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ANALYSIS OF THE EFFECTS OF DRINKING TEA AND COFFEE, SMOKING AND CONSUMING ALCOHOL ON SLEEP QUALITY OF STUDENTS RECEIVING SPORTS EDUCATION

Egemen Ermiş[1],
Osman İmamoğlu[2i]
[1]Yaşar Doğu Faculty of Sport Sciences,
Department of Coaching Training,
Ondokuz Mayıs University,
Samsun, Turkey
[2]Yaşar Doğu Faculty of Sport Sciences,
Department of Sports Management,
Ondokuz Mayıs University,
Samsun, Turkey

Abstract:
This study aims to research the effects of drinking tea and coffee, smoking and consuming alcohol before going to bed on the sleep quality of students receiving sports education. For this purpose, Pittsburgh Sleep Quality Index was applied to students receiving sports education. The data of 243 male students and 222 female students who filled in the scale were evaluated. Student t-test was used in statistical procedures. While statistically significant difference was found in subjective sleep quality, sleep duration, habitual sleep efficiency, daytime dysfunction, sleep latency/delay, use of sleep medication and total sleep score in terms of the state of drinking tea and coffee ($p<0,05$ and $p<0,0.01$), no difference was found in sleep disturbances component ($p>0,05$). Statistically, a significant difference was found in subjective sleep quality, sleep latency/delay, sleep duration, habitual sleep efficiency, sleep disturbances, daytime dysfunction, use of sleep medication and total sleep score in terms of the state of smoking and consuming alcohol ($p<0,05$ and $p<0,001$). **Conclusion:** It can be said that drinking tea and coffee, smoking and consuming alcohol before going to bed have negative effects on the sleep quality of students receiving sports education. It is recommended for students receiving sports education not to drink tea and coffee, smoke and consume alcohol before going to bed to improve the quality of sleep.

Keywords: sleep quality, student, athlete, training, tea, coffee, alcohol, smoking

[i] Correspondence: email osmani@hotmail.com

1. Introduction and Purpose

Sleep is a non-persistent and unconsciously controlled behavioural state of reduced movement and sensory sensitivity that reappears at habitual intervals over a period of 24-hours in humans (Aktaş et al., 2015; Allada and Siegel, 2008; Beersma and Gordijn, 2007).

Sleep disturbance can cause problems such as insomnia, difficulty falling asleep, inability to stay asleep and feeling under-rested, an increase in the frequency of medical diseases including cardiovascular diseases and cancer and incidence of depression, distraction, decreased pain threshold, anxiety, irritability, hallucination, decreased appetite, difficulty in urinating, diabetes and glucose intolerance (Güneş et al., 2009; Irwin, 2015; Wang and Boros, 2019). Insufficient sleep duration reduces mental well-being, such as functions like cognition, learning and storage of information in memory. It delays the growth and repair of cells. It disrupts glucose metabolism. Being sleepless reduces immune capacity and resistance to respiratory tract infections (Chandrasekaran et al., 2020: 4; Walsh et al., 2021).

Insufficient sleep in athletes increases injuries related to fatigue, and hormonal and metabolic disorders, slows down sympathetic nervous system activity and cognitive functions, delays decision making reactions by impairing emotional state, and reduces bodily reaction and exercise endurance (West, 2018). Sleeplessness has also been shown to worsen cognitive performance. Adolescents who experience more sleep inconsistency show worse performance at school. Impaired sleep quality is inversely correlated with neurocognitive and academic performance (Alhola and Polo-Kantola, 2007; Curcio et al., 2006; Lim et al., 2021; Lund et al., 2010; Díaz-Morales and Escribano, 2015; Lee et al., 2015; Raley et al., 2016).

World Health Organization reports that 23% of adults in Turkey smoke on a daily basis (Organization WHO, 2017). There are exaggerated visual messages in the media that the use of cigarettes, alcohol and illegal drugs is normal and these are increasing gradually (Konca et al., 2021). It is stated that when compared with non-smokers, smokers have reduced sleep quality and experience more situations similar to insomnia (Jaehne et al., 2012; Riedel et al., 2004). Smoking has been linked to a group of factors that cause difficulty and falling asleep and sleep disruption in both women and men (Wetter and Young, 1994). According to studies conducted, individuals who do not smoke before sleep have a deeper and longer sleep than individuals who do (Çölbay et al., 2007). Although alcohol consumption creates a sedative effect and makes it easier to fall asleep at first, it causes sleep disruption, increased transitions between stages of sleep and decreased sleep quality (Thorpy, 2001).

It is reported that students with worse sleep quality experience more physical and psychosocial problems when compared with students with good sleep quality (Lund et al., 2010). Poor quality sleep may cause problems such as difficulty in concentrating, fatigue, irritability, anxiety and depression (Fernandez et al., 2009). Physiological and/or mental diseases, use of medication, overconsumption of food and drinks that contain

caffeine, the stress in daily life, anxiety and other emotional problems can lead to deterioration in sleep pattern and quality (Ergün et al., 2017).

The aim of this study is to research the effects of drinking tea and coffee, smoking and consuming alcohol on the sleep quality of students receiving sports education.

