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NEÜ YAYINEVİ

Kinesiophobia, Physical Activity, Fear of COVID-19, and Fatigue in Adult Individuals: A Cross-Sectional Study

Yetişkin Bireylerde Kinezyofobi, Fiziksel Aktivite, COVID-19 Korkusu ve Yorgunluk: Kesitsel Çalışma

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Öz

Amaç: Yeni koronavirüs hastalığının (COVID-19) uzamış süreci ve ilgili kısıtlamalar bireylerde fiziksel inaktiviteye, COVID-19 korkusuna ve yorgunluğa neden olmaktadır. Pandemi sürecinde, hastalarda kinezyofobi ölüm korkusu ve fiziksel inaktiviteyi artırabilmektedir. Ancak bireylerde kinezyofobi ve kinezyofobinin fiziksel aktivite, COVID-19 korkusu ve yorgunlukla ilişkisi henüz bilinmediğinden mevcut çalışmada araştırılması amaçlanmıştır.
Hastalar ve Yöntem: Çalışmaya yetişkin bireyler (n=166, 36,3±15,37 yıl) dâhil edildi. Kinezyofobi (Tampa Kinezyofobi Ölçeği), fiziksel aktivite düzeyleri (Uluslararası Fiziksel Aktivite Anketi-Kısa Formu), COVID-19 korkusu (COVID-19 Korkusu Ölçeği (CKÖ-19)) ve yorgunluk (Sayısal Derecelendirme Ölçeği) 3 Haziran 2021 ve 30 Haziran 2021 arasında çevrimiçi platform üzerinden uzaktan değerlendirildi.
Bulgular: Bireylerin 91'inde (%54,8) yüksek derecede kinezyofobi vardı, 55'i (%33,1) inaktif, 84'ü (%50,6) minimal aktif ve 27'si (%16,3) çok aktifti. Kinezyofobi puanı yaş, vücut ağırlığı, vücut kütle indeksi, eğitim düzeyi, yürüme, toplam fiziksel aktivite, CKÖ-19 ve yorgunluk puanları ile anlamlı olarak ilişkiliydi (p<0,05).
Sonuç: Bireylerin çoğunluğunda kinezyofobi ve fiziksel inaktivite yaygındır. COVID-19 pandemisi boyunca bireylerin hastalığı olmamasına rağmen, yürüme, fiziksel aktiviteler ve eğitim düzeyi azaldıkça bireylerde kinezyofobi artmaktadır. Yaş, vücut ağırlığı, vücut kütle indeksi, COVID-19 korkusu ve yorgunluk arttıkça da kinezyofobi artmaktadır. Kinezyofobinin ve uzamış pandemi sürecinin olumsuz etkileri düşünüldüğünde, bireyler acilen fiziksel aktivite danışmanlığı programlarına yönlendirilmelidir.

Anahtar Kelimeler: COVID-19, fiziksel aktivite, korku, yetişkinler, yorgunluk

Abstract

Aim: The prolonged process of new coronavirus disease (COVID-19) and related restrictions cause physical inactivity, fear of COVID-19, and fatigue in individuals. During the pandemic, kinesiophobia may raise fear of death and physical inactivity in patients. However, kinesiophobia and its relationship with physical activity (PA), fear of COVID-19, and fatigue in individuals have not been known yet, which was therefore aimed to investigate in the current study.
Patients and Methods: Adult individuals (n=166, 36.3±15.37 years) were included in the study. Kinesiophobia (Tampa Scale of Kinesiophobia), PA levels (International Physical Activity Questionnaire-Short Form), fear of COVID-19 (Fear of COVID-19 Scale (FCS-19)), and fatigue (Numeric Rating Scale) were evaluated remotely between 3 June 2021 and 30 June 2021 through an online platform.
Results: Of the individuals, 91 (54.8%) had a high level of kinesiophobia, 55 (33.1%) were inactive, 84 (50.6%) were minimally active, and 27 (16.3%) were very active. Kinesiophobia score was significantly correlated with age, weight, body mass index, education level, and walking, total PA, FCS-19, and fatigue scores (p<0.05).
Conclusion: Kinesiophobia and physical inactivity are prevalent in many individuals. Although individuals have no disease during the COVID-19 pandemic, their kinesiophobia level increases as walking, physical activities, and education levels decrease. Kinesiophobia also increases as age, weight, body mass index, fear of COVID-19 and fatigue increase. Considering the negative effects of kinesiophobia and the prolonged pandemic process, individuals should be urgently directed to PA counseling programs.

