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The predictive effect of basic military training and general health status on sleep quality

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ABSTRACT

Background: *Military universities and academies affiliated with the law enforcement provide education for students who are physically and psychologically suitable for this field, unlike other university educations. This education can affect general health because it requires discipline and special effort both practically and theoretically. In this context, the aim of our study is to examine the general health status of military students in terms of some variables.*

Materials and methods: *One hundred twenty-two male students studying at the Gendarmerie and Coast Guard Academy participated in the study. The general health status of the participants was determined by the SF-12 Brief Health Questionnaire, and their sleep quality was determined by the Pittsburgh Sleep Quality Index (PSQI). In the analysis of the data, Spearmans' rho correlation, binomial logistic regression and scatter diagram analysis were used for independent groups. All analyses were performed in the Jamovi 2.3.21.0 analysis programme according to 95% confidence interval and 0.05 significance level.*

Results: *Increased physical and mental health scores of the participants, not smoking, and having a good diet were found to increase the likelihood of improving sleep quality. It was concluded that initial active duty for training, alcohol use, and being in a school team did not predict the likelihood of improving sleep quality.*

Conclusions: *As a result, it may be recommended that military students should have good general health, pay attention to nutrition and avoid smoking to improve low sleep quality.*

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Keywords: basic military training, health status, sleep quality

INTRODUCTION

All developed countries in the world have regular army and law enforcement (police and gendarmerie). The competence of the soldiers and law enforcement forces during their duties is related to the military training received by the personnel. Although individuals admitted to the military and law enforcement professions are likely to be healthier than individuals in the general population [1]. The physical and conditional skills required for these occupations are provided through basic military training [2]. The purpose of basic military training is to prepare students for military service and law enforcement by increasing both their physical fitness and psychological resilience [3]. Since the education given in military universities requires discipline and a special effort, the general health status of the students who study there may be affected.

The World Health Organization (WHO) defines health as "a state of complete physical, mental and social well-being" [4]. Individuals should be healthy in every aspect in preparation for military service. They should be physically and mentally resilient to the challenges of life. In this respect, these military trainings are likely to have physical and mental deformations due to over use, as well as their contribution to military life. It is known that initial active duty for training

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is not only physically demanding, but also that a lack of balance between resting and training can lead to more stress, fatigue and poor sleep quality, which can be a risk factor for injuries [5]. Although studies on the military population have shown that musculoskeletal disorders are common, especially due to overload, this may not be the case for military students. Because the physiological and psychological processes experienced during cadetship and military service are different from each other.

Although it has been known since time immemorial that different emotions can be experienced during initial active duty for training [6], it can be argued that these emotions can also affect other health factors such as mental and physical health and sleep quality. In a study, it was found that there were strong relationships between subjective sleep quality and stress, rest, and fatigue in initial active duty for training for 12 weeks [7]. In addition, soldiers, firefighters, correctional officers, and paramedics experience more mental health problems as they are exposed to more psychological traumatic events in their lives than other individuals [8]. However, the physiological and psychological processes experienced during cadetship and military service are different from each other. In this respect, the initial active duty for training that military students receive may lead to physiologically lower sleep quality and lower sleep quality may lead to poorer mental health. In this context, this study aimed to examine the predictive effect of general health status on sleep quality of initial active duty for training students in terms of some variables.

MATERIALS AND METHODS

RESEARCH MODEL

The model of this research, the 'descriptive, relational screening (survey)' cross-sectional model, was used to reveal the predictability of basic military training on general health status and sleep quality.

RESEARCH GROUP

One thousand twenty-two male students who received military education in Gendarmerie Coast Guard Academy participated in the research. Participants' mean age (24.18 ± 4.02), mean height (176.87 ± 6.1), and mean weight (73.54 ± 8.35) were values. Body mass index (BMI) was calculated by dividing the measured weight [kg] by height [m] square (BMI = weight ([kg] / / height [m^2]). The participants' mean BMI (23.47 ± 1.2) were calculated. According to the WHO, those with a BMI < 18.5 kg/m^2 are considered underweight, those with a BMI of 18.5 ≤ 25 kg/m^2 are considered normal, those with a BMI of 25 ≤ 30 kg/m^2 are considered overweight, and those with a BMI of ≥ 30 kg/m^2 obese.

DATA COLLECTION TOOLS

Personal information form. In the research, in the form of personal information. The variables of gender, age, height, weight, smoking and alcohol use, nutritional status, and being in the school team were included.

