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Original article

Relationship between biological rhythm and somatization levels of individuals who play sports or do not

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SUMMARY

Objective

The aim of this study is to compare and examine the biological rhythm and somatization levels of individuals who do and do not do sports, according to some variables.

Methods

The data used in this study were obtained by questionnaire. Personal Information Form, Biological Rhythm Interview of Assessment in Neuropsychiatry (BRIAN), and Somatization Scale were used as data collection tools in the study.

Results

As a result of the research, it was seen that there was a negative and significant relationship between Biological Rhythm Levels and Somatization Levels ($r = -2.231$, $p < 0.01$) of individuals who do and do not do sports. In addition, it was observed that Somatization and Biological Rhythm levels did not show a significant difference in gender variable dimension. There is no significant difference in the somatization dimension of the status of doing sports, there is a significant difference in the $p < 0.05$ level of doing sports in the Biological Rhythm dimension, there is no significant difference between the biological rhythm and somatization and the occupational status variable, and there is no significant difference between the age ranges and somatization. It was concluded that there was a significant difference at $p < 0.05$ level between Biological Rhythm and age ranges.

Conclusions

It has been stated that age-related changes are affected by biological (hormone level, body temperature, pulse, blood pressure, etc.) as well as environmental conditions.

Key words: sport, somatization, biological rhythm

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Introduction

In the 21st century, in parallel with technological and scientific developments, the problems affecting human health and thus athlete performance also show a rapid change. Social environment, diet, intense human relations in virtual and real life, environmental factors due to urbanization, economic and cultural turmoil, changes in moral and spiritual values, psychological and physical problems bring with them more intensely than in the past. The biological clock, which regulates the activities in our body, records hourly, twenty-four-hour, thirty-day or seasonal rhythms in organs and their functions. In this intense lifestyle, the timing of daily life of individuals leads to sleep and eating disorders, and therefore to psychological problems. Experiencing uneasiness and distress, coping strategies with social, life burdens and disappointments of individuals appear in the form of physical psychosomatic reactions. As in all sports branches, it is known that besides physical development, psychological state and mental fa-

ctors affect performance [1]. Environmental factors that trigger stress such as changes in technology, scientific developments, population growth and economic problems also increase people's anxiety levels. This situation may show behavioral symptoms along with personal differences [2].

In such disorders, also called "somatoform disorder", no physical results have been found to explain the discomfort within the scope of neurological and physiological studies. It has been observed in studies that children and young people show similar symptoms of discomfort. Studies on the biological history of somatization are limited [3]. Somatization (somatization) is defined as experiencing and transferring psychological discomfort in the form of somatic symptoms [4]. In another name, somatization is the behavior of somatic complaints that cannot be explained by medical findings and seeking medical help with these symptoms. In somatization, psychosocial or emotional problems are tried to be explained with somatic symptoms. Along with these symptoms, medical help is sought by establishing a physical illness relationship. Somatization has received many definitions as a still mysterious problem in psychiatry and general medicine. The common point in these nomenclatures was the presence of somatic symptoms that could not be adequately explained by organic findings [5].

In this context, the relationship between biological rhythm and somatization was examined in our study. Like all existence, the bodily activities of living things work within a certain system. The system can be daily, monthly or annual with periodic effects. Daily periods of 24 hours are defined as "Biological Hours". Many biological variables such as body temperature, heart rhythm, blood pressure, and hormone levels show periodicity in a 24-hour period [6]. This year's winners of the 2017 Nobel Prize in Medicine have proven how this clock works in the "Biological Clock" studies by US scientists Hall, Rosbash and Young [7]. A person living under normal conditions usually wakes up at the same time without any external influence. The body keeps it in balance by constantly adjusting it. In addition, the biological clock regulates the hormonal balance of living things and makes adjustments regarding oscillations.

The biological clock regulates all these metabolic interactions. In humans, many events with bodily biology, physiology, endocrine system, actions, and psychological effects occur in accordance with a standard rhythm. Sleeping and being awake, body temperature, endocrinal levels, changes in mood and cognitive processes occur in a twenty-four-hour system called the circadian rhythm [8]. The biological clock, which carries out chemical activity in our body, records hourly, twenty-four hour, thirty-day or seasonal rhythms for organs and their functions [9]. It is thought that these cyclical changes that occur during the day in physiological functions may also affect sports performance, which is a physiological process. Taking this into account, sports scientists investigated the effect of rhythm on sports performance and concluded that many parameters related to sports performance vary during the day [9-13].

The interaction of these psychological and biological factors, which form the basis of the present study, with sports was examined, and the daily life patterns, social adaptation, physical and psychological differences, biological rhythm and somatization levels of individuals who do and do not do sports were examined. As a result, it is predicted that individuals will be able to lead a higher quality psychophysical life with the contribution of sports to biological rhythm optimization and somatization absorption on individuals.

