Original Article

Lifestyle among medical students: A survey in Iran

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Abstract

Background: Medical students' well-being is important; we evaluated lifestyles at four Iranian medical universities.

Methods: In this cross-sectional study, demographic characteristics and lifestyle behaviors were assessed across educational levels using a questionnaire. SPSS version 22 was used; $p<0.05$ indicated significance.

Results: Of 850 invited students, 708 responded. Smoking, alcohol consumption, and hookah use were reported by 16.81%, 22.2%, and 13.1%, respectively; 43.4% had low physical activity and 19.9% reported a high-calorie diet. Smoking ($p=0.02$), alcohol consumption ($p=0.002$), and residence (dormitory versus family home; $p<0.001$) differed significantly across universities. Predictors of student smoking were male sex (OR 3.33, 95% CI 1.85–5.99; $p<0.001$), alcohol consumption (OR 5.03, 95% CI 2.48–8.75; $p<0.001$), hookah use (OR 10.7, 95% CI 6.72–12.23; $p<0.001$), fatigue (OR 2.6, 95% CI 1.61–4.26; $p=0.006$), parental smoking (OR 2.7, 95% CI 1.36–5.42; $p=0.005$), and parental alcohol use (OR 2.39, 95% CI 1.14–5.12; $p=0.02$). Moderate and high physical activity were protective (OR 0.62, 95% CI 0.29–0.87; $p=0.003$ and OR 0.56, 95% CI 0.25–0.77; $p=0.007$, respectively).

Conclusion: Medical students demonstrated unhealthy lifestyle patterns, highlighting the need for targeted programs to improve their attitudes and behaviors.

Keywords: Lifestyle; Medical students; University

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Introduction

The health of university students is of paramount importance, as they represent the human capital and future leadership of the nation (1). Health, in this context, necessitates the promotion of a healthy lifestyle (2). While the foundation for healthy living is established in early life, university years are critical in shaping lifestyle behaviors. These behaviors, if neglected, can have long-term adverse effects on students' health and well-being. The transition from living with parents to independent life often introduces significant changes in eating habits, physical activity, stress levels, emotional challenges, and newfound

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freedoms, all of which are key determinants of lifestyle (3). Young adults are particularly vulnerable to engaging in risky behaviors such as substance abuse, physical inactivity, and poor dietary choices (4). These behaviors significantly influence the development of diseases later in life, particularly during middle and old age (5). Lifestyle, encompassing a broad range of social values, attitudes, and activities acquired through socialization, includes behaviors such as physical activity, sleep, diet, weight management, smoking, alcohol consumption, stress management, social interactions, and exposure to environmental factors such as air pollution (6). Moreover, research has demonstrated that socio-demographic factors, including gender, age, marital status, economic standing, and employment status, are closely associated with the adoption of a healthy lifestyle (7). In 2020, 22.3% of the world's population used tobacco: 36.7% of men and 7.8% of women (8). In one recent study, the adult (15+ years old) smoking prevalence in Iran was reported as 5.60%, with 10.70% for men and 0.50% for women; 9.32% of all deaths in Iran are caused by tobacco use (9). In recent decades, lifestyle has emerged as a critical determinant of health status and has been the focus of extensive research worldwide (10). A healthy lifestyle is recognized as a way of living that minimizes the risk of serious illness and premature mortality. According to the World Health Organization (WHO), 60% of factors influencing health are related to lifestyle choices (11). Numerous studies have identified key risk factors that threaten health, including poor diet, inactivity, limited physical activity, and smoking. Addressing these risk factors can reduce premature mortality by approximately 50% (12).

