



Original Research / Orijinal Araştırma

The Effect of Physical Activity on Mental Health in Adults During COVID-19 Pandemic

COVID-19 Pandemi Sürecinde Yetişkin Bireylerde Ruhsal Sağlık Üzerine Fiziksel Aktivitenin Etkisi

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Abstract

Introduction: The COVID-19 pandemic profoundly affected the life of individuals. The purpose of this study was to determine the physical activity and mental health levels of people who had to stay home during the COVID-19 outbreak, and to examine the correlation between physical activity and mental health levels. **Methods:** A descriptive correlational study design was used in this study. The study sample consisted of 180 participants. The data collection form was consisted of 'The Personal Information Form', 'General Health Questionnaire (GHQ-12)' and 'Physical Activity Questionnaire (IPAQ)'. In the analysis of datas were used descriptive statistics, chi-square, mann whitney U test, one way anova, independent sample t-test and pearson correlation analysis. **Results:** The results have shown that in COVID-19 pandemic, the majority of participants were physically inactive, and especially in women. A negative significant correlation was found between the physical activity level and GHQ-12 score of the participants ($r = -0.872$, $p = 0.0001$). **Conclusion:** Majority of participants' physical activity level was negatively affected in the COVID-19 pandemic and this situation may negatively affects GHQ-12 score.

Key words: COVID-19, pandemic, physical activity, mental health.

Özet

Giriş: COVID-19 pandemisi bireylerin yaşamında çeşitli etkilere neden olmuştur. Bu çalışmanın amacı, COVID-19 pandemi sürecinde evde kalmak zorunda kalan kişilerin fiziksel aktivite ve ruh sağlığı düzeylerini belirlemek; fiziksel aktivite ile ruh sağlığı düzeyleri arasındaki ilişkiyi incelemektir. **Yöntem:** Bu çalışmada tanımlayıcı ilişkisel araştırma deseni kullanılmıştır. Araştırma örneklemini 180 katılımcıdan oluşmaktadır. Veri toplamada 'Kişisel Bilgi Formu', 'Genel Sağlık Anketi (GHQ-12)' ve 'Fiziksel Aktivite Anketi (IPAQ)' kullanılmıştır. Verilerin analizinde tanımlayıcı istatistikler, ki-kare, mann whitney U test, one way anova, bağımsız örneklem t-testi ve pearson korelasyon analizi kullanıldı. **Bulgular:** COVID-19 pandemi sürecinde katılımcıların büyük çoğunluğunun, özellikle kadınların, fiziksel olarak hareketsiz olduğunu göstermiştir. Katılımcıların fiziksel aktivite ve GHQ-12 skoru arasında negatif yönlü anlamlı bir ilişki saptanmıştır ($r = -0.872$, $p = 0.0001$). **Sonuç:** COVID-19 pandemisinde, katılımcıların büyük çoğunluğunun fiziksel aktivite düzeyi olumsuz etkilenmiştir ve bu durum GHQ-12 skorunu olumsuz etkileyebilir.

Anahtar kelimeler: COVID-19, pandemi, fiziksel aktivite, ruh sağlığı.

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Introduction

The recent novel coronavirus disease (COVID-19) pandemic, also known as the coronavirus pandemic, which started in December 2019 in China, has spread to many countries worldwide and is considered an international public health emergency.¹ Social distancing is crucial to slow down the spread of COVID-19. In order to minimize the spread of the COVID-19, many regional and national governments have been calling for social distance initiatives of various levels of obligation for compliance, from unenforced recommendations to quarantine and corporate closures.² Measures taken to prevent transmission of the virus and to treat those who are infected trap by the virus. Many people take due precautions according to governments' advice on self-isolation and stay at home. Social isolation at home causes increase in sedentary time spent in front of the screen, deterioration in sleeping habits, decrease in the level of physical activity and negatively affect the quality of life.³ The beneficial effects of daily physical exercise on many health outcomes have been showed in meta-analysis studies.^{4,5} Staying at home and social isolation are essential to prevent the spread of the virus in the COVID-19 pandemic. In the study of Maugeri et al. (2020), it is stated that regular physical activity during the lockdown in COVID-19 pandemic is important in terms of preventing physical and mental health problems.⁶ Reducing daily physical activity is likely to cause an increase in chronic diseases as well as anxiety and depression.⁷ It is stated that physical activity can improve the immune system by increasing immune cells. In this context, it is important to improve the immune function that defends the body against the virus with appropriate physical activity. On the other hand, different-intensity physical activity has different impacts on the immune system.³ In a study evaluating the effect of physical activity on inflammatory factors and immune cells, it was found that high-intensity exercise could cause the immune system to be suppressed by increasing oxidant production.⁸ It is reasonable to assume that physical activity could play an important role in boosting the immune system and reducing stress during the COVID-19 pandemic.⁹

