



Relationship with physical activity habits, quality of life and sleep quality in different exercise types

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A B S T R A C T

In this study, the relationship between physical activity habits, quality of life and sleep quality of individuals who exercise regularly and those who do not, were examined by considering exercise types. In the study, 300 participants (\bar{X}_{age} : 33.92±9.59) from individuals who regularly do sports (Fitness, Tennis, Swimming) by random sampling method and 200 participants who do not regularly do sports (\bar{X}_{age} : 32.72±8.45) individuals by simple random selection method from defined units participated voluntarily. In this study, in addition to the personal information form created by the researcher, three data collection tools were used: Baecke Physical Activity Habit Questionnaire (BFAA), Quality of Life Scale (SF 36), and Pittsburg Sleep Quality Index (PUKI). In the analysis of the data obtained by the face-to-face survey technique, t test in independent groups, one-way analysis of variance test and Pearson product of moments were used to observe the relationship between the variables. When the physical activity habit scores of the participants were examined according to their regular exercise status; Statistically significant differences were found in favor of the exercising group in all sub-dimensions of the SF-36 scale, except for the work index sub-dimension in BFAA. When examined in terms of different sports branches, there was no difference between the groups according to PUKI, while it was observed that BFAA and SF-36 were statistically lower in those who did not exercise compared to all other variables. In addition, the sports index sub-dimension of those who do fitness is higher in physical function, general health perception, social function and mental health sub-dimensions of those who do tennis. While sleep quality was associated with all sub-dimensions of quality of life, no statistically significant relationship was found in terms of physical activity habits. As a result, it has been observed that the quality of life increases as physical activity habits increase, and sleep quality increases as the quality of life increases, and it is thought that sleep quality is indirectly affected in terms of regular exercise.

Keywords: Exercise, Quality of Life, Sleep Quality, Physical Activities

INTRODUCTION

Exercise is one of the biggest factors in the physical fitness of the human body. Nowadays, healthy life plans and programs are planned in many sports branches, and exercises are offered to individuals regarding their needs. Considering exercise as a part of our daily life is important in terms of minimizing the problems that will be encountered in the future for our health.

Physical fitness, which is effective in moving life forward, helps to minimize risks such as cardiovascular system diseases, type 2 diabetes, some types of cancer, osteoporosis psychological disorders, as well as fitness and weight control. Therefore, a good level of physical fitness in individuals who exercise at the appropriate level in terms of duration and severity will protect against many diseases, and support reserves that will allow them to recover easily from the disease (Genç et al., 2011). However, despite this, studies have shown that physical activity is the most important condition

in terms of being healthy, and many health problems are caused by living a sedentary life (Kitiş & Gümüş, 2015).

In addition to objective assessments in determining the health status of people, the concept of quality of life has also been established and has defined as the general perception of people's lives within the scope of the cultural values they are in. It has been defined as not only being biologically healthy and not having a disease state, but also being in a state of complete well-being physically, psychologically, mentally, and socially (Başaran, Güzel & Sarpel, 2005). In this context, general perceptions of individuals regarding their physical and sexual health also include their independence status and social communication, dreams for the future, interests and living conditions (Ekim & Ocağcı, 2012). A better quality of life makes it necessary to "work, produce and be healthy". In this context, it constitutes the basis of human mobility in daily life (Vural, 2010).

Physical activity and exercise are associated with better sleep and less sleep disturbance in healthy adults (Çalık & Algün, 2013). Sleep quality is related to feeling healthy after waking up (Karakaş et al, 2017). Sleep is an indispensable necessity for every human being. Adequate sleep time varies from individual to individual. Sleep needs of people can be affected by various conditions such as "age, gender, physical condition, work, exercise, nutrition, health status, environmental conditions and individual characteristics" (Çelik, 2011). Sleep, which is especially important for human health in physiological and psychological terms, protects people from diseases and disabilities, contributes to their recovery, renews themselves physiologically and spiritually and makes people ready for the next day. Sleep loss causes a general decrease in human performance (Guyton & Hall, 2001; Davenne, 2009). In Turkey, the data showing that sleep quality and physical activity quality of life examined together are limited. Besides, no study was found in the literature in which the sleep quality was measured by comparing the branches with each other in the country. It is thought that this research will create an opportunity to improve physical activity and quality of life in individuals. Therefore, this study aimed to examine the relationship between the quality of life and sleep quality of individuals who exercise regularly and who do not regarding different types of activities.

