ORIGINAL ARTICLE

THE MENTAL STATUS AND SMOKING BEHAVIORS OF MEDICAL STUDENTS DURING THE COVID-19 PANDEMIC: A CROSS-SECTIONAL STUDY

Ülfiye Çelikkalp, Galip Ekuklu, Yusuf Ergin, Mehmet Alperen Sezer, Kaan Geldi, Faruk Yorulmaz

Trakya University School of Medicine, Department of Public Health, Edirne, TÜRKİYE

ABSTRACT

Aims: This study aimed to assess the frequency of smoking and the mental states of students who were studying in a medical faculty during the coronavirus disease-2019 pandemic and to identify associated factors.

Methods: The cross-sectional study was conducted with 432 medical students between June and August 2021. A demographic information collection form, the General Health Questionnaire-12, and the Fagerström Nicotine Addiction test were used as data collection tools in the study.

Results: The mean General Health Questionnaire-12 score of students was determined as 3.36±3.54. 63.4% of the students had a General Health Questionnaire-12 score above the cut-off score (≥2), which was determined as a risk for mental problems. In terms of general health questionnaire scores in multivariate logistic regression analysis, it was determined that those aged 21 and under [odds ratio (OR) =1.70, 95% confidence interval (CI) =1.121-2.594), women (OR =2.22, CI =1.455-3.379), those who reported that they did not eat regularly (OR =1.60, CI =1.039-2.451), and smokers (OR =2.34, CI =1.311-4.204) were at risk, and living at home with family or a group of friends was a protective factor. It was determined that addiction levels in smokers increased with age (22 years and older) (OR =3.303, 95% CI =1.244-8.765) and with drinking alcohol (OR =8.702, CI =1.024-73.975).

Conclusion: It was found that the COVID-19 pandemic significantly contributed to the increase in mental problems in medical students, and there was a slight increase in smoking behaviors.

Keywords: COVID-19 pandemic, medical students, mental health, smoking

INTRODUCTION

The already difficult medical education has been negatively affected due to the coronavirus disease-2019 (COVID-19) pandemic. During the pandemic period, medical education was greatly interrupted, clinical training was reduced, and only some pieces of training could be conducted remotely (1). With the closure of schools, students' daily lives have changed to a great extent, their motivation to study has decreased, and their anxiety and depression levels have increased (2, 3). According to a systematic review, medical students went through periods of moderate and high stress during the pandemic (4).

According to current literature, stress and anxiety are known emotional triggers for smoking (3). People are known to start smoking more during difficult situations like epidemics as a coping or defense mechanism (3). Most smokers attribute this behavior to the feeling of relaxation they get while smoking (3). However, since COVID-19 in particular is an acute respiratory disease, tobacco use in individuals has been associated with experiencing the disease more severely, hospitalization in intensive care, and death (5, 6). Smoking increases the risk for the prognosis of COVID-19 by a factor of 14.28 (5). There are a limited number of studies investigating whether smoking behaviors have changed during the COVID-19 pandemic (6).

Turk Med Stud J 2023;10(3):124-31   Çelikkalp et al. Smoking and Mental Status of Students

125

The overall effect of the COVID-19 pandemic on tobacco addiction in the general population is reported to be uncertain at the macro level (7). It is estimated that the COVID-19 pandemic led to changes in lifestyle, disruptions in education, quarantines, and isolation that resulted in mental illnesses and nicotine addiction in young people (8). However, there is not enough empirical evidence to support these findings. Smoking addiction is a serious health problem in our country, as it is in many developed and developing countries. Smoking is an important psychosocial problem in terms of its causes and is one of the most harmful behaviors for human health. Therefore this study aimed to evaluate the mental status of medical students, who are health professionals of the future, during the COVID-19 pandemic to examine their smoking behaviors and to determine the affecting factors.

MATERIAL AND METHODS

Ethics Committee Approval

Approval for the research was obtained from the Ministry of Health and Trakya University Ethics Committee (decision no: 13/16, date: 14.06.2021) for the study.

Study Design

The study was designed as a cross-sectional study. The study was conducted through face-to-face interviews with students studying at a medical school of a state university between June and August 2021. The population of the study consisted of 1693 students in the medical school. Using the sample size calculation program G*Power v3.1.9.7 (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany), the minimum (min) sample size was calculated as 364 people in the calculation made by taking the pattern effect as 0.25, α =0.05, power =0.90. Considering possible data loss, the study was conducted with 432 students. In the study, stratified sampling was conducted, and students were selected from each class using a simple random sampling method. However, since the 6th-year medical students (interns) were on duty in pandemic clinics, a sufficient number of students could not be reached from this class, and only 30 students from this class participated in the study. The study included students who were enrolled in Trakya University School of Medicine and volunteered to participate.

