ASEAN Journal of Psychiatry, Vol. 22(5), July 2021: 1-11

RESEARCH ARTICLE

THE IMPACT OF LONELINESS, ANGER, AND REGULAR PHYSICAL ACTIVITY ON MENTAL HEALTH DURING THE PANDEMIC

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Abstract

The Covid-19 pandemic has affected the entire world and mandatory restrictions have increased mental health problems. This descriptive study aimed to examine the impact of loneliness, anger, and regular physical activity on mental health and investigate their interaction with regular physical activity. The universe of the study was people who lived in Kırşehir, Turkey, 560 people participated *via* stratified sampling. Data of the study were collected through socio-demographic information form, General Health Questionnaire-12, UCLA Loneliness Scale-8, and Trait Anger Scale in March 2021. In the data analysis, the seven-way mixed-factor (ANOVA) variance analysis of such groups as regular physical activity, gender, loneliness, anger, body mass index, and educational status was compared in terms of GHQ-12 total score and the interaction effect of physical activity with each of other six independent variables were examined. The study found a statistically significant difference between physical activity groups, loneliness groups, anger groups, and age groups in terms of GHQ-12 total score, and there was no interaction effect among these variables. According to these results, it can be said that age, loneliness, anger, and regular physical activity are effective on mental distress, and it is suggested that advanced studies are conducted to examine mental distress. *ASEAN Journal of Psychiatry, Vol. 22(5), July 2021: 1-11.*

Keywords: Mental Distress, Regular Physical Activity, Loneliness, Anger

Introduction

With the new coronavirus (Covid-19), the daily life routines of people all over the world changed. The measures taken brought requirements that changed lifestyles decreased physical activity, and the time spent with others while preventing the spread of the virus. Although restrictions have protective effects against Covid-19 infection, they can have negative impacts on mental health [1,2]. When the studies on the impact of the pandemic on mental health, the following countries ' reports are as follows: China: high levels of depression and anxiety symptoms [3-5], Italy: post-traumatic stress symptoms 37%, adaptation disorder 22.9%, high level of stress 21.8%, anxiety %20.8, depression 17.3%, and sleep deprivation 7.3% [6], severe depression 7.6%, severe anxiety 9.1%, severe obsessive-compulsive symptoms 9.3% in Portugal [7], Brasil: mild-moderate level of mental distress in 52% of the

participants, severe mental distress in the 18.8% of the participants [8] and mild depression 18.1% and mild anxiety 11.4% in Japan [9]. Dealing with uncertainty, restrictions, increasing social, economic, and individual problems caused by the pandemic is getting harder; emotions such as loneliness and anger, which can trigger mental distress, can increase. It is reported that loneliness poses a significant health problem in terms of depression, anxiety, suicide thought, and avoiding health services [10]. A study found that 43% of the participants received a loneliness score over the limit, there was a positive relationship between loneliness and depression and suicide thought [11]. Another study found that individuals with mental distress had higher stress and anger levels compared to before the pandemic, and the economic, psychosocial stressors and despair increased mental distress during the pandemic [12]. In a study conducted in England, participants stated that they experienced controversy, felt angry, or conflicted with others at least once [13]. Strategies to cope with increasing mental distress in the pandemic are listed as maintaining daily routines, positive reassessments/reframing, and regular physical activity.

Regular physical activity is known to have positive impacts on mental health [14-16]. It can be said that restrictions brought due to the pandemic decreased physical activity, and this had indirect negative effects on mental health [17]. It was stated that there was an approximately 12% decline in the number of steps across the USA [18], and the decline across the world was higher [19]. It was reported that only 26% of males and 19% of females meet the physical activity instructions of the USA (US Department of Health and Human Services). It was found that physically active individuals were more psychologically negatively affected by the pandemic due to limited activity opportunities [20]. Growing mental health problems around the world are becoming a serious concern along with the pandemic. However, studies which examined changes in mental health due to pandemic-related public health constraints and inactive lifestyles provide very important information both in determining the situation and in creating strategies that will guide public mental health. In this direction, this descriptive research aimed to examine the impact of loneliness, anger, and regular physical activity on mental health during the pandemic, and to investigate the interaction between them and regular physical activity.