For this reason, this study aimed to examine the difference between the quality of life and sleep quality of individuals who do and do not exercise regularly, and to evaluate their exercise status. Accordingly, the hypotheses of the study were formed as follows.

- A difference was examined between physical activity habits, quality of life, and sleep quality according to exercise status.

- A difference was detected between physical activity habits, quality of life and sleep quality according to different activity types.

- A relationship was detected between Physical Activity Habits and participants' quality of life and sleep quality.

METHOD

Participants and Procedures

In the study, we examined the physical activity habits, quality of life and sleep quality of individuals who exercise regularly and individuals who do not exercise regularly with the screening model (Karasar, 2009). In this study, which was planned to follow the relational model, the physical activity habits, quality of life and sleep quality of the individuals of sports facilities, who exercise regularly and the individuals who do not exercise were examined. Ethics committee approval was obtained for this study, with the number E-26428519-044-1536, as a research project with file number 100/1520 by the Ethics Committee of Sakarya University of Applied Sciences.

The participants of the study was carried out with two-stage sampling method. The participants who exercise regularly were selected by the simple random sampling method from facilities affiliated with the Spor Istanbul institution within the IMM, Tuzla Kafkale, Pendik Kurtköy, Pendik Çamlık and Kartal Hasan Doğan. 142 women and 158 men (n=300; (\bar{X}_{age} : 33.92±9.59; (\bar{X}_{height} : 1.71±.09 cm; \bar{X}_{weight} : 71.81±.12.97 kg; \bar{X}_{bmi} : 24.33±3.23), and who do not exercise regularly were selected by simple random selection method from defined units, 103 women (51.5%) and 97 men (48.5%) (n=200; (\bar{X}_{age} : 32.72±8,45 (\bar{X}_{height} : 1.70±.10cm; \bar{X}_{weight} : 69.47±14.23kg; \bar{X}_{bmi} : 23.79±3.72). Individuals who have been exercising regularly for a minimum of 5 weeks do fitness (n=100), tennis (n=100) and swimming (n=100) exercises for 1 hour a day, 2 days a week. The individuals who do not exercise consist of individuals residing in the Kartal, Tuzla and Pendik districts of Istanbul province who are outside of Spor Istanbul for the research. The descriptive statistics of the participants according to the groups were given in Table 1.

Table 1. Describing statistics of participants

Type of exercise	n	Age (year)	Height (cm)	Weight (kg)
Tennis	100	33.43±9	1.71±0.1	70.87±11.7
Fitness	100	32.11±10.6	1.72±0.1	72.54±14.4
Swimming	100	36.22±8,8	1.72±0.1	72.01±12.8
Non-exercise group	200	31.13±7.7	1.70±0.1	69.48±14.2
Total	500	32.80±9	1,71±0.1	70.87±13.5

Data Collection Tools

Personal information form: It is intended to determine the regular exercise status, height, body weight, age and gender of the participants in the study.

Baecke questionnaire for the evaluation of habitual physical activity: The Exercise Habit Questionnaire developed by Beacke et al., (1982). The questionnaire consisted of three parts: exercises done at work, exercises done within the scope of sports, and exercises in leisure. These sections consisted of 16 questions in total (Salcı & Koçak, 2001). The maximum score that can be obtained from each section was 5. In this context, the highest total score of the questionnaire was 15. As the scores of the participants increased, their physical activity habits also increased; As their scores decreased, physical activity habits also decreased (Arat et al., 2006). The questionnaire was adapted into Turkish by Karaca & Turnagöl (2007) and in the reliability analyses performed, it was determined that the coefficient of this questionnaire varied between .78 and .94." When the Cronbach's α coefficients obtained in this study were examined; The total score was determined as .85, Baecke work index was .88, Baecke sports index was .79 and Baecke leisure index was .84.

