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Health Problems and Physical Activity Levels of Individuals with Chronic Diseases During Covid-19 Lockdown

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ABSTRACT

Objective: This study aims to investigate through the Omaha System (OS) the health problems and physical activity (PA) levels of the individuals with chronic diseases during COVID-19 lockdown and related factors.

Method: A descriptive-correlational design was used in the study. The research sample consisted of 182 individuals who had chronic diseases and were in home isolation. Personal information form, "Omaha System Problem Classification Sheme (PCS)", and "International Physical Activity Questionnaire (IPAQ-Short Form)" were used to collect data.

Results: The rate of individuals having insufficient PA was 57.7%. The most common health problems in PCS were nutrition, oral health, sleep and rest pattern. A significant relationship was found between the PA level and time spent sitting, isolation period and environmental domain problems ($p<0.05$).

Conclusions: Individuals with chronic diseases were determined to have insufficient physical activity and nutrition, oral health, sleep problems during COVID-19 lockdown.

Keywords: Chronic disease, COVID-19, Physical activity, Social isolation

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COVID-19 Sokağa Çıkma Kısıtlaması Sürecinde Kronik Hastalığı Olan Bireylerin Sağlık Sorunları ve Fiziksel Aktivite Düzeyleri

ÖZET

Amaç: Bu çalışma, COVID-19 karantinası sürecinde kronik hastalığı olan bireylerin sağlık sorunları ve fiziksel aktivite (FA) düzeylerini ve ilişkili faktörleri Omaha Sistemi (OS) aracılığıyla araştırmayı amaçlamaktadır.

Yöntem: Araştırmada tanımlayıcı-ilişkisel desen kullanılmıştır. Araştırma örneklemini, kronik hastalığı olan ve ev izolasyonunda olan 182 birey oluşturmuştur. Veri toplamak için kişisel bilgi formu, "Omaha Sistem Problem Sınıflandırma Şeması (PSL)" ve "Uluslararası Fiziksel Aktivite Anketi (IPAQ-Kısa Form)" kullanılmıştır.

Bulgular: FA düzeyi yetersiz olan bireylerin oranı %57.7 olup, PSL'de en sık görülen sağlık sorunları beslenme, ağız sağlığı, uyku ve dinlenme düzenidir. FA düzeyi ile oturma süresi, izolasyon süresi ve çevre sorunları arasında anlamlı bir ilişki bulunmuştur ($p<0.05$).

Sonuç: Kronik hastalığı olan bireylerin COVID-19 karantinası sürecinde yetersiz fiziksel aktivite ve beslenme, ağız sağlığı, uyku sorunları yaşadığı belirlendi.

Anahtar Kelimeler: COVID-19, Fiziksel aktivite, Kronik hastalık, Sosyal izolasyon

COVID-19 is an infectious disease progressing with severe acute respiratory syndrome caused by the virus named SARS-CoV-2 first detected in Wuhan, China, in December 2019 (1). Since the outbreak of COVID-19, authorities of most countries determined the most affected groups by covid19 and focused on this groups to maintain public health. Although having varied according to studies over time, since the initial outbreak of the pandemic, the groups at risk of severe illness due to COVID-19 are the elderly, those with chronic diseases, and healthcare workers (2).

Because of the COVID-19 pandemic, it is recommended around the world that people isolate themselves (3). Thereupon, on March 22, 2020, a curfew was declared by the government in Türkiye. The curfew required citizens to remain in their homes and only leave for urgent and basic needs, adhering to mask, distance and hygiene rules. This restriction was applied as strictly as possible to protect especially elderly individuals over 65 years of age and individuals with chronic diseases. Social support units were established within local governments to meet the basic needs of people living alone (4).

Individuals with chronic diseases are one of the groups most affected by the isolation, quarantine, and restrictions due to COVID-19 (2). During the pandemic period, the use of classification systems in evaluating the health status of individuals with chronic diseases and planning appropriate interventions is necessary to maintain the provision of services more effectively and with higher quality. The OS is the oldest and most common classification system used to identify the problems associated with health status, to plan appropriate interventions and to evaluate outcomes (5, 6). OS is known to be used effectively in many fields such as community health in the "first place, home care, mother-baby health, school health, family health, occupational health and acute care services" (7). Since the beginning of the COVID-19 pandemic, care plans have been created for COVID-19 by the developers and users of the system and integrated into the OS, contributing significantly to the recognition of the problems of society and taking appropriate initiatives during the pandemic period (8,9).

