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RESEARCH ARTICLE

EVALUATION OF PHYSICAL ACTIVITY LEVELS, SLEEP QUALITY AND NUTRITIONAL HABITS OF PARAATHLETES DURING THE PANDEMIC PROCESS

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ABSTRACT

Purpose: Cancellation or postponement of sports events due to the COVID-19 pandemic has caused great stress for athletes. There are limited studies on how physical activity levels, nutritional habits, and sleep quality are affected, especially in physically disabled athletes(para-athletes) during the pandemic process. The aim of the research is to examine the physical activity, nutritional habits, and sleep quality levels of para-athletes during the pandemic process.
Material and Methods: Eighty-seven male para-athletes were included in the study. The personal data form required to determine the characteristics within the study subject International Physical Activity Questionnaire Short Form (IPAQ Short Form), the Pittsburg Sleep Quality Index Questionnaire were used in a way consistent with the study. In addition to these sections, changes in participants' nutritional habits were also questioned.
Results: The total MET values of para-athletes were determined as 3233 ± 1421. The sleep quality index total score averages of the participants were 5.83 ± 0.80 points, indicating the level of "poor sleep quality". Food consumption of the participants It was found that 56% of them increased their food consumption, 28% did not change, and 18% decreased.
Conclusion: The results of the study showed that physical activity, nutrition, and sleep processes, which have an important place in the life cycle of para-athletes, were adversely affected during the pandemic process.

Keywords: pandemic, para-athletes, physical activity level, sleep quality, food consumption

INTRODUCTION

Physical activity is essential for maintaining and improving overall health (1). On the other hand, physical inactivity leads to the emergence of metabolic disorders, psychological problems, or increases the negative effects of it (2). It is known that sedentary behavior is an important factor in the emergence of obesity, diabetes, and cardiovascular diseases (3). Physically disabled people, who make up approximately 15% of the global population, have some limitations regarding participation in physical activity. The fact that there are different levels of deficiencies in basic features such as strength, endurance, and flexibility, which are needed at the time of activity, depending on the level of disability, can have negative effects on their fitness and general

health status (4). Regular physical activity participation in disabled individuals is critical for preventing secondary health problems and increasing functionality (5). For this reason, some projects are carried out on a global and country-basis in order to increase the participation of disabled individuals in physical activity and competitive sports from an early age. In particular, organizations such as the Paralympic games and World Champions appear as an encouraging factor for disabled individuals to participate in sports since childhood.

Humanity is fighting globally against a deadly virus (COVID-19) that is a very serious public health problem, first detected in Wuhan (China) at the end of December 2019. In this process, the World Health Organization declared a "global pandemic" on March 11, 2020 due to the fatal damage and rapid spread of the virus (6). Then, countries tried to take measures to prevent the spread of the pandemic by introducing many restrictions, social isolation, and home quarantine practices due to the new type of coronavirus. The first diagnosis in Turkey was made on March 11, 2020, and the first death occurred on March 15. As of March 16, primary, high school and university education have been turned into a distance education model with the following restrictions (7). Subsequently, restrictions were imposed on all national-level sports organizations that adversely affected athletes, and training areas such as fitness centers and gyms were closed. The results of the research related to the pandemic process underline the negative effects on many parameters related to the quality of life, economic level, and general health level of societies (8,9). Although the inability to meet the physical activity and exercise needs with outdoor activities seems to lead to the use of some practical solutions (home exercise models), these solutions have been reported to increase the tendency to sedentary behavior in groups that do not have the habit of exercising regularly (10). The barriers that occur, especially in physically disabled individuals, in reaching their own social environment and the increase in some limitations in reaching health institutions, are reflected in the results of the research, which reveals a higher risk of depression compared to the general population and a high sense of loneliness (11,12). This information can be considered as an indication that normal and disabled individuals are highly adversely affected by the pandemic.