Quality of life scale (SF 36): SF 36 is used to determine the quality of life of individuals. The Turkish adaptation of the scale developed by Ware et al. (1992) was performed by Koçyiğit et al. (1999). The scale consisted of 8 dimensions and 36 items. The Scale had 8 dimensions as Physical function, Physical role, Pain, General health perception, Vitality, Social function, Mental role and Mental health. Regarding sub-dimensions, the health of the participants scored between 0-100. In this context, as the scores approach 0, the health status deteriorates, while the health status improves as the scores approach 100. The Cronbach's α value for the scale and its sub-dimensions was found to be between .73 and .76 (Şen, 2013). When the Cronbach's α coefficients obtained in this study were examined; physical function was calculated as .74, physical role as .81, pain as .80, general health perception as .74, vitality as .78, social function as .82, mental role as .79 and mental health as .77.

Pittsburg sleep quality index: It was a data collection tool developed by Buysse et al. (1989). In this scale, participants were expected to answer 24 questions considering their sleep quality in the last 30 days. The Turkish reliability studies of the scale were performed by Ağargün et al. (1996). According to Ağargün et al. (1996), the internal consistency value of the scale was .80. This survey consisted of 7

components: sleep quality, the time required to go to sleep, length of sleep, sleep disorder, sleep habits, use of sleeping pills and daily activity disorder. Each component scored between 0-3. In this context, the total score index ranges from 0 to 21. As the scores approach 0, sleep quality increased and decreased as they approach 21 (Buysse et al., 1989).

The PSQI form used to determine sleep quality consisted of 24 questions, 19 of which were self-evaluations of the participants. Moreover, the 19th question in the scale was not considered in scoring. The high values obtained indicated the sleep quality was poor and the sleep disorder level was high. The diagnostic sensitivity of the scale was 89.6%, and the specificity was 86.5% in the determination of sleep disorders. The total score index varied between 0 and 21" (Ağargün, 1996). In this study, the Cronbach's α reliability coefficient of the scale was found to be .75.

Data Analysis

The data were analysed by SPSS and Microsoft excel programs. The data were checked for normality using the criteria of skewness and kurtosis between ± 2 (George & Mallery, 2016) and Mardia's multivariate kurtosis coefficient (Mardia, 1985). In this context, the evaluation of pairwise analysis of the participants' mean scores was performed with Independent Samples T-test, while more than two examinations were performed with the One-Way Anova test. According to the Anova test results, Tukey HSD tests were used when the variances were homogeneous in the variables with a difference between them, and Games Howel Post Hoc tests were used when they were not. Pearson Moment Corelation analysis was used to analyze the inter-scale relationships.

RESULTS

The descriptive statistics of Baecke questionnaire for the evaluation of habitual physical activity, the Quality-of-Life Scale and the Pittsburg Sleep Quality Index of the individuals participating in the study who exercise and do not exercise were given in Table 2.

According to Table 2, the physical activity habits of the participants who exercise regularly was found 8.95 ± 0.82 and who do not exercise $7.06 \pm .96$. Quality of life of exercising group was found in physical health 85.38 ± 18.20 , mental health 76.01 ± 21.41 and in non-exercising group was found physical health 73.75 ± 24.39 , mental health 66.43 ± 24.25 . Sleep quality of exercising group and non-exercising group were 4.42 ± 2.46 and 4.66 ± 2.62 , respectively.

The results regarding the differences in physical activity habits, quality of life and sleep quality of the

participants according to their regular exercise status were given in Table 3.

Table 2. Descriptive findings of participant’s physical activity habits, quality of life and sleep quality

Scale	Dimension	Exercise Group (n=300)			Non-Exercise Group (n=200)		
		\bar{x}	Min	Max	\bar{x}	Min	Max
Baecke	Total	8.95±.82	6.63	10.88	7.06±.96	4.63	9.63
Physical Activity Questionnaire	Work Index	2.57±.49	1.38	4.00	2.60±.48	1.50	3.88
	Sports Index	3.19±.37	2.00	4.50	1.89±.34	1.00	3.00
	Leisure Time Index	3.19±.61	1.50	4.75	2.57±.72	1.00	4.50
Quality of life scale (SF 36)	Physical Health	85.38±18.20			73.75±24.39		
	Physical function	90.83±15.17	5	100	80.43±19.62	5	100
	Physical role	85.92±26.68	0	100	71.13±40.16	0	100
	Pain	88.57±15.31	22.5	100	79.96±21.37	10	100
	General health perception	76.22±15.63	10	100	63.50±16.40	20	100
	Mental Health	76.01±21.41			66.43±24.25		
	Vitality	69.70±16.59	15	100	58.53±18.55	5	100
	Social function	81.96±18.23	12.5	100	70.38±22.41	0	100
	Mental role	79.56±34.81	0	100	71.67±39.69	0	100
	Mental health	72.84±16.03	12	100	65.16±16.37	8	100
Pittsburg Sleep Quality Index		4.42±2.46	0	13.00	4.66±2.62	0	11.00

