Assessment of Health-promoting Lifestyle among Medical Students of Mashhad University of Medical Sciences in 2018-2019

Nafiseh Mousavi Bazaz 1, Masoumeh Haghighi 1, Roya Boujaran 2, Vida Vakili 3, Mojtaba Mousavi Bazzaz 4, Gholamreza Haghighi 5*

1. Student Research Committee, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
2. Medical Doctor, Mashhad, Iran
3. Associate Professor of Community Medicine Department of Community Medicine, School of Medicine, Mashhad University of Medical Sciences
4. Professor of Community Medicine Department of Community Medicine, School of Medicine, Mashhad University of Medical Sciences
5. Assistant Professor of Iranian Traditional Medicine, School of Medicine, Zabol University of Medical Sciences, Zabol, Iran

Abstract
Background and Objective: Young adults, especially the students of medical fields, as the health ambassadors of every community, play a vital role in health maintenance and improvement of society. Promoting the lifestyle behaviors of this group leads to the better health status of other society members. This study was set to assess the Health-promoting Lifestyle (HPL) of medical students in Mashhad, Iran.

Material and Methods: This descriptive cross-sectional study was performed on 120 medical students of Mashhad University of Medical Sciences in 2018-2019. The data were collected by the self-reported Persian version of HPL profile II which has been validated in former studies. SPSS package (version 20) was used to analyze data, and two independent samples t-test to compare data sampling was done in two stages, including random selection of the classroom and the clinical ward, and then random selection of students in each.

Results: 50.2% of all participants were male in gender and 77.5% were single. The overall score of HPL profile II among all the participants was moderate. According to the scores of Health-promoting Lifestyle Behaviors (HPLB), stress management scored the highest (29.62±4.45), spiritual growth, and physical activity was at the lowest levels (10.84±2.07 and 16.55±4.97, respectively). Two dimensions of HPLB showed a significant difference based on the gender of the participants (better physical activity in men (p-value= 0.04) and self-responsibility for health in women (p-value=0.05)). There was not a statistical difference between HPL subscales by the participants’ marital status.

Conclusion: The HPL profile II total score is moderate, but not desirable; therefore, admitting appropriate programs for lifestyle improvement, especially in the field of mental development, physical activities, and nutrition, regarding student gender, is recommended. Our findings can attribute the health policymakers to developing health programs among the students and adding related courses to the educational curriculum.

Keywords: Health Education [MESH], Health Promotion [MESH], Health-promoting Lifestyle , Medical Students [MESH]
Assessment of Health-promoting Lifestyle among Medical Students

Mousavi Bazaz N. et al.

Introduction

Non-communicable Diseases (NCDs) had attracted worldwide attention and World Health Organization (WHO) asks every country to prevent them as an indispensable investment (1). Lifestyle, which is defined as the style of living that depends on behavioral patterns, highly influences health (2). As WHO states, health plays a pivotal role in the context of countries' significant progress, and governments need to deliver health care to the community (1, 3).

Poor lifestyle habits (e.g. using fatty-sweet foods, insufficient sleeping, low physical activity, and stress, and anxiety) are considered as the risk factors for many diseases such as acute myocardial infarction (4), hypertension (5), obesity (6), diabetes and cancer (7) and even road accidents (8). Mentioned disorders are the most common and fatal chronic diseases around the world (9, 10). Lifestyle promotion can reduce the risk of many disorders, as a healthy lifestyle declines death rates and enhances the life expectancy and also can seriously affect a country's advancement (11).

Health Promoting Lifestyle (HPL) focuses on life promotion through lifestyle which consists of six aspects of “physical activity”, “nutrition”, “health responsibility”, “spiritual growth”, “interpersonal relations” and “stress management”. This lifestyle promotes health and welfare and induces satisfaction, self-persuasion, and self-improvement (2).

Creation effective guides with healthy lifestyles is an effective way of promoting the lifestyle behaviors of society (12).

Young adults have a key role as guides and withal procreate in societies. Therefore, promoting the lifestyle of this group can easily extend to their environment (13). Among the young adults, medical students are known as health statesmen and tasked with people's health (14). High levels of stress, depression, and fatigue are the main obstacles for medical students to follow a healthy lifestyle. They lead to bad behaviors like fast food consumption, inactivity, bad sleep, and smoking (15).

Despite the importance of this issue, it is not the concern of many people worldwide because they believe young people have good health; so, less attention is paid to their behavioral lifestyles (16). Moreover, previous studies have been conducted among particular groups, for instance, elderly, menopausal, or postmenopausal women and patients (12, 17-20).

The literature of related articles shows that interventional programs can promote healthy behaviors among particular groups (21-25).