Methods

In this study, the biological rhythm and somatization levels of individuals who do and do not do sports were examined. In the descriptive study; In a universe consisting of many elements, a scanning arrangement was made on the whole universe or a group to be taken from it in order to make a general judgment about the universe [14].

Participants

The personal information distribution of the athletes participating in the research is given in the table above. 49.6% (n = 119) of the individuals participating in the research were male and 50.4% (n = 121) were female. 83.8% (n = 201) of the individuals are 18-25 years old,

TABLE I. *Demographic characteristics of the study group.*

Gender		f	%
	Male	119	49,6
	Female	121	50,4
	Total	240	100
Age	**18-25 age**	201	83.8
	26-34 age	28	11.7
	35 and above	11	4.6
	Toplam	240	100
Working status	**Working**	54	22.5
	Not working	36	15.0
	Student	150	62.5
	Total	240	100
State of doing sports	**Yes**	139	51.5
	No	101	48.5
	Total	240	100

TABLE II. *Correlation results between biological rhythm and somatization levels of ındividuals who played and didn't do sports.*

	Biological rhythm	Somatization
Biological rhythm	1	-2.231**
Somatization	-2.231**	1

r = -2.231, p < 0.01

11.7% (n = 28) are 26-34 years old, 4.6% (n = 11) are 35 years old and over. 22.5% of individuals are working, 15% are not working and 62.5% are students. Again, 51.5% of individuals do sports, while 48.5% do not do any sports.

Procedures

The data used in this study were obtained by questionnaire. Personal Information Form, Biological Rhythm Interview of Assessment in Neuropsychiatry (BRIAN), and Somatization Scale were used as data collection tools in the study. The Turkish adaptation was made by Aydemir et al. [16]. The validity and reliability study of the Somatizaston Scale was conducted by Dülgerler [17]. All of the data were included in the research. Then, statistical analyzes were applied on the data transferred to the computer on the SPSS 22.0 program. T-test was used for comparing differences between two groups, and one-way ANOVA followed by Tukey's HSD test for comparing differences between multiple groups. Differences were considered significant at P < 0.05.

Results

When Table II is examined, it is seen that there is a negative and significant relationship between Biological Rhythm Levels and Somatization Levels (r = -2.231, p < 0.01) of individuals who do and do not do sports.
When Table III was examined, it was seen that the Somatization and Biological Rhythm levels did not show a significant difference in the gender variable dimension. When Table IV is examined, it is seen that there is no significant difference in the somatization dimension of doing sports, there is a significant difference in the case of doing sports at a p < 0.05 level in the Biological Rhythm dimension, and this significant difference is due to the fact that the average of those who do not do sports is higher than those who do. When Table V is examined, it is seen that there is no significant difference between Biological Rhythm and Somatization and the occupational status variable.
When Table VI is examined, it is seen that there is no significant difference between age ranges and somatization, while there is a significant difference at p < 0.05 level between Biological Rhythm and age ranges, and this significant difference is between 18-25 age range and 26-34 age range.

Discussion

It is seen that there is a negative and significant relationship between Biological Rhythm Levels and Somatization Levels (r = -2.231, p < 0.01) of individuals who do and do not do sports. It was observed that somatization and Biological Rhythm levels did not show a significant difference in gender variable dimension.

TABLE III. *Examination of the biological rhythm and somatization levels of individuals who do and do not do sports in terms of gender.*

	Gender	N	$\bar{x}$ ± SD	T	P
Somatization	Man	119	48.21 ± 4.54	-1.684	0.095
	Woman	121	49.06 ± 3.13		
Biological rhythm	Man	119	51.61 ± 12.36	0.931	0.353
	Woman	121	50.26 ± 11.00		

p < 0.05

TABLE IV. *Examination of the biological rhythm and somatization levels of individuals who do and do not do sports in terms of their sporting status.*

	State of doing sports	N	$\bar{x}$ ± SD	T	P
Somatization	**Yes**	119	48.62 ± 3.81	-0.092	0.926
	No	121	48.67 ± 4.06		
Biological rhythm	**Yes**	119	49.20 ± 11.39	-2.680	0.008*
	No	121	53.24 ± 11.76		

p < 0.05

TABLE V. *The test results between the occupational status of the participants and their biological rhythm and somatization levels.*