Data Collection Tools

The study data were collected using the Personal Information Form, the 12-item General Health Questionnaire (GHQ-12) (9), and the Fagerström Nicotine Addiction test (10).

Personal Information Form: The form consists of 21 questions developed by the researchers in line with the literature. Students were asked about their age, gender, chronic diseases, economic level, place of stay, smoking status, alcohol consumption, exercise status, sleep patterns, diets, whether they were vaccinated against COVID-19, whether they or their families were diagnosed with COVID-19, and whether there were people who died due to COVID-19 in their families.

General Health Questionnaire-12 (GHQ-12): The General Health Questionnaire (GHQ), developed by Goldberg in the 1970s, is a test that can be filled out by individuals and is used to identify mental health problems, especially in primary care. GHQ-12 consists of 12 questions in which the respondents indicate their agreement on a four-point scale (0= Not at all; 3= More than usual) (9). The validity and reliability study of the scale in Türkiye was conducted by Kılıç (11). The responses of the scale, which has a sensitivity of 0.74 and a specificity of 0.84, can be scored as Likert type (0-1-2-3) items or as recommended in the GHQ manual (0-0-1-1). In our study, the answers selected as "a" and "b" options of the questions were scored as "1" points. The GHQ-12 score ranges from 0-12. In this study, those with a GHQ-12 score ≥2 were considered at risk in terms of mental problems.

Fagerström Nicotine Addiction Test: Karl O. Fagerström designed the test, which consists of six questions, to assess the degree of physical addiction to smoking. The questions are all closed-ended (10). The test score increases according to the degree of smoking addiction. A mild nicotine addiction is one with a test score of less than 5, a moderate addiction is one with a score of 5 or 6, and a severe addiction is one with a score of 7 or more. Uysal et al. (12) conducted a validity and reliability study of the Turkish version of the test, and its reliability was found to be moderate (α =0.56).

Statistical Analysis

SPSS 21.0 package program was used for the data analysis. While evaluating the data, its compliance with normal distribution was investigated with the Kolmogorov-Smirnov test, and it was observed that the obtained data conformed to the normal distribution (p>0.05). In the analysis of the findings, the chi-square test was used for discrete variables, while the t-test and one-way analysis of variance were used for continuous variables. Linear regression and multivariate logistic regression analysis were used to determine the extent of independent variables affecting the GHQ-12 total score. The level of statistical significance was set as p<0.05.

RESULTS

The mean age of the students participating in the study was 21.5±2.2 years, 56% were female, 54.7% had an income equal to their expenses, 31.3% lived alone, and 14.1% had a chronic disease. It was determined that 18.8% of the students had COVID-19 infection, 16% lost a relative due to COVID-19, and 90.3% thought that they had sufficient information about COVID-19.

According to the information from the students, 72.3% of them never or rarely exercised during the COVID-19 pandemic period, approximately half (44.7%) could not eat regularly, and 38% stated that their daily sleep duration changed (Table 1).

The mean GHQ-12 score of the medical school students was determined as 3.36±3.54 (min: 0, maximum: 12), and the GHQ-12 score of 63.4% of the students was found to be above the

Çelikkalp et al. Smoking and Mental Status of Students

126

Turk Med Stud J 2023;10(3):124-31

Table 1: GHQ score averages of medical school students according to some demographic characteristics.