Table 3. Examination of participants' physical activity habits, quality of life and sleep quality according to their exercise status

Scale	Dimension	Exercise Status	\bar{X}	t	p
Baecke Physical Activity Questionnaire	Total	Regularly	8.95±0.82	23.54	.000***
		Non	7.06±0.96		
	Work Index	Regularly	2.57±0.49	-0.75	.455
		Non	2.60±0.48		
Sports Index	Regularly	3.19±0.37	39.73	.000***	
	Non	1.89±0.34			
Leisure Time Index	Regularly	3.19±0.61	10.38	.000***	
	Non	2.57±0.72			
Quality Of Life Scale (SF 36)	Physical function	Regularly	91.36±13.80	6.82	.000***
		Non	80.43±19.67		
	Physical role	Regularly	86.16±26.34	4.65	.000***
		Non	71.13±40.26		
	Pain	Regularly	88.49±15.35	4.86	.000***
		Non	79.96±21.42		
	General health perception	Regularly	76.28±15.63	8.76	.000***
		Non	63.50±16.44		
Vitality	Regularly	69.92±16.45	7.01	.000***	
	Non	58.53±18.60			
Social function	Regularly	82.05±18.28	6.11	.000***	
	Non	70.38±22.46			
Mental Role	Regularly	79.53±34.96	2.27	.024*	
	Non	71.67±39.79			
Mental Health	Regularly	73.14±15.67	5.47	.000***	
	Non	65.16±16.41			
Pittsburg Sleep Quality Index	Regularly	4.42±2.47	-1.03	.306	
	Non	4.66±2.62			

*p<0.05; **p<0.01; ***p<0.001

According to Table 3, when the physical activity habit scores of the participants were examined according to their regular exercise status; a significant difference was found in favor of the participants who exercise regularly in total score, Baecke sports index and Baecke leisure index (p<0.001). However, the groups were found to be similar in the Baecke study index (p>0.05). When quality of life scores are examined according to regular exercise; Statistically significant differences

were found in favor of the exercising group in all sub-dimensions. On the other hand the sleep quality scores of the participants were examined according to their regular exercise status; no significant difference was found between the groups (p>0.05).

The results regarding the differences in physical activity habits, quality of life and sleep quality of the participants according to the type of exercise performed regularly were given in Table 4.

Table 4. Examination of participants' physical activity habits, quality of life and sleep quality according to exercise type ($n_{fitness}=100$, $n_{tennis}=100$, $n_{swimming}=100$, $n_{non-exercising}=200$)

