

Physical activity, night eating, and mood state profiles of athletes during the COVID-19 pandemic

Mine Turgut¹, Yusuf Soylu², Serkan Necati Metin³

¹ Faculty of Sport Science, Bartin University, Bartin, Turkey

² School of Physical Education and Sports, Siirt University, Siirt, Turkey

³ General Directorate of Security/ Istanbul Police Department, Istanbul, Turkey

Abstract. *Study Objectives:* The aim of this study was to examine the effect of COVID-19 Pandemic physical activity, night eating, and mood in athletes. *Methods:* 278 (men: 167 and women: 111) athletes from different branches participated the research voluntarily. In the research, personal information form and IPAQ-SF to measure the level of physical activity, the Night Eating Scale (NE) to measure the night eating level, and the Brunel Mood Scale for the mood were used. In the analysis of the data, arithmetic mean, standard deviation, correlation, and regression analysis were used. *Results:* According to the research findings, a negative significant and high correlation was found between IPAQ high intensity and IPAQ total energy expenditure and fatigue mood. There was a positive and high relation between night eating and mood swings of fatigue, depression, and angry. It was determined that eating at night did not predict physical activity, and eating at night predicted vigorous mood by 21%. *Conclusion:* According to the results of the study, it was observed that during the COVID-19 pandemic, athletes could remain physically active, but because of the negative effects of staying home in daily life, it had negative effects on night-time eating behaviour and mood.

Keywords: Athlete, COVID-19, Night Eating, Mood, Physical Activity

Introduction

In late 2019, COVID-19 was identified as a low respiratory tract infection with an unknown cause in China, and later severe acute respiratory syndrome (1). Although the new type of coronavirus epidemic has affected the whole world, both health, entertainment and have seriously affected many sports organizations such as a world cultural heritage the Olympics.

As with all viral diseases, the only way to prevent COVID-19 pathogen is to have a strong immune system, and the strong immune system is directly related to physical activity and nutritional status (2,3). According to Lippi et al. (4), the decrease in the level of physical activity can affect people psychologically negatively and as a result, anger, sadness, incitement,

and disappointment are felt intensely. It is thought that with the COVID-19 process, the quarantine conditions of athletes may have physical and psychological effects and this will have different effects on athlete performance. Many researchers (4,5) have indicated that epidemics that have a deadly effect will cause people in the quarantine process to manifest psychological symptoms such as depression, confusion, stress, and eating disorders. While the pandemic was going on, the uncertainties caused serious confusion about the athletes' exercise status, their restarting the sports activities, and, most importantly, how infected athletes can manage the process (6). Sarto et al. (7) state that because the COVID-19 pandemic process leaves athletes facing a situation like home confinement, the worsening in their physical fitness

parameters are seen as a result of inadequate and/or unsuitable training types. One of the many different factors affecting high-level performance is the changes in daily planning for athletes. Andreato et al. (8) state that the changes in the daily plans of elite-level athletes with the effect of house confinement, the decline in athletes' performance, daily negative news, financial problems, and the tension and stress due to the differences in social life, and most importantly, the uncertainty about the return to sport may adversely affect the mental health of athletes. As a result, this physical, psychological, and mental chaos caused by ambiguities can negatively affect the motivation of the athletes for their targeted success. The aim of this study is to examine the relationship between the physical activity level, night eating syndrome, and mood of athletes from different branches during the COVID-19 pandemic.

Materials and Method

Participants

Data were collected 278 athletes from different sports branches (167 male and 111 females; team athletes: 120, individual athletes: 158; age: 21.43 ± 5.74 years; BMI: 22.52 ± 3.32 kg; sport experience: 8.35 ± 8.63 years).

Data Collection

The personal data form required to determine the characteristics within the study subject was created by the researcher, and the International Physical Activity Questionnaire Short Form (IPAQ Short Form), the International Physical Activity Assessment Questionnaire (IPAQ), the Night Eating Questionnaire, and the Brunel Mood Scale were used in a way consistent with the study.

International Physical Activity Questionnaire Short Form (IPAQ SF)

The International Physical Activity Questionnaire (IPAQ) was developed by Craig et al. (9) to determine

the physical activity levels of participants in the age range between 15 and 65. IPAQ's validity and reliability study in Turkey was conducted by Ozturk (10). In the evaluation of all activities, the criterion is that each activity is done at least 10 minutes at a time. By multiplying the minutes, days, and MET values, a score is obtained as "MET minutes/week". Physical activity levels were classified as non-physically active (<600 MET – min/week), low physical activity level (600–3000 METdk/week), and adequate physical activity level (beneficial in health) (>3000 METdk/week) (9).