Non-communicable diseases (NCDs), also referred to as chronic diseases, are typically long-lasting and result from a combination of genetic, physiological, environmental, and behavioral factors. WHO statistics reveal that 41 million people die annually due to NCDs, accounting for 74% of all global deaths. Among these, 8 million deaths are attributed to smoking, 1.8 million to high-sodium diets, 1.5 million to alcohol consumption, and 830,000 to insufficient physical activity. Many of these deaths are preventable through the adoption of healthier lifestyle practices. In Iran, a middle-income country, NCDs are responsible for 81% of all deaths, with 15% of these being premature. NCDs constitute 74% of the total burden of disease in Iran (13). Furthermore, it is estimated that up to 80% of deaths from heart disease, stroke, and type 2 diabetes, as well as 40% of cancer deaths, can be prevented by addressing known lifestyle risk factors (14). University students, particularly medical students, are especially vulnerable to high-risk behaviors due to the demanding nature of their studies, which often include long hours, irregular eating patterns, reliance on convenience foods, and decreased physical activity (15). Medical students, during their internships, are frequently required to work night shifts and extended hours, which can negatively impact both their short- and long-term health and lifestyle (16). Studies indicate that medical students experience higher levels of stress and anxiety compared to the general population, with prevalence rates reaching 33%, compared to 42% among medical students in the Middle East, 35% in Asia, and 27% globally. This heightened stress poses serious implications not only for the students themselves, who are future healthcare providers, but also for the patients they will eventually care for (17). As future leaders in the healthcare field, the behaviors and lifestyles of medical students should serve as role models for the broader population, particularly those who will be under their care (18). In this study, our objective was to examine the lifestyle of medical students at several universities of medical sciences in Iran.

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Material and Methods:

In this cross-sectional descriptive study, the life style of the medical students of several medical universities in Iran has been investigated. In this survey, 850 medical students from four universities of medical sciences including three public universities (Isfahan, Kashan and Yazd University of Medical Sciences) and one tuition university (Islamic Azad University Tehran Medical sciences), in the course of basic sciences and clinic were asked to participate in the study. Demographic characteristics, educational status and family income, grade point average of the past semesters, history of previous diseases, consumption Cigarettes, cannabis, hookahs or another drug use in the student, as well as the amount of weekly physical activity and type of diet (amount of calories and fat consumed for example high calorie diet includes foods that are high in calories but low in nutritional value such as fast food, high-fat meals, or processed foods) also the consumption of fruits and vegetables, amount of night sleep and stress, high-risk sexual behavior (outside the ethical framework) so living in the dormitory or with family or alone was evaluated between 2022 and 2023. In the case of physical activity and diet, stress control and mental health, some parts of Lifestyle Questionnaire(LSQ), used . In the study by Lali et al. (2012), the construct validity of the lifestyle questionnaire was confirmed as a multidimensional tool for assessing and measuring lifestyle using factor analysis. The reliability of the questionnaire was also calculated using the Cronbach's alpha measurement method(Cronbach's α : 0.87)(18). To collect data, the data collection form prepared by the researchers along with parts of the Lifestyle Questionnaire (LSQ), was made available to the medical students at different educational levels. Students were asked to complete the form with the utmost honesty and they were assured that their information would be kept confidential and the results would be released only as a group. Next, the smoking situation was investigated due to the increase in the prevalence of smoking among young people, and its association with other variables was evaluated. This study was approved by the ethical committee of the Islamic Azad University Tehran Medical Sciences, Tehran, Iran (Ethical code number: IR.IAU.PS.REC.1401.423).

Statistics:

Values are presented as mean ± SD (standard deviation) for continuous variables and as numbers (percentage) for the categorical data. Normality of data distribution was evaluated by Kolmogorov–Smirnov's test. Researchers used the chi square or Fisher's exact test to analyze categorical data among four universities. Also, association between smoking and other variables assessed by independent t-test for continuous data with normal distribution and non-parametric Mann–Whitney test for non-normality distribution continuous data. Finally, the multivariate logistic regression model was used to predict smoking as a wrong lifestyle habit among medical students (odds ratio, 95% confidence interval). All two-sided statistical tests were performed by SPSS version 22 (SPSS, Inc.). Significance level was set up at $p<0.05$.