Scale	Dimension	Exercise Type	X	F	p	Dif.
Baecke Physical Activity Questionnaire	Total	1. Fitness	9.02±0.88	185.881	.000***	1>4
		2. Tennis	9.00±0.77			2>4
		3. Swimming	8.83±0.80			3>4
		4. Non-Exercise Group	7.06±0.96			
	Work Index	1. Fitness	2.61±0.48	.659	.578	
		2. Tennis	2.53±0.48			
		3. Swimming	2.56±0.50			
		4. Non-Exercise Group	2.60±0.48			
	Sports Index	1. Fitness	3.27±0.40	534.934	.000***	1>4
		2. Tennis	3.14±0.34			1>2
		3. Swimming	3.16±0.35			2>4
		4. Non-Exercise Group	1.89±0.34			3>4
	Leisure Time Index	1. Fitness	3.14±0.54	38.480	.000***	1>4
		2. Tennis	3.33±0.64			2>4
		3. Swimming	3.10±0.63			3>4
		4. Non-Exercise Group	2.57±0.72			
Quality of life scale (SF 36)	Physical function	1. Fitness	91.20±14.53	21.740	.000***	1>4
		2. Tennis	95.25±9.28			2>3
		3. Swimming	87.55±15.80			2>4
		4. Non-Exercise Group	80.43±19.67			3>4
	Physical role	1. Fitness	85.75±27.81	8.433	.000***	1>4
		2. Tennis	86.25±24.46			2>4
		3. Swimming	86.48±26.90			3>4
		4. Non-Exercise Group	71.13±40.26			
	Pain	1. Fitness	85.90±17.02	10.457	.000***	1>4
		2. Tennis	91.28±12.52			2>4
		3. Swimming	88.29±15.85			3>4
		4. Non-Exercise Group	79.96±21.42			
	General health perception	1. Fitness	75.15±17.90	28.183	.000***	1>4
		2. Tennis	79.65±13.15			2>3
		3. Swimming	73.98±15.03			2>4
		4. Non-Exercise Group	63.50±16.44			3>4
Vitality	1. Fitness	68.60±18.05	18.743	.000***	1>4	
	2. Tennis	72.85±14.50			2>4	
	3. Swimming	68.27±16.36			3>4	
	4. Non-Exercise Group	58.53±18.60				
Social function	1. Fitness	80.50±19.41	17.805	.000***	1>4	
	2. Tennis	87.50±14.97			2>1	
	3. Swimming	78.06±19.00			2>3	
	4. Non-Exercise Group	70.38±22.46			2>4	
Mental Role	1. Fitness	74.67±40.24	3.030	.029*	3>4	
	2. Tennis	79.33±34.42				
	3. Swimming	84.69±28.79				
	4. Non-Exercise Group	71.67±39.79				
Mental Health	1. Fitness	69.40±18.53	13.657	.000***	2>1	
	2. Tennis	76.68±12.65			2>4	
	3. Swimming	73.35±14.53			3>4	
	4. Non-Exercise Group	65.16±16.41				
Pittsburg Sleep Quality Index	1. Fitness	4.36±2.41	2.487	.060		
	2. Tennis	4.90±2.89				
	3. Swimming	4.00±1.96				
	4. Non-Exercise Group	4.66±2.62				

* $p<.05$; ** $p<.01$; *** $p<.001$

According to Table 4, when the physical activity habit scores of the participants were observed according to the type of exercise; In the total score, Baecke sports index and Baecke leisure index, the

scores of the participants who did fitness, tennis and swimming exercises were found to be significantly higher than the scores of the participants who did not exercise ($p<.001$). However, the groups were found

to be similar in the Baecke study index ($p > .05$). Besides, it was examined that the sports index scores of the participants doing fitness exercises were higher than the participants doing tennis exercises ($p < .05$).

When the quality-of-life scores of the participants were examined according to the type of exercise performed regularly; In general, it was observed that the sub-dimension scores of the participants who did not exercise in all sub-dimensions were statistically lower than the participants who participated in different types of sports. In the physical function sub-dimension, those who did not exercise were lower than the other groups ($p < 0.001$), while the scores of those who did swimming exercise were lower than those who did tennis exercise ($p < 0.001$). In the sub-dimensions of physical role, pain and vitality, the group that did not exercise were found to have statistically lower scores than the others ($p < 0.001$). In the general health perception sub-dimension, the participants who did not exercise were statistically lower than the other groups, but it was examined that the scores of those who participated in swimming exercise were lower than tennis exercise participants ($p < 0.05$). According to the social function sub-dimension, it was examined that those who did not exercise were lower than the other groups, but those who participated in the tennis exercise scored higher than the other groups ($p < 0.001$). According to the mental role sub-dimension, the scores of the participants who did swimming exercises were higher than those who did not exercise ($p < 0.01$). In the mental health sub-dimension, the participants who exercise tennis appeared to be higher than those who did not exercise and the fitness exercise group, while swimmers scored higher than those who did not exercise (0.01). No difference was observed between the groups in terms of sleep quality.

The results regarding the relationship between the physical activity habits, quality of life and sleep quality of the participants according to their exercise status were given in Table 5.

