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Abstract

Background: The COVID-19 pandemic has affected many aspects of human life, including physical and mental health. The public health measures to prevent COVID-19 transmission led to social isolation, physical inactivity, anxiety, depression, sleep disorders, obesity, and consumption of unhealthy food.

Aims: To evaluate changes in lifestyle behaviour during the fifth wave of COVID-19 in Iranian medical students.

Methods: This was a cross-sectional descriptive study. In September 2021, an online questionnaire containing 32 questions was administered to 1143 medical students in Teheran universities. Some 286 completed copies of the questionnaire were excluded because of incomplete answers. Descriptive statistics of central tendency measures and dispersion were used and independent t-test and a Chi-square test between two variables were conducted. Statistical analysis was performed using SPSS version 24.

Results: A total of 462 (53.9%) students had COVID-19 during the fifth wave of the disease, 657 (76.7%) were deprived of social and sports activities, and 278 (32.4%) had difficulty completing their academic studies. Students who took vitamin supplements experienced lower levels of stress and 711 (83.0%) reported bodyweight change. There were significant relationships between bodyweight change, stress level and hospitalization due to COVID-19. There was a significant relationship between smoking, bodyweight change and hospitalization rate. A total of 426 (50.3%) students did not have a regular sleep–wake pattern, 701 (81.8%) spent more time using social media, 197 (23.0%) consumed more fast food, and 674 (78.6%) experienced stress or anxiety.

Conclusion: There was an increased tendency towards unhealthy lifestyle among medical students in Tehran during COVID-19 lockdown. These findings can be useful in assessing lifestyle behaviours among students and in planning for improvements.

Keywords: COVID-19, medical students, lifestyle, lockdown, Islamic Republic of Iran

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Introduction

Coronaviruses are a large family that can cause respiratory infections, ranging from the common cold to more serious illnesses, such as COVID-19, which is caused by the novel SARS-CoV-2 (1). The COVID-19 pandemic has affected many aspects of human life, including physical and mental health. To evaluate lifestyle, the World Health Organization recommends assessment of alcohol consumption, smoking, physical exercise, nutrition, and stress (2).

Lifestyle is a complex concept that reflects people's awareness of their lives and personalities (3). Due to the COVID-19 pandemic, there has been a sudden change in people's lifestyles and habits. Quarantine and social distancing have led to students participating in their classes online, and staying at home has reduced physical activity. Listening to news about the increasing number of COVID-19 patients, as well as lack of physical activity, have caused stress, depression, and anxiety. Decreased physical activity leads to obesity, which increases the risk of cardiovascular disease. Obesity can also be caused by being alone at home and under stress, which increases the desire to eat and consume sugar (4). A study on physicians and hospital nurses in Wuhan, China during the outbreak of COVID-19 showed that medical care workers had a high degree of depressive symptoms and anxiety (5).

Many countries implemented social distancing and stay-at-home policies to prevent transmission of COVID-19. These policies reduced morbidity and mortality, but they also had an adverse effect on mental health, emotional state, and lifestyle behaviour (6,7). According to Kumari et al., social isolation and staying at home increased overeating and inactivity, and disrupted sleep patterns (8). Another study of 584 young people, 2 weeks after the outbreak of COVID-19 in China, found that 40.4% of the participants were prone to mental health problems and 14.4% had signs of developing post-traumatic stress disorder (9).

COVID-19 and social isolation have disrupted the education of medical students, according to a study in the United States of America, gradually affecting students' physical, mental, and emotional health, and increasing anxiety. Medical students worldwide are a vulnerable population, and higher rates of depression and suicidal ideation were reported among them during the COVID-19 pandemic, and they were less likely to seek support, than students in previous studies (10).

This study was to investigate the lifestyle patterns and their influencing factors among medical students in Tehran universities during the fifth wave of the COVID-19 pandemic in the Islamic Republic of Iran.

