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Original article

Assessing the relationship between quality of life, health-promoting lifestyle and body mass index in medical students of Southern Iran: a cross-sectional study

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Abstract: *Background* — Obesity is a condition caused by the interaction of complex factors, which include genetics and behavioral components, such as physical activity and diet. Obesity has a negative impact on physical performance, quality of life (QoL), and health-promoting lifestyle (HPL). The purpose of our study was to investigate the relationship of QoL and HPL with body mass index (BMI) in medical students of Southern Iran.
Methods — This cross-sectional study was conducted in 2021 on 536 students in Southern Iran. Data collection was completed using standardized QoL and HPL questionnaires and anthropometric measurements. Data were analyzed by chi-squared test and one-way ANOVA, assuming significance level of $p<0.05$, using the IBM SPSS Statistics 21 software package.
Results — The mean age of study participants was 21.33±2.03 years. Over 88% of them were female; 347 (64.7%) students had normal BMI and 189 (35.3%) had abnormal BMI. Among the dimensions of QoL were physical health ($p=0.03$), mental health ($p<0.001$) and general health ($p=0.01$). We revealed statistically significant differences in students with different BMI levels. Among the dimensions of HPL, stress management ($p<0.001$), physical activity ($p<0.001$) and nutrition ($p<0.05$) exhibited statistically significant differences in groups based on BMI.
Conclusion — Based on the results of this study, we concluded that it is necessary to plan multiple interventions, especially in the form of continuous and short-term training courses, and to encourage medical students to pursue a healthy lifestyle, especially in terms of nutrition, physical activity and stress management.

Keywords: quality of life, health-promoting lifestyle, body mass index, medical students, Southern Iran.

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Introduction

Obesity is a chronic metabolic disease characterized by an increase in body fat reserves. It is one of the main causes of disability [1] and the fifth highest cause of death worldwide [2]. Obesity is a condition caused by the interaction of complex factors, which include genetics and behavioral components, such as physical activity and diet. The latter is under the influence of social, cultural and environmental factors [3]. Medical studies emphasize that obesity is a major risk factor for many diseases, such as type 2 diabetes, coronary artery disease, high blood pressure, gallstones, sleep apnea, osteoarthritis, hyperemia, some cancers and even mental illnesses [4, 5]. All mechanisms related to obesity and mental diseases are not still fully understood, but it is clear that obesity is an important risk factor for physical health [6].

Obesity has a detrimental effect on physical performance. Obese people do not possess the capability to pursue a fully active and effective life [7, 8]. It is well documented that obesity is strongly associated with morbidity and mortality, albeit not fully investigated in terms of its impact on functional status and health-related QoL (HRQoL) [9]. In addition to complications and difficulties of being overweight or obese, being underweight can be also associated with a reduction in mental QoL. Even after controlling for high-risk health behaviors and sociodemographic characteristics, deviation from normal weight is associated with a reduction in physical or mental QoL among young people [10]. On the other hand, low body mass index (BMI) deteriorates QoL in healthy and sick people and loss of muscle protein leads to a decrease in BMI and QoL [11]. The World Health Organization defined the QoL as an individual's perception of his or her position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns [12]. In general, QoL is a broad concept that is related to all aspects of human life [13]. High body mass index, weight gain and obesity clearly cause a decline in physical health and a sense of well-being; hence, they are the crucial factors reducing the QoL [14].

Decreasing QoL has negative effects on social life, family, work and recreational activities It also increases the risk of hospitalization and death due to heart failure [15]. Obesity and

overweight are not only among the factors affecting the QoL, but are also a common public health problem, the increase of which is one of the major concerns of global health care. It is necessary to regulate behavioral factors and HPL [16]. HPL include preventive activities for self-actualization, recovery, treatment, and disease prevention. The World Health Organization pointed out that 60% of the quality of health and life in people depends on their behavior and lifestyle. HPL requires a positive approach to life and a tool to increase well-being and self-actualization [17].

In fact, HPL declines sharply after the age of 18, so it is important to promote HPL among young college students because it is much easier to change behavioral patterns in early adulthood than in middle and late adulthood. To achieve this, it is first of all necessary to identify variables affecting such behaviors [17, 18]. Students are extremely vulnerable due to lack of sleep, mental stress caused by irregular lifestyle, heavy academic workload, job preparation activities and increased exposure to risky behaviors. This vulnerability is aggravated by the students' lack of attention to health management and the ease of ignoring the importance of maintaining proper health [18]. Meanwhile, medical students are expected to play an important role in promoting health in their near future as physicians and as health science specialists, and be promoters of HPL [19].

Currently, few studies have comprehensively investigated the difference between QoL and HPL vs. different BMI statuses among medical students. Considering ever-increasing prevalence of overweight and obesity, and its relationship with health behaviors and subsequent QoL, our study aimed at investigating the relationship of QoL and HPL with BMI status in medical students of Southern Iran in 2021.

Methods

Study design and participants

This cross-sectional study was conducted in 2021 on 536 students of Jiroft University of Medical Sciences in Southern Iran. Sampling was performed by census method, and the data were collected from all students in good standing at the time of the research and willing to participate in the study. The goal of our study was explained to each participant, from which we obtained oral informed consent. Participants were assured that all data will remain confidential and only general results of the study will be published. Participants were encouraged to fully complete the questionnaires patiently and carefully.

Data collection

Collected data included demographic information (age, sex, marital status and monthly income) and anthropometric measurements (height, weight, waist circumference and blood pressure). Weight was measured with digital scales, height and waist circumference were measured with a tape measure, and then body mass index was calculated. Blood pressure was measured in a sitting position after 15 minutes of rest with a digital sphygmomanometer. After two measurements with 5-minute intervals, the mean blood pressure was reported. If the difference in systolic or diastolic pressure was more than 10 mmHg after two measurements, a third measurement was recorded. BMI (kg/m2) was calculated by measuring height and weight, and results were classified into underweight (<18.5), normal weight (18.5-24.9), overweight (25.0-29.9), and obese (≥30.0) [10].

BMI between 18 and 25 was considered desirable, while its undesirable value was either below 18 or above 25. For blood pressure index, systolic blood pressure of 120 mm Hg and diastolic blood pressure of 80 mm Hg or less was considered normal, while more than 120x80 mm Hg was considered abnormal. Waist circumference was considered ideal when its value was less than 90 cm, whereas the unfavorable condition was equal to or greater than 90 cm [20]. The history of overweight and obesity in the participant's family was investigated as well. To measure the QoL, the 26-question QoL questionnaire of the World Health Organization (World Health Organization Quality of Life (WHOQoL-BRIEF)) was employed, while the HPL questionnaire (Health-Promoting Lifestyle Profile II (HPLP II)) was used to measure HPL. The short form of the QoL questionnaire has four subscales of physical health, mental health, social relations, environmental health, and a total score. First, a raw score was obtained for each subscale, then each of these raw scores were converted into a standard score ranging from 0 to 100. A higher score implied a better QoL. The validity and reliability of the Persian version of this questionnaire has been previously confirmed [21]. The HPL questionnaire measures the possibility of a person engaging in HPL; it has 52 questions based on multiple dimensions (nutrition, exercise, responsibility for health, stress management, interpersonal support, self-actualization). The response range was a 4-point Likert scale from 'never' to 'always', with a score between 1 and 4 for each question. The validity and reliability of the Persian version of this questionnaire has been confirmed in previous studies [22, 23].

Data analyses

Data analyses were completed using SPSS software version 21. The Kolmogorov-Smirnov normality test examined whether variables were normally distributed (P-value >0.05). We also conducted descriptive statistics tests, chi-squared tests and one-way analyses of variance (ANOVA) in order to analyze the data at a significance level less than 0.05.

Results

The lowest age of the participants in our study was 18 years and the highest was 26 years. The mean age was 21.33±2.03 years. Many study participants (64.7%) had normal BMI, 23.3% were overweight or obese, and 54.5% had familial history of overweight or obesity. Statistically significant differences between all demographic variables except gender and BMI status ($p>0.05$) were observed. There was a significant difference between blood pressure status, waist circumference ($p<0.001$ in all cases) and normal/ abnormal status of BMI (*Table* 1).

