2019 and spread out quickly across the world. In Turkey, the first case was announced on March 11, 2020, and the epidemic continues to increase dramatically (1). The outbreak has not been fully controlled yet. Therefore, the number of deaths due to COVID-19 has been rising. Because of the deaths, people often experience psychological symptoms, including fear, panic and phobia during pandemics. The natural or human-made disasters could cause phobic conditions. In addition to environmental factors, genetic, personal and physiological features may also bring along phobia (2). During the pandemic, experiencing fear and anxiety have affected the health-related quality of life (3). COVID-19 outbreak has overwhelmed people's physical activity. Closing universities, schools and gyms, restrictions on public movements, flexible working hours and teleworking have affected people's daily activities (4). On the other hand, staying at home, social distancing, working from home and changes in sleeping patterns have impaired sleep quality (5). The most common cause of death in COVID-19 patients is pneumonia leading to respiratory failure. For this reason, existing lung diseases may cause COVID-19 to occur more frequently (6). During the pandemic period, restriction in daily activities and isolation have been recommended to reduce the risk of COVID-19 transmission and protect the patients at high risk. In addition to the positive effects of these recommendations, they may disturb patients' physical and mental health (7). Lung disease patients' life quality might be affected because of the isolation period and decreased outpatient visits (8, 9). There exist no studies assessing physical and mental health in non-cystic fibrosis (CF) bronchiectasis during COVID-19 pandemic. Hence, the aim of the present study was to compare COVID-19 phobia, quality of life, health anxiety, physical activity level and sleep quality during COVID-19 pandemic between non-CF bronchiectasis and healthy controls.

METHODS

Study design

The cross-sectional study was performed between June 2020 and October 2020 at Hacettepe University, Faculty of Physical Therapy and Rehabilitation.

Hacettepe University Non-Interventional Clinical Research Ethics Board (GO 20/602; 23.06.2020) approved the study, and all participants read and confirmed the informed consent form before agreeing to participate in this study.

Study population

The patients obtained from the unit database were reached by phone calls and the patients were informed about the study. The patients aged 18-60 years who diagnosed with non-CF bronchiectasis, had no acute exacerbation or infection in the last two weeks and were willing to participate were included. The patients who had a cognitive problem and were unable read and/or write were excluded. The healthy controls aged 18-60 years who were relatives of the researchers, the university staff, students, and willing to participate were included. The healthy controls who had a cardiopulmonary disease and were unable read and/or write were excluded.

Data Collection and Assessments

The data were collected using Google Forms. By using the forms, demographic information, smoking status, and physical characteristics were recorded. The modified Medical Research Council Dyspnea Scale (mMRC) was used for evaluation of dyspnea perception (10).

COVID-19 phobia

COVID-19 phobia was evaluated using the Coronavirus 19 Phobia Scale (CP19-S). The scale consists of psychological (6 items), somatic (5 items), social (5 items), and economic (4 items) subdimension. The total C19P-S score is calculated by sum of the subdimension scores. High scores demonstrate tendency to COVID-19 phobia both for subdimensional and general (2).

Quality of life

Quality of life was evaluated using the Nottingham Health Profile (NHP). The NHP consists of six subgroups including pain, emotional reactions, sleep, social isolation, physical activity, energy. The score changes from 0 to 100, and the quality of life varies inverse proportionality according to NHP (11, 12).

Health anxiety

Health anxiety was evaluated using the Health Anxiety Inventory (HAI). The score range of the scale is between 0 and 54 for 18 items, and higher score indicates higher level of health anxiety (13,14). The cut-off point for moderate health anxiety and hypochondriasis are 18 and 27, respectively (15).

Physical activity level

The short form of the International Physical Activity Questionnaire (IPAQ-SF) was used to evaluate physical activity level. The IPAQ-SF assesses walking, moderate, and vigorous activities and sitting time over the last 7-days. The physical activity score is calculated by multiplying the metabolic equivalent (MET) value corresponding to the duration of each activity, and then summing all these values excluding the sitting time (16,17). The total score is interpreted as low, moderate, and high levels of physical activity according to the reference values (18).