Material and Method

Population and Sample

The universe of the study was adults aged between 18-65 who lived in Kırşehir, Turkey. Kırşehir is a province located in the central part of Turkey and close to the capital. As the number of universes was not known, sampling calculation was conducted and a table prepared for the "sample size for two-sample ratio test" in the determination of the sample size of the study [21]. A study conducted with adults in Turkey found the frequency of regular physical activities as 14.8% [22]. The sample size stated in the table by considering the 5% significance level, 95% strength rate, and regular physical activity prevalence (15%) was found to be 311 females, 233 males, 544 people in total. Considering the possible data losses during the implementation of the study, a number above the suggested one was taken as the sample size. Stratified sampling method was used to determine the sample [23]. There are 3 large parks and 5 gyms open to the public, suitable for regular physical activity in Kırşehir, Turkey. For the selection of the stratified sample, these gyms, parks, and neighborhoods where they are located were considered as layers. From each layer, the participant was reached according to their distribution, a total of 560 people who did and did not do regular physical activity were contacted.

Data Collection Tools

Socio-demographic Information Form

This form prepared by the researchers following the literature consists of fifteen questions related to demographic data and regular activity.

General Health Questionnaire-12 (GHQ-12)

GHQ developed by Goldberg (1972), is used to research or scan mental problems. The Turkish validity and reliability study was conducted by Kılıç (1996). Cronbach's Alpha internal consistency of the scale was 0.84, and the retest correlation was 0.67. There are 12 questions in GHQ-12. Each question questions the symptoms of the last few weeks, and consists of 4 options as never, as usual, more often than usual, and very often. The first two options of the answers to the survey questions are calculated on a score of "0" and the other two options are calculated on a score of "1", and participants can score between 0-12. It is accepted that mental health deteriorates as the score obtained from the survey increases, and the possibility of psychiatric problems increases. In the present study, 0-0-1-1 GHQ type scoring was used. Cronbach's Alpha internal consistency coefficient was 0.89.

Ucla Loneliness Scale-8 (ULS-8)

The scale developed by includes 20 items and is 4-item Likert type. The Turkish adaptation of the scale was conducted. The 8-item short form of the scale was introduced into Turkish by [24,25]. The internal consistency coefficient of the scale was 0.96, and the reliability coefficient of the test retest was 0.94. In this study, Cronbach's Alpha internal consistency coefficient was 0.80. As the score obtained from the scale increases, level of loneliness increases, as well.

Trait Anger Scale (TAS)

The scale developed by was adapted into Turkish by Özer in 1994. The scale consists of 10 items and is a 4-point Likert type. The lowest score to take from trait anger scale is 10 and the highest score is 40. In the validity and reliability study, Cronbach's alpha value was 0.79. In this study, Cronbach's Alpha internal consistency coefficient was 0.80. As the score from the scale increases, it shows that the level of anger is high.

Data analysis

The data of the study were evaluated in SPSS 21.0 program and frequency and percentage values were calculated for descriptive data. In the study, with the calculation of dependent and independent variables' descriptive statistics and GHQ-12 Cronbach's Alpha internal consistency coefficient, the comparison of groups of regular physical activity, gender, loneliness score, anger score, age, body mass index, and educational status (2x2x2x2x4x2x2) with seven-way mixed-factor (ANOVA) variance analysis was conducted in terms of GHQ-12 total score. Additionally, the interaction effect of the six other independent variables of physical activity was examined.

Ethical declaration

Approval was obtained from Kırşehir Ahi Evran University Social and Humanities Ethics Committee dated 04.03.2021 and 2021/1 meeting number. Data were collected in accordance with the Declaration of Helsinki, and each participant was informed and approved by a voluntary form.