In terms of the difference between normal and abnormal BMI status, and demographic variables, there were significant differences ($p<0.05$) between all variables except age group ($p>0.05$). Regarding the differences between overweight/obese and non-overweight/obese, and demographic variables, they were statistically significant between all variables ($p<0.05$) except for the presence of overweight and obesity in the family ($p>0.05$). As for the differences between obese or nonobese and demographic variables, we observed a significant difference in waist circumference ($p<0.001$) and the presence of overweight/obesity in the family ($p<0.05$), but there were no significant differences in other variables.

Table 1. Frequency distribution of demographic characteristics, blood pressure and waist circumference vs. BMI status

Variables		*BMI Number (%)*				*Total Number (%)*	*P-value*
		Normal weight	Underweight	Overweight	Obese		
Age, years old	Less than 20	134 (63.2)	24 (11.3)	51 (24.1)	3 (1.4)	212 (39.6)	0.000
	20-25	103 (66.9)	29 (18.8)	12 (7.8)	10 (6.5)	154 (28.7)	
	25 and above	110 (64.7)	11 (6.5)	49 (18.8)	0 (0)	170 (31.7)	
Gender	Male	48 (77.4)	8 (12.9)	6 (9.7)	0 (0)	62 (11.6)	0.052
	Female	229 (63.1)	56 (11.8)	106 (22.4)	13 (2.7)	474 (88.4)	
Marital status	Single	317 (66.6)	58 (12.2)	89 (18.7)	12 (2.5)	476 (88.8)	0.006
	Married	30 (50)	6 (10)	23 (38.3)	1 (1.7)	60 (11.2)	
Monthly income	Under $400	309 (62.9)	62 (12.6)	108 (22)	12 (2.4)	491 (91.6)	0.034
	Above $400	38 (84.4)	2 (4.4)	4 (8.9)	1 (2.2)	45 (8.4)	
Blood Pressure	Hypotension	36 (53.7)	2 (3)	27 (40.3)	2 (3)	67 (12.5)	0.000
	Normal BP	311 (66.3)	62 (13.2)	85 (18.1)	11 (203)	469 (87.5)	
Wrist circumstances	Normal	310 (66.4)	61 (13.1)	95 (20.3)	1 (0.2)	467 (87.1)	0.000
	Abnormal	37 (53.6)	3 (4.3)	17 (24.6)	12 (17.4)	69 (12.9)	
BMI	Normal	347 (100)	0	0	0	347 (64.7)	0.000
	Abnormal	0	64 (33.9)	112 (59.3)	13 (6.9)	189 (25.3)	
Overweight/Obese	Yes	0	0	112 (89.6)	13 (10.4)	125 (23.3)	0.000
	No	64 (15.6)	347 (84.4)	0	0	411 (76.7)	
Overweight/obesity in family	Yes	176 (60.3)	50 (17.1)	63 (21.6)	3 (1)	292 (54.5)	0.000
	No	171 (70.1)	14 (5.7)	49 (20.1)	10 (4.1)	244 (45.5)	

Table 2. Statistical assessment of differences in QoL dimensions vs. BMI status

*Variables Mean±SD**	*BMI*				*P-value*
	Normal	Abnormal			
	Normal weight	Underweight	Overweight	Obese	
Physical health	26.72±4.47	25.50±3.21	25.71±3.66	25.23±5.50	0.023
			25.60±3.64		0.003
Mental health	20.95±3.87	19.42±4.43	19.78±2.60	18.15±2.64	0.000
			19.55±3.35		0.000
Social relationships	11.10±2.15	11.20±2.52	11.14±1.94	10.00±1.47	0.307
			11.08±2.14		0.898
Environmental health	25.62±3.86	25.18±2.45	25.41±3.57	24.38±4.87	0.550
			25.26±3.33		0.279
Total QOL and general health	7.38±1.60	6.95±1.54	7.06±1.73	6.30±1.65	0.018
			6.97±1.67		0.006

* Mean and standard deviation for health-related QoL dimensions.