Characteristics	Value (Percentage)	GHQ-12 Mean ± SD	p-value
Gender			
Female	242 (56.0)	4.12±3.65	**0.002**
Male	190 (44.0)	3.06±3.31	
Age			
21 years and under	229 (53.0)	3.85±3.51	0.239
22 years and older	203 (47.0)	3.44±3.57	
Mother's education			
Primary school	89 (20.6)	3.76±3.56	
Middle school	37 (8.6)	3.86±3.89	0.279
High school	129 (29.9)	4.06±3.60	
College or higher	144 (33.3)	3.27±3.40	
Father's education			
Primary school	45 (10.4)	3.28±3.20	
Middle school	30 (6.9)	5.03±3.79	**0.009**
High school	128 (29.6)	4.21±3.74	
College or higher	224 (51.9)	3.24±3.55	
Income			
Income < expenses	71 (16.4)	4.52±3.82	
Income = expenses	236 (54.7)	3.69±3.49	**0.028**
Income > expenses	125 (28.9)	3.12±3.40	
Accommodation			
Family members	98 (22.6)	4.08±3.80	
Dormitory/student housing	130 (30.1)	3.19±3.48	**0.018**
Friends	69 (16.0)	4.62±3.90	
Alone	135 (31.3)	3.31±4.49	
Chronic disease			
Yes	61 (14.1)	4.19±4.29	0.204
No	371 (85.9)	3.57±3.40	
Physical activity			
Sometimes, never	107 (24.8)	3.98±3.61	**0.002**
Always, regularly	325 (75.2)	2.83±3.21	
Regular diet			
Yes	239 (55.3)	3.04±3.17	**0.000**
No	193 (44.7)	4.43±3.82	
Sleep habits			
Changed	164 (37.9)	4.25±3.90	**0.007**
No change	268 (62.1)	3.30±3.86	
COVID-19 infection			
Yes	81 (18.8)	4.40±4.15	**0.036**
No	351 (81.2)	3.49±3.37	
COVID-19 knowledge level			
Sufficient	390 (90.3)	3.58±3.50	0.167
Insufficient	42 (9.7)	4.38±3.87	
Smoking status			
Yes	90 (20.8)	5.21±3.30	**0.001**
No	342 (79.2)	3.25±3.99	
Alcohol consumption*			
Never-former drinker	256 (59.2)	2.86±3.05	**0.001**
Current	172 (39.8)	4.17±3.76	
Smoking status during the COVID-19 pandemic**			
Increased	46 (10.6)	7.0444±3.78	
Decreased	24 (5.6)	5.0833±3.86	**0.001**
No change	29 (6.7)	2.2759±2.21	

Significant values are marked as bold. *Percentages do not add up to 100% because of the missing data in the survey responses. **Percentages are calculated based on 432 survey respondents
GHQ-12: General Health Questionnaire-12, COVID-19: Coronavirus disease-2019, SD: Standard deviation

TMSJ

Turk Med Stud J 2023;10(3):124-31

Çelikkalp et al. Smoking and Mental Status of Students

127

cut-off score (≥2), which indicates a risk for mental problems. The mean GHQ-12 scores of female students, those with low economic status, those who do not regularly exercise, and have regular eating habits, those who have changed their sleep duration, those who drink alcohol, and those who have had COVID-19 infection were found to be higher (p<0.05) (Table 1).

In addition, it was determined that 14.8% of the students consumed alcohol 1-2 times a week, 26.6% smoked, and 39.8% of the smokers had moderate and high addiction levels. When asked if their smoking habits had changed during the pandemic, 10.4% stated that their smoking behavior increased during this period. In addition, it was found that the GHQ-12 mean scores of the students who smoked at an increasing rate during the pandemic were higher (p<0.05) (Table 1).

According to the multivariate logistic regression analysis, it was determined that those aged 21 and under (odds ratio (OR) =1.70, 95% CI =1.121-2.594), women OR=2.217, confidence interval (CI) =1.455-3.379], those who reported that they did not eat regularly (OR =1.596, CI =1.039-2.451), and smokers (OR =2.348, CI =1.311-4.204) were at risk in terms of their general health status. It was observed that students living at home with their families or friends had a better level of protective health. The highest risk was found to be in the smoking group, with an elevated risk of 2.35 times. This result revealed the suitability of the multivariate binary logistic regression model that was created to estimate the variables that affect students' overall health status. The multivariate binary logistic regression model explains 11.6% of the variance (Nagelkerke R^2 =0.116) (Table 2).

When the smoking status of the students was compared with demographic data, it was determined that those who lived with their friends at home, those who did not eat regularly, those whose sleep patterns changed during the pandemic period, and those who drank alcohol had higher smoking rates (p<0.05) (Table 3).

According to the multivariate logistic regression analysis, it was determined that the smoking addiction levels of the students increased by being in the older age group (22 years and older) (OR =3.303, 95% CI =1.244-8.765) and by drinking alcohol (OR =8.702, CI =1.024-0.975). It was determined that the highest risk was 8.70 times higher in the alcohol group. This result revealed the suitability of the multivariate binary logistic regression model created to estimate the variables affecting the smoking addiction level of the students and explained 27% of the variance (Nagelkerke R^2 =0.270) (Table 4).