The cancellation or postponement of sports events due to the COVID-19 pandemic has caused great stress for athletes (13). The restrictions applied during the process and the closure of sports fields caused a decrease in the training numbers of the athletes and negatively affected their physical activity levels (14). In addition, there are research results showing that depression, eating disorders, and anxiety levels in athletes are negatively affected for reasons such as the increase in death cases and the fact that they constitute a large part of the written and visual news about the pandemic (9).

Another important issue is the negativities experienced by the athlete while managing factors such as training level, sleep pattern, and nutrition during the pandemic process. Changes in the type and content of constraints have created new problems in adapting to situations such as increasing uncertainties. In particular, the results of research on sleep quality show that complaints such as insomnia, sleep loss, and poor sleep quality increase in the general population (15). Unsurprisingly, these complaints are more common in depressed people, while those with a strong social network and a sense of belonging have fewer symptoms (15). It is known that people with disabilities have a higher risk of depression, a lower level of life satisfaction (16), and a higher sense of loneliness compared to normal individuals (11). Some research results also emphasize that individuals with physical disabilities are forgotten, especially during the pandemic process (12) and that few studies have been conducted (17). There are limited studies on how physical activity levels, nutritional habits, and sleep quality are affected, especially in physically disabled athletes(para-athletes) during the pandemic process. For this reason, the aim of the research is to examine the physical activity, nutritional habits, and sleep quality levels of para-athletes during the pandemic process.

MATERIAL AND METHODS

Participants

Eighty-seven healthy, competitive male para-athletes with at least three years of sports history and no injury history in the last year were included in the study. (41 soccer players, 17 swimmers, and 29 track and field athletes). Data was collected in 2021 from 4 to 26 October via a web-based online survey (https://forms.gle/o6Cz8vmiPykQF77). During the data collection process, the curfew restriction and

distance education processes continued in the country. This study was approved by the ethics committee of Dokuz Eylül University (2021/05-29, Date: 15.02.2021) and the Ministry of Health.

Data Collection

The International Physical Activity Questionnaire Short Form (IPAQ Short Form) and the Pittsburg Sleep Quality Index Questionnaire, which were used to determine the characteristics of the study subject, were used in accordance with the study. In addition to these sections, changes in participants' nutritional habits were also questioned. The names and surnames of the volunteers who participated in the study were not taken.

Short Form International Physical Activity Questionnaire (IPAQ SF)

The International Physical Activity Questionnaire (IPAQ) was created by Craig et al. to examine the physical activity levels of populations in the age range between 15 and 65. In addition, the questionnaire is a measurement method with a high level of validity and reliability (18). The evaluation of all activities: the criterion is that each activity is done at least 10 minutes at a time. By multiplying the min., days, and MET values, a score is obtained as "MET min./week. Physical activity levels were classified as low physically active (600 MET min/week), moderate physically active (600-3000 MET min/week), and very active (> 3000 MET min/week) (19). Saglam's validity and reliability study in the Turkish version was conducted by Saglam (31).

Pittsburg Sleep Quality Index (PSQI)

The PSQI questionnaire developed by Buysse et al. evaluates sleep quality, quantity, and sleep disturbance (29). The questionnaire, which evaluated the last one month period, consists of nineteen questions in total under the titles of sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disorder, use of sleep medication and deterioration in daytime work. All questions are scored between 0-3 points. A very good quality sleep is defined when the athletes experiences all of the five characteristics mentioned: (a) Sleeping more time while in bed (at least 85% of the total time in bed), (b) Falling asleep in 30 min or less, (c) Sleeping for more 7 h or more, (d) Falling back asleep within 20 min after getting up, and (e) Waking up—for five minutes or longer—no more than once a night. Subjects were asked to rate the quality of their sleep based on the above five points as 'very good', 'fairly good', 'fairly bad' and 'very bad' (30). The validity and reliability of turkish version PSQI was conducted by Ağargün et al. (22).

Table 1. Content of IPAQ short form.