Table 3. Statistical assessment of differences in health-promoting lifestyle (HPL) dimensions vs. BMI status

*Variables Mean±SD**	*BMI*				*P-vale*
	Normal	Abnormal			
	Normal weight	Underweight	Overweight	Obese	
Self-actualization	30.37±5.65	28.42±6.86	30.31±4.15	30.64±6.71	0.077
			29.68±5.44		0.171
Responsibility for health	30.63±6.66	31.32±10.53	30.93±6.17	29.46±2.96	0.797
			30.96±7.77		0.608
Interpersonal support	17.95±4.02	17.17±5.92	17.65±3.44	15.07±5.21	0.064
			17.31±4.57		0.094
Stress management	20.12±2.92	17.12±6.61	19.86±3.31	19.30±1.37	0.000
			18.89±3.92		0.000
Exercise	14.14±4.44	12.98±3.55	11.45±3.00	10.38±2.46	0.000
			11.89±3.26		0.000
Nutrition	16.56±3.74	15.62±4.18	17.33±3.58	18.92±5.42	0.005
			16.86±4.03		0.393
Total HPL	129.80±16.92	122.65±24.19	127.55±13.82	123.61±9.01	0.014
			125.62±17.87		0.008

* Mean and standard deviation for HPL dimensions.

The results of one-way ANOVA demonstrated that among the dimensions of QoL, physical health (p<0.05), mental health (p<0.001) and general health (p<0.05) in BMI-based groups, statistically significant differences were revealed. Also, for normal and abnormal BMI, there were significant differences between dimensions of QoL: physical health (p<0.005), mental health (p<0.001) and general health (p<0.01) (*Table 2*).

The results of one-way ANOVA showed that among the dimensions of the HPL, stress management (p<0.001), exercise (p<0.001), nutrition (p=0.005) and a total HPL score (p=0.014) exhibited statistically significant differences between BMI-based groups. Also, in normal and abnormal BMI conditions, the results of one-way ANOVA suggested that among the dimensions of HPL, stress management (p<0.001), exercise (p<0.001) and a total HPL score (p<0.01) differed statistically significantly between individuals with normal BMI and abnormal BMI values (*Table 3*).

Regarding the difference of QoL between overweight/obese and non-overweight/obese groups, we established statistically significant differences in physical health (p<0.05), mental health (p<0.005), and total QoL score and general health (p<0.05).

As for the differences of QoL between obese/nonobese status groups, we found statistically significant differences in mental health (p<0.05) and general health (p<0.05).

In terms of differences of HPL between overweight/obese and non-overweight/obese individuals, there were statistically significant differences in stress management (p<0.001) and nutrition (p<0.01).

In regards to differences of HPL between obese/nonobese groups, there were statistically significant differences in interpersonal support (p<0.05), exercise (p<0.05), and nutrition (p<0.05) (*Table 4*).

Between gender and HRQoL, we found statistically significant differences for the scores of mental health (p<0.05), social relationships (p<0.001), environmental health (p<0.005), QoL and general health (p<0.001). We observed significant differences between HPL dimensions by gender (i.e., between male and female students): the total score of HPL (p<0.05), responsibility for health (p<0.05), stress management (p<0.005), exercise (p<0.005),

and nutrition (p<0.05). The mean score of stress management and exercise was higher in male students.

Discussion

According to the results of our study, there were statistically significant differences in the QoL in the areas of physical health, mental health, total QoL score and general health in different groups of students with different body BMI, and especially the differences in QoL between obese/nonobese students in terms of mental health, total QoL and general health. The mean scores of nutrition and responsibility for health were higher in female students, while the mean score of stress management and exercise were higher in male students. In the present study, 11.9% of students were underweight, 64.7% were normal, 20.9% were overweight, and 2.4% were obese. In the study by Pakseresht et al. (2017) on medical students of Gilan, 7.5% of the participants were underweight, 71.3% were normal, 19.2% were overweight, and 1.2% were obese [24]. In the study of Almutairi et al. (2018) on Saudi students based on BMI scores, 50% had normal weight, 20.8% were overweight, and 11.3% were obese [25]. In the study by Al-Momani et al. (2021), two-thirds of male medical students in Saudi Arabia were obese or overweight [26]. In Mehri et al. study (2016), obesity and overweight were more prevalent in Iranian female students [27].