DISCUSSION

The results demonstrate that 63.4% of the medical students scored above the cut-off score; that is, their mental health was poor according to the GHQ-12 scale. In some overseas studies conducted on medical students using the same scale, this rate was 62% in Sri Lanka, 70% in India, and 77% in the USA (13-15). When these studies focusing on the mental health of students are compared with the pre-pandemic studies, it is seen that these problems have increased during the pandemic period (16). For example, in pre-pandemic studies, this rate was found to be 21% lower in New Zealand, 47.4% lower in Australia, and 54.4%

Table 2: Multivariate regression analysis for GHQ-12 level of medical students.					
Variables	B	SE	OR	(95% CI)	p-value
Age					
22 years and older (reference)	1				
21 years and under	0.534	0.214	1.707	(1.121-2.594)	**0.013**
Gender					
Male (reference)	1				
Female	0.796	215	2.217	(1.455-3.379)	**0.001**
Regular diet					
Yes (reference)	1				
No	0.467	219	1.596	(1.039-2.451)	**0.033**
Smoking status					
No (reference)	1				
Yes	0.853	297	2.348	(1.311-4.204)	**0.004**
Stay					
Alone (reference)	1				
Family or friends	-0.763	324	0.466	(0.247-0.880)	**0.019**
COVID-19 infection					
No (reference)	1				
Yes	0.090	0.266	1.095	(0.650-1.843)	0.734

Significant values are marked as bold.*Parameters for logistic regression model: Age, gender, nutritional status, living arrangement, smoking and COVID-19 infection status.
Model x^2 =9.134, Hosmer-Lemeshow test: p=0.243, Nagelkerke R^2: 0.116
OR: Odds ratio, CI: Confidence interval, SE: Standard error, COVID-19: Coronavirus disease-2019, GHQ: General Health Questionnaire-12

TMSJ

Çelikkalp et al. Smoking and Mental Status of Students

128

Turk Med Stud J 2023;10(3):124-31

lower in Iran (16-18). The results obtained from this study are similar to those of other studies, and high GHQ-12 mean scores showed that the effect of COVID-19 on the mental health of medical students was substantial and that their mental health was negatively affected.

In a systemic review, it was reported that medical students went through periods of moderate and extreme stress during the pandemic, and therefore, students should be seen as a "vulnerable population" (4). Hence, urgent preventive measures such as screening and education programs should be implemented because university students are accepted as a high-risk group in terms of depression and anxiety symptoms (4, 19, 20). Due to the epidemic's nationwide spread, strict isolation policies and the shutdown of educational facilities, students' mental health has been negatively impacted (20). Especially with the disruption of daily routines, while the motivation to study decreases, the pressure on independent learning increases, and uncertainty about the future can be experienced (20). Additionally, this anxiety that worsens at unusual and unexpected times may be an important risk factor for unhealthy behaviors like smoking. In a study conducted on university students, it

Table 3: Smoking status of medical school students according to some demographic characteristics.

Characteristics	Smoking status				p-value
	Yes		No		
	Value	%	Value	%	
Gender					
Female	43	17.8	199	82.2	**0.049**
Male	47	24.7	143	75.3	
Age					
21 years and under	42	18.3	187	81.7	0.108
22 years and older	48	23.7	155	76.4	
Accommodation					
Family members	16	16.3	82	83.7	
Dormitory/student housing	16	12.3	114	87.7	**0.001**
Friends	27	39.1	42	60.9	
Alone	31	23.0	104	77.0	
Regular diet					
Yes	29	12.1	210	87.9	**0.001**
No	61	31.6	132	68.4	
Sleep habits					
Changed	43	26.2	121	73.8	**0.022**
No change	47	17.5	222	82.5	
COVID-19 infection					
Yes	20	24.7	61	75.3	0.211
No	70	19.9	281	80.1	
Alcohol consumption					
Yes	79	30.9	177	69.1	**0.001**
No	11	6.4	161	93.6	

Significant values are marked as bold.
COVID-19: Coronavirus disease-2019

Table 4: Multivariate regression analysis for FTND (Fagerström test for Nicotine Dependence) level of students.