Studies report that, during the pandemic period, due to isolation and restrictions, there are disruptions in individuals' chronic disease management and decreases in their physical activity levels; furthermore, their health, cardiovascular health in the first place, is adversely affected (10,11). World Health Organization (WHO) lists insufficient physical activity, which is responsible for 6% of deaths worldwide, as the fourth leading cause of death globally (12). Even short-term (1-4 weeks) inactivity has been associated with increased cardiovascular risk factors (13).

In order to protect the individuals from the negative effects of COVID-19, evaluating their current health status and taking initiatives for them to maintain a healthy lifestyle is an urgent need (14). The researchers encountered no studies investigating by means of OS the individuals with chronic health problems during the COVID-19 pandemic. In this context, this study was conducted to diagnose the health problems of individuals with chronic diseases during the COVID-19 restrictions, to determine through OS their physical activity levels and related factors.

The research questions are as follows: (a) What is the physical activity level of individuals with chronic diseases who are in home isolation during the COVID-19 pandemic? (b) What are their health problems according to the PCS? (c) Are there statistically significant relationships among health problems, socio-demographic factors, duration of isolation and physical activity levels?

MATERIALS AND METHODS

Research Design and Participants

Descriptive and correlational design was used. The research population consisted of individuals with chronic diseases and in home isolation, who were relatives of the students taking the public health nursing practice course at a foundation university in Istanbul, Türkiye, between May 1 and May 31, 2020 (n=220). The sample of the study consisted of 182 individuals who agreed to participate in the study voluntarily. The sample size was calculated using the full census sampling method (percentage of the population covered: 82%).

Data Collection Tools

Data collection tools consist of "Personal Information Form", "Omaha System Problem Classification Scheme (PCS)", and "International Physical Activity Questionnaire (IPAQ-Short Form)".

Personal Information Form: It consists of 7 questions regarding the participants' "age, sex, marital status, educational status, body mass index (BMI), chronic diseases and the number of days spent in home isolation".

Omaha System Problem Classification Scheme (PCS): PCS, which is one of the three basic components of the Omaha System, is a list that diagnoses health problems with four problem domains, 42 problems and 335 signs/symptoms. Environmental domain problems included in the list are *"Income, Sanitation, Residence, Neighborhood/Workplace Safety*; Psychosocial domain problems are *Communication with community resources, Social contact, Role change, Interpersonal relationship, Spirituality, Grief, Mental health, Sexuality, Caretaking/Parenting, Neglect, Abuse, Growth and development*; Physiological domain problems are *Hearing, Vision, Speech and language, Oral health, Cognition, Pain, Consciousness, Skin, Neuro-musculoskeletal Function, Respiration, Circulation, Digestion-hydration, Bowel function, Urinary function, Reproductive function, Pregnancy, Postpartum, Communicable/infectious condition* and Health-related Behavior domain problems are *Nutrition, Sleep and rest pattern, Physical activity, Personal care, Substance use, Family planning, Health care supervision, Medication regimen"* (15). The Turkish validity and reliability study of the scale was conducted in 2006. The median kappa values for the problems are 0.81 (16).

International Physical Activity Questionnaire (IPAQ-Short Form): This questionnaire was developed in 1996 to be used in adults between the ages of 18-65, aiming to measure the level of physical activity, make international comparisons, and obtain surveillance. The validity-reliability study of the IPAQ in Türkiye was conducted by Saglam et al. (2010). The Kappa coefficient of the Turkish version of the scale is 0.69. The form consists of 7 questions to obtain information about the "time spent sitting, walking, and during moderate and vigorous physical activity". The scale is scored by "multiplying the duration (minutes), frequency (days) and MET (Metabolic Equivalent of Task; walking=3.3 METs, moderate physical activity=4.0 METs, vigorous physical activity=8.0.METs) of the activities performed during the last week prior to its filling out. From this calculation, a physical activity score in the form of MET-minutes/week is obtained. The score obtained is evaluated in 3 categories as inactive, minimally active and active. Inactive is below 600 MET-min/week, minimally active between 600-3000 MET-min/week, active over 3000 MET-min/week" (17,18).

