

THE ANALYSIS OF THE BIOPSYCHOSOCIAL CHARACTERISTICS OF THE INDIVIDUALS DOING PILATES AND THE SEDENTARY INDIVIDUALS IN COVID-19 PANDEMIC PERIOD

COVID-19 PANDEMİ SÜRECİNDE PİLATES YAPAN BİREYLER İLE SEDANter BİREYLERİN BİYOPSİKOSOSYAL KARAKTERİSTİKLERİNİN ANALİZİ

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ABSTRACT

Purpose: The aim of our study is to analyse the biopsychosocial characteristics of the individuals doing pilates and the sedentary individuals in Covid-19 pandemic period.

Methods: Participants were randomly allocated into pilates (n=27) and control groups (n=27). The biopsychosocial conditions of the participants were assessed on the Cognitive Exercise Therapy Approach Scale (BETY-BQ). Participants also were evaluated by the Beck Depression Scale (BDS), Fear of Covid-19 Scale, The Fatigue Severity Scale (FSS), Pittsburgh Sleep Quality Index (PSQI), and The Nottingham Health Profile (NHP). After the first evaluation, all the participants were given an informative presentation emphasising Covid-19 and the importance of physical activity during the pandemic period. The pilates group participated in 50-minute sessions of pilates twice a week for 8 weeks. At the end of the 8-week period, all the participants were evaluated with the same evaluation methods.

Results: In the pilates group; there was a significant difference in the scores of BETY-BQ, BDS, the Fear of Covid-19 Scale, PSQI and NHP ($p<0.05$) while there was no significant difference in FSS ($p>0.05$). In the control group, BDS, the Fear of Covid-19 Scale, PSQI and NHP scores differed significantly ($p<0.05$) but BETY-BQ and FSS did not differ significantly ($p>0.05$).

Conclusions: At the end of the study, it was deduced that the pilates exercises done in the Covid-19 pandemic period had a positive effect on the biopsychosocial characteristics of the individuals.

Keywords: Biopsychosocial, Covid-19, Physical activity, Pilates, Sedentary

ÖZET

Amaç: Çalışmanın amacı, Covid-19 pandemi döneminde pilates yapan bireyler ile sedanter bireylerin biyopsikososyal özelliklerini analiz etmektir.

Yöntem: Katılımcılar randomize olarak pilates (n=27) ve kontrol (n=27) gruplarına ayrıldı. Katılımcıların biyopsikososyal durumları Bilişsel Egzersiz Terapi Yaklaşımı Ölçeği (BETY-BQ) ile değerlendirildi. Katılımcılar ayrıca Beck Depresyon Ölçeği (BDÖ), Covid-19 Korkusu Ölçeği, Yorgunluk Şiddet Ölçeği (YŞÖ), Pittsburgh Uyku Kalitesi İndeksi (PUKİ) ve Nottingham Sağlık Profili (NSP) ile değerlendirildi. İlk değerlendirmenin ardından tüm katılımcılara Covid-19 ve pandemi döneminde fiziksel aktivitenin önemini vurgulayan bilgilendirici bir sunum yapıldı. Pilates grubu 8 hafta boyunca haftada iki gün 50 dakikalık pilates seanslarına katıldı. 8 haftalık süre sonunda tüm katılımcılar aynı değerlendirme yöntemleri ile değerlendirildi.

Bulgular: Pilates grubunda BETY-BQ, BDÖ, Covid-19 Korku Ölçeği, PUKİ ve NHP puanlarında anlamlı fark bulunurken ($p<0,05$) YŞÖ puanlarında anlamlı fark bulunmadı ($p>0,05$). Kontrol grubunda BDÖ, Covid-19 Korku Ölçeği, PSQI ve NHP puanları arasında anlamlı fark varken ($p<0,05$), BETY-BQ ve YŞÖ arasında anlamlı fark yoktu ($p>0,05$).

Sonuç: Çalışma sonunda Covid-19 pandemi döneminde yapılan pilates egzersizlerinin bireylerin biyopsikososyal özellikleri üzerinde olumlu etkisi olduğu sonucuna varıldı.