Iran is one of the developing countries which contends with some medical ills as cardiovascular disorders, obesity, hypertension, and cancer (2). Extensive research has shown that lifestyle is one of the main causes of many diseases (26-28). As young people especially medical students have significant impacts on the other groups' patterns of behavior; HPL is fundamental for this group, consequently, they would be health promoters in the population.

Despite the importance of this issue, few studies have been conducted to assess the Health-Promoting Lifestyle Behaviors (HPLB) among medical students, and literature from the Persian region for this group is even more limited. Therefore, this study was carried out as the first one among medical students of Mashhad University of Medical Sciences (MUMS) to assess HPLB, and the findings should make a crucial contribution to health policy determinants.
Materials and Methods

This cross-sectional study was conducted on medical students at Mashhad University of Medical Sciences (MUMS), Mashhad, Iran for one year and one month from February 2018 to March 2019 years.

In this study, to explore HPL among students, 120 students participated. We used the Persian version of Health-promotion lifestyle profile II with 52 items to collect data from available samples.

By Mohammadi et al. This self-administered questionnaire version was validated with Cronbach’s alpha 82% (29). To include all educational stages, the researcher attended medical college classrooms and other educational gatherings (journal clubs and morning reports) at Quaem & Imam Reza hospitals. The questionnaires were collected after describing the study for the students and distributing them by random.

The sample size was computed 106 people; with the average estimation formula and in terms of the type 1 error (α) and estimated error, 5%, and 3%, respectively, and standard deviation d= 8; which increased to 120 people by considering the 10% drop.

The two-stage sampling design was applied to 120 attendees of the study; first, the selection was randomly done according to the classroom and clinical ward and the second stage consist of randomized selecting students in each.

Inclusion criteria: studying at the time of research; Exclusion criteria: incomplete fill out the questionnaires.

Data collection was done through a two-section questionnaire. The first part included four demographic questions (age, gender, educational stage, and civil status); the second part included the HPLP questionnaire.

The HPLP II questionnaire, designed by Walker et al. (1), consists of 52 items with six dimensions of health responsibility (9 questions), physical activity (8 questions), nutrition (9 questions), spiritual growth (9 questions), interpersonal relationships (9 questions), and stress management (8 questions). The items are rated on a four-point Likert scale (“never”, “frequently”, “almost”, and “always”) and numerically ranked from 1 to 4 (1= “never” and 4= “always”). The lowest and highest possible scores for the total scale were 52 and 208, respectively.

To divide into three levels, unfavorable lifestyle (less than 50% of the total score), moderate (50 to 75% of the total score), and favorable (75 to 100% of the total score) were calculated and divided from the total score in every aspect and the whole score (Table 2).

Ethics

After being informed about the aims and procedure of the study, each participant gave informed written consent to participate in the study, which was approved by the Mashhad University of Medical Science Ethics Committee (Registration code: MUMS/950679). Researchers assured the confidentiality and namelessness of data.

Statistical analysis

Data were expressed as means ± SD (for parameters with a normal distribution) or median and interquartile range (in the case of non-normally distributed data). Numerical data were compared using two independent-samples t-tests. Statistical analysis was performed using the SPSS package (version 20) and a p-value < 0.05 was considered statistically significant. Kolmogorov-Smirnov test was used to check the normality of the data.

Results

As mentioned before, this study set to evaluate the six aspects of HPLB among medical students of MUMS. The samples were divided according to the number of employees in the educational levels regarding, which displays the main characteristics of all 120 participants, the mean age of the students was 22.08±2.31 and 50.8% of them were male in gender. The distribution of these data based on the Kolmogorov-Smirnov test was normal.
Comparing the results with the total mean and mean of each component, the overall health-promoting lifestyle status among students is in a moderate status. The components of responsibility and stress control are in moderate and favorable condition; the components of physical activity, nutrition, and interpersonal communication are in the moderate status and the components of spiritual growth are in the unfavorable condition.

The results, represented in Table 3, indicate that there was no significant difference between means of four components of HPLB (nutrition, stress management, interpersonal relations, and spiritual growth) and students’ gender (p-value= 0.1, 0.8, 0.7, 0.5, respectively). But the males had significantly higher physical activity than females (p-value=0.04) and the difference between self-responsibility for health and the gender was also significant (p-value=0.05, higher in females). The marital status of students did not have significant relations with HPLB subscales.

As shown in Table 2, among the HPLB subscales, stress management scored the highest, and self-responsibility for health, interpersonal relations, nutrition, physical activity, and spiritual growth were in lower levels, respectively.