	Working status	n	x̄ ± SD	F	P Tukey HSD
Somatization	**Working**	54	47.85 ± 4.05	4.078	0.18
	Not working **student**	36 150	47.55 ± 4.29 49.13 ± 3.68		
Biological rhythm	**Working**	54	52.29 ± 11.72	0.693	0.50
	Not working **student**	36 150	49.38 ± 11.04 50.76 ± 11.85		

p < 0.05

TABLE VI. *The test results between the age range and biological rhythm and somatization levels of the participants.*

	Age	n	x̄ ± SD	F	P Tukey HSD
Somatization	**18-25 age**	201	48.72 ± 3.99	0.269	0.764
	26-34 age **35 and above**	28 11	48.17 ± 3.97 48.36 ± 1.80		
Biological rhythm	**18-25 age**	201	50.28 ± 11.32	3.000	**(18-25)-** **(26-34)*** 0,052 **(26-34)** **(35 and above)***
	26-34 age **35 and above**	28 11	55.92 ± 11.90 49.45 ± 15.48		

p < 0.05

Işık et al. [15] concluded that somatization is more common in women. In similar studies, Bolat T. [16] found a significant difference that somatization is seen more in favor of women (t = 2.987 p = 0.003), while Fidanoğlu [17] found that somatization scores of women and men were different, and women's somatization score It has been revealed that the mean mean (13.18 ± 5.26) of men is higher than the somatization score (10.18 ± 4.69) of men. As revealed in our study, studies on somatic symptoms reported that the frequency of symptoms was higher in women [18,19].

In similar studies in the literature, Adan and Natale [20] reported that men were more evening eater in the study they carried out on 1256 Italian and 879 Spanish university students, while some other studies in Spain and the USA revealed that women were more morning oriented. On the other hand, there are also studies showing that there is no significant difference between the sexes [21]. In the study of Giannotti et al. [22] conducted on a large sample (n = 6631 participants), and in the study of Kim et al. [23], no gender difference was found in adolescents in terms of being morning-night.

It was seen that there was no significant difference in the somatization dimension of doing sports, there was a significant difference in the p < 0.05 level of doing sports in the Biological Rhythm dimension and this significant difference was due to the fact that the average of those who did not do sports was higher than those who did.

Eker et al. [24] reached different results in their study and determined that the results of the SCL-90-R test in those who do not do sports are not different from those who do sports, considering the somatization values.

Morning people mostly prefer outdoor sports (eg golf), while evening people prefer indoor sports (eg water polo). Daytime training has no significant effect on melatonin release. Moderate or high-intensity nighttime exercise suppresses the release of melatonin the next night. In short, this means that the circadian clock functions are affected due to the suppression of the release of melatonin during sleep and the intense exercise. The

effects of exercise on melatonin concentration vary according to age and exercise habits [25].

It was observed that there was no significant difference between Biological Rhythm and Somatization and occupational status variable.

The authors stated in their studies that the somatization levels of the individuals in the research group were seen at a higher level with the (S.O 155.45) value, followed by students with (S.O 147.97) and individuals who did not work with (S.O 125.68). Considering the data of individuals who are working and students, it can be said that social engagement is directly proportional to the level of somatization. In another study, Saatçi and Akpınar [26] found that most of the students had a high index of somatization and depression [26].

In a study conducted in the USA, 8% of university students were morning, 63% were intermediate and 29% were evening people [27], similarly, in a study in India, participants aged 8-23 years were found. It was found that 2% of them are evening and 35% are morning people [28].

In our study, the chronotype distribution of the group coincides with the above-mentioned findings obtained from two different cultures (America and India). The fact that young people go out more at night during university years, irregular sleep and study hours, and the absence of factors that make it compulsory to get up early, such as work life, bring evening features to the fore. In adulthood, regular business life, marriage and having children bring responsibility for life and morning sickness.

While there is no significant difference between age ranges and somatization, it is seen that there is a significant difference at $p < 0.05$ level between Biological Rhythm and age ranges, and this significant difference is between 18-25 age range and 26-34 age range.

Individuals who show morning features in childhood begin to show more evening features around the age of 13. Studies have shown that adolescents and young adults are mostly evening eater [23,29]. From the age of 18-20, the needle changes direction in favor of morning sickness [30]. As a result of Monk and Kupfer's [31] study conducted with young adults, adults, elderly and elderly individuals, when all age groups were compared, it was shown that morning characteristics increase with advancing age. This finding is also consistent with the findings of some other studies [32]. It has been stated that age-related changes are affected by biological (hormone level, body temperature, pulse, blood pressure, etc.) as well as environmental conditions [30].

Ethical consideration

All participants voluntary agreed to participate to the online survey and WHO COVID-19 protocol implemented.

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Conflict of interest

The Authors declare no conflict of interest.

Author contributions

Authors significantly contributed to study conception, data acquisition, data analysis, or interpretation.

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