Methods

This was a web-based, cross-sectional descriptive study conducted during the fifth wave of the COVID-19 pandemic (delta variant) in the Islamic Republic of Iran. This wave peaked in August 2021 and was caused by the delta variant of SARS-CoV-2. Medical students at Shahid Beheshti University, Tehran University of Medical Sciences, Iran University of Medical Sciences, and Islamic Azad University, Tehran Medical Branch were surveyed online in September 2021 using the snowball sampling method. Data were collected using Google Forms through a self-reported questionnaire that was designed using a previously validated questionnaire of lifestyle patterns

(11). The questionnaire was completed by 1143 students; 857 fully answered the questions and 286 incomplete questionnaires were excluded from the study. We also excluded students aged 30 years and first-semester students (because of confounding factors such as stress, lifestyle changes, and relocation to start university), as well as students with history of disability and psychiatric illness. Students' names and phone numbers were not collected to protect confidentiality.

The questionnaire consisted of 32 questions divided into 2 parts: the first included demographic information, and the second, information about the health and lifestyle of students during the COVID-19 pandemic. There were 5 questions about history of COVID-19, hospitalization, remdesivir injection, family members with COVID-19, and death of relatives from COVID-19.

Statistical analysis was performed using SPSS version 24. The mean and standard deviation were calculated as descriptive statistics. Independent t test and bivarite c2 test were used to assess the correlation between lifestyle aspects and COVID-19 infection rate, hospitalization, and stress level. P

Results

Sociodemographic characteristics of survey respondents

There were 161 male (18.8%) and 696 female (81.2%) participants, 792 were single (92.4%) and 65 (7.6%) were married. The mean (standard deviation) age of students was 23.4 (1.8) years. The average age of female students was 21.8 (3.6) years, and the mean age of male students was 24.6 (4.4) years. Seven hundred and sixty-one (88.8%) students were unemployed, 75 (8.8%) were employed, and 21 did not answer this question. There were 647 (75.9%) undergraduates, 54 (3.6%) masters students, and 156 (18.2%) doctoral students. Most students (n = 782, 91.2%) had health insurance, and 104 (12.1%) had not been vaccinated as of the time of the survey.

Lifestyle changes during COVID-19 lockdown

Physical activity

Three hundred and eight (35.9%) students stated that they undertook physical activity at least once or twice, or ≥ 3 times weekly (Table 1). Physical distancing restricted physical activity, learning, and daily activities in 657 (76.7%) students (Table 2). Students who exercised less during the week had more difficulty in studying because of stress, anxiety, or depression (P = 0.006) (Table 3).

Medical history and drug treatment

Six hundred and sixty-eight (77.9%) students had no history of underlying disease (Table 4).

Eighty-three (9.7%) students reported regular drug treatment, with levothyroxine being the most common (n = 22; 2.67%) (results not shown). Students who took vitamin supplements experienced significantly lower levels of stress (P = 0.003) (Table 5).

Rate of COVID-19 infection

Four hundred and sixty-two (53.9%) students acquired COVID-19 during the fifth wave of the disease, 182 (21.2%) required remdesivir injection, and 32 (3.7%) were hospitalized with severe COVID-19 (Table 4).

Body weight and obesity

Most students (n = 625; 72.9%) did not have a sudden change in health status during the COVID-19 pandemic, but 91 (10.6%) reported such a change (Table 2). A large number of students (83.0%, n = 711) had a change in body weight and 78.6% (n = 674) reported becoming overweight. Change in body weight in the last 6 months resulted in significant increases in stress levels (P = 0.03) and hospitalization because of COVID-19 (P = 0.007) (Table 5).

Smoking

There were 809 (94.4%) nonsmokers and only 47 (5.6%) smokers (Table 1). Most students (n = 831, 97.0%) either did not smoke at all or did not smoke during the COVID-19 pandemic (Table 2). Students who smoked had more academic problems (P = 0.002), and more difficulty in studying because of depression, anxiety, or stress (P = 0.002) (Table 3). Smokers also had a higher rate of hospitalization because of COVID-19 (P

Sleeping

Approximately half of the students (n = 431, 50.3%) did not have a regular sleep–wake pattern (Table 1). Four hundred and sixty (53.7%) students slept between 6 and 8 hours daily, 262 (30.6%) between 8 and 10 hours, 117 (13.7%) 10 hours. Five hundred and eighty-four (68.1%) students experienced reduced sleep time (Table 2). Students with irregular sleep patterns and those who slept > 10 or Table 3).