As seen in Table 5, weak positive correlation was observed in sub-dimensions of quality of life according to total physical activity habit scores; physical function ($r = 0.263$, $p = 0.001$), physical role ($r = 0.195$, $p = 0.00$), general health perception ($r = 0.314$, $p = 0.00$), physical function ($r = 0.263$, $p = 0.00$), vitality ($r = 0.258$, $p = 0.00$). A very low correlation was observed in the sub-dimensions of pain ($r = 0.13$, $p = 0.00$), mental health ($r = 0.191$, $p = 0.00$) and social function ($r = 0.173$, $p = 0.00$).

According to the work index, no relationship was observed in the physical and mental role sub-dimension, while a very low relationship was observed in other dimensions. According to the sports index, weak positive correlation was observed with physical function ($r = 0.288$, $p = 0.00$), general health perception ($r = 0.309$, $p = 0.00$), vitality ($r = 0.246$, $p = 0.00$), and social function ($r = 0.20$, $p = 0.00$). On the hand a very low correlation was observed in the physical role ($r = 0.184$, $p = 0.00$), pain ($r = 0.16$, $p = 0.00$) and mental health ($r = 0.143$, $p = 0.00$) sub-dimensions.

According to the leisure time index, weak positive correlation has been observed with physical function ($r = 0.242$, $p = 0.00$), general health perception ($r = 0.278$, $p = 0.00$), vitality ($r = 0.285$, $p = 0.00$), mental health ($r = 0.288$, $p = 0.00$) and very low correlation in the physical role ($r = 0.194$, $p = 0.00$), pain ($r = 0.131$, $p = 0.00$) and social function ($r = 0.19$, $p = 0.00$).

It is seen that sleep quality is not affected by physical activity scores, but it has a weak negative relationship with quality of life sub-dimensions.

Table 5. The relationship between participants' physical activity habits, quality of life and sleep quality.

		Quality of Life								Pittsburg Sleep Quality Index
		Physical Health				Mental Health				
		Physical Function	Physical Role	Pain	General Health Perception	Mental Role	Vitality	Mental Health	Social function	
Baecke PAQ (Total)	r	.263**	.195**	.13**	.314**	.056	.258**	.191**	.173**	-.064
	p	0.00	0.00	0.004	0.00	0.209	0.00	0.00	0.00	0.152
Baecke Work Index	r	-.104*	-0.053	-.096*	-.054	-.095*	-.116**	-.144**	-.130**	.03
	p	0.021	0.237	0.032	0.231	0.034	0.009	0.001	0.004	0.509
Baecke Sports Index	r	.288**	.184**	.16**	.309**	.069	.246**	.143**	.20**	-.074
	p	0.00	0.00	0.00	0.00	0.125	0.00	0.001	0.00	0.101
Baecke Leisure Time Index	r	.242**	.194**	.131**	.278**	.093*	.285**	.288**	.19**	-.059
	p	0.00	0.00	0.003	0.00	0.037	0.00	0.00	0.00	0.189
Pittsburg Sleep Quality	r	-.242**	-.335**	-.333**	-.363**	-.259**	-.354**	-.232**	-.337**	1
	p	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

* Correlation is significant at the 0.05 level (2-tailed), ** Correlation is significant at the 0.01 level (2-tailed).

DISCUSSION AND CONCLUSION

In this study, the difference between the quality of life and sleep quality of individuals and the relationship between physical activity habits and quality of life and sleep quality was observed by considering exercise status and different types of activities.

Table 3 showed that there was a statistically significant difference between individuals who exercise regularly and those who did not, according to the Baecke Physical Activity Habits Questionnaire total scores. Although both groups showed moderate activity habits, physical activity habits were higher in the exercising group ($p < .001$). It was examined that both groups were similar in the physical activity habit and work index sub-dimension, but the statistical difference was observed in favour of the exercising group in the sports index and leisure time indexes also affect the total score (Baecke Sports Index $t = 39.73$, $p < 0.001$; Baecke Leisure $t = 10.38$, $p < 0.001$). In this sense, it can be said that the exercise group spent more active time outside of work. Although the selected sports branches (Tennis, Fitness, swimming) were determined as moderate (1.26 mJ/s) (Yazıcı et al., 2021; Florindo et al., 2003; Ainsworth et al. 2000) activities were based on the population of the research, this result can be considered as an expected result.

In terms of quality of life, it was observed that there was a statistically significant difference in favour of the exercising group in all sub-dimensions of the quality-of-life scale in individuals who exercise and non-exercise. In terms of sleep quality, although individuals who exercise had better scores than those who did not, no statistically significant difference was observed between the groups. In the literature, there were many studies describing the positive effects of exercise on quality of life and sleep quality in studies conducted on both healthy individuals and patients. It was concluded that the employees participating in sports activities have a positive difference in the quality of life variable and all other variables related to the research (Cited from Bardakçı, Biçer, 2022). Also, in a master's thesis study, which was designed with a remote exercise method with experiments and control groups during the pandemic period, it was stated that an increase in the quality of life and sleep quality was observed in the exercise group and there was no change in the control group (Küçük, 2021). Banno et al. (2018) pointed out that although higher quality studies were needed according to their systematic review and meta-analysis study on whether exercise can improve sleep quality, they pointed out that exercise

can improve sleep quality without significant negative effects.

In addition, the study by Yaran, Ağaoğlu & Tural (2017), differentiates university students according to whether they regularly did exercise or did not exercise, physical activity habits, quality of life and sleep quality in both groups. At the end of the research, the physical activity habits of the group that regularly did exercise were found to be significantly higher than the physical activity habits of the group that did not do exercise. In this context, based on the results of both studies, it can be said that regular exercise increased physical activity and habits. In addition, in the study of Yaran, Ağaoğlu, and Tural (2017), it was found that similar to this research, the state of exercise did not make a significant difference in sleep quality.

The differences between the physical activity habits, quality of life and sleep quality of the participants in the exercise type were given in Table 4. Physical activity habit scores of individuals engaged in fitness, tennis and swimming exercises were found to be significantly higher than the scores of individuals who did not exercise regularly. Although this result was an expected result in terms of the population of the research, when the sub-dimensions of the scale were observed, there was no difference between the group that did not exercise and other types of activities according to the sub-dimension of the work index. According to the sports index sub-dimension, it was observed that the sports index of the group doing fitness was higher than the group that non-exercising and tennis, and the group that non-exercising had a lower index than the other groups. According to the Baecke leisure time index, it was seen that the group that non-exercising had a lower score than all other groups. In this sense, it can be said that the exercise group spent their spare time more actively, regardless of the type of sport.

It was observed that the scores of the non-exercising group were statistically lower than the other groups in all sub-dimensions of quality of life except for the mental role. It was known that exercise contributed to the quality of life for many individuals. Although the type of exercise depended on the exercise-related parameters and the exercise environment, it contributed widely to the quality of life (Berger, 2009). Physical function was the most important component of quality of life that affects the ability to perform daily activities comfortably. In this study, where tennis players had the highest score, it was observed that those who did not exercise scored lower than other exercise groups. In addition, it was observed that the physical functions of tennis players were higher than swimmers.

In terms of physical role difficulty, which represents the absence of problems in physical health at work or in other daily activities, and in the pain dimension, which represents limitation due to pain, the sub-dimension score means of those who non-exercise were lower than other types of exercise. However, no statistical difference was found between exercise types.

In the general health perception dimension, which expressed the belief that their health was perfect, it was seen that the participants who play tennis had the highest score, similarly, those who did not exercise have a lower score than the others, but the participants who play tennis have higher scores than the swimmers.

It was observed that the participants who play tennis have higher scores and those who did not exercise have statistically lower scores than other types of exercise in the dimension of vitality, which expresses constantly feeling alive and energetic, and social function, which represents carrying out ordinary activities without interruption due to physical or emotional problems. In addition, there was a statistically significant difference between those who play tennis and those who prefer fitness and swimming exercise type. In this case, it can be thought that the participants who play tennis do not have problems in carrying out social activities compared to others.