Anahtar Kelimeler: Biyopsikososyal, Covid-19, Fiziksel aktivite, Pilates, Sedanter

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INTRODUCTION

Covid-19 pandemic caused people all over the world both physically inactive and to be negatively affected in terms of psychology (Gelen et al., 2020). Most individuals have been observed to have the fear of getting infected, live close to the concept of death, tend to take too many precautions, fear spreading the virus, fear of death, have anger, attention disorder, concentration difficulty, fatigue, disturbed sleep, quarrel with family members and be isolated from social life (Silva et al., 2020; Kabeoğlu & Gül 2021). That the terms such as social distance, isolation and contact are frequently used in society has caused individuals to develop a new fear called “coronaphobia” or “fear of Covid-19” (Arpaci et al., 2020).

Physical activity is a health improving behaviour which is positively related to physical and psychosocial health (Davies et al., 2012). Physically active individuals are stated to experience less stress, depression, and anxiety. With Covid-19 pandemic, the precautions taken with the aim of reducing the risk of infection limited the physical activity of the individuals and, therefore, became the basis of loads of physical and psychological problems (Arslan & Ercan 2020).

Developed by Joseph Pilates in the 1920s, Pilates is a kind of exercise method requiring body stability, strength, and flexibility as well as muscle control, body pose and focusing on breathing and including mind and body unity. It can be performed individually or as a group by using a mat or some apparatus (Wells et al., 2012). Pilates provides psychomotor benefits, contributes to a better functional capacity, and increases the independence and life quality (García-Garro et al., 2020; Villarreal-Angeles et al., 2020). In addition, it ensures the spine mobilisation and helps the postural defects be corrected. It gets the individuals to raise body awareness (Anderson 2009). The individuals who do pilates state that they feel calmer, energetic, and renewed and they are more aware of their own body (Wells et al., 2012). It has been observed in the women who have recently given birth that they have a more quality sleep, need shorter time for falling asleep and have improvement in daily activities (Ashrafinia et al., 2014).

No such study that analyses the biopsychosocial characteristics of the individuals doing pilates and the sedentary individuals in the Covid-19 pandemic period was found in the literature. In this regard, it was aimed to analyse biopsychosocial characteristics of the individuals doing pilates and the sedentary individuals in Covid-19 pandemic period.

METHODS

Participants

Regardless of gender, 54 individuals aged between 20-50 were included on a voluntary basis. They were given detailed information about the study and the written confirmation form regarding their approval of participating in the study voluntarily was taken from them after they signed. This study was approved by the Istanbul Medipol University, Non-clinical Research Ethics Committee with the date 03.02 2022 and number 108.

Of the participants, the sedentary individuals who have no neurological, mental, vestibular, orthopaedic disorder and sedentary and have got at least 2 doses of Covid vaccine were included in the study. The participants having orthopaedic, neurological, or musculoskeletal problems at a level preventing them to do pilates, the ones who are in the condition of not being able to attend the exercise programme regularly, the ones who are pregnant or suspected to be pregnant and Covid positive ones were excluded from the study.

Procedure

Patients who met the inclusion criteria and were accepted to be enrolled in the study were randomly allocated into experimental (n=27) and control groups (n=27). Participants were randomised into Pilates or control groups using sealed opaque envelopes that were created at each institution prior to the initiation of the investigation by an independent researcher not involved with the intervention in a 1:1 ratio. All the participants were assessed by the physiotherapist with the same evaluation methods at the beginning of the study and at the end of the 8-week pilates exercise programme. Following the first evaluation, all the individuals in the pilates or control groups were given an informative presentation highlighting the significance of physical activity in the pandemic period. The participants in the pilates group were taken 50-minute reformer pilates group sessions twice a week for 8 weeks. In view of the pandemic period, the sessions accompanied by the physiotherapist were held in groups of 2 or 3 participants.

The participants in the control group were only given the information presentation and evaluated using the same methods after 8 weeks.

Interventions

The reformer pilates sessions lasted 50 minutes and were done twice a week. Each session started with warm-up exercises, went on with breathing exercises, and ended with stretching and cooling exercises. All the exercises applied were first demonstrated by the physiotherapist. Corrections were made with oral and tactical warnings by the physiotherapist when necessary. Breathing control was reminded by the physiotherapist and exhaling was emphasised in the hard parts of the movement. For the individuals having difficulty in doing the exercise, the moves were simplified by applying the stages. Exercise programme was given in Table 1.