IPAQ short form (short last 7 days self-administered format) CONTENT AND QUESTIONS	
1.	During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?
2.	How much time did you usually spend doing vigorous physical activities on one of those days?
3.	During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.
4.	How much time did you usually spend doing moderate physical activities on one of those days?
5.	During the last 7 days, on how many days did you walk for at least 10 minutes at a time?
6.	How much time did you usually spend walking on one of those days?
7.	During the last 7 days, how much time did you spend sitting on a week day?

Food Consumption Assesment

It is aimed at evaluating the amount of food consumption before and during the pandemic quarantine semi-quantitatively. Participants answered questions about their food consumption behaviors since the implementation of lockdown in quarantina compared to the time before on a 3-level scale ("1-increased," "2-unchanged," "3-decreased").

Statistical Analysis

Microsoft Excel has been used to compile, code, and sanitize the collected data. The IBM SPSS 25.0 application has been used to conduct the analysis using descriptive, correlational, and inferential statistics. Mean and standard deviation are the variables defined by measurement, while percentages are used to describe variables that are represented by count. The Shapiro-Wilk test was performed to determine if the data on physical activity, food consumption, and sleep quality were normal (p=0.05). Spearman's correlation analysis

was used to assess the relationship between the MET score, PSQI score and food consumption values.

RESULTS

Physical Activity Levels

The physical activity levels of the participants have an increasing standard deviation trend with the increase in the intensity of physical activity(table 2). Especially in moderate and vigorous physical activities, standard deviation values show a wide distribution. Total MET values were determined as 3233 ± 1421 MET. Thirty-eight participants had moderate levels of physical activity(2162,4 ±390,7 MET). Forty-nine participants had a high level of physical activity (4318.3 ± 1428.3).

Table 2. Physical activity level values of participants.

ENERGY EXPENDİTURE PARAMETERS (MET)	MEAN ± SD
Sitting	865,4 ±281,8
Low intensity PA	557,1 ±522,2
Moderate intensity PA	290,6 ±2144
High intensity PA	1802 ±3146
Total MET	3233 ±1421

PA: Physical Activity,MET: Metabolic Equivalent

Sleep Quality Index

The sleep quality index total score averages of the participants were 5.83 ± 0.80 points, indicating the level of 'poor sleep quality'. Although the sleep-related drug use levels of the participants were '0', the perceived sleep quality values were found to be low and the difficulties in falling asleep were found to be inefficient. In addition, the total sleep time parameters have normal values.

Nutritional Behavior

Food consumption behaviors of the participants before and during the pandemic; It was found that 56% of them increased their food consumption, 28% did not change, and 18% decreased.

Results of Correlation Analysis

For correlation analysis, total MET values were classified as low physical activity level (0–600 total MET), adequate physical activity level (601-3000 MET), and high physical activity level (3001 and higher MET values). There was no correlation between physical activity level, food consumption, sleep latency, and subjective sleep quality (r = 0.036, 0.161, 0.053, p = 0.850, 0.394, and 0.781 respectively), but there was a significantly positive correlation between subjective sleep quality and sleep latency (r = 0.705, p<.001).

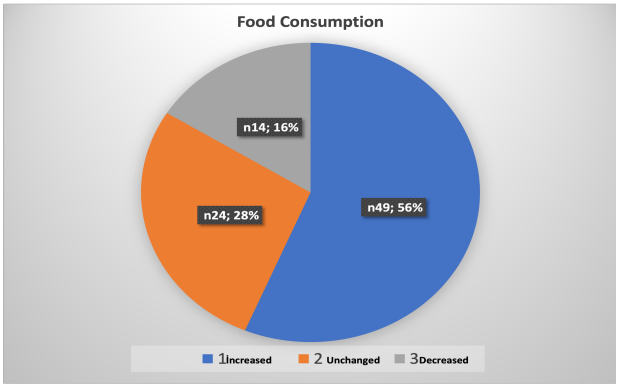

Figure 1. Comparison of food consumption levels before and during the pandemic.

Table 3. Sleep variables of participants.