Loss of freedom, isolation from the loved ones during the pandemic and uncertainty about the nature of the virus can have a dramatic effect on the mental health.¹⁰ During the early days of the lockdown, mostly acute stress reactions may occur. Personality disorders, depression, anxiety symptoms, and adjustment disorders are among the first and most common psychiatric disorders. When the quarantine period is extended and the effects of the COVID-19 increase, post-traumatic stress disorders, depression, acute stress disorder, panic disorder, anxiety disorder, somatic symptom disorders, and other mood disorders can be observed. In addition, alcohol and substance abuse may be seen as a coping or adaptive response. As the process prolongs, with increased hopelessness suicidal thoughts and even attempts may be seen.¹¹ When it comes to mental health problems, various studies have shown that physical activity can provide significant benefits in the prevention of anxiety, depression, burnout, and perceived illness.^{12,13} 12-item General Health Questionnaire (GHQ-12) is widely used for screening common and general mental disorders.¹⁴ Therefore, physical activity becomes an important ally for the management of these health issues affecting the population, especially during the COVID-19 pandemic. In this context, the aim of this research is to determine the physical activity levels and GHQ-12 score of people who had to stay at home during the Covid-19 pandemic; The following questions were formed in order to examine the relationship between physical activity levels and GHQ-12 score.

Research Questions

1. What is the physical activity levels and GHQ-12 scores of participants during the Covid-19 outbreak?
2. Do the the physical activity levels and GHQ-12 scores of participants differ according to their socio-demographic and health-related characteristics?
3. Do the the GHQ-12 scores of participants differ according to their Covid-19 health characteristics?
4. Is there a correlation between physical activity level and GHQ-12 score of participants during the Covid-19 pandemic?

Methods

Design and Participants

A cross-sectional analytic study design was used in this study. The study population consisted of 796 persons enrolled in a vocational training course in Konya, Turkey. The formula of sample size of unknown universe was used to determine the sample size. As the prevalence is unknown, the prevalence was accepted as 50%, with a standard deviation of 5% and a confidence interval of 95%, and the sample was calculated to be at least 169 individuals. There were 180 participants who agreed to participate in the study.

Data collection and procedure

The data from the participants was obtained using the online survey. A questionnaire form was created in the computer program and participants were asked to fill out a questionnaire link from the social media groups. At the conclusion of this process, the questionnaire was completed by 180 individuals who approved to participate to the study and submitted the online survey. The data were collected using a Personal Information Form, a General Health Questionnaire (GHQ-12) and the Physical Activity Questionnaire (IPAQ) between 1 September - 30 November 2020. These scales were chosen because they have been adapted to Turkish society. The Personal Information Form was developed by the researchers, and contained questions related to sociodemographic characteristics of the participants.

General Health Questionnaire (GHQ-12), The 12-item General Health Questionnaire (GHQ-12) was developed by Goldberg and Williams (1997).¹⁴ It has been shown to be a valid and reliable instrument across cultures and is widely used in population surveys. It is generally used as a screening inventory for the detection of non-psychotic psychiatric conditions, spanning the continuum of anxiety and depression. Validity and reliability study of the Turkish version of the scale was carried out by Kiliç et al. (1997).¹⁵ The GHQ-12 items contain concerns about attitude, feelings, self-esteem and worry over the past four weeks. For each question, there were four opinions ranging from 'never,' 'same as usual,' 'more than usual' and 'much more than usual'. The scale is scored bi-modally (0-0-1-1) with a description of responses following the standard procedure. Total score ranges between 0 and 12. Validation studies recommend cut-off point of 2 to indicate common mental disorders. Participants who scored lower than 2 points, scored 2 to 3 points and scored more than 4 points were diagnosed as at good (low risk), moderate (medium risk) and poor (high risk) mental state, respectively in terms of non-psychotic psychiatric conditions. Sensitivity of the scale was 0.74, whereas the specificity was 0.84.¹⁵ Cronbach Alpha of the scale in this study was calculated as 0.84.

Physical Activity Questionnaire (IPAQ), Physical activity levels of the participants were determined with the International Physical Activity Questionnaire (IPAQ).¹⁷ This scale is also shown to be valid and reliable in Turkish.¹⁶ In our study, the self-administered short form of the questionnaire, which measures physical activity in the 'last seven days' was used to evaluate the level of physical activity. This short form consists of seven questions and provides information about sitting, walking, moderate-intensity activities, and the time spent in vigorous activities.¹⁶ Calculation of the total score of the short form includes the sum of time (minutes) and frequency (days) of walking, moderate-intensity activity, and vigorous activity. The sitting score (sedentary behavior level) is calculated separately. In order to be included in calculation each activity should be done for at least 10 minutes at a time. The score is obtained as 'MET-minutes/week' by multiplying the minute, day and MET value (multiplier of resting oxygen consumption). Thus, the energy consumption for each individual for intense, moderate, walking, sitting, and total physical activities was obtained in MET-min/week. Walking time (minutes) was multiplied by 3.3 METs to calculate the walking score. For moderate-intensity activity and vigorous activity, 4 METs and 8 METs are taken as multiplier respectively. According to the total physical activity score, the physical activity levels of the participants were 'inactive (less than 600 MET-min / week), moderate (minimally active) (between 600-3000 MET-min / week) and very active (3000 MET-min / week and above).^{16,17}

Ethical considerations

All human studies should be approved by the appropriate ethics committee and performed in accordance with the ethical standards outlined in the 1964 Declaration of Helsinki and its later amendments. The ethical approval required for the study was obtained from the Selcuk University Faculty of Sport Sciences Non-Interventional Ethics Committee (Ethic Number:2020/48). The informed voluntary consent form was attached to the data collection tools, and participants were required to read and approve the form as verification of their voluntary participation in the study.

Data analyses

The data of the study were evaluated using the statistical package program SPSS for Windows 22.0 (Statistical Package for Social Science). Frequency, mean, and standard deviation were used in descriptive statistics. The suitability of the data for normal distribution was evaluated using the Kolmogorov-Smirnov test. In the analysis of the data, chi-square, independent sample t-test, mann whitney U test, one way anova, and pearson

correlation analysis and were used. The results were evaluated at 95% confidence interval and $p < 0.05$ significance level.

Results

Sociodemographic and health characteristics

The mean age of participants was 34.56 ± 4.93 . Of them 51.7% were female; 55.0% were single; 36,7% were housewives and 52.2% had children. Slightly more than half (54,4 %) were primary/secondary school graduates. Vast majority of them (89.4%) declared inadequate income and more than half (58.9%) reported poor health. The percentage of the participants with a chronic disease was 61.1%. With respect to the COVID-19 health characteristics of the individuals, 44.4% were COVID-19 positive / suspicious, 15.6% were hospitalized due to COVID-19, 77.2% were Covid-19 reported suspects cases in their immediate vicinity, It was determined that 56.1% were in involuntary quarantine as a result of COVID-19, and 47.8% have close relatives at risk for COVID-19 in their family (over 65, chronic disease, etc.). COVID-19 pandemic profoundly affected the general life of 37.2% of the individuals and 50.6% of them reported they have little knowledge about the Covid-19.

Physical activity and GHQ-12 scores

When the physical activity levels of individuals are examined; it was observed that 63.9% of them were not physically active and 36.1% had a low level of physical activity. When the GHQ-12 scores the individuals were evaluated, it was determined that 49.4% were in the high-risk group in terms of GHQ-12 scores, 30.0% were in the medium-risk group and 20.6% were in the low-risk group (Table 1).

Table 1. Participants' physical activity levels and GHQ-12 scores

IPAQ	n	%
Low active (600-3000 MET-min / week)	65	36.1
Inactive (<600 MET-min / week)	115	63.9
GHQ-12		
High risk (4 and more)	89	49.4
Medium risk (2-3)	54	30.0
Low risk (less than 2)	37	20.6

Sociodemographic-health characteristics and physical activity levels

When the sociodemographic-health characteristics and physical activity levels of the individuals were evaluated, it was seen that women (33.3%) were more physically inactive than men (30.6%), and the difference was statistically significant ($p < 0.05$). It was observed that singles (36.1%) were physically inactive compared to married ones (27.8%), and the difference was statistically significant ($p < 0.05$). Primary/secondary school graduates (35.0%), civil servants/workers (24.4%), those who have children (37.2%), who declared inadequate income (56.7%), who perceive poor health (36.7%) and those without any chronic disease (57.4%) were found to be more physically inactive, and the difference was statistically significant ($p < 0.05$) (Table 2).

Table 2. Distribution of sociodemographic health characteristics and physical activity levels of the participants

	Low (600-3000 MET-min / week) n (%)	Inactive (<600 MET-min / week) n (%)	Test Value p***
Gender			
Female	33 (18.3)	60 (33.3)	X ² =0.033
Male	32 (17.8)	55 (30.6)	p=0.021
Marital status			
Married	31 (17.2)	50 (27.8)	X ² =0.298
Single	34 (18.9)	65 (36.1)	p=0.031
Education status			
Primary / secondary school	35 (19.4)	63 (35.0)	X ² =0.015
High school and upper	30 (16.7)	52 (28.9)	p=0.001
Job *			
Housewife	25 (13.9)	41 (22.8)	X ² =1.624
Civil servant/Worker	19 (10.6)	44 (24.4)	p=0.011
Self-employment	21 (11.7)	30 (16.7)	
Having Children			
Yes	27 (15.0)	67 (37.2)	X ² =4.654
No	38 (21.1)	48 (26.7)	p=0.031
Perceived income level **			
Good	1 (0.6)	6 (3.3)	X ² =1.626
Middle	5 (2.8)	7 (3.9)	p=0.001
Poor	59 (32.8)	102 (56.7)	
Perceived health status **			
Good	4 (2.2)	14 (7.8)	X ² =1.673
Middle	21 (11.7)	35 (19.4)	p=0.020
Poor	40 (22.2)	66 (36.7)	
Chronic illness *			
Yes	21 (11.7)	49 (27.2)	X ² =1.854
No	44 (24.4)	66 (57.4)	p=0.010

* Yates corrected chi-square analysis was performed because there was an observed number less than 25 in the cells.

** Since there is an expected number less than 5 in the cells, Fisher Exact test was performed. *** p <0.05

Sociodemographic-health characteristics and GHQ-12 scores

When sociodemographic-health characteristics and general health levels of individuals are evaluated, women (25.0%), singles (29.4%), primary/secondary school graduates (29.4%), civil servants/workers (20.6%), those who have children (31.7%), those who perceive their income level as inadequate (42.8%), those who reported poor health (22.2%) and those without any chronic diseases (28.3%) are in the low risk group with respect to their counterparts in terms of GHQ-12 scores and the difference is statistically significant (p <0.05) (Table 3).

Table 3. Distribution of sociodemographic health characteristics and GHQ-12 scores of participants

	High risk (4 or more)	Medium risk (2-3)	Low risk (less than 2)	Test Value p***
	n (%)	n (%)	n (%)	
Gender *				
Female	18 (10.0)	30 (16.7)	45 (25.0)	X ² =0.505 p=0.010
Male	19 (10.6)	24 (13.3)	44 (24.4)	
Marital status				
Married	15 (8.3)	30 (16.7)	36 (20.0)	X ² =3.473 p=0.030
Single	22 (12.2)	24 (13.3)	53 (29.4)	
Education status				
Primary / secondary school	23 (12.8)	22 (12.2)	53 (29.4)	X ² =5.913 p=0.040
High school and upper	14 (7.8)	32 (17.8)	36 (20.0)	
Job *				
Housewife	14 (7.8)	22 (33.3)	30 (16.7)	X ² =6.238 p=0.020
Civil servant/Worker	14 (7.8)	12 (6.7)	37 (20.6)	
Self-employment	9 (5.0)	20 (11.1)	22 (12.2)	
Having Children				
Yes	20 (11.1)	17 (9.4)	57 (31.7)	X ² =14.346 p=0.001
No	17 (9.4)	37 (20.6)	32 (17.8)	
Perceived income level **				
Good	-	-	7 (3.9)	X ² =13.563 p=0.010
Middle	-	7 (3.9)	5 (2.8)	
Poor	37 (20.6)	47 (26.1)	77 (42.8)	
Perceived health status **				
Good	-	-	18 (10.0)	X ² =26.050 p=0.000
Middle	8 (4.4)	17 (9.4)	31 (17.2)	
Poor	29 (16.1)	37 (20.6)	40 (22.2)	
Chronic illness *				
Yes	13 (7.2)	19 (10.6)	38 (21.1)	X ² =1.074 p=0.001
No	24 (13.3)	35 (19.4)	51 (28.3)	

* Yates corrected chi-square analysis was performed because there was an observed number less than 25 in the cells.