Night Eating Questionnaire (NE)

It is a self-notification questionnaire that measures the frequency and presence of night eating behaviour, consisting of 14 questions, developed by Allison et al. (11). The survey includes questions about morning appetite and first food intake of the day, evening and night eating, food intake rate after 3 dinners, cravings, control over eating behaviour at night, difficulty falling asleep, frequency of waking up and eating at night, awareness and the affective status during night meals. The total score can be between 0 and 52. In the actual study, the recommended GYS cut-off score is 25 in researches for screening purposes (11). Turkish validity and reliability study were conducted by Atasoy et al. (12).

Brunel Mood Scale

The Brunel Mood Scale developed by Terry et al. (13,14) to determine the mood states of athletes before and after narrow-field games, has been changed from "Affective Profile-Adolescents" to the Brunel Mood Scale. The Brunel mood scale is composed of 24 mood states and 6 sub-dimensions in its original form and is scaled as (0) not at all and (5) highly. Its Turkish adaptation was made by Cakiroglu in (15). After the Turkish adaptation of the scale, the number of items decreased to 19 and consisted of 4 sub-dimensions as anger, depression, fatigue, and vigour. The Cronbach alpha coefficients of the sub-dimensions are determined as .75 for anger, .85 for depression, .81 for fatigue, and .78 for vigour.

Statistical Analysis

SPSS 20 statistics program was used in analysing the data. Whether or not the variables had normal distribution or not was analysed with Kolmogorov-Smirnov and Shapiro Wilk tests the variables had normal distribution ($p>0,05$). A pearson correlation analysis and linear regression analysis were used to determine the relationship between variables. Significance was set at $p<0.05$ and $p<0.01$ respectively.

Results

In this part of the study, statistical information about the differences between the physical activity, night eating and mood states according to the variables of gender and correlation and regression scores between them will be included.

When moderate intensity, high intensity and the physical activity total scores of female and male athletes

in team and individual sports are examined in Table 1, it appears that physical activity level of male athletes in team sports is 780.54 kcal/week at moderate intensity, 1416.76 kcal/week at high intensity, and physical activity total is 2522.56 kcal/week, of female athletes, on the other hand, 798.68 kcal/week at moderate intensity, 1802.11 kcal/week at high intensity, and the physical activity total is 2723.61 kcal/week it appears to be a week. In individual sports, it is determined that physical activity level of male athletes is 690.43 kcal/week at moderate intensity, 1382.88 kcal/week at high intensity, and their total physical activity score is 2305.31 kcal/week, while in female athletes 740.00 kcal/week at moderate intensity, 1490.62 kcal/week at high intensity, and their physical activity total is 2430.19 kcal/week.

There is significant negative correlation between fatigue and IPAQ_{high intensity} ($r=-,463$, $p<.05$), and IPAQ_{total} ($r=-,545$, $p<.05$) energy expenditure measured by IPAQ. NE was significant positive correlation with fatigue ($r=,458$, $p<.05$), depression ($r=,606$, $p<.01$) and angry ($r=,697$, $p<.01$).

Table 1. COVID-19 Pandemic during Physical Activity Levels of Athletes

	IPAQ Scores			
	Team Athletes		Individual Athletes	
	Men	Women	Men	Women
IPAQ _{moderate(kcal/week)}	780.54	798.68	690.43	740.00
IPAQ _{intense(kcal/week)}	1416.76	1802.11	1382.88	1490.62
IPAQ _{total(kcal/week)}	2522.56	2723.61	2305.31	2430.19

Table 2. IPAQ, NE, and Mood for Men Athletes (Pearson Correlation Coefficient)

	1	2	3	4	5	6	7	8
(1) IPAQ _{moderate intensity}	1	.478*	.639**	.120	-.027	.040	.005	-.356
(2) IPAQ _{high intensity}		1	.921**	.032	-.463*	-.807	-.182	-.177
(3) IPAQ _{total}			1	-.126	-.545*	-.211	-.265	-.096
(4) NE				1	.458*	.606**	.697**	-.425
(5) Fatigue					1	.534*	.599**	-.545*
(6) Depression						1	.715**	-.230
(7) Angry							1	-.269
(8) Vigour								1

* $p<0.05$; ** $p<0.01$

As a result of linear regression analysis, it is observed that the physical activity scale shows that there is no significant interaction with the night eating state ($\beta = .025$, $p > .05$, $R^2 = -.007$) and that the vigorous mood predicts the night eating state at a significant level ($\beta = -.113$, $p > .05$, $R^2 = -.205$) and explains 21% of the total variance in the night eating level.

Discussion

As a result of the impact of the COVID-19 process, athletes are faced with a situation where they were confined to the home, which is a different place from their daily training ground. It is stated that home confinement for athletes will have a negative effect on psychophysiological conditions and psychological well-being, combined with the effect of differentiation of the person's daily circadian rhythm and physiological responses (5,6).

It is stated that positive (17,18) and negative (19,20) moods in the face of the events that people have experienced will affect their recovery processes with the differentiation of their physiological and psychological responses (21). It is stated that the negative mood experienced in psychological processes such as depression, anxiety, stress, and tension decrease with the positive effect of physical activity/exercise (22-25). During the COVID-19 process, the relationship between athletes' physical activity and mood states was examined. It is found that there is a negative significant and high correlation between the physical activity at a high intensity and the amount of physical activity total energy expenditure and the athletes' fatigue

mood. Accordingly, the level of fatigue increases as the level of physical activity increases. It is stated that fatigue occurs in any state of exercise, stress, or rest, and many factors such as age, sex, mental and psychological processes, physical and physiological effects, and health are effective on fatigue (26-29). In the researches, fatigue is defined as a state of inability to perform a given task as soon as possible at maximum performance (30,31). In the studies examining the effect of fatigue on athlete performance (30,32), training load is evaluated as an important result of performance responses in athlete performance, recovery, and training periodization. The fact that the exercise of high intensity performed by athletes creates fatigue shows a result in line with the literature in general.

As another finding of this study, it is found that there is a positively significant and high relationship between night eating and fatigue, depression, and anger when the relationship between night eating and mood is examined. As another result of the study, it is determined that there is no significant relationship between physical activity and eating at night. In the examination of the literature, it was found that eating at night had an effect on a depressed mood, stress, and anxiety (33-35). The similarity of studies in the literature and the results of this study shows that the behavior of eating at night affects the psychologically negative mood. Home confinement has a negative effect on changing daily activity patterns, such as night sleep, and on impaired eating behaviours, as well as on parameters that affect physical fitness, such as body fat index (36-38). In the course of the COVID-19 pandemic, it is possible that the fact that these conditions occur more likely will negatively affect health, not only mentally, but also

Table 3. Linear Regression Analysis on the Predictor of Night Eating

		R ²	ΔR ²	β	t	F
Model 1	IPAQ _{total}	.007	-.004	.025	-.428	.654
Model 2	Fatigue	.225	.205	.040	1.019	11.227*
	Depression			.093	1.778	
	Angry			.027	.730	
	Vigour			-.113*	2.025	

* $p < .05$

physically. However, during the COVID-19 pandemic, another important effect of home confinement is that athletes did not apply the training methods necessary to improve physical or technical performance specific to their branches. However, it is seen that they are able to maintain their overall physical capacity by using various training methods that can be applied at home to improve their physical performance. Because of this, fatigue arises due to the effect of highly intensified training, but this does not affect the behavior of eating at night in athletes. In parallel with our findings, in other studies in the literature (16,39,40), home confinement in the COVID-19 process negatively affects people's psychological processes. As a result, an important factor affecting night eating behavior can be said that athletes are not used to a routine home life due to long-term house confinement, and stressful and uncertain situations lead tonight eating behavior due to people's inability to make sense of the situation they are in (41) and the complexity of the mood. IPAQ-SF is used in this study to measure the level of physical activity. When the literature is examined, (4,42) it is believed that the results of studies with different objective measurement tools will also contribute to the literature differently.

Conclusion

Athletes have been in different moods, positive, and negative, many times before, during and after the competition. They have also experienced the positive and negative impact of these moods, directly or indirectly, on the performance. But in a process, unexpected effects of which arise at an unexpected moment, like the COVID 19 pandemic process, the home confinement of people with high-level performance has created a negative state of emotion, even if they are physically active. Accordingly, it can be said that it is important that the scenarios are included in the programs of both federations, coaches, and other assistants to ensure that athletes are able to maintain their performance and be ready, both mentally and physically, in emergency situations such as a pandemic, epidemic, and natural disaster that occurs unexpectedly in the next periods.

Conflicts of Interest

The authors declare that there is no conflict of interest in this manuscript.

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Correspondence:

Yusuf Soylu

School of Physical Education and Sports, Siirt University, Siirt, Turkey

E-mail: soylusyusuf@gmail.com