Results:

In this cross-sectional descriptive study, out of 850 medical students in 4 major universities of medical sciences in Iran (Islamic Azad University of Tehran Medical Branch as a private university, Isfahan, Yazd and Kashan as a public university), 708 fully completed the form. The results of the characteristics of medical students of each university are shown in Table 1. The general status lifestyle item among the medical students are shown in Figure1.

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Table 1: Basic characteristics of medical students in several universities of medical sciences in Iran

Variables Mean±SD or Number (Percent%)	Islamic Azad University, Tehran Medical Branch (N=243)	Isfahan University of Medical Sciences (N=150)	Yazd University of Medical Sciences (N=165)	Kashan University of Medical Sciences (N=150)
Age	22.81±3.82	22.79±2.42	22.10±2.91	22.99±2.87
Gender				
Male	91(37.4)	89(59.3)	84(50.9)	72(48)
Female	152(62.5)	61(40.7)	81(49.1)	78(52)
Ethnicity				
Fars	125(51.4)	104(69.3)	142(86.1)	119(79.3)
Other	118(48.6)	46(30.7)	23(13.9)	31(20.7)
Number of children in the family	2.42±1.68	2.50±0.97	2.79±1.17	2.68±1.35
Marital status				
Single	227(93.4)	137(91.3)	151(91.5)	136(90.7)
Married	16(6.6)	13(8.7)	14(8.5)	14(9.3)
Father education				
Under diplom	17(7)	17(11.3)	23(13.9)	19(12.7)
Diplom	59(24.3)	39(26)	36(21.8)	44(29.3)
University level	167(68.7)	94(62.7)	106(64.2)	87(58)
Mother education				
Under diplom	21(8.6)	20(13.3)	31(18.8)	30(20)
Diplom	70(28.8)	47(31.3)	42(25.5)	47(31.3)
University level	152(62.6)	83(55.3)	92(55.8)	73(48.7)
BMI	23.74±4.06	23.87±4.44	23.45±4.43	23.76±4.13
Grade				
Basic Science	155(63.8)	73(48.7)	99(60)	75(50)
Clinical Coarse	88(36.2)	77(51.3)	66(40)	75(50)
The average grade point in the previous semesters	16.21±2.73	16.10±1.84	15.67±2.27	16.14±1.74
Past Medical history				
Positive	56(23)	39(26)	35(21.2)	25(16.7)
Negative	187(77)	111(74)	130(78.8)	125(83.3)
Monthly Family income				
Under 150 million RLS[1]	48(19.8)	54(36)	55(33.3)	56(37.3)
150 million RLS and more	195(80.2)	96(64)	110(66.7)	94(62.7)
Smoking in parents				
Yes	47(19.3)	14(9.3)	18(10.9)	16(10.7)
No	196(80.7)	136(90.7)	147(89.1)	134(89.3)
Alcohol consumption in parents				
Yes	40(16.5)	10(6.7)	9(5.5)	10(6.7)
No	203(83.5)	140(93.3)	156(94.5)	140(93.3)

[1] 1 US dollar is equal to 500,000 Rials (RLS)

In this study, approximately 17% of the participating medical students smoked, with 9% having started smoking before entering university. The significant difference was observed in chi-square analysis among students of 4 universities of medical sciences for smoking (p=0.02). 21.3% of medical students of Isfahan University of Medical Sciences smoked cigarettes, while this result was 19.8% in the Tehran Islamic Azad University, 14.5% in Yazd University of Medical Sciences and 10% in Kashan University of Medical Sciences. Also, there was a statistically significant difference between alcohol consumption in medical students of 4 universities of medical sciences (p=0.002).