Component	Mean	Standart Deviation
Subjective Sleep Quality	1,58	1,2
Sleep Latency	1,64	1,35
Sleep Duration	0,38	0,71
Habitual Sleep Efficiency	0,96	1,07
Sleep Disturbances	0,67	0,64
Use Of Sleep Medication	0	0
Daytime Dysfunction	0,60	0,68
Total Score	5,83	0,80

In scoring, seven component scores are derived, each scored 0 (no difficulty) to 3 (severe difficulty). The component scores are summed to produce a global score (range 0 to 21). Higher scores indicate worse sleep quality.

DISCUSSION

The aim of this study is to evaluate the physical activity, sleep quality levels, and nutritional habits of para-athletes during the pandemic process. To our knowledge, few studies have focused on this topic.

In the results of the study, it was seen that the physical activity levels of 42% of the para-athletes were "moderate" and showed a wide distribution between moderate and high-intensity activity levels. When the literature is examined, a similar study

Table 4. Correlation analysis results of physical activity levels, PSQI, and food consumption values.
Spearman's Correlations

Variable		Total MET	Food Consumption	Sleep Latency	Subjective Sleeep Quality
1. Total MET	Spearman's rho	—			
	p-value	—			
2. Food Consumption	Spearman's rho	-0.036	—		
	p-value	0.850	—		
3. Sleep Latency	Spearman's rho	-0.161	-0.069	—	
	p-value	0.394	0.717	—	
4. Subjective Sleep Quality	Spearman's rho	0.053	-0.056	0.705	—
	p-value	0.781	0.770	< 0.001*	—

*p≤0.001, MET: Metabolic equivalents

shows that there is a significant decrease in the weekly training times of the athletes preparing for the Tokyo Olympics (-9.4 hours/week) (23). In another study, it was reported that approximately 70% of German Olympic para-athletes were negatively affected by decreasing their activity levels (24). Our research findings are similar to the literature. Our findings suggest that there are differences in the "individual training behavior" of the participants and that they may have moved away from the physical effort required for high performance.

In the results of the research, the total sleep scores of para-athletes show that their sleep quality was adversely affected during the pandemic process. When the results of the research were examined, it was reported that the sleep quality of normal individuals deteriorated during the pandemic process (25,26). In another study, it was reported that the sleep quality of disabled individuals was negatively affected in a similar way to the results in normal individuals (27). Our findings suggest that this deterioration, which is observed especially despite the use of sleep medications, may be a negative reflection of the changes in the daily lives of para-athletes during the pandemic process, and its psychological reflections require investigation.

In our findings regarding food consumption, when the food consumption of the participants before and during the pandemic is compared, it is observed that 56% increase, 18% decrease, and only 28% can keep their food consumption constant. In a study conducted with 2951 Turkish adult participants during the pandemic process, it was observed that 51% of the participants had increased body weight due to emotional and uncontrolled overeating during the pandemic process (28). Another study conducted on young Egyptian participants draws attention to the increase in food consumption associated with anxiety and depression (8). Our findings support the change in food consumption behavior similar to the literature results. It is thought that investigating the psychological reasons underlying these changes may be important in terms of protecting the general health of para-athletes.

Limitations

The limitations of this study are that the para-athletes participating in the study were not differentiated according to the type and level of disability, and the validity and reliability of the questionnaire related to nutritional behavior was not studied.

CONCLUSION

The results of the study showed that physical activity, nutrition and sleep processes, which have an important place in the life cycle of para-athletes, were adversely affected during the pandemic process, and the dimensions of these effects were individually different.It is thought that the psychological dimensions of these reflections should be examined in future studies.

Practical Applications

It has been observed that disabled people should be remembered or ignored in pandemic decisions made throughout the country; special supports should be provided to meet their physical activity needs, and training studies are required to increase the level of knowledge about nutrition.

It is necessary to increase the awareness of coaches and sports managers about their needs during the pandemic process, especially in the restriction processes of para-athletes, and that professional support should be provided to monitor their psychological state, train them about the process and meet their training needs.

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