Social media (screen time)

Computer, tablet, and mobile phone use was > 4 hours daily (258 students, 30.1%), 2–4 hours daily (297 students, 34.7%), and Table 1).

A large number of students (n = 701, 81.8%) reported that they spent more time using social media during the COVID-19 pandemic (Table 2), and these students were more likely to develop COVID-19 (P = 0.004) (Table 3).

Eating habits and nutritional changes

Increased consumption of fast food during the COVID-19 pandemic was reported by 584 (68.1%) students

(Table 2). There was a significant relationship between consumption of fast food and incidence of COVID-19

(P = 0.001) and related hospitalization (P Table 5). Students who consumed more fruits and vegetables were less likely to have COVID-19 (P = 0.009).

Mental health and hygiene

Six hundred and seventy-four (78.6%) students experienced excessive stress or anxiety during the COVID-19 pandemic (Table 2). Most students (n = 776, 90.5%) reported that they had an obsession with washing or hygiene during the pandemic. Weekly consumption of fast food was significantly associated with stress level

(P = 0.002). Students who were less physically active (P = 0.024) and used more social media (P = 0.02) were more obsessed with hygiene and handwashing (Table 3). Six hundred and ninety-three (80.7%) students used toothbrushes and mouthwashes at least once or twice daily, 118 (13.9%) used them ≥ 3 times, and 42 (4.8%) used them occasionally (Table 1). Five (6.0%) students stated that they did not use a toothbrush or mouthwash at all.

Discussion

This study investigated the changes in lifestyle behaviour of medical students in Tehran during the fifth wave of COVID-19. At the time of the study, partial lockdown and some physical distancing restrictions were implemented, and consequently many social activities were cancelled. Our study demonstrated that several factors that affected students' lifestyles, including physical activity, sleep patterns, smoking, nutrition, depression, and anxiety, changed significantly during the COVID-19 pandemic, indicating that students experienced an unhealthy and sedentary lifestyle.

A systematic review by Ammar et al. (10), which investigated the lifestyles of 1047 adults found that, during the COVID-19 pandemic, physical activity decreased, sleep quality deteriorated, unhealthy dietary intake increased, and average time spent sitting at home increased from 5 to 8 hours. We found that ~78% of the study participants reported that their physical activity was limited during the COVID-19 pandemic. This is consistent with a study in Poland that reported reduced physical activity among adults during the pandemic (12), and a study in Canada that reported a significant reduction in physical activity among children and adolescents (13). In Northern Italy, 22% of participants increased their physical activity, 14% of adults maintained a constant level of physical activity, but 50% decreased their physical activity during the COVID-19 pandemic (14).

According to Dragun et al. (15), 32% of Croatian medical students reported weight loss and 19% reported weight gain during lockdown, while physical activity remained constant. These findings are inconsistent with our study because we found that 78.6% of students reported being overweight and 10.5% lost weight during the fifth COVID-19 wave in the Islamic Republic of Iran.

In our study, people with irregular sleep patterns and those who slept > 10 or

Rawat et al. showed that high weight and stress led to a lack of sleep (17), which was similar to our study. Altena et al. found that reduced physical activity and stress decreased sleep quality during the COVID-19 pandemic (18). In the study of Dragun et al. (15), the average sleep duration increased by 1.5 hours. However, among nursing students, the quality of sleep was lower despite their longer sleep time (19). This result is inconsistent with our study because 68% of participants experienced reduced sleep time. Ismail et al. found that stress and anxiety impaired the quality of sleep, and reduced energy levels during the day: 10.8% of participants had poor sleep quality and there was a 26.2% increase among people who felt tired during the pandemic (20).

Our study showed a significant relationship between healthy food intake and the rate of

COVID-19 infection and hospitalization and stress levels. Our findings were consistent with the study of Rawata et al. (17), which revealed that when people experienced stress and anxiety, their cortisol and blood insulin levels increased; both of which led to increased appetite and likelihood of choosing unhealthy foods. Similarly, 68.1% of students in our study experienced more fast food consumption during the pandemic. However, 2 other studies (21, 22) indicated that fast food intake was reduced during the COVID-19 pandemic.

We found that 78.6% of the participants experienced anxiety and distress. Similarly, Liu et al. reported that 50.7% of mental health professionals experienced depressive symptoms and 44.7% reported anxiety (23). Giuntella et al. (24) found that depression increased as a result of physical distancing and reduced socialization during the COVID-19 pandemic. Socializing was

In our study, participants who smoked had more academic difficulties and mental health problems during the COVID-19 pandemic, as well as a higher rate of hospitalization for COVID-19. According to Di Renzo et al. (4), some smokers in Italy reduced the number of cigarettes smoked daily because of fear of respiratory distress and death from COVID-19, and some had quit smoking altogether during the pandemic.

In a study of northern Italians during the COVID-19 pandemic, 23% started taking supplements to boost their immune systems (24). In our study, 21% of participants took vitamin C (11.4%) and vitamin D (9.9%) supplements.

According to a Dutch study of 1004 respondents aged 18–88 years (20), about one fifth adjusted their lifestyle to healthier eating habits, exercise, and relaxation. However, 10% of the total population surveyed stated that they had acquired an unhealthy lifestyle because of the COVID-19 pandemic.

Some of the strengths of our study were the large sample size and online nature of the questionnaire because our target population was students and they all had access to the internet. However, the online nature of the questionnaire and the availability of self-reporting tools may have led to inaccurate reporting. One of the limitations of this study was that the number of female respondents was about 4 times that of men. In a study by Smith et al. (25), the number of female participants in online surveys was higher, and should be considered when reviewing the results. Another limitation was that we only examined medical students in Tehran, and did not compare them with students in other fields in other cities. We recommend that this study be performed with a wider range of variables and a larger population.

Conclusions

Our study showed a tendency towards unhealthy lifestyle among medical students in Tehran during the COVID-19 lockdown. These changes affected sleep, body weight, obesity, nutrition, use of social media, mental health, and physical activity. In the current situation in which the pandemic has stabilized to some extent as a result of vaccination, it is important to gather more research evidence in this area, to identify students prone to psychological, behavioural, and nutritional disorders that may endanger their physical and mental health. The evidence could help in planning and determining priorities. It is also necessary to be able to maintain and promote medical students' mental health as the core of the country's medical staff, with appropriate psychological and behavioural strategies and techniques. The main purpose of this study was to assess the lifestyle changes in medical students in Tehran, which could be helpful for health policymakers and physicians. As the COVID-19 pandemic continues, our results should be validated in future larger population studies.

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Competing interests: None declared.

Changements dans les comportements liés au mode de vie et les habitudes alimentaires des étudiants en médecine iraniens pendant le confinement dû à la COVID-19

Résumé

Contexte : La pandémie de COVID-19 a touché de nombreux aspects de la vie humaine, y compris la santé physique et mentale. Les mesures de santé publique visant à prévenir la transmission de la COVID-19 ont conduit à l'isolement social, à la sédentarité, à l'anxiété, à la dépression, aux troubles du sommeil, à l'obésité et à la consommation d'aliments malsains.

Objectifs : Évaluer les changements dans les comportements liés au mode de vie des étudiants en médecine iraniens pendant la cinquième vague de COVID-19.

Méthodes : Il s'agissait d'une étude transversale descriptive. En septembre 2021, un questionnaire en ligne contenant 32 questions a été remis à 1143 étudiants en médecine dans les universités de Téhéran. Quelque 286 copies remplies du questionnaire ont été exclues en raison de l'incomplétude des réponses. Des statistiques descriptives des mesures de tendance

centrale et de dispersion ont été utilisées et un test t indépendant et un test chi carré entre deux variables ont été effectués. Une analyse statistique a été réalisée à l'aide du logiciel SPSS version 24.

Résultats : Au total, 462 (53,9 %) étudiants avaient contracté la COVID-19 pendant la cinquième vague de la maladie, 657 (76,7 %) étaient privés d'activités sociales et sportives et 278 (32,4 %) avaient des difficultés à terminer leurs études universitaires. Les étudiants qui avaient pris des suppléments vitaminiques ont connu des niveaux de stress plus faibles et 711 (83,0 %) ont signalé un changement de poids corporel. Il existait des relations significatives entre l'évolution du poids corporel, le niveau de stress et l'hospitalisation due à la COVID-19. Il y avait une relation significative entre le tabagisme, l'évolution du poids corporel et le taux d'hospitalisation. Au total, 426 étudiants (50,3 %) n'avaient pas de sommeil ou d'éveil régulier, 701 (81,8 %) passaient plus de temps à utiliser les médias sociaux, 197 (23,0 %) consommaient davantage de fast-food et 674 (78,6 %) souffraient de stress ou d'anxiété.

Conclusion : Une tendance accrue à un mode de vie malsain a été constatée chez les étudiants en médecine à Téhéran pendant le confinement dû à la COVID-19. Ces résultats peuvent être utiles pour évaluer les comportements liés au mode de vie des étudiants et pour planifier des améliorations.

19-

WHO EMRO | Changes in lifestyle behaviour and dietary patterns among Iranian medical students during

: هذه دراسة وصفية مقطعية . وفي سبتمبر / أيلول 2021 ، قُدم استبيان إلكترونيطرق البحث يحتوي على 32 سؤالًا إلى 1143 طالبًا في كليات الطب بجامعات طهران . واستُبعد قرابة 286 نسخة من استبيانات المشاركين بسبب عدم اكتمال الإجابات . واستُخدمت إحصاءات وصفية لمقاييس الاتجاه المركزي والتشتت، وجرت الاستعانة باختبار "test-t" المستقل، واختبار مربع كاي بين متغيرين . واستُخدم الإصدار 24 من برنامج SPSS لإجراء التحليل الإحصائي .

: إجمالاً، أُصيبَ 462 طالبًا (53.9%) بمرض كوفيد -19 خلال الموجة الخامسة منالنتائج المرضِ، وحُرم 657 طالبًا (76.7%) من الأنشطة الاجتماعية والرياضية، وجابه 278 طالبًا (32.4%) صعوبة في إكمال دراساتهم الأكاديمية . وأما الطلاب الذين تناولوا مكملات الفيتامينات، فعانوا مستويات أقل من التوتر، وأفاد 711 طالبًا (83.0%) بحدوث تغيير في وزن الجسم . ولقد خلص إلى وجود علاقات مهمة بين تغير وزن الجسم ومستوى الإجهاد والإدخال إلى المستشفى بسبب كوفيد -19. كذلك تبيَّن وجود علاقة مهمة بين التدخين وتغيير وزن الجسم ومعدل الإدخال إلى المستشفى . وافتقر 426 طالبًا (50.3%) إلى نمط نوم - استيقاظ منتظم، وقضى 701 طالب (81.8%) وقتًا أطول في استخدام وسائل التواصل الاجتماعي، وتناول 197 طالبًا (23.0%) المزيد من الوجبات السريعة، وتعرَّض 674 طالبًا (78.6%) للتوتر أو القلق .

: تبيَّن وجود اتجاه متزايد نحو نمط حياة غير صحي بين طلاب الطب في طهران فيالاستنتاجات أثناء فترة الإغلاق لكوفيد -19. وهذه النتائج يمكن أن تكون مفيدة في تقييم سلوكيات نمط الحياة بين الطلاب من جهة، وفي التخطيط لتحسينات في هذا الشأن من جهة أخرى .

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11 / 14

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