Data Collection

The data were collected by phone calls between May 1 and May 31, 2020, when a curfew was imposed on individuals over 65 years of age and with chronic diseases in Türkiye Students trained to use Omaha System collected the data under the supervision of the first and 2nd authors.

Ethical Consideration

Before the research, approval was obtained from the Istanbul Medipol University Ethics Committee Presidency (Number:10840098-772.02-E.43574, date: 03.09.2021). Written informed consent was received from the individuals participating in the study.

Data Analysis

The data obtained in the research were analyzed in the computer environment using the software SPSS version 22.0 for Windows (IBM Corporation, Armonk, NY). Descriptive statistics were used for demographic data. The number of isolation days and time spent sitting were compared with physical activity levels using independent t-tests and with health problems using chi-square analysis. While determining physical activity levels, 600 METs were used as the cut-point. Accordingly, below 600 METs was categorized as inactivity, 600 METs and above as moderate-vigorous physical activity (MVPA). In BMI analysis, 25 kg/m^2 was used as the cut-point. Below 25 was categorized as underweight or normal, and 25 and above was categorized as overweight or obese. Spearman correlation analysis was used to determine the relationship between variables. The significance level was accepted to be $p<0.05$.

RESULTS

This study was carried out with individuals having chronic diseases. Considering the distribution of the diseases, hypertension was the most common among all (47.3%, n=86), which was followed by diabetes mellitus (32.4%, n=59) and cardiovascular diseases (19.8%, n= 36). Of the individuals participating in the study, 57.7% (n=105) had inactivity and 42.4% (n=77) had MVPA. Other sociodemographic characteristics of the individuals are given in Table 1.

Figure 1 shows the health problems of the individuals with chronic diseases and in home isolation during the COVID-19 pandemic, as diagnosed according to the PCS. Accordingly, most common problems are nutrition 82.4% (n=150), physical activity 76.9% (n=140), oral health 52.7% (n=96), sleep and rest pattern 52.7% (n=96), respectively. The most common problem diagnosed in the "environmental domain" is residence (32.4%, n=59); in the "psychosocial domain", social contact (41.2%, n=75); in the "physiological domain", oral health (52.7%, n=96); and in the "health-related behaviors domain", nutrition (82.4%, n=150).

Table 1: Bivariate analysis of physical activity and demographic variables for Turkish adults (n=182)						
Variables	**N (%)/Mean±SD**	**Inactive N (%)/Mean±SD**	**Moderate to vigorous active N (%)/Mean±SD**	**t (df)**	**χ^2 (df)**	**p**
Age, years	47.37±11.04	48.12±10.14	46.34±12.16	1.035(180)		0.279
BMI, kg/m²	28.15±5.05				0.915(1)	0.339
Underweight and normal	50 (27.5)	26(24.8)	24(31.2)			
Overweigt and obese	132 (72.5)	79(75.2)	53(68.8)			
Gender					5.350 (1)	0.021*
Male	72 (39.6)	34 (32.4)	38 (49.4)			
Female	110 (60.4)	71 (67.6)	39 (50.6)			
Education					8.395(2)	0.015*
Primary school	82 (45.1)	54 (51.4)	39 (37.1)			
High school	67 (36.8)	39 (37.1)	28 (36.4)			
University	33 (18.1)	12 (11.4)	21 (27.3)			
Marital Status					1.325 (1)	0.25
Married	151 (83)	90 (85.7)	61(79.2)			
Single	31(17.0)	15 (14.3)	16 (20.8)			
Type of Chronic Diseases						
Hypertension	86(47.3)	48(45.7)	38(49.4)		0.236(1)	0.627
Cardiovascular diseases	36(19.8)	22(21.0)	14(18.2)		0.215(1)	0.643
Diabetes Mellitus	59(32.4)	35(33.3)	24(31.2)		0.095(1)	0.758
Pulmonary diseases	28(15.4)	13(12.4)	15(19.5)		1.720(1)	0.19
Others	20(10.9)	14(13.3)	6(7.8)		1.394(1)	0.238
Isolation Period, day	46.93±26.02	51.26±23.644	41.04±28.047	2,661(180)		0.009*
Time Spent Sitting, hour	6.82±3.25	7.35(3.345)	6.09(3.023)	2.651(171.971)		0.009*