Sleep quality

The Pittsburgh Sleep Quality Index (PSQI) was used to evaluate sleep quality. The last 5 of 24 questions are excluded in the PSQI scoring (19,20). PSQI score of >5 is indicative of sleep disturbance (21).

The Turkish versions of the questionnaires were used and the required permissions were obtained for the present study.

Statistical analysis

The SPSS for Mac (Version 20.0, IBM Inc., Armonk, NY, USA) was used for statistical analysis. Before the study, sample size calculation (G*Power 3.0.10 system) was performed to detect the number of participants is needed. By performing this calculation, two independent means/groups for an α value of 0.05, the effect size of 0.50, 80% power were used. The result of calculation revealed that including at least 14 participants for each group is necessary (22). Descriptive statistics were expressed as mean \pm SD, minimum-maximum, frequency, and percentage. Normality was tested visually (histograms and probability plots) as well as using Kolmogorov-Smirnov test. Normally distributed variables were compared using Student's t test. Mann-Whitney U test was performed for the comparison of non-normally distributed variables. The relationships between the parameters were analyzed assessed using Pearson or Spearman's rank correlation coefficients accordingly to the normality. The probability of error was taken as $p < 0.05$ (23).

RESULTS

Forty-six non-CF bronchiectasis and 60 healthy controls were evaluated regarding to the aforementioned criteria. Out of the initial group, seven patients and 15 healthy controls did not volunteer, three patients passed away, the contact details of six patients were missing, and one healthy con-

Table 1. Demographic Characteristics of Patients with Non-CF Bronchiectasis and Healthy Controls

Characteristics	Patients (n=30) Mean \pm SD /median (min-max)	Healthy (n=44) Mean \pm SD/median (min-max)	p
Age, years	29.97 \pm 12.57	30.43 \pm 7.95	0.858
Sex (Female/male), n (%)	16 (53.3%)/14 (46.7%)	25 (56.8%)/19 (43.2%)	0.815
Height, cm	167.80 \pm 10.68	170.48 \pm 8.66	0.239
Weight, kg	63.80 \pm 17.08	69.18 \pm 16.61	0.180
Body mass index, kg/m ²	22.45 \pm 4.54	23.68 \pm 4.73	0.267
Smoking history, pack-year	1.43 \pm 4.33	1.89 \pm 3.47	0.219
Smoking, n (%)			
Current smoker	1 (3.3%)	8 (18.2%)	
Ex-smoker	4 (13.3%)	6 (13.6%)	0.151
Non-smoker	25 (83.3%)	30 (68.2%)	
mMRC (0-4)	2 (1-2)	0 (0-2)	<0.001*

Descriptive analyses were presented using (mean \pm SD) and median (min-max) for normally and non-normally distributed variables, respectively. Mann-Whitney U-test * $p < 0.05$. mMRC: modified Medical Research Council Dyspnea Scale.

Table 2. Comparison of COVID-19 Phobia, Quality of Life, Health Anxiety, Physical Activity, and Sleep Quality between Patients with Non-CF Bronchiectasis and Healthy Controls

Parameters	Patients (n=30) Mean±SD/median (min-max)	Healthy (n=44) Mean±SD/median (min-max)	p
CP19-S			
Psychological	19.30±6.93	18.95±6.67	0.830
Somatic	9 (5-15)	9 (5-25)	0.846
Social	13.90±5.97	13.82±4.96	0.949
Economic	8 (4-15)	8 (4-20)	0.876
Total (20-100)	49.90±16.48	49.68±16.30	0.955
NHP (0-100)			
Energy	66.67 (0-100)	100 (0-100)	0.004*
Pain	100 (37.5-100)	100 (50-100)	0.004*
Emotional reactions	83.33 (0-100)	88.89 (11.11-100)	0.669
Sleep	80 (0-100)	90 (20-100)	0.120
Social isolation	80 (20-100)	100 (0-100)	0.163
Physical mobility	87.50 (50-100)	100 (25-100)	<0.001*
HAI	19 (4-31)	15 (5-36)	0.050
IPAQ-SF			
Total (MET-min/week)	510 (0-13668)	982.5 (0-9333)	0.232
Moderate (MET-min/week)	0 (0-2880)	120 (0-4000)	0.019*
Vigorous (MET-min/week)	0 (0-9600)	0 (0-7680)	0.813
Walking (MET-min/week)	396 (0-4620)	495 (0-6930)	0.260
Sitting (min/day)	408.62±214.75	424.88±186.54	0.734
PSQI			
Subjective sleep quality	1 (0-3)	1 (0-3)	0.189
Sleep latency	1 (0-3)	1 (0-3)	0.581
Sleep duration	0 (0-3)	0 (0-12)	0.219
Sleep efficiency	0 (0-3)	0 (0-2)	0.236
Sleep disturbance	1 (0-2)	1 (0-3)	0.030*
Use of sleep medication	0 (0-3)	0 (0-3)	0.350
Daytime dysfunction	0 (0-2)	1 (0-3)	0.056
Global score (0-21)	4.5 (0-13)	6 (1-20)	0.544

Descriptive analyses were presented using (mean ± SD) and median (min-max) for normally and non-normally distributed variables, respectively. Mann-Whitney U-test *p < 0.05., CP19-S: Coronavirus 19 Phobia Scale, MET: metabolic equivalent for task, NHP: Nottingham Health Profile, HAI: Health Anxiety Inventory, IPAQ-SF: short form of the International Physical Activity Questionnaire, PSQI: Pittsburgh Sleep Quality Index.

trol had a history of COVID-19. Consequently, 30 non-CF bronchiectasis and age and sex matched 44 healthy controls were included. Physical characteristics, dyspnea, and smoking history of the participants and comparison of these parameters between the groups were shown in Table 1. There was no statistically significant difference in terms of age, sex, height, body weight, and body mass index were found between the groups (p>0.05). Patients' dyspnea perception was significantly

higher than that of controls (p<0.05, Table 1). The occupations of the participants were classified as full-time employment (23.3% of patients, 61.1% of controls), part-time employment (0% of patients, 6.8% of controls), unemployed (13.3% of patients, 6.8% of controls), retired (13.3% of patients, 2.3% of controls), housewives (10% of patients, 2.3% of controls) and students (40% of patients, 20.5% of controls).

The comparison of COVID-19 phobia, quality of life, health anxiety, physical activity, and sleep quality between the patients with non-CF bronchiectasis and controls was shown in Table 2. No statistically significant differences were found in total CP19-S score, all CP19-S subdimension scores; NHP emotional reactions, sleep, and social isolation scores between the groups ($p>0.05$). The NHP energy, pain, and physical mobility scores of the patients were significantly lower than those of controls ($p<0.05$, Table 2).

The HAI score was similar between the groups ($p=0.05$, Table 2). The 56.7% of the patients and 36.4% of controls had HAI score ≥ 18 , while 16.7% of the patients and 9.1% of controls had HAI score ≥ 27 .

The 53.3% of the patients and 31.8% of controls had low physical activity level, 30% of the patients and 52.3% of controls had moderate physical activity level, and 16.7% of the patients and 15.9% of controls had high physical activity levels ($p=0.129$). Merely a small proportion of the patients (less than 7%) and a slightly larger percentage of the controls (just over 18%) participated in moderate-intensity physical activity for a minimum of 150 minutes per week, whereas more than 83% of the patients and 81.8% of the controls failed to complete at least 75 minutes of vigorous-intensity physical activity per week. The patients had significantly lower moderate physical activity level than that of controls ($p<0.05$). Total, vigorous, and walking physical activity levels and total sitting time were similar between the two groups ($p>0.05$, Table 2).

The PSQI total score and all domains except for PSQI sleep disturbance domain were similar between the patients and controls ($p>0.05$). The PSQI sleep disturbance score of the patients was significantly higher than that of controls ($p<0.05$). The 53.3% of the patients and 45.5% of controls had PSQI score >5 . The 53.3% of the patients and 27.7% of controls failed to adhere to the recommended 7–9 hours of sleep per day.

There was a negative correlation between PSQI sleep disturbance and NHP energy ($r=-0.506$ $p=0.004$), pain ($r=-0.483$ $p=0.007$), sleep ($r=-0.455$ $p=0.011$), social isolation ($r=-0.446$ $p=0.013$) and physical mobility subscales ($r=-0.568$ $p=0.001$) in the patients.

DISCUSSION

To the best of our knowledge, this is the first study comparing COVID-19 phobia, quality of life, health anxiety, physical activity level, and quality of sleep during the pandemic between non-CF bronchiectasis patients and healthy controls. The remarkable findings of our study are that the patients have impaired quality of life, reduced moderate-intensity physical activity and common sleep disturbance during the pandemic.

Coronaphobia and fear of COVID-19 have been used to describe the fear of dealing with COVID-19. In the present study, we have shown that coronaphobia was similar in the non-CF bronchiectasis patients and healthy controls. Similarly, Haktanir et al. showed no difference in fear of COVID-19 between patients with chronic disease and healthy controls (24). Another study reported no significant differences between oncological patients and healthy controls regarding fear of COVID-19. Furthermore, the researchers stated that both groups' fear of COVID-19 was increased (25). From these results, we infer that COVID-19 pandemic causes similar levels of coronaphobia in both healthy controls and patients with various chronic diseases including bronchiectasis.

In the present study, the quality of life of the patients was found to be negatively affected during COVID-19 pandemic. The patients experienced a lack of energy, musculoskeletal pain, and decreased physical mobility. Reduced physical activity can cause musculoskeletal pain (26). Furthermore, physical activity is a protective factor against fatigue and lack of energy (27). The moderate physical activity level of the patients was lower than that of healthy controls, and more than half of the patients (53.3%) had low level of physical activity. Celenay et al. found that individuals who stayed at home during COVID-19 period had more pain perception compared with those who continued working (28). In this study, the vast majority of the patients (76.7%) were staying at home during COVID-19 pandemic. Staying at home a long time and physical inactivity may have contributed more musculoskeletal pain perception and lack of energy in non-CF bronchiectasis than healthy controls.

In the present study, the groups had similar levels of health anxiety during COVID-19 pandemic. Ac-

cording to the cut-off points, 56.7% of the patients and 36.4% of healthy controls had moderate health anxiety; 16.7% of the patients and 9.1% of healthy controls were identified as hypochondriasis. During COVID-19 pandemic, Landi et al. found that 33.8% of adults had moderate health anxiety, and 8.1% of individuals had hypochondriacal concerns (15). These findings were similar to the findings of our study. However, the percentage of the bronchiectasis patients were higher than the findings of Landi et al. A previous study conducted in Turkey during COVID-19 pandemic reported that the mean HAI scores were 17.9 ± 7.6 in individuals with chronic disease and 14.6 ± 6.7 without chronic disease (29). Consistent with these findings (29), we found a higher mean HAI score in patients with chronic diseases compared with healthy controls. On the other hand, the mean HAI score of the healthy controls in our study (16.4 ± 7.0) during the COVID-19 pandemic were similar to the results (16.6 ± 6.7) of Aydemir et al.'s healthy controls before the pandemic (13). Despite a numerical difference between groups, we did not observe a statistically significant difference in HAI scores between patients and healthy controls. Therefore, it is recommended to evaluate a larger sample size to reconsider the results and enhance the generalizability of the findings.