2. Method

2.1 Participants

Students attending Ondokuz Mayıs University Faculty of Sports Sciences participated in the study. The participants consisted of 243 male and 222 female students. Students filled in Pittsburgh Sleep Quality Index (PSQI) based on voluntariness.

Sleep Quality Index: PSQI (Pittsburgh Sleep Quality Index) is a self-report scale that assesses sleep quality and disturbance over a one-month period. Pittsburgh Sleep Quality Index (PSQI) is the most commonly used general measurement of sleep quality in both clinical and research environments (Mollayeva et al., 2016). PSQI consists of 7 components: subjective sleep quality (component 1), sleep latency (component 2), sleep duration (component 3), habitual sleep efficiency (component 4), sleep disturbance (component 5), use of sleep medication (component 6), and daytime dysfunction (component 7). The scores obtained with the calculation of a total of 7 components are evaluated as the total PSQI score. The score of each sub-component is evaluated between 0 and 3. The total score has a value between 0 and 21. High values show poor sleep quality and high sleep disturbance levels. A total PSQI score of ≤5 shows "good sleep quality", while a score of >5 shows "poor sleep quality" (Ağargün et al. 1996; Buysse et al.,1989). Cronbach's alpha coefficient was found as 0,81 in this study.

2.2 Statistical Analysis

The data were found to have a normal distribution with the Kolmogorov Smirnov test. Student t-test was used in statistical procedures. The statistical significance level was $p<0.05$.

2.3 Limitations

This study is limited to university students studying in the faculty of sports sciences. The study group was considered to include the whole population. Since body mass index is roughly accepted as an indicator of being healthy, participants with abnormal values were excluded from the study.

3. Results

Table 1: Age, height and weight comparisons of students by gender

		n	Mean	Std. deviation	t-test
Age (years)	Male	243	21,82	2,60	0,15
	Female	222	21,34	2,32	
Height (cm)	Male	243	177,28	16,10	5,34**
	Female	222	168,36	16,23	
Weight (kg)	Male	243	74,23	9,74	12,56**
	Female	222	63,11	8,46	
Body Mass Index (kg/m^2)	Male	243	23,69	2,41	4,19**
	Female	222	22,36	2,30	

**p<0,001

Table 2: Sleep quality percentages of students according to the state of drinking tea and coffee, smoking and consuming alcohol before going to bed

	Drinking tea and coffee		Smoking and consuming alcohol	
	Yes	No	Yes	No
Sleep Quality Classification	n (%)	n (%)	n (%)	n (%)
Poor sleep quality (> 5)	187 (87,79)	216 (89,68)	193 (90,61)	210 (83,33)
Good sleep quality (≤ 5)	26 (12,21)	36 (10,32)	20 (9,39)	42 (16,67)
Total sleep mean score	213 (100)	252 (100)	213 (100)	252 (100)

Table 3: Comparison of sleep components and total scale scores by the state of drinking tea and coffee

	Drinking tea and coffee before bed	N	Mean	Std. deviation	t	p
Subjective sleep quality	Yes	213	1,47	0,79	4,19	0,000**
	No	252	1,18	0,71		
Sleep latency	Yes	213	1,65	0,73	3,69	0,000**
	No	252	1,41	0,67		
Sleep duration	Yes	213	0,74	0,76	4,29	0,000**
	No	252	0,47	0,57		
Habitual sleep efficiency	Yes	213	0,30	0,46	5,38	0,000**
	No	252	0,11	0,31		
Sleep disturbance	Yes	213	1,33	0,59	0,42	0,676
	No	252	1,31	0,59		
Use of sleep medication	Yes	213	0,10	0,31	-2,20	0,028*
	No	252	0,17	0,38		
Daytime dysfunction	Yes	213	1,17	0,65	3,54	0,000**
	No	252	0,98	0,55		
PSQI total score	Yes	213	6,79	2,91	4,60	0,000**
	No	252	5,66	2,38		

*p<0,05 and **p<0,001

Table 4: Comparison of sleep Quality Scale scores by the state of smoking and consuming alcohol

	Smoking / Consuming alcohol before bed	N	Mean	Std. deviation	t	p
Subjective sleep quality	Yes	217	1,60	0,78	8,14	0,000**
	No	248	1,06	0,65		
Sleep latency	Yes	217	1,65	0,77	3,54	0,000**
	No	248	1,42	0,62		
Sleep duration	Yes	217	0,82	0,77	7,27	0,000**
	No	248	0,39	0,50		
Habitual sleep efficiency	Yes	217	0,32	0,47	6,74	0,000**
	No	248	0,08	0,28		
Sleep disturbance	Yes	217	1,41	0,61	3,08	0,002*
	No	248	1,24	0,57		
Use of sleep medication	Yes	217	0,09	0,29	-2,90	0,004*
	No	248	0,19	0,39		
Daytime dysfunction	Yes	217	1,26	0,67	6,51	0,000**
	No	248	0,90	0,49		
PSQI total score	Yes	217	7,18	3,10	7,96	0,000**
	No	248	5,31	1,88		

*p<0,05 and **p<0,001

4. Discussion and Conclusion

In this study, the mean age of the athlete students who participated in the study was found as 21,82 years in male students and as 21,34 years in female students. Mean height was found as 177,28 cm in male students and as 168,36 cm in female students. Mean weight was found as 74,23 kg and as 63,11 kg in female students. Mean body mass index was found as 23,69 kg/m² in male students and as 22,36 kg/m² in female students (Table 1). While the ages of the participants were similar in terms of gender, body mass index was found to be statistically different (p<0,001). Although ideal body mass index is considered to be 21-22 kg/m², 22 and 23 can be considered ideal for athletes (Hsu et al., 2018; İmamoğlu et al., 2010). Therefore, it can be said that the body mass index values of the participants were within normal limits.