Key words: COVID-19, physical activity, fear, adults, fatigue,

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INTRODUCTION

When the first new coronavirus disease-2019 (COVID-19) cases started to appear in Turkey, the World Health Organization declared this newly emerging outbreak a pandemic. Since then, many measures have been taken to protect public health against the pandemic all over the world (1). In this process, as a result of the restrictions and measures that have been put into effect rapidly, people have been forced to stay at home. With the long-term implementation of strict quarantine measures, many radical changes have occurred in the lifestyle of societies. The leading radical changes include a decrease in physical activity levels, withdrawal from daily routines, and deterioration in mood. Therefore, the quality of life of individuals has gradually decreased (2). Compared to the pre-pandemic period, physical activity levels of the individuals have decreased significantly during the pandemic period (3), while their sedentary behaviors have increased (4,5). In addition, increased levels of depression, anxiety disorder, fear, and stress have been observed in individuals living under social isolation conditions due to the pandemic (6,7).

In extraordinary conditions caused by pandemic diseases like COVID-19, a sense of fear may occur in individuals. Depending on this fear, some individuals may feel sick and even commit suicide even though they have not been infected with the COVID-19 disease (8). During the pandemic, most individuals feel a moderate level of fear of COVID-19 (9,10). Fear of COVID-19 in adolescent children negatively affects adolescent mental health and well-being (11). During the restrictions due to the COVID-19 pandemic, kinesiophobia seen in patients can also bring on concerns such as fear of death. The most critical aspect of COVID-19 is the unknown course of the pandemic, the uncertainty of when the disease will be brought under control, and the ever-increasing number of cases. This situation can further increase the anxiety of the masses with some analyses and disinformation (12,13). It is also known that 64.1% of the individuals have become physically and mentally tired during the pandemic period (14).

The negative effects of the COVID-19 pandemic, which has been going on for about 1.5 years today, on human health continue to increase. Due to the increasing number of cases and restrictive measures, the individuals are seriously affected by this process both psychologically and physically. It is known that physical inactivity, fatigue, and fear of COVID-19 develop in the individuals during the COVID-19 pandemic. However, the kinesiophobia status of these individuals during the COVID-19 pandemic and the relationship of kinesiophobia with physical activity levels, fear of COVID-19, and perception of fatigue have not been known, yet. Therefore, this study was conducted to investigate the kinesiophobia, physical activity levels, fear of COVID-19, and perceived fatigue in adults during the COVID-19 pandemic process and relationships between these parameters.

PATIENTS AND METHODS

This prospective and cross-sectional study was approved by the Izmir Democracy University Non-Interventional Clinical Research Ethics Committee on May 26, 2021 (Decision no. 2021/06-13). The study consisted of adult individuals who could understand and respond to the questionnaires, had a smartphone, a computer, or an electronic device to access the questionnaires, and volunteered to participate in the study. Individuals who had any physical, mental problems, or chronic disorders that may prevent physical activity, had been diagnosed with COVID-19, had had COVID-19, and/or were pregnant were not included in the study. The individuals were first informed about the study, and then their informed consents were obtained. The study was conducted in accordance with the principles of the Declaration of Helsinki.

The participants filled out all the questionnaires on their smartphones or computers between 3 June 2021 and 30 June 2021 through a form created on an online platform (Microsoft Forms). Within the scope of the study, the socio-demographic characteristics of the individuals (age, gender, height, body weight, body mass index, education level, history of disease and infection, and presence of a chronic disease) were recorded. While primary outcome was physical activity, secondary outcomes were kinesiophobia, fear of COVID-19, and fatigue.

The Tampa Scale of Kinesiophobia

This scale was developed by Vlaeyen et al. to measure the fear of movement or re-injury (15). There are 17 items on this scale measuring parameters, such as injury, re-injury, fear, and avoidance in work-related activities (15). The Turkish version of the scale is valid and reliable (16). It uses a 4-point Likert-type scale (1: strongly disagree, 2: disagree, 3: agree, 4: strongly agree). The total score of the scale is calculated after the scores of the answers to the 4th, 8th, 12th, and 16th questions are reversed. The

minimum and maximum scores from the scale range between 17 and 68. High scores indicate a high level of kinesiophobia (15,16). The cut-off score for a high degree of kinesiophobia is 37 (15).