### Table 1. Main characteristics of the 120 participants

<table>
<thead>
<tr>
<th>Demographic factors</th>
<th>Number (%)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td>22.08±2.31</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>61 (50.8%)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>59 (49.2%)</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>27 (22.5%)</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>93 (77.5%)</td>
<td></td>
</tr>
<tr>
<td>Year of education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>20 (16.7%)</td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td>22 (18.3)</td>
<td></td>
</tr>
<tr>
<td>Third</td>
<td>19 (15.8%)</td>
<td></td>
</tr>
<tr>
<td>Fourth</td>
<td>25 (20.8%)</td>
<td></td>
</tr>
<tr>
<td>Fifth</td>
<td>17 (14.2%)</td>
<td></td>
</tr>
<tr>
<td>Sixth</td>
<td>8 (6.7%)</td>
<td></td>
</tr>
<tr>
<td>Seventh</td>
<td>9 (7.5%)</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2. Student score status of six aspects/total of HPLB among 120 medical students at MUMS, in 2018-2019

<table>
<thead>
<tr>
<th>subscales of HPL</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean±SD</th>
<th>Student score status**</th>
<th>Maximum score achievable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical activity and fitness (8Q) *</td>
<td>8</td>
<td>32</td>
<td>16.55±4/97</td>
<td>moderate</td>
<td>32</td>
</tr>
<tr>
<td>Nutrition (9Q)</td>
<td>12</td>
<td>32</td>
<td>18.61±3.52</td>
<td>moderate</td>
<td>36</td>
</tr>
<tr>
<td>Self-responsibility for health (9Q)</td>
<td>16</td>
<td>38</td>
<td>26.98±4.45</td>
<td>moderate</td>
<td>36</td>
</tr>
<tr>
<td>Spiritual growth (9Q)</td>
<td>6</td>
<td>16</td>
<td>10.84±2.07</td>
<td>unfavorable</td>
<td>36</td>
</tr>
<tr>
<td>Interpersonal relations (9Q)</td>
<td>14</td>
<td>31</td>
<td>22.43±3.54</td>
<td>moderate</td>
<td>36</td>
</tr>
<tr>
<td>Stress management (8Q)</td>
<td>17</td>
<td>36</td>
<td>29.62±4.55</td>
<td>favorable</td>
<td>32</td>
</tr>
<tr>
<td>Total score (Q52)</td>
<td>90</td>
<td>178</td>
<td>125±0.58</td>
<td>moderate</td>
<td>208</td>
</tr>
</tbody>
</table>

HPL: health-promoting lifestyle
SD: standard deviation
*Number of questions in each aspect
**Based on the division in the text of the article
**Table 3.** Mean and standard deviation of HPLB subscales by gender and marital status of the participants

<table>
<thead>
<tr>
<th>Subscales of HPL</th>
<th>Gender (mean±SD)</th>
<th>Marital status (mean±SD)</th>
<th>df</th>
<th>t</th>
<th>p-value</th>
<th>df</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MALE (n=61)</td>
<td>FEMALE (n=59)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical activity and fitness</td>
<td>17.47±5.21</td>
<td>15.61±4.57</td>
<td>118</td>
<td>-2.08</td>
<td>0.04</td>
<td>16.33±5.59</td>
<td>16.62±4.81</td>
<td>118</td>
</tr>
<tr>
<td>Nutrition</td>
<td>18.19±3.56</td>
<td>19.05±3.46</td>
<td>118</td>
<td>1.33</td>
<td>0.1</td>
<td>17.96±3.37</td>
<td>18.80±3.56</td>
<td>118</td>
</tr>
<tr>
<td>Self-responsibility for health</td>
<td>26.21±4.16</td>
<td>27.77±4.63</td>
<td>118</td>
<td>1.97</td>
<td>0.05</td>
<td>27.14±4.52</td>
<td>26.93±4.45</td>
<td>118</td>
</tr>
<tr>
<td>Spiritual growth</td>
<td>10.73±2.02</td>
<td>10.49±2.12</td>
<td>118</td>
<td>-</td>
<td>0.194</td>
<td>10.88±2.24</td>
<td>10.82±2.03</td>
<td>118</td>
</tr>
<tr>
<td>Interpersonal relations</td>
<td>22.34±3.36</td>
<td>22.52±3.75</td>
<td>118</td>
<td>0.279</td>
<td>0.7</td>
<td>23.00±4.06</td>
<td>22.26±3.38</td>
<td>118</td>
</tr>
<tr>
<td>Stress management</td>
<td>29.70±4.19</td>
<td>29.54±4.94</td>
<td>118</td>
<td>0.558</td>
<td>0.8</td>
<td>29.44±4.68</td>
<td>29.67±4.54</td>
<td>118</td>
</tr>
</tbody>
</table>

HPL: health-promoting lifestyle
SD: standard deviation
p-value significant at p 0.05

**Discussion**

The key finding of the current study states that the mean of HPL in the participants is moderate, like what Pouresmaeili et al. (30) and some other studies discussed (31-35). This finding is contrary to earlier studies that have shown the poor lifestyle choices of medical students (36, 37). Nevertheless, more accurate plans should be made to enhance the current students’ situation.