The COVID-19 pandemic has caused an increase in sedentary time and reduced physical activity in healthy population (30). Our study showed that moderate-intensity physical activity level was reduced in the patients with non-CF bronchiectasis during COVID-19 pandemic. While most of the patients (53.3%) had low level of physical activity, more than half of the healthy controls (52.3%) had moderate physical activity level. O'Neill et al. reported that the median values for total (2700 MET-min/week), vigorous (0), moderate (1620 MET-min/week) intensity physical activity and walking (561 MET-min/week) in patients with bronchiectasis before COVID-19 pandemic. In our study, median values for total IPAQ-SF score (510 MET-min/week), moderate-intensity physical activity and walking score (396 MET-min/week) in the patients were lower than the findings of O'Neill et al. during COVID-19 pandemic (31). Similar to our results, Lopez-Sanchez et al. found that moderate-intensity physical activity level was reduced in a chronic condition, including lung diseases during COVID-19

quarantine compared to before COVID-19 quarantine (32). In addition to daily life restrictions due to COVID-19 pandemic period, higher perception of shortness of breath may have affected the physical activity level of the patients.

Adults should engage minimum 150 min of moderate or 75 min of vigorous-intensity physical activity per week according to World Health Organization (33). In the present study, most patients and controls did not meet these recommendations for health-enhancing physical activity level. Recent meta-regression analysis suggests that adults should spend their time for sitting fewer than 9 hours a day to reduce all-cause mortality (34). In the present study, 36.7% of the patients and 36.4% of healthy controls were sitting more than 9 hours per day during COVID-19 pandemic. Although sedentary behavior was similar in both of the groups, non-CF bronchiectasis is expected to be more affected by sedentary behavior due to present chronic lung disease.

The life changes, including working from home, sleep late, and social isolation have affected sleep quality during COVID-19 pandemic (5). In this study, 53.3% of the patients and 45.5% of the healthy controls had sleep disturbance. Furthermore, sleep disturbance domains of sleep quality deteriorated in the patients. Gao et al. stated that sleep disturbance was common in patients with steady-state bronchiectasis (56.9%) than healthy individuals (28.8%) (21). Our results showed a higher rate of sleep disturbances perception in the healthy controls (45.5%) compared to Gao et al. results. In a new study conducted during the pandemic period reported that insomnia score was higher in individuals with chronic diseases than individuals without chronic diseases (35). Another study reported the presence of a higher prevalence of sleep disturbances in females and individuals with chronic disease during COVID-19 pandemic (36). The National Sleep Foundation recommends 7–9 hours of sleep per day for adults aged 18–64 years (37). In this study, 53.3% of the patients and 27.7% of healthy controls did not meet the recommendation for sleep duration during COVID-19 pandemic. On the other hand, sleep disturbance domains of sleep quality were negatively correlated with energy, pain, sleep, social isolation, and physical mobility

domains of quality of life in these patients. During COVID-19 pandemic, sleep disturbance may have caused the impaired quality of life in patients with non-CF bronchiectasis.

The current study has some limitations. First, we were unable to assess pre-pandemic period physical activity levels of the participants. Second, the study population included participants in Turkey. Cultural factors can affect physical activity habits of both the patients and healthy individuals.

To conclude, the present study demonstrated that the COVID-19 pandemic has resulted in a decline in quality of life, reduced moderate-intensity physical activity, and increased sleep disturbances among non-CF bronchiectasis patients. Furthermore, COVID-19 pandemic threatens not only non-CF bronchiectasis patients but also healthy controls, since both patients and healthy individuals have experienced coronaphobia and exhibited low levels of physical activity. Failing to meet the recommended physical activity levels for health benefits, as observed in the participants, may increase the risk of mortality. Therefore, future pandemic-related studies should consider assessing the effect of sedentary behavior and physical inactivity during COVID-19 pandemic on mortality. On the other hand, telerehabilitation programs, particularly those that offer physical activity counselling, have become crucial for both non-CF bronchiectasis patients and healthy individuals during the isolation and pandemic period. Furthermore, incorporating behavioral and psychosocial interventions may be an effective strategy for minimizing coronaphobia during the same period.

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