The International Physical Activity Questionnaire-Short Form

This questionnaire, which has a valid and reliable Turkish version (17), was developed by Craig et al. (18). It provides knowledge about the daily sitting time and the time spent on walking and doing moderate and vigorous physical activities in the last week. The questionnaire measures the frequency (days) and duration (minutes) of physical activities performed in the last seven days. Then, the amount of weekly physical activity (MET-min/week) spent on these physical activities is calculated by using the appropriate metabolic equivalents (MET) for vigorous (8 METs) and moderate (4 METs) activities and walking (3.3 METs). The scores are used to classify individuals as physically inactive, minimally active, and very active (19).

The Fear of COVID-19 Scale

This scale was developed by Ahorsu et al. (7) to measure the fear of COVID-19. The Turkish version of the scale is valid and reliable (20). It is a single-factor scale and consists of seven items. It is scored using a 5-point Likert type scale (1: strongly disagree; 2: disagree; 3: neither agree nor disagree; 4: agree; 5: strongly agree). A minimum of seven and a maximum of 35 points can be obtained from the scale. It is considered that the higher the total score obtained from the scale is, the higher the fear of COVID-19 is (9).

The Numeric Rating Scale

The scale is a single-item measurement tool that evaluates the severity of fatigue. Fatigue is graded between zero (energetic/no fatigue) and 10 (unbearable fatigue). The scale has horizontal and vertical forms, and the horizontal form was used in this study (21).

Statistical Analyses

The population of the study (459 individuals) was estimated by using the Raosoft sample size calculator (22), and the necessary sample size was calculated as at least 166 individuals based on a physical inactivity response rate of 39%, a 90% confidence level, and a maximum margin of error of 5% (23). All statistical analyses were conducted using the "Statistical Package for the Social Sciences" version 15.0 software package. The fit of variables to normal distribution was analyzed by using visual (histogram and probability graphs) and analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk tests). Descriptive statistics were represented by frequency (n), percentage (%), mean (×), standard deviation (SD), median and percentiles (25%-75%) values. Relationships between variables that either fit or did not fit the normal distribution were determined using the Pearson or Spearman correlation analysis methods, respectively. The probability of a Type I error in statistical analyses was determined as $p<0.05$.

RESULTS

Of the 195 individuals who responded to the questionnaires, 29 were excluded from the study due to having COVID-19 (n=24) and being pregnant (n=5) (Figure 1). The results of 166 individuals who met the inclusion criteria were analyzed. The socio-demographic characteristics of these individuals are presented in Table 1.

There was a high level of kinesiophobia in 91 (54.8%) individuals (Figure 2). In addition, 55 (33.1%) individuals were inactive, 84 (50.6%) were minimally active, and 27 (16.3%) were very active (Figure 3, Table 2). Also, 162 (97.6%) of the individuals were found to feel tired recently.

There was a statistically significant correlation between the kinesiophobia scores of the individuals and their age, body weight, body mass index,

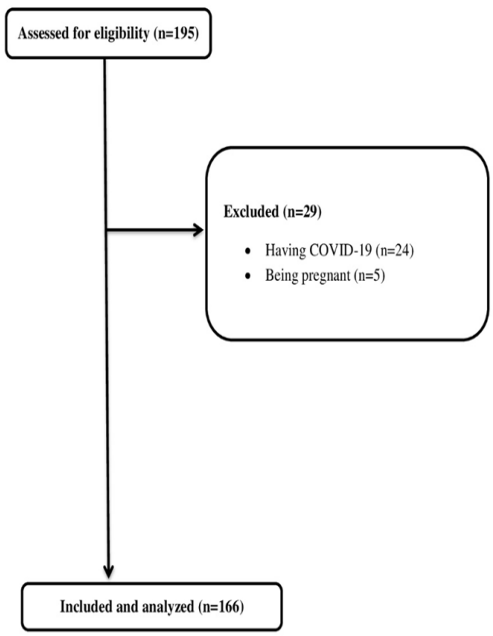

Figure 1. Flow diagram of the study

Table 1. Social and demographic characteristics of the individuals.