Variables	B	SE	OR	(95% CI)	p-value
Age					
21 years and under	1				
22 years and older	1.195	0.498	3.303	(1.244)-(8.765)	**0.016**
Alcohol consumption					
No	1				
Yes	2.164	1.092	8.702	(1.024)-(73.975)	**0.048**

Significant values are marked as bold.
*Parameters for logistic regression model: Age, alcohol consumption status. Model x^2 =18.7641, Hosmer-Lemeshow test: p=0.625, Nagelkerke R^2: 0.270
OR: Odds ratio, CI: Confidence interval, SE: Standard error

Turk Med Stud J 2023;10(3):124-31

Çelikkalp et al. Smoking and Mental Status of Students

129

was emphasized that nicotine addiction was associated with higher levels of anxiety (3).

In our study, it was determined that there was an increase in students' smoking behavior during the pandemic period, that one out of every four students smoked, and that the mental state of the students who smoked was worse. Although it is known that the COVID-19 infection will be experienced more severely in smokers, the increase in smoking behavior during the pandemic period reflects that COVID-19 negatively affects the mental health of students. One of the ways to cope with negative emotions can be in the form of abusing all kinds of stimuli, including cigarettes and alcohol (13). The results are in line with those of other research in which it was shown that there was an increase in the number of smokers during the pandemic (8, 21, 22).

According to studies, smoking more cigarettes may be linked to more mental distress (21). Additionally, quarantining causes a 9.1% increase in smoking, which is most frequently linked to a decline in quality of life, less sleep, increased anxiety, and depressive symptoms (21). This may suggest that increased stress brought on by the coronavirus pandemic in general causes individuals to use stimulants more frequently.

In this study, it was determined that one out of every five students smoked. In a study conducted by Sönmez et al. (23); among medical students, 19.5% of the students were found to be smokers. The smoking rate was 18.26% among first-year students and 21.27% among sixth-year students (23). In a study conducted on 1208 students at Uludağ University School of Medicine, the smoking rate was 17.3%, while in a study conducted on 230 students at Düzce University School of Medicine, it was 31.3% (24, 25). In a study conducted at Gazi University School of Medicine in 2004, the smoking rate among first-year students was determined to be 17.6% (26). In this study, although there was no significant difference by age, the smoking rate was higher in the group aged 22 and above. Although the observed rates vary, the common result in all of these studies is that smoking behavior among medical students is significant, and it tends to increase in higher academic years.

Smoking behavior is more common in males in general (27). In student studies, it is emphasized that male students demonstrate a higher prevalence of nicotine addiction than women, both during the COVID-19 outbreak and in general (3, 27). Smoking among women has increased as much as among men in developed countries since 2000 (28). In this study, it can be said that there is no significant difference between the smoking behaviors of male and female students.

On the other hand, female students had a higher risk of mental health problems than males (19, 29). According to the literature, mental health issues are more common in women (30). Women experience emotions more intensely than men do, due to physiologic differences such as genetic sensitivity, hormones, and cortisol levels (31). Women may therefore feel more depressed and anxious since they are more sensitive to stress

and pain (31). There are also hypotheses indicating that this increased frailty in women is caused by physiological reactivity and hormones (32, 33). In this regard, our results are consistent with the literature.

In the present study, it was determined that students who live alone, who are under 21 years of age, who do not eat regularly, who do not exercise, and who are infected with COVID-19 have poor mental status. According to estimations made by the American Psychiatric Association, over 50% of people will experience the detrimental effects of the situation caused by severe acute respiratory syndrome (SARS) coronavirus-2 on their mental health (34). It is also expected that these problems will occur at a higher rate, especially in those who have had COVID-19. Socialization is an important factor in the protection of mental health. In the study of Tahara et al. (19) in Japan, it was reported that less communication with friends was a risk factor for negative mental health in students. Therefore, it can be said that staying with family or friends is a protective factor for mental health.

In the current study, the fact that students in the younger age group had more mental problems is in line with other studies. In the study of Li et al. (35) the stress levels of nurses with less professional experience were higher. As individuals' vocational training increases with age, their levels of negative affect are likely to decrease due to the development of their clinical performance (36). Improving the professional knowledge of healthcare professionals on issues such as disasters or epidemics during training periods prepares them for such events and may contribute to their becoming less affected (36). In this process, there is a need to organize training programs by evaluating new technological opportunities.