SF-12 Brief Health Questionnaire. SF-12 is a questionnaire that can be used to show the current health status of the population and to reveal the workforce loss of chronic diseases [9]; it is even the most widely used [10]. The General Health Questionnaire is a questionnaire that examines mental illnesses and is used as a first-stage screening test in social studies. The 12-item general health questionnaire is widely preferred because it is short, has high sensitivity and specificity in distinguishing cases, and can be used in various socio-cultural settings. While it is stated that the scale can be used safely in the detection of non-psychotic depression and anxiety symptoms, it is not recommended to be used in the detection of psychotic and manic patients and chronic mental patients [11]. In order for the scale to be evaluated correctly, no data should be missing. First of all, it is checked whether there is missing data and then the coefficients created by the researchers and the physical and mental health scores are calculated [12].

Pittsburgh Sleep Quality Index (PSQI). It was developed in 1989 to assess sleep quality [13]. The scale consists of 24 questions to evaluate sleep quality in the last 1 month. The first 18 questions of the questionnaire are based on the person's self-evaluation, the other 6 questions are asked to be answered by the person's partner or roommate and these 6 questions are not included in the scoring. The PSQI scoring consists of 7 components (subjective sleep quality, sleep latency, sleep duration, habitual sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping pills, and daytime dysfunction). In the scoring of each problem, the numbers from 0" to 3" are scored according to the values they receive, and the total score is obtained by adding up the scores of the seven components. The total scale score is between 0 and 21, and between 0 and 4; sleep quality is good, if it is between 5 and 21, it means that the sleep quality is bad. While the Cronbach's alpha value of the scale is 0.80, the Cronbach's alpha value of the PSQI scale in this study is 0.70.

ANALYSIS OF DATA

In the study, "frequency (n), percentage (%), arithmetic mean ($\bar{x}$) and standard deviation (SD)" are used for personal information. According to the Shapiro-Wilk normality test results, it has been determined that data are not distributed normally ($p < 0.05$). The relationship between the groups was used in Spearmans' rho correla-

Table 1. The number (N) and per cent (%) values of the descriptive variables of the participants

	Group	N	%
BMI classification	Underweight	3	0.29
	Normal weight	817	79.94
	Overweight	202	19.77
Nutritional status	Sufficient	567	55.48
	İnsufficient	455	44.52
Use of alcohol	Yes	73	7.14
	No	949	92.86
Use of cigarette	Yes	402	39.33
	No	620	60.67
School team	Yes	86	8.41
	No	936	91.59
PSQI status	Good	419	41.0
	Bad	603	59.0

BMI — body mass index; PSQI — Pittsburgh Sleep Quality Index

tion analysis and binomial logistic regression analysis for relational probability estimates. A scatter diagram was used to decipher the direction of the relationship between the variables.

ETHICS APPROVAL CONSENT TO PARTICIPATE

Before starting the study, permission was obtained from the Scientific Research and Publication Ethics Committee of Karamanoğlu Mehmetbey University (Date: 24.05.2022, No: 71182).

Table 2. The average of the participants basic military training, total Pittsburgh Sleep Quality Index (PSQI), physical and mental health scores

Variables	Mean	Standard deviation
Basic military training	6.67	3.58
Physical health	57.28	5.76
Mental health	41.90	7.05
Total PSQI	5.48	2.42

RESULTS

The descriptive variables, physical and mental health scores, and sleep quality results of the participants are presented below.

Table 1 shows that the majority of the participants were of normal weight, did not drink alcohol or smoke, were not on the school team, had poor sleep quality and their nutritional status was adequate. The average of the participants' basic military training, sleep quality and health scores are given below (Table 2).

Table 2 shows that the participants' had weekly basic military training averages (6.67 ± 3.58), total PSQI averages (5.48 ± 2.42), physical health score averages (57.28 ± ± 5.76) and mental health score averages (41.90 ± 7.05). The Spearmans' rho correlation test results of the participants' physical health, mental health, total PSQI and basic military training values according to some variables are given below (Table 3).