Table 1. Intervention Programme

Name of the move	Repetition number
1. Footwork series: Toes	10
2. Footwork series: Arches	10
3. Footwork series: Heels	10
4. Footwork Series: Tendon stretch	10
5. Hundred	10 full breaths
6. Reach and pull: Pull, circles	3-6
7. Reach and pull: Triceps press	3-6
8. Short spine massage	5
9. Shave the head	3-5
10. Hug a tree	3+3
11. Long box: Pulling straps I	3-5
12. Long box: Pulling straps II	3-5
13. Short box: Round	3-5
14. Short box: Flat back	3-5
15. Short box: Side to side	3+3
16. Short box: Twist	3+3
17. Short box: Tree front	3+3
18. Short box: Side sit up	3+3
19. Long stretch	5
20. Elephant	5-8
21. Stork	5-8
22. Stomach massage: Round	10
23. Stomach massage: Hands back	10
24. Stomach massage: Reaching	5
25. Stomach massage: Twist	5+5
26. Chest expansion	3
27. Frog, leg circles	5-8
28. Knee Stretch series: Round	5-10
29. Knee stretch series: Arch/flat back	5-10
30. Knee stretch series: Knees off	5-10
31. Running	10
32. Pelvic lift	10
33. Front splits	3-5
34. Forward lunge	3-5

The individuals in the control group were only given the information presentation. In this presentation, the participants were informed about covid-19. The physical and psychological effects of covid-19 were mentioned and the effects of physical activity on the immune system were emphasised. They were advised to join the same pilates programme that was applied to the pilates group after the completion of the study.

Measures

The participants' demographic information, covid-19 history, covid-19 vaccination status, physical activity, the existence of a chronic illness, pain story and the medicine used were recorded to the anamnesis form.

Primary outcome

Cognitive Exercise Therapy Approach Scale (BETY-BQ)

The biopsychosocial conditions of the participants were assessed on the Cognitive Exercise Therapy Approach Scale (BETY-BQ). Each item was graded between 0-4 according to the Likert system. The increase of the point refers to the worsening of biopsychosocial conditions. (4: Yes, always, 3: Yes often, 2: Yes sometimes, 1: Yes seldom, 0: No, never) (Ünal et al., 2017).

Secondary outcome

Beck Depression Scale (BDS)

Beck Depression Scale is made up of 21 items including depressive symptoms. Between 0-9 points refer to minimal level of depression; 10-16 points refer to mild level of depression; 17-29 points refer to mid-level of depression; and 30-63 points refer to severe depression symptoms (Beck et al., 1961).

Fear of Covid-19 Scale

Fear of Covid-19 Scale was used to evaluate the fear levels of the participants. The scale was formed with the experts' evaluation of the scales that evaluate different fear parameters and by giving importance to the participants' views. The scale is graded with one factor and is a five-point Likert scale 1=Strongly disagree; 5= Strongly agree). The scale consists of 7 items. The point that can be got from the scale is between 7-35. That the point is high means the fear of covid-19 is high (Ahorsu et al., 2020).

The Fatigue Severity Scale (FSS)

The scale consists of 9 questions. Each question is graded out of seven points. The increase of points reveals that the fatigue level is rising. 28 and higher points show severe fatigue (Armutlu et al., 2007).

Pittsburgh Sleep Quality Index (PSQI)

Pittsburgh Sleep Quality Index (PSQI) developed by Buysse et al was used to analyse the sleep quality of the participants. PSQI comprises 7 components: 1 subjective sleep quality 2 sleep latency 3 sleep duration 4 accustomed sleep activity 5 sleep disorder 6 sleeping pills use 7 daytime dysfunctions. Each component is evaluated points between 0-3. The total point is between 0-21. The increase of the point shows that the sleep quality is worsening. While a point between 0-4 is regarded as good sleep quality, a point between 5-21 is described as poor sleep quality (Buysse et al., 1989).

Nottingham Health Profile (NHP)

Participants' life quality as to health was evaluated The Nottingham Health Profile. The questionnaire comprises 6 sections such as pain (8 items), physical activity (8 items), energy (3 items), sleep (5 items), social isolation (5 items) and emotional reaction (9 items). The total number of the questions is 38. The questions are answered as "yes" or "no". Each section is graded between the range of 0-100. 0 refers to the best health condition and 100 refer to the worst (Kind & Carr-Hill 1987)

Statistical analysis

Sample size calculation was performed with G*Power 3.1.9.2. with %5 level of significance and in 0.787 power size. The power of the study was calculated as 95% with 40 individuals, 20 individuals per group. Considering a minimum 25% of leaving rate, the study was completed with 27 individuals per group.

The data obtained from the research were analysed by using SPSS (Statistical Package for Social Sciences) for Windows 22.0. As descriptive statistical methods, numbers, percentage,

average and standard deviation were used in the analysis of the data. The differences between the rates of categorical variables in the independent groups were analysed using chi-square and Fisher exact tests. T-test was used in the comparison of the quantitative consistent data between two independent groups. The alterations of in-group repetitive measurements were analysed using dependent groups t-test. Statistical significance was assessed using an alpha level of 0.05.

RESULTS

The flow chart of the participants is shown in figure 1. The gender of the participants showed significant relation. The whole pilates group consisted of females while there were 6 males and 21 females in the control group. The age, BMI measurements, marital status, Covid-19 history, vaccination status, the presence of chronic illnesses, pain story, medicine use conditions were homogeneous in the groups ($p>0.05$), (Table 2).

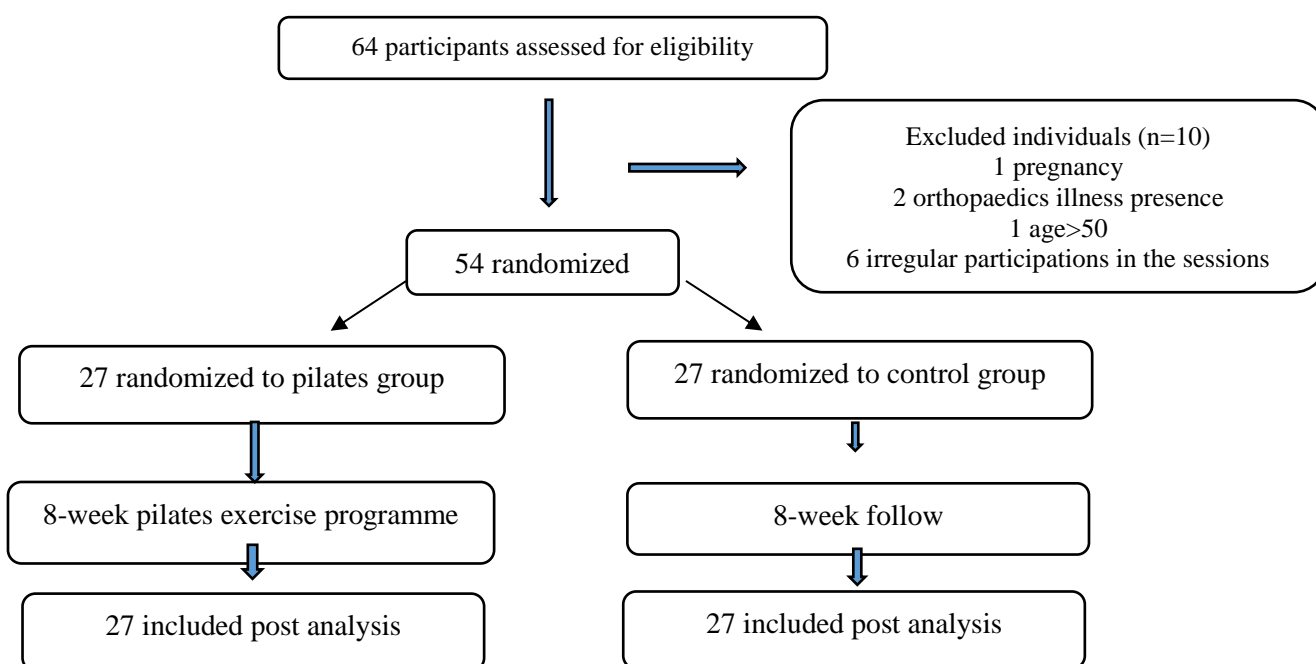


Figure 1. Flow diagram of study participants

Table 2. Participant characteristics

		Pilates		Control		Total		X ²	P
		n	%	n	%	n	%		
Gender	Male	0	%0.0	6	%22.2	6	%11.1	6.750	0.011
	Female	27	%100.0	21	%77.8	48	%88.9		
Marital Status	Single	14	%51.9	18	%66.7	32	%59.3	1.227	0.203
	Married	13	%48.1	9	%33.3	22	%40.7		
Covid-19 History	Present	10	%37.0	16	%59.3	26	%48.1	2.670	0.086
	Absent	17	%63.0	11	%40.7	28	%51.9		
Vaccination	2	12	%44.4	13	%48.1	25	%46.3	0.588	0.745
	3	10	%37.0	11	%40.7	21	%38.9		
	4	5	%18.5	3	%11.1	8	%14.8		
The Presence of Chronic Disorder	Present	6	%22.2	2	%7.4	8	%14.8	2.348	0.125
	Absent	21	%77.8	25	%92.6	46	%85.2		

Pain Story	Present	17	%63.0	11	%40.7	28	%51.9	2.670	0.086
	Absent	10	%37.0	16	%59.3	26	%48.1		
Medicine Use	Present	7	%25.9	2	%7.4	9	%16.7	3.333	0.071
	Absent	20	%74.1	25	%92.6	45	%83.3		
		Mean	Sd	Mean	Sd	t	sd	p	
Age		32.19	5.32	30.70	8.35	0.78	52	0.441	
BMI		20.99	2.55	22.58	3.72	-1.83	52	0.075	

Chi-Square Analysis; Independent Groups T-Test, n: Number, Sd: standard deviation, BMI:Body mass index, Statistical significance level $p < 0,05$

BETY-BQ measurements did not differ in the groups ($p > 0.05$). The decrease in the score after the exercise in the in-group analysis in the pilates group was found significant ($t = 3.561$; $p = 0.001$). A significant difference was not obtained in the in-group analysis of the control group ($p > 0.05$), (Table 3).

BDS measurement showed significant differences in both in-group and intergroup comparison ($t = -2.187$; $p = 0.033$), (Table 3).

Covid-19 Fear Scale measurements did not show significant difference between two groups ($p > 0.05$). The decrease in the score both in pilates and the control group was found significant ($t = 2.583$; $p = 0.016$; $t = 3.368$; $p = 0.002$ respectively), (Table 3).

FFS measurements did not show differences both in-group and intergroup ($p > 0.05$), (Table 3).

For the PSQI total point measurements, no differences were found between the groups ($p > 0.05$). The decline in the scores of both in pilates and the control group was significant in the in-group analysis ($t = 4.222$; $p = 0.000$; $t = 2.785$; $p = 0.010$ respectively), (Table 3).

NHP total point measurements did not differ between the two groups ($p > 0.05$). The decline in the scores of both in pilates and the control group was significant in the in-group analysis ($t = 2.156$; $p = 0.041$; $t = 3.094$; $p = 0.005$ respectively), (Table 3).

Table 3. The participants' BETY-BQ, BDS, Covid-19 Fear Scale, FSS, PSQI, NHP results

Groups	Pilates (n=27)		Control (n=27)		t^a	p
	Mean	Sd	Mean	Sd		
BETY-BQ Before	27.074	11.286	24.074	14.765	0.839	0.405
BETY-BQ After	22.074	9.623	22.593	16.192	-0.143	0.887
t^b	3.561		1.620			
p	0.001		0.117			
BDS Before	9.741	6.746	11.296	7.730	-0.788	0.434
BDS After	6.074	5.560	9.815	6.934	-2.187	0.033
t^b	4.611		3.407			
p	0.000		0.002			
Fear Scale Before	15.778	7.127	13.630	6.077	1.192	0.239
Fear Scale After	12.074	5.797	12.111	5.570	-0.024	0.981
t^b	2.583		3.368			
p	0.016		0.002			
FSS Before	33.889	13.198	29.333	13.989	1.231	0.224
FSS After	31.111	12.024	28.222	13.265	0.838	0.406
t^b	1.083		1.112			
p	0.289		0.276			
PSQI Before	6.220	2.621	5.630	3.794	0.668	0.507
PSQI After	4.889	2.225	4.815	3.223	0.098	0.922
t^b	4.222		2.785			
p	0.000		0.010			
NHP Before	94.381	65.156	113.809	96.924	-0.864	0.391

NHP After		70.735	66.989	103.765	88.882	-1.542	0.129
t ^b		2.156		3.094			
p		0.041		0.005			

^a Independent groups T-Test; ^b Dependent groups T-Test, Sd: standard deviation, BETY-BQ: Cognitive Exercise Therapy Approach Scale, BDS: Beck Depression Scale, FSS: The Fatigue Severity Scale, PSQI: Pittsburgh Sleep Quality Index, NHP: Nottingham Health Profile
Statistical significance level $p < 0,05$

DISCUSSION

While the precautions and the limitations due to Covid-19 pandemic led people to a more sedentary lifestyle, social isolation affected individuals' mental health negatively. In our study aiming at analysing the effects of pilates exercises on biopsychosocial characteristics of the individuals in Covid-19 pandemic period, it was found out that there are significant differences in the results of BETY-BQ, BDS, Covid-19 Fear Scale, PSQI and NHP but there are no significant differences in FSS in the pilates group. However, in the control group, BDS, Covid-19 Fear Scale, PSQI and NHP results showed significant differences while no significant differences were obtained from BETY-BQ and FSS results.

No differences in the BETY-BQ scale results were found between the groups in our study; however, the in-group analysis in the pilates group provided differences. It was reported that reformer pilates did not make a difference in the BETY-BQ score of the individuals diagnosed with fibromyalgia, but a significant difference was obtained from the house mat pilates group (Caglayan et al., 2022). This result shows that pilates exercises have a positive effect on the biopsychosocial characteristics of the individuals. Moreover, it was thought that the participants were supported socially because the exercises were done as a group, the exercises had positive effects on the existing chronic pain of the individuals and with a general point of view the individuals added physical activity in their lives.

Lambert et al (2002) stated that the lockdown may cause people to get in adequate sunlight. Therefore, it was stated that the levels of serotonin related to depression may decline. In a study carried out with university students at the beginning stage of Covid-19 pandemic, it was found that the students took 2.528 steps a day on average in April 2020. It was seen that the decline in the average steps the university students take a day ended in the increase in their depression levels (Cihan & Şahbaz Piriñçi 2020). Similarly, Bulgurođlu et al. (2021) stated that the physical activity levels of the university students declined, and their level of depression increased in Covid-19 pandemic period. Sfindla et al (2020) reported that the individuals who have a reasonable or enough level of physical activity experience fewer psychological problems than the inactive ones.

Hassan and Amin (2011) concluded that there is a significant decrease in the depression levels of the women who do pilates regularly. In a meta-analysis done by Fleming and Herring (2018), it was shown that pilates lessens depression and anxiety and has positive effects on psychological health. Suata et al. (2022) reached a conclusion that pilates exercises affect body health positively and therefore reduce depression levels. In many studies analysing the effects of pilates on depression in the literature, it was concluded that pilates reduces the depression level (Vancini et al., 2017; Kamali & Norouzi 2016; Eyigor et al., 2010; Halis et al., 2016). In our study, it was found out that the BDS results of the control group are significantly higher than those of the pilates group in the intergroup evaluation. When the results of intergroup measurements were compared, the results of the pilates group were seen to be better. According to in-group comparison of both pilates and control groups, significant differences were observed between the initial and the final assessment results of BDS. This result makes us think that the significant difference in the control group may be related to the gradual normalisation process and the domination of the positive change in the pilates group may be linked to the fact that the individuals did pilates regularly. In the gradual normalization process, Covid 19 measures have been gradually reduced, and we believe that the socialization of individuals by ending the quarantine process is also effective in this result.

Toprak Celenay et al. (2020) revealed that coronavirus phobia of home office workers is 1.35 times more than the ones working outside. Çelik (2021) stated that physically more active participants among the individuals having different levels of physical activity have lower levels of coronavirus phobia. In our study, although Covid-19 Fear Scale results did not show any significant differences between the pilates and the control group, there was a bigger decline in the fear points of the pilates group.

When the groups are compared in themselves, significant differences were observed between the initial and the final assessment results of Covid-19 Fear Scale both in the pilates and the control group. The significant difference in the control group suggested to us that this result may be related to the fact that the individuals have got used to the pandemic period and the gradual normalisation process. Although there is no significant difference between the intergroup results of the final assessment, the higher decline in points in the pilates group may show that regular pilates has a positive effect on Covid-19 fear levels of the individuals. The fact that the hormones secreted with regular physical activity increase the person's well-being may have been effective in this result.

Pilates exercises are influential on women's fatigue in postmenopausal and postpartum period (Aibar-Almazán et al., 2019; Ashrafinia et al., 2015). In a study in which the activity of different exercise approaches in patients with rheumatoid arthritis, it was seen that there was a significant improvement in the fatigue conditions of the individuals in all groups (Yentür et al., 2021). When an intergroup comparison was made, no significant difference was observed between the groups in the result of the initial and the final assessment. When an in-group comparison was made, no significant difference was observed between the control and pilates groups in the result of the initial and the final assessment.

Pilates exercises, one of whose essential principles is breathing, increase the general wellness by activating the parasympathetic nervous system with respiratory control and it was thought that this condition may have positive effects on physical and mental fatigue. However, in accordance with the result of our study, although pilates exercises showed significant differences in different illness groups, the results are not significant in the healthy individuals in the pandemic period.

Zhang et al. (2020) stated that more than 1/3 of the medical personnel showed insomnia symptoms in the pandemic period. It was detected that the group with insomnia symptoms had more psychological problems about the pandemic. Diniz et al. (2020) showed that the decline in physical activity increases the risk of insomnia up to 1,5 times. Another study stated that sleep and physical activity are related, and more active individuals have more sleep quality (Bisson et al., 2019). In our study, according to intergroup comparison of both pilates and control groups, no significant differences were observed between the initial and the final assessment results of PSQI. The in-group comparison of the groups, significant differences were observed between the initial and the final assessment results of PSQI. The significant differences in the control group suggested that the result is related to the gradual normalisation process. In the intergroup final assessment, there was no significant difference between the groups but there was a higher decline in the total point of the pilates group. Like the literature, this result showed that the individuals adding physical activity to their lives have better sleep quality.

In a study in the pandemic period, Tural (2020) reported that the level of physical activity is related to life quality. That Covid-19 pandemic period led the young individuals to be sedentary and affected their life quality negatively is reported in another study (Cihan & Şahbaz Piriñçi 2020). In Covid-19 pandemic the decrease in the level of physical activity of university students and that the students' life quality levels got affected negatively because of depression were revealed (Bulguroğlu et al., 2021). Gillison et al. (2009) stated that mild group exercises affect the general life quality positively and the positive effects in life quality in physical terms can be obtained with average weight exercises. Bize et al. (2007) asserted that there is a significant relation between the physical activity level of the individuals and life quality in terms of health. Similarly, the individuals with high level physical fitness have a high-quality life. In our study no significant difference was found between the pilates and the control group in terms of NHP results but there was a high decline in the pilates group. The results of our study are of the quality supporting the literature.

The strength point of the study is that pilates performed during the Covid-19 pandemic is one of a limited number of studies that evaluate the biopsychosocial characteristics of individuals. The presence of 6 male participants in the control group and the fact that the groups are not homogeneous in terms of gender in the comparison between the groups may be a limitation of our study. Dec. At the same time, while this study was being conducted, Covid-19 cases decreased, restrictions and measures were eased, and a gradual normalization process began. This may have affected the parameters we evaluated and may constitute another limitation of our study. In addition, the fact that no other evaluation parameters other than the anamnesis form were used to determine the physical activity of sedentary individuals at the control group level can also be cited as another limitation of our study.

CONCLUSION

Our study reached a conclusion that pilates exercises done in the Covid-19 pandemic period have positive effects on the biopsychosocial characteristics of the individuals. That future studies are made with a longer follow-up period may provide better statistical results. In the light of the data obtained, encouraging individuals for physical activity in the pandemic period may enable them to cope with psychological problems derived from social isolation more easily.

Conflict of interest

The authors report no actual or potential conflicts of interest.

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Authors Contributions

Plan, design: AIT, GAB; **Material, methods and data collection:** AIT; **Data analysis and comments:** AIT, GAB; **Writing and corrections:** AIT, GAB.

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