Results

A total of 560 people who performed regular physical activity (n=285) and did not (n=275) participated in the study. Demographic characteristics of participants shown in Table 1 include the following information: 58% female, 53.4% married, 60.3% university graduate, 46.9% had balanced income-expense, 51.4% was employed, 49.1% had a sedentary lifestyle, average height was 171.94 ± 9.03, the average weight was 74.47 ± 115.20, BMI average was 25.10 ± 4.41, and the average age was 31.04 ± 10,56 (Table 1).

Table 1: Socio-Demographic Characteristics of Participants

		n	**%**
Gender	Male	235	42
	Female	325	58
Marital status	Married	299	53.4

	Single	261	46.6
Education level	Primary Education	35	6.3
	Secondary education	106	19
	University	338	60.3
	Postgraduate	81	14.4
Income status	Income<expense	186	33.3
	Income=expense	263	46.9
	Income>expense	111	19.8
Employment Status	Yes	288	51.4
	No	272	48.6
Regular Physical Activity status	No	275	49.1
	Yes	285	50.9
The time of performing physical activity	Less than a year	94	16.8
	1-3 years	77	13.8
	3-5 years	41	7.3
	More than 5 years	73	13
Age	X±SD=31.04±10.56	min-maks=18-67	
Height (cm)	X±SD=171.94±9.03	min-maks=140-200	
Weight (kg)	X±SD=74.47±115.20	min-maks=37-157	
BMI	X±SD=25.10±4.41	min-maks=15.47-62.49	

First, the participants were divided into two groups considering the total score averages obtained from UCLA Loneliness Scale-8 (avg.=12.92) and Trait Anger Scale (avg.=20.15) as those below and above both total points. Later, as some groups had few people, merging the categories was preferred as homogeneity of variance assumption could not be ensured in the group comparisons. In this direction, educational status was combined as primary and secondary education, and graduate and postgraduate were combined as higher education, forming two groups. In the body mass index groups, the groups of slim, slightly fat, obese, and morbid obesity were combined and formed two groups as normal and abnormal. The age variable was grouped into four groups: 24 and under, 25-29, 30-39, and 40 and above. This way, there were 2 groups for regular physical activity status (inactive-active), 2 groups for gender (female-male), 2 groups for loneliness scores (below and above average), 2 groups of anger score (below and above average) 4 groups of age, 2 groups of body mass index, and 2 groups of educational status; GHQ-12 total score was compared to the seven-way mixed-factor variance analysis. According to the results, there was statistically significant difference between the physical activity groups ($F(1,654)=13,14$; $p<0,001$; part $\eta^2=0,020$), between the loneliness score groups ($F(1,654)=33,00$; $p<0,001$; part $\eta^2=0,048$), between anger score groups ($F(1,654)=35,54$; $p<0,001$; part $\eta^2=0,052$), and between age groups ($F(3,654)=10,05$; $p<0,001$; part $\eta^2=0,044$).

According to the results, it was found that in terms of GHQ-12 total score average, the total score average of the inactive group of physical activity groups (avg.=3.71) was statistically higher than the active group's total score average (avg.=2.71); the total score average of the loneliness score above average group (avg.=4.26) was statistically higher than the total score average of the loneliness score below average group (avg.=2.33); the total score average of the anger score above average group (avg.=4.34) was

statistically higher than the total score average of the anger score below average group (avg.=2.34). The comparison of the age groups was examined by Tukey multiple comparison tests as there were four groups, and it was seen that both the group aged 24 and below (avg.=4.02) and the 25-29 age group (avg.=3.85), had higher GHQ-12 total score average than 30-39 (avg.=2.70) and 40 and above age group (avg.=2.15) (Table 2).