The results relevant to scores of HPL dimensions show that stress management has the highest score. It is likely Related to difficult admission to medical school so that better stress management leads to success in entrance exams for Iran’s best universities including MUMS, however, it may be an untrue conclusion due to the small number of participants in our study. Different work statuses of participants also should be considered, because it is believed that the last 3 years of educating medicine, is more stressful for the students (38), still merely a quarter of our participants are in these stages. However, this finding is not supported by previous research, stress management scored medium in other studies (30, 31, 39, 40).

The students scored lowest in spiritual growth. It may partly be supported by the idea of the "age gap in religion" signifies that young adults tend to be less pious than their elders (41). Although this result does not match those been attained in Nacar et al. (33) and other studies (40, 42, 43) suggesting the medium to high score of spiritual growth. This contrary may be due to geographic and cultural differences.

The second-lowest subscale of this study was associated with physical activity, feasibly due to lack of leisure time, excessive workload, and poor sports complex, which is present in some other studies (2, 31, 34, 44). Therefore, there is a definite need for taking measures to improve the physical activity situation of the students, by informing and motivating them and allocating facilities.

This experiment detected significant differences in average scores between physical activity and self-responsibility based on gender; higher in males and females respectively. Higher physical activity scores in men may be related to androgenic hormones and are in line with earlier projects conducted by Wei et al. (39) and others (38, 45). Considering the fitness low score despite...
its crucial role in preventing NCD; policymakers should pay more attention to improving medical students’ fitness. The better status of health responsibility in women is consistent with the result of Leung et al. study in 2020 (46). These differences should be considered for making appropriate decisions.

A surprising result, rarely described before, was a meaningless difference in HPL subscales between single and married participants. Generally being a woman as a wife or mother and a man as a husband or father, increases responsibility. Also having less free time could lead to more fast food consumption and less physical activity (44). This observation could be attributed to the limited number of married students in our research or to an Iranian culture in which before the wedding ceremony the couples must live with their parents although, they are married!

These findings might be somewhat limited by the study design, cross-sectional, therefore the causations cannot be determined. Also, the HPLB of the participants could just investigate short-term. Besides, the sample included only medical students of MUMS and students studying medicine at other universities were not comprised. Thus, the results of this article cannot be extrapolated to other centers or countries. As a further matter, the data collection only relies on self-reporting by the students then has bias. Using a standard questionnaire can be considered as one of the strengths of this study.

Further studies on the present topic with more focus on comparison HPLB between native and non-native students for making better policies are recommended.

Conclusion

The results of this study showed that health-promoting behaviors among students were generally moderate. Stress management was at its best, mental development at its worst. The other aspects of health-promoting behavior were moderate. Differences in the status of various aspects of health-promoting behaviors between the two sexes require different planning in the two groups.

Acknowledgment

Not applicable.

Declarations

Funding source: The grant of the Deputy of Research of Mashhad University of Medical Sciences (MUMS) has provided the funding for this study (Registration code: MUMS/ 920249). This deputy has not played a further role in study design, data collection and analysis, writing the paper, and in the decision of paper submission for the current publication.

Ethical Approval

This project was approved by the Ethics Committee of Mashhad University of Medical Sciences.

Conflict of Interest

The authors declare that there is no conflict of interest respecting all aspects of this research.

Authors’ contributions: Study concept and design: Mojtaba Mousavi Bazzaz, Vida Vakili, Gholamreza Haghighi, Data collection: Nafiseh Mousavi Bazzaz, Masoumeh Haghighi, Roya Boujaran, Data analysis, and Expounding: Mojtaba Mousavi Bazzaz, Nafiseh Mousavi Bazzaz, Drafting of the manuscript: Nafiseh Mousavi Bazzaz, Masoumeh Haghighi, Roya Boujaran, Critical revision of the manuscript: Vida Vakili, Gholamreza Haghighi, Supervision: Mojtaba Mousavi Bazzaz, Gholamreza Haghighi.

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Assessment of Health-promoting Lifestyle among Medical Students

Mousavi Bazaz N. et al.


Assessment of Health-promoting Lifestyle among Medical Students


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How to cite: