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RESEARCH ARTICLE

Evaluation of Health-promoting Lifestyles in Iranian students during the COVID-19 Epidemic: An Observational Study

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Abstract:

Aim:

This research was conducted with the aim of examining the health-promoting lifestyles of a specified student population in Iran.

Background:

The occurrence of the Coronavirus 2019 (COVID-19) pandemic caused changes in mental health and lifestyle. Clinical students were one of the groups with the most clinical exposure and thus were potentially most affected by the COVID-19 pandemic.

Methods:

A cross-sectional study was conducted among students of Jiroft University of Medical Sciences (JMU) in the south of Iran, who were studying in the clinical field in 2021. A consecutive sample of 200 students was used for the study. Data was collected using the Health Promoting Lifestyle Profile (HPLP) Questionnaire of Walker *et al*., the total score of the questionnaire includes a range of at least 52 points up to a maximum of 208 points. For all statistical analysis, SPSS version 26 was used. The significance level of the p-value was less than 0.05.

Results:

The mean score of total students in the lifestyle promotion of health was 129.11 ± 12.11. The highest average score was in the field of spiritual growth (24.97 ± 5.19) and the lowest score was obtained in the field of physical activity (5.17 ± 16.32). The highest average score was in nursing students.

Conclusion:

The present study showed that the level of health-promoting lifestyle among clinical students of JMU is at a moderate level indicating that promoting this lifestyle is an urgent global need, especially during the COVID-19 pandemic.

Keywords: COVID-19, Health-promoting, Lifestyle, Fatalities, Student, Pandemic.

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1. INTRODUCTION

COVID-19 was identified in December 2019 in the city of Wuhan, China, following the rapid spread of COVID-19, and the increase in the number of infections and fatalities, on March 2020, the World Health Organization announced COVID-19 as a pandemic. The spread of COVID-19 saw one of the most important issues in public health. As a result, many countries faced various issues and challenges in the fields of health, economy, and social issues [1]. Nowadays, health promotion has received increasing attention due to its pivotal role in health care [2, 3]. The World Health Organization (WHO) has also emphasized the importance of health promotion, which includes promoting a healthy lifestyle,

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creating a supportive environment for health, and public health policies [4, 5]. According to the WHO, 60% of each person's health and quality of life depends on their lifestyle and behaviors [4, 6]. Lifestyle is defined as all behaviors that are under the control of a person and affect a person's health [7]. Health-promoting behaviors are considered essential components of a healthy lifestyle that reduce the risk of illness or injury and act to maintain and increase spiritual growth, well-being, and satisfaction [8]. Health-promoting behaviors are tools to increase a person's physical and mental health and will have a positive impact on people's lives [9, 10].

People's lifestyle is also an effective factor in health and reducing chronic diseases and thus increasing life expectancy [11, 12]. The majority of deaths and morbidity in today's societies are due to improper lifestyle practices such as smoking, poor eating habits, and inadequate physical activity, so accurate assessment of lifestyle and health behaviors are essential to developing and designing programs for health promotion and preventive policies [13, 14].

Among the members of society, young adults are very important because they are in the process of forming life habits and behaviors and these behaviors generally remain the same until adulthood. Students are in fact in a developmental stage that is a bridge between youth and middle age and includes major changes in behaviors, lifestyle habits, ways of thinking, and interpersonal and social relationships [15, 16].

With changes in educational conditions as well as living conditions, many students face a wide range of inappropriate habits including poor nutrition, inadequate activity, and poor interpersonal relationships as well as various psychological pressures [17, 18]. The Coronavirus 2019 (COVID-19) pandemic is one of the most significant environmental changes that have had a significant impact on the lives of many people, especially students [19, 20].

Due to the high infectivity and transmission of the disease, the WHO declared a state of emergency and recommended that countries reduce the person-to-person transmission of the disease by reducing contact, especially with affected individuals and caregivers, and its global spread [21, 22].