Table 2: Seven-way Mixed-Factor Variance Analysis in Terms of GHQ-12 Total Score

	F	p	Part η^2
Independent Variables			
Physical Activity Groups (2)	13.14	0.00	0.02
Gender Groups (2)	1.4	0.24	0.002
Loneliness Score Groups (2)	33	0.00	0.048
Anger Score Groups (2)	35.54	0.00	0.052
Age Groups (4)	10.05	0.00	0.044
BMI Groups (2)	0.00	0.97	0.000
Educational Status Groups (2)	0.54	0.46	0.001
Interactions			
Physical Activity Groups X Gender Groups (2x2)	0.02	0.9	0.000
Physical Activity Groups X Loneliness Score Groups (2x2)	2.58	0.11	0.004
Physical Activity Groups X Anger Score Groups (2x2)	4.42	0.05	0.007
Physical Activity Groups X Age Groups (2x4)	1.2	0.31	0.005
Physical Activity Groups X BMI Groups (2x2)	0.02	0.89	0.000
Physical Activity Groups X Educational Status Groups (2x2)	0.11	0.74	0.000

Although there was a difference in statistical level between both physical activity groups and loneliness score groups in terms of GHQ-12 total score, there was no interaction effect between the two variables ($F(1,654)=2.58$; $p>0.05$; part $\eta^2=0.004$) (Figure 1).

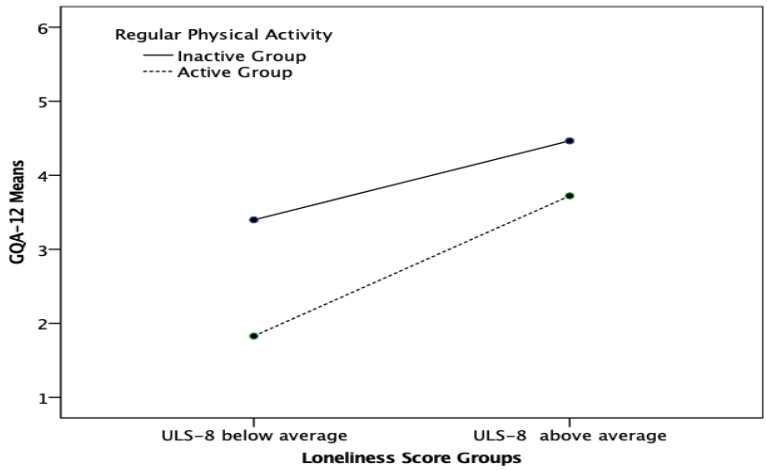

Figure 1: Comparison of Physical Activity and Loneliness Score Groups in Terms of GHQ-12 Total Score

Similarly, although there was a difference in statistical level between both physical activity groups and anger score groups in terms of GHQ-12 total score, there was no interaction effect between the two variables (F(1.654)=4.42; p>0.05; part η^2=0.007) (Figure 2)

Figure 2: Comparison of Physical Activity and Anger Score Groups in Terms of GHQ-12 Total Score

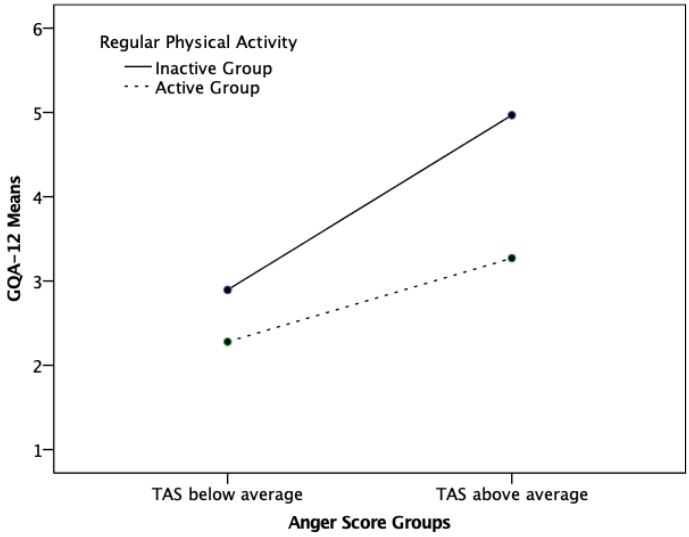

Figure 2: Comparison of Physical Activity and Anger Score Groups in Terms of GHQ-12 Total Score

Similarly, although there was a difference in statistical level between both physical activity groups and age groups in terms of GHQ-12 total score, there was no interaction effect between the two variables (F(3.654)=1.20; p>0.05; part η^2=0.005) (Figure 3).

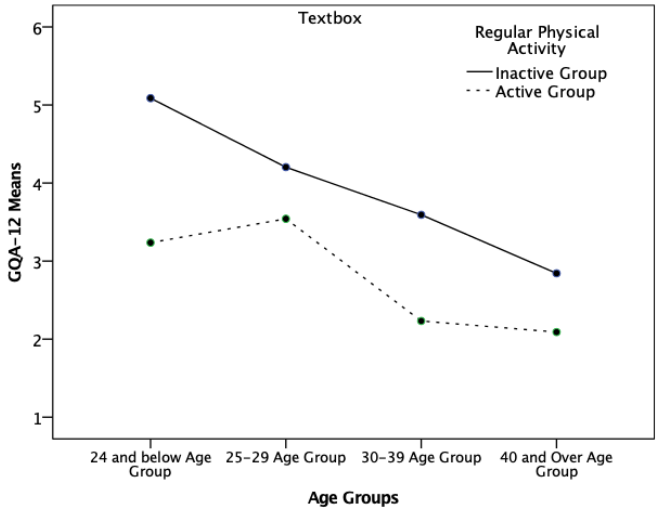

Figure 3: Comparison of Physical Activity and Age Groups in Terms of GHQ-12 Total Score

In contrast, there was no statistically significant difference between gender groups (F(1.654)=1.40; p>0,05; part η^2=0.002), body mass index groups (F(1,654)=0.01; p>0.05; part η^2=0.000), and

educational status groups (F(1,654)=0,54; p>0,05; part η^2=0,001) in terms of GHQ-12 total score. Additionally, there was no interaction effect in significant level statistically between physical activity groups and gender groups (F(1,654)=0,02; p>0,05; part η^2=0,000), body mass index groups (F(1,654)=0,02; p>0,05; part η^2=0,000) and educational status groups (F(1,654)=0,11; p>0,05; part η^2=0,000) in terms of GHQ-12 total score. According to this result, it is understood that physical activity groups show similar score distribution in all of the six independent variable groups.

Discussion

It is known that the compulsory changes brought by the Covid-19 pandemic into daily life routines encourage an inactive lifestyle, increasing the physical health problems as well as negatively affecting the mental health of the community (Ashdown-Franks et al., 2020). Additionally, the increase in loneliness due to restrictions makes it harder for individuals to cope with the difficulties they go through and contribute to the increase in psychological distress. In this study, which was conducted to examine the impact of loneliness, anger, and regular physical activity on mental health in pandemic conditions, there was a statistically significant difference between physical activity groups, loneliness score groups, anger score groups, and age groups in terms of GHQ-12 total score and there was no interaction effect between these variables.

The score of the inactive group, which is one of the physical activity groups, was significantly high compared to the active group in terms of GHQ-12 total score. A study showed that increasing physical activity can improve mental health. A study conducted with 20 thousand people in Scotland reported that doing daily physical activity was associated with less psychological distress [26]. A study conducted in Singapore found a positive relationship between high sedentary behavior and psychological distress, while physically active individuals had lower levels of psychological distress [27]. In another study, it was found that when adolescents with low and high physical activity in terms of GHQ-12 score were compared, GHQ score decreased by 2.13 points with regular physical activity [28]. The protective and improving effect of regular physical activity on mental health was also defined in the literature, and the results of the study are consistent with the literature. It can be said that regular physical activity is relaxing for individuals both physically and mentally, it helps to cope with the high stress of the pandemic, resulting in the less psychological distress of the active group.

In the study, the GHQ-12 score of the group with a higher-than-average loneliness score was significantly higher compared to individuals with low loneliness. The study by Wong et al. found that there was a significant increase in the loneliness, anxiety, and sleep deprivation levels after the start of the Covid-19 pandemic, and being female, living alone, having 4 or more chronic disease were associated with independently increasing loneliness [29]. A community-based study in England found that 29.2% of the participants scored 4 or more in GHQ, and 35.86 of them felt alone sometimes or often [30].

A study conducted with Slovenian adults found that participants experienced social loneliness rather than emotional loneliness, and demographic variables and past mental illness history were determinant for emotional, social, and general loneliness [31]. In a study conducted with Swedish adults, individuals' having $\geq$ 3 in GHQ-12 and frequently perceived stress, loneliness, or sleep problems were associated (Blom, et al., 2020). A study conducted in Ghana found the loneliness prevalence as 18.1% with mental distress [32]. The results of the present study are consistent with the literature and it can be said that the restrictions such as social distance, staying at home, decrease in the social interaction, which were implemented to prevent infection in the pandemic, contributed to this situation. In pandemic conditions, the inability of individuals to go out on the street with complete closure prevented them from both socializing and performing physical activity in gyms or outside the home. This condition also appears to have negatively affected mental health.

In the study, the anger score was found to be higher than the average group's level of psychological distress. A study found that participants showed increased levels of stress and anger during the pandemic compared to before. The study, which investigated the relationship

between anger and mental health in the Australian general population, found that mood, anxiety and substance use disorder were independently associated with anger symptoms [33,34]. A study conducted in the Netherlands found that anger and anger attacks were linked to depression and anxiety disorders [35]. It was found that mental health problems increased anger, and alcohol-addicted individuals had higher anger expression than the healthy control groups [36]. The results of the present study are consistent with the literature, and the stress increased due to pandemic, increase in mental distress, and uncertainties may have increased anger, as well.

With the comparison of the age groups in the study, it was found that young age group (18-29 years) had higher GHQ-12 total score than middle and older age group. A study noted that young people had high general psychiatric disorders and loneliness, and having a job and living with a partner were protective factors [36]. Additionally, it was found that having ≥ 3 from GHQ-12 were higher in young and low-educated individuals compared to older individuals. When those who suffered from mental distress were examined, it was found that younger students tended to feel more alone, anxious, and suicidal than older students. The levels of mental distress before the pandemic and the impact of secondary results of the pandemic on mental health were studied, and it was found that young adults were more at risk for mental distress. Although restrictions in pandemic conditions are more towards older individuals, it can be said that older people can cope with the process more efficiently and experience less mental distress thanks to the decrease in their daily life stressors due to older ages, having regular income due to being retired, calmer approach to problems with mature point of view.

Although there was a statistical difference between physical activity groups and loneliness, anger, and age groups in terms of the GHQ-12 total score in the study, there was no interaction between physical activity and these variables. A study found that moderate physical exercise can be beneficial in coping with the perception of loneliness [37]. It was revealed that regular exercise in the woods reduces negative moods such as depression and anger and improves mood [38]. It was also shown that there was a strong negative correlation between anger and exercise and healthiness [39-41]. In the study, it can be said that regular physical activity does not have a common effect with variables such as loneliness, anger, age, is related to the difficult conditions caused by the pandemic, that individuals face unprepared and sudden life changes, the increase in individual, social, economic stressors this condition affects mental health independently of the common effect of regular physical activity with other variables.

Conclusion and Suggestion

In the study, it was found that there was a statistically significant difference between mental distress and regular physical activity, loneliness, anger, and age variables, and there was no interaction effect between them. It can be said that the restrictions and measures taken to prevent pandemic infection led to many problems, both physical and mental, at the social level, and that regular physical activity was effective in dealing with these problems. In this direction, it is recommended to conduct advanced studies on mental distress in the pandemic.

Limitations of Research

The limitations of research can be listed as cross-sectional data, data collection based on self-declaration, and not generalizing results to populations with different characteristics.

Conflict of Interest

Authors declared no conflict of interest.

Financial Disclosure

Authors declared no financial support.

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Received date: 28 July 2021 Accepted date: 02 August 2021