Abbreviation: BMI, body mass index.
**p < .05.*

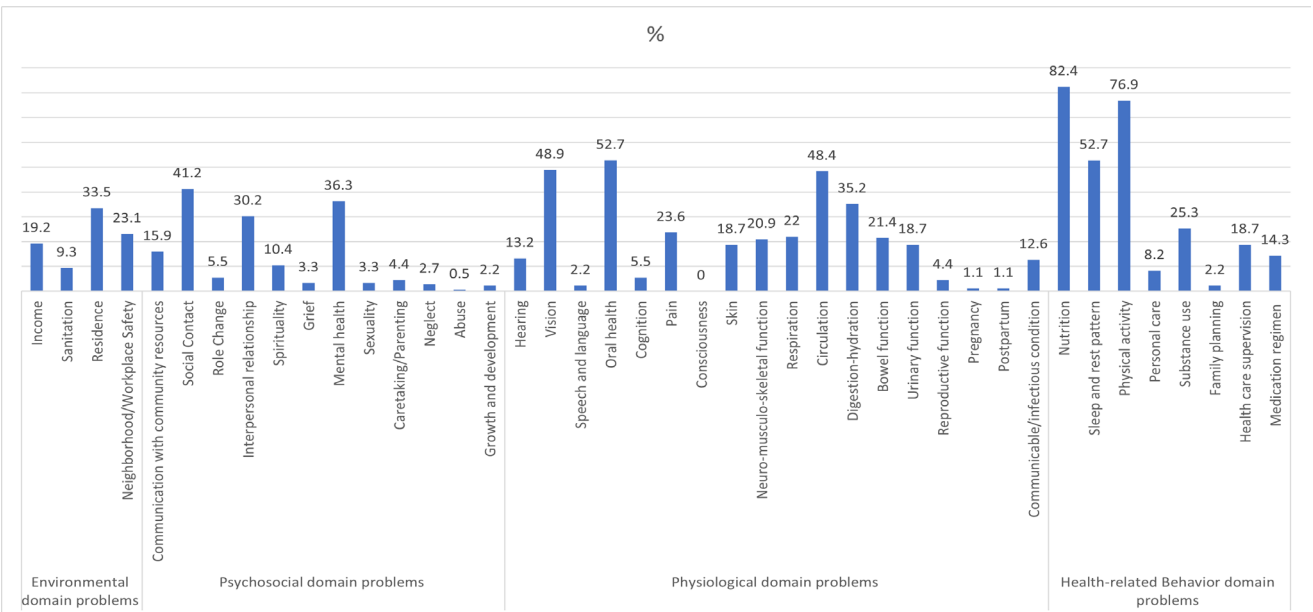

Figure 1. *The Domains and Problems of Adults With Chronic Diseases (n=182)*

When the physical activity levels of individuals were evaluated according to their sociodemographic characteristics, individuals with a higher number of isolation days were determined to have a higher inactivity rate than individuals with a lower number of isolation days (p<0.05). Women, primary and high school graduates, and individuals with sanitation problems, neighborhood/workplace safety problems and skin problems were found to have a higher inactivity rate than others (p<0.05).

The MVPA levels of males and university graduates were determined to be higher than those of other individuals in Table 2 (p<0.05).

As a result of the spearman correlation analysis, weak negative correlations were found between IPAQ and the number of isolation days (r=.202; p<.01), time spent sitting (r=.192; p<.01), Environmental domain problems in Table 3 (r=.151; p<.05).

Table 2: Bivariate analysis of physical activity and health problems for Turkish adults (n=182)