According to literature, individual's diets may change because of high levels of stress brought on by natural disasters, especially there may be a decrease in healthy eating behaviors (37). Considering that changes in appetite and behavioral changes are common among the physical symptoms of mental health problems, the results are consistent with the literature (38). The relationship between stress and nutrition can affect each other bilaterally (39). On one hand, while the organism increases the level of stress hormones when it cannot get enough nutrients for itself, on the other hand, the increase in stress leads individuals to consume unhealthy food, including instant food, snacks, and food with intense calories (39, 40). In fact, nutrition and lifestyle changes have occurred with the increase in time spent idle and the decrease in physical activity due to online lessons during the pandemic period (8). In particular, curfews to reduce the risk of disease transmission have led to a restriction of physical activities and an increase in stress (37). Contrary to the studies reporting that physical activity decreased during the COVID-19 pandemic period, there are also studies reporting an increase (8, 41). In some studies, it has been stated that some people try to cope with mental problems related to the pandemic by relying on negative health behaviors such as smoking or alcohol consumption, contrary to health-enhancing behaviors such as

Çelikkalp et al. Smoking and Mental Status of Students

130

Turk Med Stud J 2023;10(3):124-31

physical activity (5). In the present study, it is seen that the higher smoking behavior in students with poor nutrition and sleep problems is consistent with the literature.

In this study, while smoking behavior was found to be higher in students who drink alcohol, live with friends, and are 22 years of age or older, it was determined that those who live alone have more mental problems than those who live with their family or friends, but their smoking addiction is lower. Smoking and alcohol use can also be signs of troubled environmental conditions. In this study, the rate of alcohol consumption among students is consistent with the literature. In a study conducted by Yengil et al. (42); among medical students, the alcohol consumption rate was found to be 43.8%. In Western countries, the lifetime alcohol consumption rate among university students varies between 88% and 96% (42). In Türkiye, the rate of alcohol consumption among university students is lower compared to Western countries (42). The environment can accommodate both advantages and disadvantages for health. Research shows that a circle of friends who smoke and a sense of curiosity are important reasons for starting to smoke (3, 28). Students who lived alone were thought to have a lower tendency to develop bad habits because they were more sensitive to mental problems and more focused on academic achievement. The use of all other substances is more common in smokers than non-smokers (43). The fight against smoking is the most critical step in protecting students from harmful habits. It would be useful to question the reasons with different independent variables in new studies.

Those with low incomes have a higher risk of mental health problems than those with high incomes (Table 1). Low socioeconomic status is associated with high anxiety. Loss of income and education in the pandemic and curfews have been important sources of stress (44). Moreover, the negative economic effects of the pandemic on thousands of people are also emphasized (3). As a matter of fact, low income can put participants in a vicious circle. For example, when needs are not met due to a loss of income, anxiety begins to occur, nutrition and sleep patterns change depending on anxiety, and it may trigger an increase in negative behaviors such as nicotine consumption. Therefore, it can be said that the status of income is a factor affecting mental health and smoking behavior.

CONCLUSION

In this study, it was determined that more than half of the medical students experienced mental problems during the COVID-19 pandemic, and there was an increase in their smoking behavior. Mental health problems in medical students, who are future physicians, are too critical to ignore. Studies on the SARS epidemic, for instance, have demonstrated that psychological impacts are not always temporary and can result in severe, ongoing mental health issues (45, 46). Additionally, students who experience hardships are more likely to use tobacco and other drugs. Educational measures and training programs should be implemented to protect young people against smoking and prevent the development of addiction. Universities should promote the accessible psychological support sources, guidelines, and psychological counseling services, starting with the identification of students at risk. It will be important to determine the dimensions and determinants of the problem with more comprehensive research.

REFERENCES

1. Chandratre S. Medical students and covid-19: challenges and supportive strategies. J Med Educ Curric Dev 2020;7:2382120520935059. [Crossref]

2. Cao W, Fang Z, Hou G et al. The psychological impact of the covid-19 epidemic on college students in china. Psychiatry Res 2020;287:112934. [Crossref]

3. Ayran G, Köse S, Küçükoğlu S et al. The effect of anxiety on nicotine dependence among university students during the covid-19 pandemic. Perspect Psychiatr Care 2022;58(1):114-23. [Crossref]

4. Salazar de Pablo G, Vaquerizo-Serrano J, Catalan A et al. Impact of coronavirus syndromes on physical and mental health of health care workers: systematic review and meta-analysis. J Affect Disord 2020;275:48-57. [Crossref]

5. Günay S, Ünsal E, Argüder E et al. Tütün bağımlılığının covid-19 ağırlığı üzerine etkisi. İzmir Göğüs Hastanesi Dergisi 2021;35(1):22-31. [Crossref]

6. Vardavas CI, Nikitara K. Covid-19 and smoking: a systematic review of the evidence. Tob Induc Dis 2020;18:20. [Crossref]

7. Stanton R, To QG, Khalesi S et al. Depression, anxiety and stress during covid-19: associations with changes in physical activity, sleep, tobacco and alcohol use in Australian adults. Int J Environ Res Public Health 2020;17(11):4065. [Crossref]

8. Kosendiak A, Król M, Ściskalska M et al. The changes in stress coping, alcohol use, cigarette smoking and physical activity during covid-19 related lockdown in medical students in Poland. Int J Environ Res Public Health 2021;19(1):302. [Crossref]

9. Goldberg DP. Manual of the General Health Questionnaire. Windsor: NFER Publishing; 1978. [Crossref]

10. Fagerström KO, Heatherton TF, Kozlowski LT. Nicotine addiction and its assessment. Ear Nose Throat J 1991;70(11):763-5. [Crossref]

11. Kılıç C. General health questionnaire: a validity and reliability study. Turk Psikiyatri Derg 1996;7(1):3-9. [Crossref]

12. Uysal MA, Kadakal F, Karşidağ C et al. Fagerstrom test for nicotine dependence: reliability in a Turkish sample and factor analysis. Tuberk Toraks 2004;52(2):115-21. [Crossref]

13. Dahanayake D, Rajapakse H, Wickramasinghe A et al. Psychological wellbeing and mental health amongst medical undergraduates: a descriptive study assessing more than 1,000 medical students in Sri Lanka. Int J Soc Psychiatry 2022;68(6):1263-9. [Crossref]

14. Philip S, Molodynski A, Barklie L et al. Psychological well-being and burnout amongst medical students in India: a report from a nationally accessible survey. Middle East Curr Psychiatry 2021;28:54. [Crossref]

Turk Med Stud J 2023;10(3):124-31   Çelikkalp et al. Smoking and Mental Status of Students

131

15. Wieczorek T, Kołodziejczyk A, Ciułkowicz M et al. Class of 2020 in Poland: students' mental health during the covid-19 outbreak in an academic setting. Int J Environ Res Public Health 2021;18(6):2884. [Crossref]

16. Dendle C, Baulch J, Pellicano R et al. Medical student psychological distress and academic performance. Med Teach 2018;40(12):1257-63. [Crossref]

17. Farrell SM, Moir F, Molodynski A et al. Psychological wellbeing, burnout and substance use amongst medical students in New Zealand. Int Rev Psychiatry 2019;31(7-8):630-6. [Crossref]

18. Farahangiz S, Mohebpour F, Salehi A. Assessment of mental health among Iranian medical students: a cross-sectional study. Int J Health Sci (Qassim) 2016;10(1):49-55. [Crossref]

19. Tahara M, Mashizume Y, Takahashi K. Mental health crisis and stress coping among healthcare college students momentarily displaced from their campus community because of covid-19 restrictions in Japan. Int J Environ Res Public Health 2021;18(14):7245. [Crossref]

20. Wang C, Zhao H. The impact of covid-19 on anxiety in Chinese university students. Front Psychol 2020;11:1168. [Crossref]

21. Carreras G, Lugo A, Stival C et al. Impact of Covid-19 lockdown on smoking consumption in a large representative sample of Italian adults. Tob Control 2022;31(5):615-22. [Crossref]

22. Koopmann A, Georgiadou E, Reinhard I et al. The effects of the lockdown during the covid-19 pandemic on alcohol and tobacco consumption behavior in Germany. Eur Addict Res 2021;27(4):242-56. [Crossref]

23. Sönmez Cİ, Ayhan Başer D, Aydoğan S et al. Evaluation of knowledge, attitudes, behaviors and frequency of smoking among medical students of Düzce University. Konuralp Medical Journal 2017;9(2):160-6. [Crossref]

24. Vatan İ, Ocakoğlu H, İrgil E. Determining smoking prevalence among Uludağ university faculty of medicine. TAF Prev Med Bull 2009;8(1):43-8. [Crossref]

25. Mayda AS, Tufan N, Baştaş S. Düzce Tıp Fakültesi öğrencilerinin sigara konusundaki tutumları ve içme sıklıkları. Kor Hek 2007;6(5):364-70. [Crossref]