While the rate of participants who had good sleep quality was found as 12,21% in the participants who drank tea and coffee before bed and as 10,32% in those who did not, it was found as 9,39% in the participants who smoked and consumed alcohol before bed and as 16,67% in those who did not. While poor sleep quality was seen with a rate of 87,79% in the participants who drank tea and coffee before bed and 89,68% in those who did not, it was seen with a rate of 90,61% in the participants who smoked and consumed alcohol before bed and as 83,33 in those who did not (Table 2). It can be said that the participants who drank tea and coffee before bed and those who smoked and consumed alcohol had similar effects on their sleep quality.

In their study, Ergün et al. (2017) found that PSQI mean total score of the participants who drank 5 and more glasses of tea a day was higher than those of the participants who drank 1-2 glasses a day. No significant difference was found on the effects of coffee consumption on sleep quality in the same study. Saygılı et al. (2011) reported that consuming caffeine including drinks such as tea and coffee did not have any effects on sleep quality. In their study, Çömez and Çebi (2020) found significant differences in "*subjective sleep quality and sleep latency*" in terms of using tea and coffee. In this study, while statistically significant difference was found in subjective sleep quality, sleep duration, habitual sleep activity, daytime dysfunction, sleep latency, use of sleep medication and total sleep scores in terms of the state of drinking tea-coffee ($p<0,05$ and $p<0,0.01$), no difference was found in sleep disturbance component ($p>0,05$). It was found that the athlete students who stated that they drank tea and coffee before bed had poorer sleep quality than the athlete students who did not. It can be said that drinking tea and coffee before bed can have a negative effect on athlete students' sleep quality.

Since the nicotine in the cigarette has a stimulating effect, it is thought that individuals may have difficulty falling asleep (Bellatorre et al., 2017). It has been reported that the sleep quality of individuals is inversely correlated with the number of cigarettes they smoke (Kakinami et al., 2016). Students who smoke have been found to have significantly lower sleep quality than students who do not (Altıntaş et al., 2006). Consuming alcohol has a negative effect on sleep by decreasing the effects of REM sleep. It was found that total sleep duration is not affected by alcohol, while sleep quality decreases significantly (Lydon et al., 2016). It was concluded that students who consume alcohol actively have less total sleep duration (Singleton and Wolfson, 2009). Statistically, a significant correlation was found between students' mean PSQI score and smoking and consuming alcohol. It was found that students who consume alcohol have poorer quality of sleep when compared with students who do not (Köybaşı, 2020). In a study they conducted, Şalva et al. (2020) found that mean PSQI score differed significantly between the participants who smoked and those who did not. In their study, İslamoğlu et al. (2018) found that sleep quality mean scores of the participants who smoked were higher than those of the participants who did not. Aysan et al. (2014) found the mean sleep quality scores of participants who smoked were higher than those of the participants who did not. In the same study, while it was found that smoking did not affect sleep quality scores, students who consumed alcohol were found to have worse sleep quality than students who did not. Ergün et al. (2017) found that participants who smoked and consumed alcohol had significantly higher PSQI mean scores than the participants who did not. In a study by Eliöz et al. (2018), sleep quality was not found to differ in terms of athletes' smoking habits.

In this study, a statistically significant difference was found in subjective sleep quality, sleep latency, sleep duration, habitual sleep activity, sleep disturbance, daytime dysfunction, use of sleep medication and total sleep scale scores ($p<0,05$ and $p<0,001$). It was found that students who smoked and consumed alcohol before bed had poorer sleep quality than students who did not. It can be said that smoking or consuming alcohol

before bed can have negative effects on athlete students' sleep quality. It can also be said that the number of cigarettes and alcohol will also be effective on sleep quality.

It can be said that in addition to drinking tea and coffee, smoking and consuming alcohol before bed also have a negative effect on sleep quality in students receiving sports education. It is recommended for students receiving sports education not to drink tea and coffee, smoke and consume alcohol before going to bed in order to improve the quality of sleep.

Conflict of Interest Statement

The authors declare no conflicts of interest.

About the Authors

Dr. Egemen Ermiş is Associate Professor Doctor at Ondokuz Mayıs University, Yaşar Doğu Faculty of Sports Sciences, Samsun, Turkey.

Dr. Osman İmamoğlu is Professor Doctor at Ondokuz Mayıs University, Yaşar Doğu Faculty of Sports Sciences, Samsun, Turkey.

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