Depending on the high scores obtained, it was observed that there was a statistical difference only between the swimmers and those who did not exercise, according to the mental role, which represents the absence of problems in work or other daily activities due to mental problems, and it can be thought that a more similar distribution was achieved between the groups compared to other dimensions. Finally, in the mental health sub-dimension, which expresses feeling calm, happy, and comfortable all the time, although the tennis group got the highest score, it was seen that there was a statistical difference between the fitness group and the exercising group, and there was a statistical difference in favour of the swimmers between the swimmers and those who did not exercise. Eime, Harvey et al. (2010) observed differences in quality of life and life satisfaction of individuals participating in different types of physical activities such as tennis and netball club activities, gymnastics activities and walking, and stated that the tennis and netball club group had a statistically higher mean.

There was no difference found between the exercise groups in terms of sleep quality. In the study of Seferoglu et al. (2013) wanted to examine the relationship between skill acquisition, quality of life, sleep quality and depression levels in a 12-week

experimental study, and according to the results of the study, a relationship was observed between the quality of life and sleep quality, but it was that other parameters were not affected as tennis skill increased. In a study observing the relationship between fitness and quality of life in individuals aged 80 and over, it was concluded that an increase in physical fitness levels contributes to the quality of life even in older ages (Takata et al. 2010).

Yfanti et al. (2014) stated in their research that they wanted to examine the effects of recreational swimming exercises on physical condition and quality of life in females and stated that swimming contributes to the prevention and treatment of chronic diseases, increasing the quality of life, well-being, and longevity. Swimming was a sport suitable for all age groups with its physical and mental benefits that work the whole body and have a low risk of physical injury.

The relationship between physical activity habits and quality of life and sleep quality was given in Table 5. It was seen that there was a weak positive relationship between physical activity habit and quality of life in other sub-dimensions except for the mental role sub-dimension. Again, it was observed that there were positive and significant relationships in the physical health dimensions compared to the sports index sub-dimension of the Baecke Physical Activity Questionnaire, while there were significant weak relations between the quality-of-life sub-dimensions in the leisure time sub-dimension. However, it was observed that there were significant but very low-strength positive correlations in the sub-dimensions of work index and quality of life.

In terms of sleep quality, it was observed that the quality of life increases as the sleep index score decreased, which showed that the sleep quality of individuals with increased quality of life also affects positively. However, in this study, it was observed that sleep quality was not directly related to physical activity habits and sub-dimensions. In this respect, it suggested that sleep quality was affected by other variables (age, gender, mood, illness, lifestyle, drug use and environmental factors). In addition, Çalık & Algün (2013) evaluated the relationship between physical activity and sleep quality of the elderly who did not exercise. At the end of the study, it was determined that the physical activity and habits of the elderly individuals who did not exercise, similar to this study, were not related to their sleep quality.

In a study conducted by Alkaya and Okuyan (2017) on the exercise habits of nurses and the factors affecting their quality of life, it was observed that the sleep quality of those who did not exercise was lower.

In addition, it was stated in the literature that people who exercise regularly face fewer insomnia problems. It was also observed that exercise improves sleep quality by providing a smoother and more regular transition between sleep cycles and stages, and moderate-intensity exercises lasting 20-30 minutes four to five times a week help better sleep (Kelley & Kelley, 2017; Tuncer et al., 2020).

In conclusion, it was observed that physical activity habits were statistically different in individuals who did exercise and did not exercise and that their quality of life was statistically different in favour of the physical activity group in all sub-dimensions, but there was no significant difference between sleep quality.

It was observed that the physical activity habits of the participants included in different types of exercise were different from those who did not exercise. Quality of life sub-dimensions were lower in those who did not exercise. On the other hand, it was observed that the scores of the tennis-playing group in the physical function, general health perception, social function and mental health sub-dimensions were higher than the fitness and swimming groups. There was no statistical difference observed between sleep quality and exercise types.

It was observed that there was a significant positive weak relationship in all sub-dimensions of physical activity habit and quality of life, and the highest correlation with the quality of life was observed in the Baecke Sports index and Leisure time index sub-dimensions. In addition, while there was no direct relationship between sleep quality and physical activity habits, it was observed that it was associated with quality of life.

In future studies, the relationship between life and sleep quality can be evaluated with experimental studies, taking into account the reasons why individuals prefer sports branches.

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COMPLIANCE WITH ETHICAL STANDARDS

Authors' Contributions

Authors contributed equally to this paper.

Conflict of Interest

No potential conflict of interest was reported by the authors.

Ethical Approval

For this type of study, formal consent is not required.

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