Variables	N (%)/ Mean±SD	Inactive N (%)/Mean±SD	Moderate to vigorous active N (%)/Mean±SD	t (df)	χ^2 (df)	p
Income problem	35 (19.2)	22 (21)	13(16.9)		0.474(1)	0.491
Sanitation problem	17 (9.3)	15(14.3)	<5 (<5)		7.167(1)	0.007*
Residence problem	59 (32.4)	36 (34.3)	25 (29.9)		0.395(1)	0.530
Neighborhood/ workplace safety problem	42(23.1)	30(28.6)	12(15.6)		4.221(1)	0.040*
Communication with community resources problem	29(15.9)	13(12.4)	16(20.8)		2.339(1)	0.126
Social contact problem	75(41.2)	49(46.7))	26(33.8)		3.052(1)	0.081
Interpersonal relationship problem	55(30.2)	34(32.4)	21(27.3)		0.550(1)	0.458
Spirituality problem	19(10.4)	12(11.4)	7(9.1)		0.260(1)	0.610
Mental health problem	66 (36.3)	40 (38.1)	26 (33.8)		0.360(1)	0.548
Hearing Problem	24(13.2)	12(11.4)	12(15.6)		0.670(1)	0.413
Vision Problem	89(48.9)	56(53.3)	33(42.9)		1.951(1)	0.161
Oral health Problem	96(52.7)	55(52.4)	41(53.2)		0.013(1)	0.908
Pain problem	43 (23.6)	23 (21.9)	20(26)		0.408(1)	0.523
Skin problem	34(18.7)	25 (23.8)	9(11.7)		4.296(1)	0.038*
Neuro-musculo-skeletal function problem	38(20.9)	20(19)	18(23.4)		0.504(1)	0.478
Respiratory problem	40(22)	21(20)	19(24.7)		0.566(1)	0.452
Circulatory problem	88(48.4)	47(44.8)	41(53.2)		1.281(1)	0.258
Digestion-hydration problem	64(35.2)	38(36.2)	26(33.8)		0.115(1)	0.735
Bowel function problem	39(21.4)	26(24.8)	13(16.9)		1.638(1)	0.201
Urinery function problem	34(18.7)	19(18.1)	15(19.5)		0.056(1)	0.813
Communicable/ infectious condition problem	23 (12.6)	15 (14.3)	8 (10.4)		0.611(1)	0.434
Nutrition problem	150(82.4)	90(85.7)	60(77.9)		1.861(1)	0.172
Sleep and rest patterns problem	96(52.7)	58(55.2)	38(49.4)		0.618(1)	0.432
Physical activity problem	140 (76.9)	92(87.6)	48(62.3)		15.995(1)	<0.001*
Personal care problem	15(8.2)	6(5.7)	9(11.7)		2.096(1)	0.148
Substance use problem	46(25.3)	29(27.6)	17(22.1)		0.722(1)	0.395
Health care supervision problem	34(18.7)	17(16.2)	17(22.1)		1.014(1)	0.314
Medication regimen problem	26(14.3)	12(11.4)	14(18.2)		1.655(1)	0.198

Note: Problems present in ten or fewer participants were not listed: Role change, Grief, Sexuality, Caretaking/parenting, Neglect, Abuse, Growth and development, Speech and language, Cognition, Consciousness, Reproductive function, Pregnancy, Postpartum, Family planning.
**p < .05.*

Table 3: Correlation Analysis of Variables (n=182)												
	Mean	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1.IPAQ, MET	1287.01	2035.12	1	.022	-.023	-.102	-.202**	-.192**	-.151*	-.094	-.104	-.128
2. Chronic diseases	1.26	.55		1	.159*	.152*	.092	.057	.006	.116	.113	-.031
3. Age, year	47.37	11.04			1	.250**	.029	-.027	-.105	-.056	.161*	-.121
4.BMI, kg/m2	28.15	5.05				1	-.003	-.021	-.113	-.119	.116	.086
5. Isolation period, day	46.93	44253,00					1	.087	.103	.122	.026	-.010
6. Time spent sitting, hour	6.82	3.25						1	-.059	.018	-.087	.018
7.Environmental domain problems	0.85	1.09							1	.273***	.273***	.346***
8.Psychosocial domain problems	1.56	1.64								1	.321***	.242**
9.Physiological domain problems	3.51	2.50									1	.254**
10.Health-related behavior domain problems	2.81	1.26										1

Abbreviation: IPAQ, International Physical Activity Questionnaire. MET, Metabolic Equivalent of Task. BMI, body mass index.
**p< .05. **p< .01. ***p < .001*

DISCUSSION

During the pandemic period, chronic disease management of individuals has been disrupted and their physical activity levels have decreased due to isolation and restrictions, which has adversely affected their health, particularly their cardiovascular health (10,11). In order to protect and maintain public health, it is important to evaluate individuals with chronic diseases in a holistic way. In the present study, the health problems of individuals with chronic diseases during COVID-19 restrictions were diagnosed through OS, and their physical activity levels and related factors were determined. In the study, the most common chronic diseases in individuals were hypertension, diabetes mellitus and cardiovascular diseases, respectively, and 72.5% of individuals were overweight or obese. WHO reports that obesity and chronic diseases are important risk factors for COVID-19 more than 2.8 million people die each year due to overweight and obesity (3). Hospitalizations and the need for ventilation are reported to likely increase in individuals with chronic diseases such as obesity, hypertension and diabetes (19,20). In a meta-analysis aiming to investigate the connections between obesity and mortality in COVID-19, overweight/obese individuals were determined to be at risk of severe comorbidities, need for advanced respiratory support and high mortality (21).

Several studies have reported that COVID-19 restrictions increase health problems and physical inactivity (14, 22).

The physical activity level of more than half of the participants in this study was found as inactive (17). The time spent sitting by the participants in a day was found to be approximately 7 hours. In a cross-sectional study by Rahman, et al. (22) the prevalence of physical inactivity was found to be lower (37%), and high sedentary behavior (>8h/day) was reported to be 20.9%. In another cross-sectional study by Martinez, et al. (14) 79.4% of 1613 Brazilian adults stated that the pandemic negatively affected their level of physical activity and their frequency of performing physical activity decreased. Whereas, many guidelines recommend that adults and the elderly be active in their daily lives and do at least 150 minutes of moderate physical activity per week (23, 24). Nevertheless, in addition to the concerns of individuals with chronic diseases for getting infected, restrictions and measures have made the recommended physical activity levels rather difficult to reach.

In the study, according to the PCS, the two most common problems in individuals with chronic health issues were determined as nutrition and physical activity, respectively. Similar to the present study, previous studies have also reported that social restrictions due to COVID-19 negatively affect nutrition and physical activity behaviors (25). In a study utilizing the OS before the COVID-19 pandemic, unlike the present study, the most common problems in adults with insufficient physical activity levels were reported to be in the physiological field, which was followed by the environmental and psychosocial fields, respectively

(26). In the present study, problems in the "physiological domain" and "health-related behaviors" domain stand out as the priority problem areas.

In this study, physical inactivity levels of women were found to be lower than those of men. Women have various roles such as a mother, wife and working woman, making it difficult for them to perform regular physical activity (27). In the study of Rahman, et al.(22) the levels of physical inactivity and sedentary behavior of women are stated to be higher than those of men. Based on this information, it can be said that COVID-19 restrictions also affect women's physical activity negatively.

In the present study, the physical activity level of the university graduates was determined to be higher than that of the groups with a lower education level. Rahman, et al.(22) stated that the low education level is one of the risk factors that increase physical inactivity. In a study that had a 10-year follow-up period and was conducted with Dutch adults, individuals with higher education levels were found to be more active than those with lower education levels (28). Piirtola et al. (29) found in their 35-year long-term study that education level has an independent role in developing long-term physical inactivity and that people with low education levels had a high level of physical inactivity. The study results suggest that special efforts are needed to promote physical activity among people with low education levels.

In the study, individuals with a higher number of isolation days or determined to have an "environmental domain" problem had lower IPAQ scores. In other words, their inactivity was determined to increase. "Environmental domain" problems are stated to be one of the important predictors of PA behavior (26). Unlike the present study, in a study conducted during COVID-19 lockdown, lower income, not being Caucasian, having high-risk medical conditions, higher BMI, negative experiences related to mental health, and symptoms related to increased physical health were all found to be significantly associated with low physical activity level (25). The associated variables are seen to vary according to the different models used in the studies.

CONCLUSIONS

This study shows that the most common health problems in individuals who have chronic diseases and are in home isolation are physical activity, nutrition, and sleep and rest pattern. More than half of the individuals participating in the study are inactive, and there is a linear relationship between the number of isolation days and inactivity.

It is recommended that individuals be encouraged to perform regular physical activity during home isolation due to COVID-19 and home-based physical activity programs be planned. In preventing adverse health outcomes due to physical inactivity, health professionals and public health institutions can implement programs, develop guidelines and policies to increase physical activity. The OS can be used as part of the COVID-19 guideline to diagnose community health problems, set appropriate goals and conduct appropriate initiatives during the COVID-19 pandemic. Additional research is needed to determine the present group's level of physical activity during the pandemic period and effective factors.

DECLARATIONS

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Conflict of Interest

No conflict of interest was declared by the authors.

Author Contribution

Concept: SK, AD; Design: SK, AD; Literature Review: AD, SB; Data Collection and Processing: SK, AD; Analysis or Interpretation: SK; Writing: SK, AD, SB; Critical Review: SK,AD.

Data Availability

Available upon request.

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