The impact of COVID-19 on health can be assessed in two ways: directly, as an infectious disease, and indirectly as a risk factor, for example, an increase in psychiatric disorders due to national shutdowns or activity delays, follow-ups and limited access to health care services [23].

The implementation of home quarantine policies, despite the positive consequences, has also caused negative effects in the community with the outbreak of the COVID-19 pandemic and the application of quarantine, and the need to observe social distancing, many individuals' daily habits have been affected. The stress and psychological effects of this disease on the one hand, and changes in eating habits and inactivity due to quarantine on the other hand are factors that make it necessary to pay attention to health-promoting lifestyle behaviors, especially in students. Due to limited studies in this field during the COVID-19 pandemic in Iran, the present study was conducted to determine the health-promoting lifestyle of students during the coronavirus epidemic.

2. MATERIALS AND METHODS

2.1. Target Population and Setting

A cross-sectional study was conducted among students of Jiroft University of Medical Sciences (JMU) (JMU) in the south of Iran, in 2021. A consecutive sample of 200 students was used for the study. The sampling method was random sampling between students who were enrolled in clinical courses in the fields of medicine, nursing, and paramedical disciplines. Inclusion criteria consisted of students of JMU who are enrolled in a clinical course and were satisfied with taking part in the study and exclusion criteria were students who did not consent to participate in the study or did not have the necessary cooperation to complete the questionnaire, almost 15% were excluded from the study.

2.2. Data Collection

Data were collected using a two-part questionnaire. In the first part, demographic and educational information of students including age, gender, marital status, residence status in Jiroft city, the status of the region, history of physical and mental illness, the field of study, and semester were asked. The second part of the questionnaire included the Health Promoting Lifestyle Profile (HPLP) Questionnaire of Walker *et al*. [24]. This questionnaire measures health-promoting behaviors in six dimensions. These dimensions include nutrition, physical activity, health responsibility, stress management, interpersonal relationships, and spiritual growth. This questionnaire consists of 52 questions that are scored with a 4-choice Likert scale (1 = never, 2 = sometimes, 3 = often and 4 = always), and the total score of the questionnaire includes a range of at least 52 points up to a maximum of 208 points. The questionnaire was translated into Farsi and its reliability and validity were verified by Mohammadi Zeidi *et al*. [7]. The data collection was conducted through online Google forms distributed *via* social media platforms, including Whatsapp.

2.3. Data Analysis

SPSS version 26 was used for all statistical analyses, descriptive statistics including frequency, percentage, mean, and standard deviation, and for normality tests, we used Kolmogorov-Smirnov which indicated that the majority of the data were normal. For comparison mean more than two groups used ANOVA and also tukey's post hoc tests were completed to compare between groups. For comparing the mean of the two groups we used the Mann-Whitney U test and in condition non-parametric, the significance level was a p-value less than 0.05.

3. RESULTS

In this study, 200 students were evaluated. The mean and standard deviation of the age of the students was 23.18 ± 1.99 years. The sex distribution of study participants shows that 59% of study participants were female. The majority of participants (81.5%) were single and 17% were married without children and 1.5% were married with children. The main students in the present study were non-native students of the region (54%), the rest were natives. Most of the students

lived in dormitories (63%), 29.5% lived in private homes and 6% of people lived in a rented house and 1.5% lived in a relative's house. The main participants in the study did not mention any specific history of physical or mental illness, 8% of the participants in the study mentioned a history of physical illness and 5.5% mentioned a history of certain neurological diseases (Table **1**).

The highest frequency according to the field of the participants in this study was medicine (51%), nursing (14%), midwifery (9.5%), operating room (7%), science laboratory (6%), environmental health (5%), public health (4%) and anesthesia (3.5%). The scores obtained in the health-promoting lifestyle questionnaire in terms of each of the six dimensions of health-promoting behaviors are shown in Table **2**.

Table **3** shows the mean and standard deviation of students' scores by field of study. The average total score of nursing students was higher than in other fields. Comparing the scores obtained by field of study, a significant difference was observed in the areas of spiritual growth, nutrition, physical activity, stress management, and total score between students in medical, nursing, and paramedical fields of study.

Table 1. Demographic characteristics of the studied participants.

Variables		Number (percent)
Age	Mean ± standard deviation	23.18±1.99
Sex	Female	118 (59)
	Male	82 (41)
Marital status	Single	163 (81.5)
	Married without children	34 (17)
	Married with children	3 (1.5)
Indigenous status	Non- Indigenous	108 (54)
	Indigenous	92 (46)
Residual status	Dormitory	126 (63)
	Private house	59 (29.5)
	Rental house	12 (6)
	Relatives' house	3 (1.5)
History of physical illness	Yes	16 (8)
	No	59 (92)
History of neurology and psychiatry diseases	Yes	11 (5.5)
	No	189 (94.5)

Table 2. Scores obtained in different constructs of the health promoting lifestyle questionnaire.

Dimensions of Health-promoting Behaviors	Achievable Score	Mean±SD	Minimum	Maximum
Spirituality growth	9-36	24.97±5.19	9	36
Health responsibility	9-36	23.03±5.25	11	36
Interpersonal relationship	9-36	24.49±4.48	12	36
Nutrition	9-36	22.40±4.86	11	36
Physical activity	8-32	16.32±5.17	8	32
Stress management	8-32	18.58±3.85	10	32
Total HPLP score	52-208	129.8. ±22.11	65	207

Table 3. Scores obtained in the Health promoting lifestyle questionnaire by field of study.

Field of Study		Spirituality Growth	Health Responsibility	Interpersonal Relationship	Stress Management	Physical Activity	Nutrition	Total HPLP Score
Medicine	Mean	24.04	22.42	24.08	17.84	15.17	22.25	125.80
	SD	5.030	4.508	3.542	3.341	4.629	4.626	18.067
Nursing	Mean	27.34	24.74	25.38	20.62	19.00	24.09	141.17
	SD	5.434	6.512	6.124	4.590	6.266	4.800	28.173
Paramedical disciplines	Mean	24.65	22.69	24.51	18.20	16.14	21.12	127.29
	SD	4.664	5.081	4.347	3.470	4.176	5.007	19.873
P-value *		0.001	0.110	0.297	0.001	0.001	0.007	0.002

Note: * Kruskal-Wallis test

Post hoc spiritual growth score test for binary comparison showed that there is no significant difference between this score in medical and paramedical disciplines (p = 0.784) while significant differences were observed between nursing and medical disciplines (p <0.001) and nursing and paramedical disciplines (p = 0.003).

Post hoc stress management score test for binary comparison showed that there is no significant difference between this score in medical and paramedical disciplines (p = 0.853) while significant differences were observed between nursing and medical disciplines (p <0.001) and nursing and paramedical disciplines (p = 0.002).

Post hoc physical activity score test for binary comparison showed that there was no significant difference between this score in medical and paramedical disciplines (p = 0.531) and also no difference was seen between nursing and paramedical disciplines (p = 0.082) but significant differences were seen between nursing disciplines, and medicine (p <0.001)

Post hoc nutritional score test for binary comparison showed that this score was not significantly different between medical and paramedical students (p = 0.369) and also there was no difference between nursing and medical students (p = 0.105) but a significant difference was observed between nursing and paramedical students (p <0.001).

The post hoc test of the total score of the questionnaire for binary comparison showed that this score was not significantly different between medical and paramedical students (p = 0.837) but significant differences were observed between nursing and medical students (p = 0.003), and between nursing and paramedics (p = 0.0009).

Table **4** shows the scores obtained by students according to the local status of the region. As shown, the total score and score of different areas of native students were higher than non-native students, but only in the areas of spiritual growth (p = 0.013), nutrition (p = 0.035), and total score (p = 0.044) observed significant differences.

Table **5** shows the mean and standard deviation of the scores obtained in different constructs of the Health Promoting Lifestyle Questionnaire according to the history of mental disease. According to the results of analytical tests, significant differences were observed only in the field of spiritual growth (p = 0.047).