26. İlhan F, Aksakal N, İlhan MN et al. Gazi Üniversitesi Tıp Fakültesi öğrencilerinin sigara içme durumu. Kor Hek 2005;4(4):188-98. [Crossref]

27. Provenzano S, Santangelo OE, Grigis D et al. Smoking behaviour among nursing students: attitudes toward smoking cessation. J Prev Med Hyg 2019;60(3):E203-10. [Crossref]

28. Kılıç H, Pempeci S, Sarıkulak E et al. Tıp fakültesi öğrencilerinin sigara içme konusundaki tutumları. Gazi Tıp Derg 2021;32(4A):619-24. [Crossref]

29. Wu JH, Du JK, Lee CY et al. Effects of anxiety on dental students' noncognitive performance in their first objective structured clinical examination. Kaohsiung J Med Sci 2020;36(10):850-6. [Crossref]

30. Yakar B, Öztürk Kaygusuz T, Pirinççi E et al. Knowledge, attitude and anxiety of medical students about the current covid-19 outbreak in Turkey. Fam Pract Palliat Care 2020;5(2):36-44. [Crossref]

31. Gao W, Ping S, Liu X. Gender differences in depression, anxiety, and stress among college students: a longitudinal study from China. J Affect Disord 2020;263:292-300. [Crossref]

32. Bal U, Çakmak S, Uğuz Ş. Anksiyete bozukluklarında cinsiyete göre semptom farklılıkları. Arşiv Kaynak Tarama Derg 2013;22(4):441-59. [Crossref]

33. Fernandes MA, Ribeiro HKP, Santos JDM et al. Prevalence of anxiety disorders as a cause of workers' absence. Rev Bras Enferm 2018;71(suppl 5):2213-20. [Crossref]

34. American Psychiatric Association. New Poll: Covid-19 Impacting Mental Well-Being. Available from: URL: https://www.psychiatry.org/news-room/news-releases/new-poll-covid-19-impacting-mental-well-being-amer.

35. Li R, Chen Y, Lv J et al. Anxiety and related factors in frontline clinical nurses fighting covid-19 in Wuhan. Medicine (Baltimore) 2020;99(30):e21413. [Crossref]

36. Labrague LJ, De Los Santos JAA, Fronda DC. Perceived covid-19-associated discrimination, mental health and professional-turnover intention among frontline clinical nurses: the mediating role of resilience. Int J Ment Health Nurs 2021;30(6):1674-83. [Crossref]

37. Serin Y, Şanlıer N. Emotional eating, factors affecting food intake and basic nursing approaches. J Psychiatr Nurs 2018;9(2):135-46. [Crossref]

38. Göl İ, Erkin Ö. Mental status of nursing students assessed using the general health questionnaire during the covid-19 pandemic in Turkey. Perspect Psychiatr Care 2021;57(4):1712-8. [Crossref]

39. Eskici G. Covid-19 pandemia: nutrition recommendations for quarantine. Anatol Clin 2020;25:124-9. [Crossref]

40. Özcan Ç, Kızıl M. Evaluation of the effect of job stress level on employment conditions, diet quality and anthropometric measurements. Bes Diy Derg 2020;48(3):56-64. [Crossref]

41. Puccinelli PJ, da Costa TS, Seffrin A et al. Reduced level of physical activity during covid-19 pandemic is associated with depression and anxiety levels: an internet-based survey. BMC Public Health 2021;21(1):425. [Crossref]

42. Yengil E, Çevik C, Demirkıran G et al. Smoking among medical school students and attitudes against smoking. Konuralp Medical Journal 2014;6(3):1-7. [Crossref]

43. Korkmaz M, Ersoy S, Özkahraman Ş et al. Tobacco products-alcohol consumption status and approach to smoking in students of Suleyman Demirel University. SDÜ Tıp Fak Derg 2013;20(2):34-42. [Crossref]

44. Birinci M, Bulut T. Impact of covid-19 on social-economically disadvantaged groups: an assessment from social work perspective. Turk J Soc Work 2020;4(1):62-8. [Crossref]

45. Suwantarat N, Apisarnthanarak A. Risks to healthcare workers with emerging diseases: lessons from mers-cov, ebola, sars, and avian flu. Curr Opin Infect Dis 2015;28(4):349-61. [Crossref]

46. Taylor S. The Psychology of Pandemics: Preparing for the next global outbreak of infectious disease. Cambridge Scholars; 2019. [Crossref]