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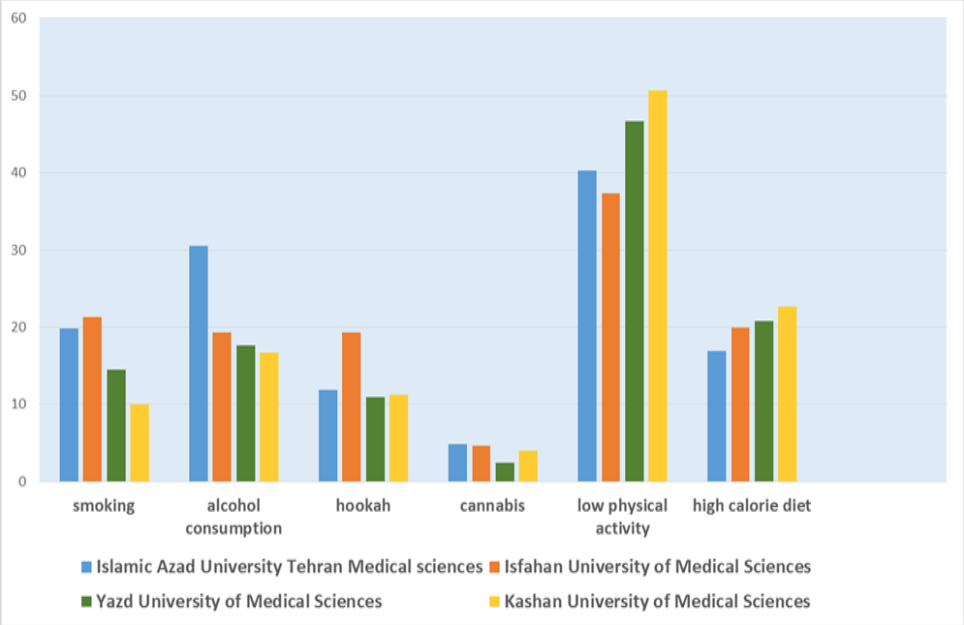


Figure 1: Comparing the medical students' lifestyle in several universities of medical sciences in Iran

In other words, 30.5% of medical students of Islamic Azad University of Tehran Medical Branch (the highest frequency) consumed alcohol, while this rate was 16.7% in Kashan University of Medical Sciences, which had the lowest consumption rate. Also, a significant difference was observed in the type of residence of medical students in these 4 universities (p<0.001). 6.6% of medical students of Islamic Azad University of Tehran Medical Branch lived in the dormitory, while this ratio was 35.3% in Isfahan Medical Sciences, 44.2% in Yazd and 46% in Kashan Universities of Medical Sciences. There was no significant difference between 4 major universities of medical sciences in the consumption of hookah, cannabis, feeling tired, physical activity, type of diet, night sleep duration (hours), stress and harmful sexual activity (p>0.05) (Table 2).

Table 3 showed the association between medical students smoking and other variables in bivariate analysis and multivariate logistic regression model. There was a statistically significant association between smoking in the medical students and older age (p=0.003), male gender (p<0.001), higher BMI (p=0.005), alcohol consumption (p<0.001), hookah consumption (p=0.005), feeling tired (p<0.001), smoking in parents (p<0.001), alcohol consumption in parents (p<0.001), which university study at (p=0.02), physical activity (per week) (p=0.02), type of diet (p=0.006), dangerous sexual activity (p<0.001) and stress (p=0.008). In the multivariate logistic regression model, after entering the significant variables of chi-square analysis, the chance of smoking in male compared to female students was estimated to be 3.33 times (OR: 3.33, 95%CI: 1.85-5.99, p<0.001). Also, the chance of smoking in students who consume alcohol was 5.03 times that of non-alcoholics (OR: 5.03, 95% CI: 2.48-8.75, p<0.001). No feeling tired was found as a predictor of not smoking among medical students (OR: 2.6, 95%CI: 1.61-4.26, p=0.006).

In addition, parental smoking and alcohol consumption can be predictors of smoking in medical students (OR: 2.7, 95%CI: 1.36-5.42, p=0.005) (OR: 2.39, 95%CI: 1.14-5.12, p=0.005) p=0.02). In the comparison of universities of medical sciences in the

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logistic regression model, only the students of Kashan University of medical sciences were 71% less at risk of smoking than those of Tehran Islamic Azad University of Medical Sciences (OR: 0.29, 95%CI: 0.12-0.69, p=0.006). As well as, the odds ratio of smoking in medical students with high and moderate physical activity was 71% and 38% lower than students with low physical activity (OR: 0.29, 95%CI: 0.25-0.77, p=0.007) (OR: 0.62, 95%CI: 0.29-0.87, p=0.003).