Table 4. Scores obtained in different structures of health-promoting lifestyle questionnaires according to the local status of the region.

Indigenous status		Spirituality Growth	Health Responsibility	Interpersonal Relationship	Stress Management	Physical Activity	Nutrition	Total HPLP Score
Non-autochthon	Mean	24.06	22.69	23.82	18.03	15.88	21.69	126.17
	SD	5.203	5.106	4.364	3.265	4.724	4.376	19.428
Autochthon	Mean	26.03	23.45	25.28	19.24	16.83	23.23	134.05
	SD	4.995	5.405	4.507	4.376	5.631	5.269	24.309
P-value*		0.013	0.370	0.075	0.131	0.299	0.035	0.044

Note: *Mann-Whitney test

Table 5. Comparison of the score obtained in the Health promoting lifestyle questionnaire according to the history of mental illness.

History of Neurology and Psychiatry Diseases		Spirituality Growth	Health Responsibility	Interpersonal Relationship	Stress Management	Physical Activity	Nutrition	Total HPLP Score
Yes	Mean	21.73	21.36	23.27	17.27	14.73	22.64	121.00
	SD	5.331	4.589	4.519	4.149	5.042	6.975	24.352
No	Mean	25.16	23.13	24.57	18.66	16.41	22.38	130.31
	SD	5.133	5.276	4.478	3.835	5.174	4.730	21.931
P-value *		0.047	0.270	0.455	0.200	0.293	0.957	0.204

Note: *Mann-Whitney test

Table 6. The relationship between the score in the lifestyle questionnaire promoting students and semester students.

The Relationship between the Students' Scores and Semester	Spirituality Growth	Interpersonal Relationship	Health Responsibility	Nutrition	Physical Activity	Stress Management	Total HPLP Score
Spearman correlation coefficient	-0.089	-0.032	0.018	0.009	-0.169	-0.018	-0.04
P-value	0.209	0.651	0.803	0.895	0.017	0.797	0.571

Table 7. Comparison of scores obtained in health promotion lifestyle questionnaire in terms of residence status.

Housing		Spirituality Growth	Health Responsibility	Interpersonal Relationship	Stress Management	Physical Activity	Nutrition	Total Score
Dormitory	Mean	24.33	22.79	23.79	18.35	16.44	21.83	127.52
	SD	5.146	5.281	4.723	3.944	5.216	5.046	22.893
No-dormitory	Mean	26.07	23.45	25.69	18.99	16.11	23.36	133.66
	SD	5.113	5.195	3.767	3.688	5.117	4.381	20.266
P-value*		0.012	0.266	0.001	0.088	0.945	0.003	0.013

Note: *Mann-Whitney test

In examining the relationship between semester and students' scores, only a significant inverse relationship was observed between the score of physical activity and semester (p = 0.017) (Table **6**).

Table **7** shows the average and standard deviation of students' scores by residence status. The total score of non-dormitory students was higher than dormitory students. According to the results of analytical tests, significant differences were observed only in the areas of spiritual growth (p = 0.012), interpersonal relationships (p = 0.001), nutrition (p = 0.003), and total score between the dormitory and non-dormitory students (p = 0.013). There were no significant relationships between the health-promoting lifestyle score and other variables such as gender, marital status, and the history of physical illness.

4. DISCUSSION

The COVID-19 pandemic affected the health-promoting lifestyle of students during the coronavirus epidemic. Examining people's lifestyles during the pandemic was an effective step in formulating individual and collective programs and policies to improve health-promoting behaviors and lifestyle modifications. Clinical students were one of the groups most affected by the COVID-19 pandemic.

The findings of our study showed that the average score of health-promoting lifestyle for all participants was 129.80. Also, the highest mean score was obtained in the field of spiritual growth (24.97. 5.19) and the lowest score was obtained in the field of physical activity (16.32 ± 5.17). Based on the average of the total score obtained, the health-promoting lifestyle of clinical students of JMU appears to be moderate. This result is somehow consistent with the finding of Rahimi *et al*. study conducted among students of the Tehran University of Medical Sciences during the pandemic. They found that the mean score among the students was 138.28. Also, the lowest score was related to physical activity and the highest score was related to spiritual growth [3, 25]. Moreover, the results of a study carried out in Turkey indicated that the mean score was 126.37 [26]. The figures in our study and other similar studies indicate that the average level of a health-promoting lifestyle is far from the desired level.

Numerous studies in Iran show a low score of physical activity as a health-promoting behavior both before and during the COVID-19 Pandemic [27, 28]. This suggests that low physical activity is a challenge, especially among Iranian students, which may be related to an intensive academic and internship work schedule, insufficient motivation for exercise and mobility, or limited access to sports equipment [25]. On the other hand, due to the need to observe social distancing during the COVID-19 pandemic, staying at home may reduce out-of-home activities and consequently inadequate mobility and physical activity [29].

Our study showed that the total score of the Health Promoting Lifestyle Questionnaire in the study sample was significantly higher in nursing students than in medical and other paramedical students. It seems that nursing students, for reasons such as early clinical exposure to patients, the need to communicate effectively and empathetically with the patient, and the need for stress management, had more adaptation to reinforce health-promoting behaviors in the study sample.

Although in our study there was no difference in the level of health-promoting lifestyle according to the history of physical illness, the score in the field of spiritual growth was significantly different according to the history of mental illness and it seems that neurological diseases reduce health-promoting behaviors in the area of spiritual growth focuses on the development of one's inner resources and keeps one in balance. These behaviors bring inner peace to the individual and allow them to move towards what is beyond human existence [24, 30].

Our study also showed that there was a significant relationship between students' grade level and semester only in the field of physical activity so higher semester students received lower physical activity scores. This finding may be due to the fact that engaging in more shifts in internships had prevented the opportunity for proper planning for regular physical activity.

The findings of our study also showed that there is a significant difference between dormitory students and non-dormitory students in the areas of self-fulfillment, interpersonal relationships and nutrition, as well as in the overall score of a health-promoting lifestyle. In all these areas, the average score of non-dormitory students was higher than students living in dormitories. In line with our study, Bakui *et al*. showed that students living with families had better eating habits than students living in dormitories. Rahimi *et al*. reported that the highest nutritional score was related to students who lived with their families.

Due to the COVID-19 pandemic and the need to observe social distancing, research questionnaires were distributed online among the sample, which was the most important limitation of the present study. However, it was tried to attract more participation from the research community by explaining

the goals and importance of the research and another limitation was the study had been conducted in only one center, and other factors not evaluated in the study may affect the relationship between the variables.

CONCLUSION

The present study showed that the level of health-promoting lifestyle among clinical students of JMU is at a moderate level indicating that promoting this lifestyle is an urgent global need, especially during the Covid-19 pandemic. Therefore, considering that physical activity is one of the important known factors in increasing a health-promoting lifestyle and preventing chronic diseases, more attention should be paid to this issue and finding a solution to increase the average level of daily physical activity. Also, it seems that student support systems should be more proactive in supporting students living in dormitories, especially during the COVID-19 pandemic.

AUTHORS' CONTRIBUTION

SD, HA, and RF were involved in all aspects of study conception and design, data collection, data analysis, interpretation, drafting of the manuscript, and critically revising the manuscript for intellectually important content; AJ, SNH, and MH helped in the general design of the study, data analysis, results from interpretation, co-authoring, and editing along with the whole manuscript All the authors have read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

LIST OF ABBREVIATIONS

JMU	=	Jiroft University of Medical Sciences
HPLP	=	Health Promoting Lifestyle Profile
WHO	=	World Health Organization

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study protocol was approved by IR.JMU.REC.1399.077 number in the Ethics Committees of Jiroft Medical University (JMU).

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committees and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

All participants volunteered to participate in the study

FUNDING

This investigation was sponsored by JMU, Iran.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data that support the results of this study are accessible from the corresponding author [S.D] upon reasonable request.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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