When Table 3 is examined, it can be observed that BMI and physical health values decrease as the amount of basic military training increases, mental health scores increase as physical health scores increase, and an increase

Table 3. The Spearmans' rho correlation test results of participants

Variables		Body mass index	Basic military training	Physical health	Mental health
Basic military training	r	–0.12			
	p	< 0.000***			
Physical health	r	–0.02	–0.08		
	p	0.63	0.01*		
Mental health	r	0.05	–0.05	0.08	
	p	0.14	0.13	0.01**	
Total PSQI	r	–0.00	0.05	–0.42	–0.43
	p	0.90	0.13	< 0.000***	< 0.000***

*p < 0.05, **p < 0.01; ***p < 0.001; PSQI — Pittsburgh Sleep Quality Index

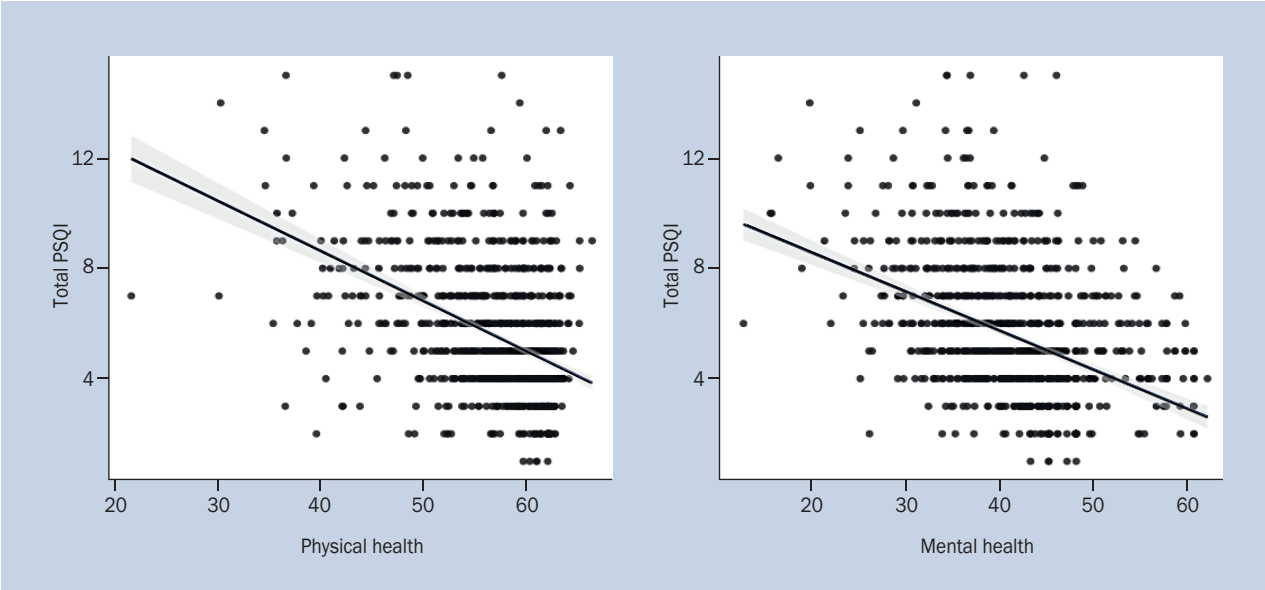

Figure 1. The scatter diagram of the variables; PSQI – Pittsburgh Sleep Quality Index

Table 4. The binomial logistic regression test results of the participants

Predictor	Estimate	Standard error	Z	Confidence range 95% (lower–upper)	Odds ratio	P
İntercept	16.8637308	1.49	11.34	1.44-3.88	2.1	< 0.000**
Physical health	–0.1754594	0.02	–9.04	0.81–0.87	0.8	< 0.000**
Mental health	–0.1274394	0.01	–9.88	0.86–0.90	0.9	< 0.000**
Basic military training	0.0063873	0.02	0.28	0.96–1.05	1.0	0.71
Use of cigarette (No/Yes)	–0.3410118	0.15	–2.21	0.53–0.96	0.7	0.03*
Use of alcohol (No/Yes)	–0.6606277	0.35	–1.91	0.26–1.01	0.5	0.06
School team (No/Yes)	–0.2384837	0.27	–0.87	0.46–1.35	0.8	0.4
Nutritional status (insufficient-sufficient)	0.3167692	0.15	2.08	1.02–1.85	1.4	0.04*

Model: N: 1022, R^2 = 0.32 (Negelkerkes), Model = $x^2(7)$ = 275.40, area under the curve: 0.80, p < 0.001, *p < 0.05, **p < 0.001

in physical and mental health scores reduces (improves) PSQI scores. The scatter diagram of the participants' are given below (Fig. 1).

As seen in Figure 1, as the participants' physical and mental health scores increase, their total sleep quality scores decrease. Total sleep quality scores increase as the amount of initial active for training increases. A lower sleep quality score means better sleep. The binomial logistic regression test results of the participants' are given below (Table 4).

When Table 4 is examined, the PSQI status model is statistically significant according to the physical and mental health scores in the model, as well as smoking and nutrition status ($p < 0.05$). Physical and mental health scores can increase the probability of a decrease in PSQI scores by 0.8 and 0.9 times, respectively ($R^2 = 0.32$, $p < 0.000$). Not smoking and adequate nutrition can increase the probability of a decrease in PSQI scores by 0.7 and 1.4 times, respectively. Decreased PSQI scores mean better sleep quality. In the model, it was found that basic military training, alcohol use and participation in the school team had no predictive effect.

DISCUSSION AND CONCLUSIONS

In this study, which investigated the predictive effect of general health status and initial active duty for training on sleep quality of basic military training students in Gendarmerie Coast Guard Academy, the following results were obtained.

Military health selection criteria mean that candidates must fulfill certain criteria related to physical performance capacity, BMI, and general health status [14]. In previous

studies, it was observed that military students scored adequate scores in physical fitness parameters [15] and had good body composition [16, 17]. In this study, 79.94% of the military students had normal weight, 92.86% of them did not drink alcohol and 60.67% did not smoke. The military training given in these training institutions, where those with good physical fitness are accepted before starting military service, aim to improve the current status of the students. For example, the improvement in the physical fitness levels of students who received 20 weeks of initial active duty for training in South Africa shows the contribution of military training [18]. The fact that such military training is effective not only in the short term but also in the long term can be based on data from a 4-year longitudinal study of Spanish navy cadets [19].

The military training may not always have positive outcomes; cadets may also experience undesirable negative effects such as poor quality sleep as a result of excessive practical training. It was found that 59% of military students had poor sleep quality, and sleep quality decreased as the amount of initial active duty for training increased in this study. Military students are expected to adopt a healthy lifestyle, but the incidence of sleep problems can vary. This point brings to mind the idea that military training may have ignored the load-rest relationship or that failure to comply with the principle of individual loading may have been reflected in the sleep of military students. At this point, it can be considered that determining the type, scope, intensity, frequency, and acute and chronic workloads of the applied training before initial active duty for training [20] may help to eliminate this situation. In addition, the result that initial active duty for training was associated with sleep quality but did not predict sleep quality in this study indicates that more detailed research on sleep quality should be conducted. This is because sleep quality can be caused not only by physical fatigue but also by people's mental health status and bad habits such as smoking and alcohol consumption.

Although the majority of studies in the military field focus on psychological resilience [21], the mental state of military students and related factors are also extremely important. In a study conducted on military students, symptoms of depression were found less frequent in addition to the prevalent rate of anxiety [22], indicating that the mental health of military students is as important as their physical health. As in this study, mental health status is related to mental health status in military students, and interpreting these two factors separately from each other may not contribute. Mental health problems are known to increase smoking [23] and decrease the likelihood of quitting smoking [24]. Interestingly, the military population in this study had very low rates of smoking and alcohol consumption, which could be seen as a reason for better mental health.

It can be said that the fact that the military students in this study went through both theoretical and practical challenging physical and psychological initial active duty for training [25], did not negatively affect their physical and mental health, but it decreased their sleep quality. The elimination of this negative effect may predict the likelihood that military students will improve sleep quality by avoiding smoking and alcohol consumption.

SUGGESTIONS

Considering that military students undergo rigorous training during the day, seminars can be organized for students and instructors by psychology and social work experts with a multidisciplinary approach to ensure that students are physically, mentally, socially, emotionally, and spiritually healthy. Medical evaluation teams can be established in academies, scans (physical and mental) can be made and the results can be recorded. These records ensure that the military student is always ready, and the risks that he may face when he starts his professional life can be minimized.

LIMITATIONS OF THE STUDY

A questionnaire was used, not an assessment by an expert in a clinical setting when determining the physical and mental health status of military students. Even if individuals have existing health problems, in some cases, the person is not aware of them without the evaluation of a healthcare professional. The other limitation of the study is that the current physical and mental health data of the students before military education is not known and the data are collected in a cross-sectional way at a time.

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Conflict of interest: None declared

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