** Since there is an expected number less than 5 in the cells, Fisher Exact test was performed. *** p < 0.05

COVID-19 health characteristics and GHQ-12 scores

When evaluating the COVID-19 health characteristics and GHQ-12 scores of the participants, it was found that those who were not positive/suspected for COVID-19 (33.3%) were in a low-risk category in terms of GHQ-12 scores, and the difference was statistically significant ($p < 0.05$). It was noticed that those who were not hospitalized due to COVID-19 (45.0%) were in a low-risk GHQ-12 scores category and the difference was statistically significant ($p < 0.05$). Participants with COVID-19 cases in their local setting (41.1%) were shown to be in a high-risk category in terms of GHQ-12 scores and the difference was statistically significant ($p < 0.05$). It was noticed that those who persisted under mandatory quarantine due to contact/disease with COVID-19 (16.1%) were in a low-risk GHQ-12 scores category and the difference was statistically significant ($p < 0.05$) (Table 4).

Table 4. Distribution of Covid-19 health characteristics and GHQ-12 scores of the participants

	High risk (4 or more) n (%)	Medium risk (2-3) n (%)	Low risk (less than 2) n (%)	Test Value p
Covid-19 Positive / Suspicious situation				
Yes	18 (10.0)	33 (18.3)	29 (16.1)	t:1.263
No	19 (10.6)	21 (11.7)	60 (33.3)	p=0.003
Hospitalization due to Covid-19				
Yes	13 (7.2)	7 (3.9)	8 (4.4)	t:0.936
No	24 (13.3)	47 (26.1)	81 (45.0)	p=0.001
Covid-19 status in the immediate vicinity				
Yes	74 (41.1)	35 (19.4)	30 (16.7)	t:1.572
No	15 (8.3)	19 (10.6)	7 (3.9)	p=0.033
Mandatory quarantine as a result of being in contact / sick with Covid-19				
Yes	60 (33.3)	33 (18.3)	8 (4.4)	t:0.561
No	29 (16.1)	21 (11.7)	29 (16.1)	p=0.000
Presence of an individual at risk for Covid-19 in the family (over 65, chronic disease, etc.)				
Yes	48 (26.7)	26 (14.4)	12 (6.7)	U:7.500
No	41 (22.8)	28 (15.6)	25 (13.9)	p=0.040
Overall life impact of Covid-19				
Slightly affected	15 (8.3)	6 (3.3)	12 (6.7)	F:4.256
Quite impressed	21 (11.7)	27 (15.0)	14 (7.8)	p=0.001*
It affected so much	35 (19.4)	39 (21.7)	15 (8.3)	
Knowledge level about the Covid-19 process				
Low	7 (3.9)	17 (9.4)	13 (7.2)	F:5.208
Middle	15 (8.3)	31 (17.2)	8 (4.4)	p=0.001*
High	41 (22.8)	43 (23.9)	5 (2.8)	

* p <0.05, t: Independent groups t test, U: Mann Whitney U test, F: ANOVA

It was found that people at risk for COVID-19 in the family (over 65 years of age, with chronic diseases) were in a high-risk category for GHQ-12 scores and the difference was statistically important (p<0.05). It was noted that those who agreed that COVID-19 has so much impact on their overall life were in a high-risk category in terms of GHQ-12 scores and the difference was statistically important (p<0.05). It was noted that those who reported that the degree of understanding of COVID-19 was high in the low-risk category in terms of GHQ-12 score and that the difference was statistically important (p<0.05) (Table 4).

The relationship between physical activity levels and GHQ-12 score

As the association between the level of physical activity of individuals and their GHQ-12 score was measured, it was observed that, as the average level of physical activity declined, the GHQ-12 score increased. It was determined that there was a negative and strong relationship between these variables ($r = -0.872$, $p = 0.0001$) (Table 5).

Table 5. The relationship between physical activity level and GHQ-12 scores

	Physical Activity Level	GHQ-12 scores
Physical Activity Level	1.00	
GHQ-12 score	$r=-0.872$ $p=0.000*$	1.00

r: Pearson Correlation Analysis, *(p<0.05)

Discussion

The COVID-19 pandemic has led to a new way of life and significant changes in societies worldwide. It is

important to understand the influence of the pandemic on people's behavior, such as physical activity engagement and also on mental health status as well as their consequences during and after the pandemic. The present study contributes evidence on the effects of quarantine on mental health and its relation to physical activity in Turkey. The results of this study support the hypothesis that people spent less time in doing regular physical activity during the COVID-19 quarantine than they did before the pandemic. In this study we found that on a weekly average, approximately 63.9% of the participants reduced their total physical activity MET-min/week. This result is consistent with the findings of a recent study in adult population by Barwais (2020) which used a self-reported physical activity questionnaire that collected data before and during the COVID-19 pandemic. The study found a statistically significant reduction in time spent in doing physical activity.¹⁸ Experiencing the fear of COVID-19 has motivated, sometimes forced, individuals to isolate themselves by working from home and replace face-to-face interactions with online socialization. As a result, the cumulative minimum physical activity decreased because most of the office work had to be done at home. Often sitting in a fixed position in front of a screen for long periods of time has been referred to by society as working from home. Before COVID-19, it was assumed that people moved more while working in the office, including commuting to and from the workplace. The partial curfew policy also prevented going out of the home for meals, shopping, or leisure time physical activity.⁹

Preventive measures for COVID-19, such as staying at home, reduce physical activity and force individuals to live sedentary lives. Physical inactivity is at the forefront of the problems, leading to the accumulation of body fat by promoting the structure of the intestinal microbiome, intestinal dysbiosis and exacerbation of systemic inflammation. Contributing to a trace of health-depleting disorders, obesity increases metabolic resistance, promotes gut microbial breakdown, stimulates the release of adipose tissue cytokines, thereby altering the signals involved in the production of antioxidants. As a result, the body is flooded by toxic molecules such as free radicals, pro-inflammatory mediators, and enhanced glycation end products. These toxic molecules affect the function of the cell in all body tissues, including the brain. Neuroinflammation is directly associated with dysregulation of emotions and progressive declines in motor and cognitive functions.¹⁹ A meta-analysis by Stubbs et al. (2017) observed anxiolytic effects for physical activity when compared with controls in subjects with diagnosed anxiety or other stress-related disorders.²⁰ Similarly López-Bueno et al. (2020) stated that higher levels of physical activity were associated with lower levels of anxiety during COVID-19.²¹ In our study, so far as the general health status of the participants was concerned, it was found that 49.4% were in the high-risk group, 30.0% were in the medium-risk group, and 20.6% were in the low-risk group for mental illness. One of the reasons for this may be that the participants had a low degree of physical activity. Our findings are consistent with prior research during the pandemic, indicating that level of physical exercise levels are correlated with GHQ-12 score. When the correlation between the level of physical activity of people and their GHQ-12 score was assessed, there was a significant negative correlation between physical activity levels and GHQ-12 score ($r = -0.872$, $p = 0.0001$). Similarly, Maugeri et al.,(2020) found that the decrease in overall physical activity had a significantly negative effect on the psychological wellbeing and overall wellbeing of the population.⁶ Similarly, a cross-sectional study of older adults who survive the COVID-19 pandemic indicates that there is a well-established correlation between higher levels of overall physical activity and decreased symptoms of depression.²² In another study, Qin et al (2020) showed that individuals with vigorous physical activity tend to have a stronger mental state and less sedentary screen time than those with low physical activity.²³ Strategies for alleviation of the COVID-19 pandemic may have an effect on physical activity and GHQ-12 score, whereas those suffering reduced physical activity may also have elevated levels of stress and anxiety. These partnerships are confused by inherited and shared environmental influences, in the case of depression, age and sex, in the case of anxiety.²⁴

Conclusion

In conclusion, the majority of participants were physically inactive in the COVID-19 pandemic and this situation may negatively affects GHQ-12 score. Individuals who are socially isolated and inactive physically are particularly have higher risk for mental health problems, given the increased degree of isolation older adults are experiencing during the current pandemic. The effect of physical activity on mental wellbeing is deeply positive by improved self-esteem and resistance to stress and depression. The direction of the association cannot be inferred from the current study's cross-sectional design. The individuals may be encouraged to do physical activity to protect their mental health. The healthcare professionals may offer the individuals appropriate physical activity programs and give advice on how to do it. Future studies will need to

apply more objective measures of physical activity and explore the longitudinal effects of physical activity and the COVID-19 pandemic on mental health, although the results of this study are promising.

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