	Individuals (n=166) ×±SD / Median (25%-75%) / n; %
Age (year)	36.3±15.37
Male / Female	52; 31.3% / 114; 68.7%
Weight (kg)	68.92±14.85
Height (m)	1.68±0.09
Body mass index (kg/m^2)	24.2±4.06
Daily sleeping duration (hour)	7.5±1.28
Education level	
Elementary school	10; 6%
Secondary school	7; 4.2%
High school	18; 10.8%
College	83; 50%
Postgraduate	33; 19.9%
Doctorate	15; 9.1%
Total Score of Tampa Scale of Kinesiophobia (17-68)	37.93±6.06
Total Score of Fear of COVID-19 Scale (7-35)	18.29±5.39
Vigorous physical activity (MET-min/week)	489.01±1196.09 / 0 (0-320)
Moderate-intensity physical activity (MET-min/week)	288.96±477.17 / 70 (0-360)
Walking (MET-min/week)	822.91±921.97 / 495 (247.5-1188)
Total physical activity (MET-min/week)	1600.89±1804.12 / 1005 (396-2123.25)
Daily sitting duration (hour)	15.09±1.56
Score of Fatigue Numerical Rating Scale (0-10)	4.69±2.23

kg: kilogram, m: meter, MET: metabolic equivalent, min: minute. Descriptive analyses were presented using ×±SD (mean±standard deviation), median, percentiles (25%-75%), n (frequency) and % (percentage).

education level, time spent on walking, time spent on total physical activity, fear of COVID-19 and fatigue scores (Figure 4-5, Table 3, $p<0.05$). On the other hand, there was no statistically significant correlation between kinesiophobia scores and height, daily sitting and sleeping times, time spent on vigorous physical

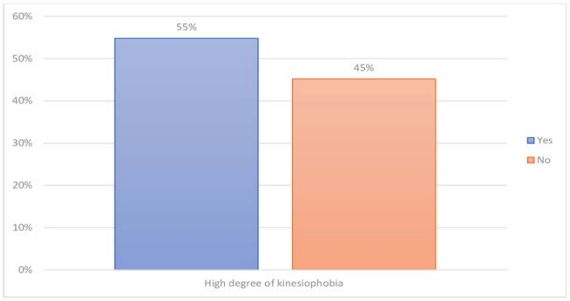

Figure 2. Presence of high degree of kinesiophobia in the individuals

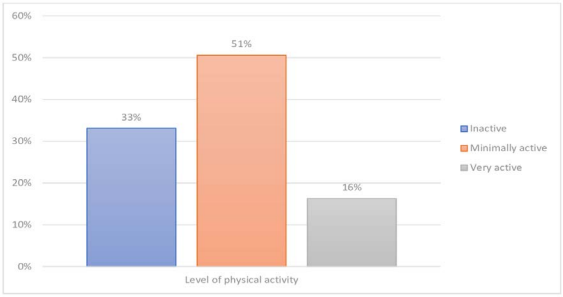

Figure 3. Rate of physical activity levels in the individuals

Table 2. The incidence of high degree of kinesiophobia and physical inactivity in the individuals.

	Individuals (n=166)	
	n	%
Presence of high degree of kinesiophobia	91	54.8%
Level of physical activity		
Inactive	55	33.1
Minimal active	84	50.6
Very active	27	16.3

Descriptive analyses were presented using n (frequency) and % (percentage).

Table 3. Relationship between kinesiophobia and other outcomes in the individuals.

	Total Score of Tampa Scale of Kinesiophobia	
	r value	p value
Age (year)	0.328	<0.001#
Weight (kg)	0.192	0.013#
Height (m)	0.099	0.203
Body mass index (kg/m^2)	0.190	0.014#
Daily sleeping duration (hour)	0.091	0.241
Education level (from elementary school to doctorate)	-0.349	<0.001*
Total Score of Fear of COVID-19 Scale (7-35)	0.296	<0.001#
Vigorous physical activity (MET-min/week)	-0.106	0.174
Moderate-intensity physical activity (MET-min/week)	-0.147	0.059
Walking (MET-min/week)	-0.327	<0.001*
Total physical activity (MET-min/week)	-0.299	<0.001*
Daily sitting duration (hour)	0.076	0.333
Score of Fatigue Numerical Rating Scale (0-10)	0.188	0.015#

kg: kilogram, m: meter, MET: metabolic equivalent, min: minute, r: correlation coefficient, p: p value. Spearman correlation analysis, *p<0.05 and Pearson correlation analysis, #p<0.05.

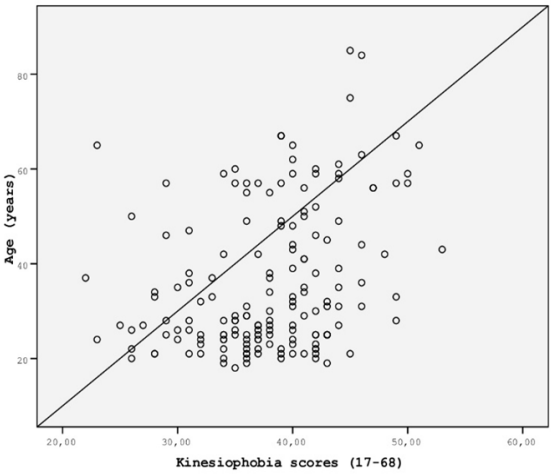

Figure 4. Correlation between age and kinesiophobia scores in the individuals

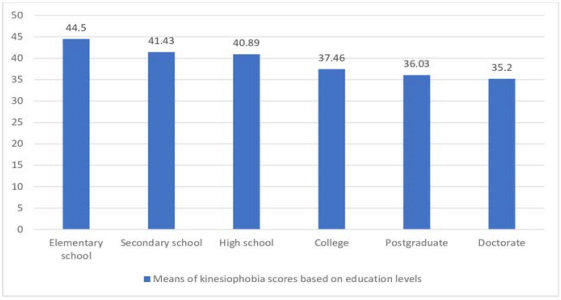

Figure 5. Comparison of means of kinesiophobia scores according to education levels of the individuals

activity and time spent on moderate physical activity (Table 3, p>0.05). A statistically significant correlation was found between the fear of COVID-19 scores and time spent on total physical activity (r=-0.186; p=0.017), fatigue scores (r=0.156; p=0.045). There was also a statistically significant correlation between the fatigue scores and the time spent on walking (r=-0.167; p=0.031).

DISCUSSION

The most important results of our study, which was carried out during the prolonged COVID-19 pandemic, were the existence of a high level of kinesiophobia in many individuals (54.8%) and the inadequate physical activity in the majority of these individuals (83.7%). In addition, the kinesiophobia scores of these individuals, who did not have any diseases that prevented them from doing physical activity during the COVID-19 pandemic, increased as their time spent on walking and total physical activities in a week and their education level decreased. Another important result was that the kinesiophobia score increased as the age, body weight, body mass index, fear of COVID-19 and fatigue increased.

While the total kinesiophobia score and the incidence of kinesiophobia were found to be significantly higher in individuals with low back pain who worked actively from home due to the COVID-19 pandemic restrictions, the physical activity score and sitting time were found to be similar (24).

Kinesiophobia was observed in 49.51% of all these individuals working from home. In addition, the kinesiophobia scores of the employees increased as their low back pain increased (24). The mean age, gender distribution, and total kinesiophobia scores of the individuals included in our study were similar to the characteristics of the individuals working from home included in this study. The individuals in our study had a higher level of kinesiophobia (54.8%) than the rate reported in the study of Bahar Özdemir (49.51%) (24). In addition, while all individuals included in the study of Bahar Özdemir (24) were physically active minimally, 83.7% of the individuals participating in our study were found to be inactive and minimally active. Unlike the results of the study of Bahar Özdemir, it was found that the increase in the kinesiophobia scores of the individuals participating in our study was directly affected by the decrease in the time spent on weekly physical activities and the decrease in the level of education. The high level of kinesiophobia observed in more individuals in our study can be attributed to the fact that our study was conducted during the prolonged period of the COVID-19 pandemic and that individuals who were not actively working in this process were also included in the study. In addition, the transformation of the virus into a more severe form through mutation (25) may have caused a higher rate of kinesiophobia in our individuals reflecting the general population. In this sense, our study is very valuable in that it has shown that kinesiophobia can develop in the individuals who do not have a problem that prevents them from moving physically in extraordinary processes such as pandemics. Consistent with the results of our study related to physical inactivity, studies published to date have reported that physical inactivity is seen in all segments of society due to the COVID-19 pandemic and the accompanying restrictions (2-7). In fact, it has been shown that physical activities have generally decreased in individuals, sedentary behaviors, such as spending long periods in front of the screen or lying down throughout the day, have increased, and accordingly, the quality of life has decreased, and the levels of depression, anxiety disorder, anxiety, fear, and stress have increased (2-7). Unlike these studies published in the literature, it was shown in our study that kinesiophobia increased with the decrease in the time spent on weekly walks and total physical activities in the individuals who did not have any diseases that prevented physical activity. This result is important because kinesiophobia is defined as the excessive avoidance of physical movement and activity by individuals who experience injuries or painful situations due to the fear of recurrence of the problem (26). In addition, it is known that kinesiophobia increases as physical activities decrease in individuals with chronic diseases (27). Therefore, it is necessary to consider kinesiophobia and the relationship of kinesiophobia with physical activities, body weight, and fear of COVID-19 in both patients and healthy individuals during the COVID-19 pandemic. In this process, while directing individuals to physical activities, it is beneficial to evaluate their kinesiophobia status and to direct them to both private physical activity counseling (11) and psychological counseling when necessary.

In the ongoing COVID-19 pandemic since the beginning of 2020, individuals all over the world have accessed a variety of worrying videos or news about the pandemic, which can be speculative, via smartphones and computers. Due to all these negative pieces of news, some individuals who were highly afraid of the process committed suicide though they were not infected with COVID-19 (8). The mean scores of the individuals included in our study from the fear of COVID-19 scale were close to a moderate level. Moreover, as the fear of COVID-19 increased, it was determined that physical activities decreased, fatigue and kinesiophobia increased in these individuals, who participated in our study, and it was shown that one of the most important determinants of kinesiophobia was the fear of COVID-19 score. The fear scores of the individuals in our study were similar to the fear scores of university students in the study conducted by Duman (9). Duman reported that students had a moderate level of fear of COVID-19 and that this fear was even higher in students who lost their relatives due to COVID-19 (9). In another study, similar to this result of our study, it was reported that individuals living in Çorum province experienced a fear of COVID-19, close to a moderate level (10). In another study conducted in the United Kingdom during the quarantine period due to the pandemic, it was reported that fear of COVID-19 affected adolescents' mental health and well-being negatively, while physical activity positively affected their mental health and well-being (11). Therefore, if we consider the linear relationship between fear of COVID-19 and kinesiophobia shown in our study, we see that more importance should be given to community-based physical activity counseling in this process. For this reason, individuals should be directed to

physical activities by experts, taking into account the COVID-19 measures, both through media channels such as television and radio and through social media platforms. In this way, kinesiophobia seen in individuals can be reduced by decreasing the fear of the long-standing COVID-19 pandemic. Further studies are needed to investigate the effects of physical activity counseling in this regard.

Of the individuals participating in our study, 97.6% stated that they had been tired recently, and their fatigue was moderate according to their mean fatigue scores. It was reported that individuals living in Istanbul during the pandemic period experienced psychological fatigue (64.1%) at a lower rate than this rate, found in our study (14). In addition, when psychologically normal individuals were compared with those who were tired, the belief that the pandemic would be controlled, the satisfaction with the preventive measures taken by the authorities, and the confidence that the COVID-19 pandemic would be overcome were found to be higher in psychologically normal individuals (14). Another important result of our study was that as fatigue score increased, the time spent on walking decreased, and fear of COVID-19 along with kinesiophobia increased. Therefore, perceived physical and mental fatigue, which is a psychological outcome, may be due to fear and anxiety about the COVID-19 pandemic (8,14). For this reason, within the framework of the pandemic measures, physical activity counseling can reduce individuals' fatigue, fears of movement, and fears of COVID-19. Further studies are urgently needed because it is uncertain when the pandemic will end.

The population of our study mostly consisted of the individuals belonging to the younger age group. Considering that being a middle-aged and/or an older individuals is a major risk factor for the COVID-19 virus, the middle and older age group may have been more affected in terms of kinesiophobia, physical activities, fatigue, and fear although there was no COVID-19 transmission during the pandemic process. For this reason, it is recommended to include the middle-aged and older population in future studies which was our main limitation.

CONCLUSION

In conclusion, 54.8% of the adult individuals who were healthy during the prolonged COVID-19 pandemic had a high level of kinesiophobia, 83.7% had physical inactivity, and 97.6% had a feeling of fatigue in recent days. During the COVID-19 pandemic, kinesiophobia is directly affected by the decrease in the time spent on physical activities, advanced age, increase in body weight, decrease in education level, and increase in fear of COVID-19 and fatigue negatively. In addition, the factors that increase the fear of COVID-19 in this process include the decrease in the time spent on physical activities and the increase in perceived fatigue. Considering that perceived fatigue also increases with the decrease in the time spent on walking, it is recommended to give more importance to counseling of physical activity to prevent the long-term negative effects of the pandemic. In this context, scientific and cultural programs that inform, educate, and direct the society, including physiotherapists, should be organized as soon as possible.

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