In addition, medical students being stress-free was a significant predictor for not smoking (OR: 2.24, 95%CI: 1.26-3.98, p=0.006). Finally, not having harmful sexual activity was a strong predictor of not smoking in medical students (OR: 6.8, 95%CI: 3.6-12.88, p<0.001).

Table 2: Difference in lifestyle among medical students of several universities of medical sciences in Iran

Variables Mean±SD or Number (Percent%)	Islamic Azad University, Tehran Medical Branch (N=243)	Isfahan University of Medical Sciences (N=150)	Yazd University of Medical Sciences (N=165)	Kashan University of Medical Sciences (N=150)	p.value
Smoking					
Yes	48(19.8)	32(21.3)	24(14.5)	15(10)	0.02*
No	195(80.2)	118(78.7)	141(85.5)	135(90)	
Alcohol Consumption					
Yes	74(30.5)	29(19.3)	29(17.6)	25(16.7)	0.002*
No	169(69.5)	121(80.7)	136(82.4)	125(83.3)	
Hookahs					
Yes	29(11.9)	29(19.3)	18(10.9)	17(11.3)	0.09
No	214(88.1)	121(80.7)	147(89.1)	133(88.7)	
Cannabis (Gol) consumption					
Yes	12(4.9)	7(4.7)	4(2.4)	6(4)	0.6
No	231(95.1)	143(95.3)	161(97.6)	144(96)	
feeling tired					
Yes	43(17.7)	17(11.3)	19(11.5)	18(12)	0.1
No	200(82.3)	133(88.7)	146(88.5)	132(88)	
Physical activity (per week)					
Low (under 30 minutes)	98(40.3)	56(37.3)	77(46.7)	76(50.7)	0.06
Moderate (30-90 minutes)	105(43.2)	59(39.3)	53(32.1)	52(34.7)	
High (more than 90-150 minutes)	40(16.5)	35(23.3)	35(21.2)	22(14.7)	
Diet					
Low calorie, fat and sugar	26(10.7)	19(12.7)	17(11.3)	16(10.7)	0.7
Moderate calorie, fat and sugar	126(72.4)	101(67.3)	112(67.9)	100(66.7)	
High calorie, fat and sugar	41(16.9)	30(20)	36(20.8)	34(22.7)	
Residence					
Dormitory	16(6.6)	53(35.3)	73(44.2)	69(46)	<0.001*
Alone in private house	52(21.4)	20(13.3)	18(10.9)	25(16.7)	
With family	175(72)	77(51.3)	74(44.8)	56(37.3)	
Night sleep duration(hours)					
< 6h	51(21)	24(16)	20(12.1)	29(19.3)	0.1
6-8 h	160(65.8)	99(66)	126(76.4)	99(66)	
>8 h	32(13.2)	27(18)	19(11.5)	22(14.7)	
Stress					
Yes	31(12.8)	12(8)	11(6.7)	11(7.3)	0.1
No	212(87.2)	138(92)	154(93.3)	139(92.7)	
Harmful sexual activity					0.1
Yes	20(8.2)	11(7.3)	8(4.8)	4(2.7)	
No	223(91.8)	139(92.7)	157(95.2)	146(97.3)	

Statistical significance is indicated by *

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Table3: Investigating smoking status among medical students in bivariate analysis and predicting cigarette consumption by using multivariate logistic regression model

Variables	Smoking		p.value	OR(95CI%)	p.value
	Yes 119(16.8%)	No 589(83.2%)			
Age(years)	23.46±3.88	22.52±2.98	0.003✱	1.06(0.95-1.19)	0.2
Gender			<0.001✱	3.33(1.85-5.99)	<0.001✱
Male	85(71.4)	251(42.6)			
Female(reference)	34(28.6)	338(57.4)			
BMI	24.91±5.14	23.46±4.17	0.005✱	1.02(0.62-1.21)	0.3
Marital status					
Single	108(90.8)	543(92.2)	0.5		
Married	11(9.2)	46(7.8)			
Grade					
Basic Science	59(49.6)	343(58.2)	0.08		
Clinical Coarse	60(50.4)	246(41.8)			
Monthly Family income					
Under 150 million RLS[2]	40(33.6)	173(29.4)	0.3		
150 million RLS and more	79(66.4)	416(70.6)			
Alcohol consumption			<0.001✱		
Yes	82(68.9)	75(12.7)		5.03(2.48-8.75)	<0.001✱
No(reference)	37(31.1)	514(87.3)			
Hookahs					
Yes	65(54.6)	39(6.6)	0.005✱	10.7(6.72—12.23)	<0.001✱
No(reference)	54(45.4)	550(93.4)			
Residence					
Dormitory	32(26.9)	179(30.4)	0.06		
Alone in private house	28(23.5)	87(14.8)			
With family	59(49.6)	323(54.8)			
feeling tired					
Yes(reference)	30(25.2)	67(11.4)	<0.001✱	2.6(1.61-4.26)	0.006✱
No	89(74.8)	522(88.6)			
Smoking in parents					
Yes	32(26.9)	63(10.7)	<0.001✱	2.7(1.36-5.42)	0.005✱
No(reference)	87(73.1)	526(89.3)			
Alcohol consumption in parents					
Yes	29(24.4)	40(6.8)	<0.001✱	2.39(1.14-5.12)	0.02✱
No(reference)	90(75.6)	549(93.2)			
Name of university					
Isfahan University of Medical Sciences	32(26.9)	118(20)	0.02✱	0.69(0.33-1.44)	0.3
Yazd University of Medical Sciences	24(20.2)	141(23.9)		0.66(0.32-1.39)	0.2
Kashan University of Medical Sciences	15(12.6)	135(22.9)		0.29(0.12-0.69)	0.006✱
Islamic Azad University, Tehran Medical Branch (reference)	48(40.3)	195(33.1)			
Physical activity (per week)					
High(more than 90-150 minutes	33(27.7)	99(16.8)	0.02✱	0.56(0.25-0.77)	0.007✱
Moderate(30-90 minutes)	40(33.6)	229(38.9)		0.62(0.29-0.87)	0.003✱
Low(under 30 minutes) (reference)	46(38.7)	261(44.3)			
Diet					
High calorie, fat and sugar	36(30.3)	105(17.6)	0.006✱	2.1(1.03-4.51)	0.8
Moderate calorie, fat and sugar	69(58)	420(71.3)		0.9(0.47-1.77)	0.06
Low calorie, fat and sugar(reference)	14(11.8)	64(10.9)			
Harmful sexual activity					
Yes(reference)	23(19.3)	20(3.4)	<0.001✱	6.8(3.6-12.88)	0.001
No	96(80.7)	569(96.6)			
Stress					
Yes(reference)	19(16)	46(7.8)	0.008✱	2.24(1.26-3.98)	0.006✱
No	100(84)	543(92.2)			
Night sleep duration(hours)					
< 6h	18(15.1)	106(18)	0.2		
6-8 h	79(66.4)	405(68.8)			
>8 h	22(18.5)	78(13.2)			

Statistical significance is indicated by ✱; [1] 1 US dollar is equal to 500,000 Rials (RLS)

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Discussion:

Non-communicable diseases (NCDs) are responsible for a significant proportion of global morbidity and mortality, particularly in terms of premature deaths. Evidence suggests that adopting a healthy lifestyle can mitigate the risk of developing these diseases or experiencing early mortality associated with them (11, 13). However, young adults, especially university students, are more susceptible to engaging in high risk behaviors and adopting unhealthy lifestyle practices (15). In the present study of the 850 medical students enrolled in this study, 708 completed the questionnaire accurately; this represents a difference between the students who completed it and those who did not that there is a need for review. Approximately 17% of ۷۰۸ medical students reported smoking, with 25% of male students being smokers. This finding is consistent with the results of Mokhtari's study on male students at Guilan University of Medical Sciences, where the prevalence of smoking was reported to be 23% (20). Similarly, Pazdro-Zastawny et al. found that 20% of medical students in Poland smoked (both traditional and electronic cigarettes), with a significantly higher prevalence among males, which is in alignment with our findings (21).

In a study conducted by Alzahrani et al. in Saudi Arabia, 23% of students were smokers. Additionally, 31% of participants engaged in a high level of physical activity during their studies, compared to 20% in our study. Furthermore, while 30% of students in the Saudi study believed they adhered to a healthy diet, only about 10% of our participants reported healthy diet (22).Chandramouleeswaran and colleagues, in a prospective cohort study from India, reported that 45% of medical interns experienced high levels of stress, a finding similar to our results, which indicated that approximately 50% of students were unable to effectively manage or control stress (23). In contrast to our study, which found that only 9% of students had initiated smoking before entering medical school, Adhikari et al. reported that 15% of students smoked, with 69% starting before medical school (24). Furthermore, Žnidarič et al. found that medical students engaged in an average of 30 minutes of moderate-intensity physical activity per day (11), and Ilic et al. reported that 62% of students engaged in regular physical activity (25). However, in our study, only 19% of students engaged in more than 150 minutes of physical activity per week, and 43% reported less than 30 minutes per week, a substantially lower level of physical activity compared to medical students in Europe. Pop et al. found that 31% of European medical students smoked, and nearly 50% occasionally consumed alcohol, whereas in our study, only 22% of students reported alcohol consumption. Additionally, Pop's study reported an average of 3.21 ± 2.71 hours of physical activity per week among European medical students, with 19% engaging in daily physical activity, figures that surpass the averages in our study (26). Our findings also revealed significant variations in smoking and alcohol consumption across different universities. For example, 21.3% of medical students at Isfahan University of Medical Sciences were smokers, compared to 19.8% at Islamic Azad University Tehran Medical Branch, 14.5% at Yazd University of Medical Sciences, and 10% at Kashan University of Medical Sciences. Similarly, the prevalence of alcohol consumption was highest at Islamic Azad University Tehran Medical Branch (30.5%) and lowest at Kashan University of Medical Sciences (16.7%). One possible explanation for the higher alcohol consumption at Islamic Azad University may be the higher prevalence of alcohol use among the parents of students at this institution.

Differences in accommodation types among universities may account for some of these variations, particularly the lack of

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dormitories at Islamic Azad University Tehran Medical Branch and the high cost of living in Tehran. However, no significant association was found between accommodation type and smoking habits, with 15% of students living in dormitories, 24% of those living at home without family, and 15% of those living with family reporting smoking.

In comparison to other studies, the prevalence of smoking among medical students in our country is comparable to that in other regions, while the lower prevalence of alcohol consumption may be attributed to the legal, cultural, and religious context in our country. However, with regard to stress management, dietary habits, and particularly physical activity, our medical students appear to be in a less favorable condition compared to their counterparts in other countries, highlighting the need for targeted interventions. This study examined the lifestyles of medical students in several large, well-resourced cities in Iran, Furthermore, all data for this research were collected via self-reports from students who chose to participate in the study. Consequently, the findings cannot be generalized to the entire young population.

Promoting a healthy lifestyle among medical students is imperative, as it is not only vital for their well-being but also for their future roles as healthcare professionals responsible for advocating physical and mental health. Some changes in dietary habits, physical activity, and lifestyle may be attributable to the demanding workload and practical training associated with medical education. Therefore, universities should prioritize enhancing facilities and resources to support the adoption of healthier lifestyle choices among medical students (26).

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