The increasing prevalence of obesity worldwide is attributed to lifestyle changes, and this phenomenon is associated with an increase in the incidence of chronic diseases and mental disorders [6, 9]. The proportions of overweight medical students in different studies were 13% in Indian students [28], 26.9 % in Saudi Arabian students [29], 19.7 % in American freshmen [30] and up to 34.4 % in Greek students [31]. In addition, a study reported that the rate of obesity/overweight has increased from 24.9% in the first year of medical school to 37.1% in the last year [32]. Therefore, special attention should be paid to medical and health science students so that they can improve their QoL by adopting a healthy lifestyle, and in the future, as medical and health science specialists, they should fulfill their educational role in promoting healthy lifestyles. In Makarova et al. study (2021), only 12.3% of medical students reported high QoL. Adverse changes in student lifestyles, including irrational daily schedule, low physical activity, and unbalanced diet can cause a decrease in QoL [33]. In the present study, there was a statistically significant difference between the scores of mental health dimension (p=0.025) and total QoL and general health (p=0.038) between obese (BMI≥30) and nonobese students. In the study by Serinolli et al. (2017), there was also a negative relationship between increasing BMI and QoL in medical students in the mental health dimension [34].

We observed significant differences in dimensions of QoL, such as physical health (p=0.003), mental health (p<0.001) and total QoL and general health (p=0.006) between normal and abnormal BMI groups. Relationship between BMI and mental health is also conflicting. One study found a nonlinear relationship between BMI and mental health, with a greater likelihood of mental health problems seen in obese females. Also, the mentioned study showed that in the relationship betweenBMI and mental illness, higher correlations were apparent in middle-aged people, while younger and older people had a lower chance of having a mental illness [35]. Other studies showed high risks of mental disorders in young obese females [36], while underweight [37] constitute another risk group.

In the study by Lolokote et al. (2017), there was a statistically significant relationship between normal BMI and mental health in Chinese students [38]. It seems that psychological distress is common in medical students and varies significantly based on their gender and education level. The psychological well-being of medical students should be considered with caution, and more attention should be paid to the elimination of risk factors to prevent subsequent adverse outcomes [39]. The general health and well-being of medical students has become a matter of concern because medical students have higher levels of stress than their non-medical counterparts. Long-term stress may lead to serious consequences, such as depression, anxiety, low QoL or adjustment disorders [40]. Besides BMI status, factors such as dormitory life, lack of planning, insufficient sleep, excessive use of social networks, night shifts, and low physical activity can affect the mental health of medical students more than other dimensions of QoL. In the study by Carpi and Vestri, mental health issues and sleep problems were highly prevalent among medical students. Quantity and quality of sleep can also affect the QoL in all aspects, especially mental health [41]. In the study by Rathod et al. (2018), there was an inverse and statistically significant relationship between short sleep duration and overweight and obesity in medical students [42].

Table 4. Statistical assessment of differences in quality of life (QoL) and health-promoting lifestyle (HPL) dimensions between overweight/obese and non-overweight/obese, as well as obese and nonobese individuals

Variables	*BMI*					
*Mean±SD**	Overweight/ obese	Non-overweight/ obese	P-value	Obese	Nonobese	P-value
Physical health	2.66±3.85	26.53±4.32	0.044	25.23±5.40	26.35±4.19	0.343
Mental health	19.61±2.64	20.71±3.99	0.004	26.33±4.22	18.15±2.64	0.025
Social relationships	11.02±1.92	11.12±2.20	0.648	10.00±1.47	11.12±2.15	0.061
Environmental health	25.30±3.71	25.55±3.67	0.502	24.38±4.87	25.52±3.65	0.271
Total QoL and general health	6.98±1.73	7.13±1.60	0.049	6.30±1.65	7.26±1.63	0.038
Self-actualization	30.32±4.44	30.07±5.89	0.652	30.46±6.71	30.12±5.56	0.829
Responsibility for health	30.78±5.93	30.74±7.38	0.959	29.46±2.96	30.78±7.13	0.504
Interpersonal support	17.38±3.72	17.83±4.37	0.300	15.07±5.21	17.79±4.18	0.022
Stress management	19.80±3.16	19.65±3.41	0.000	19.30±1.37	19.69±3.39	0.678
Exercise	11.34±2.96	13.96±4.33	0.655	10.38±2.46	13.43±4.21	0.010
Nutrition	17.49±3.81	16.41±3.82	0.006	18.92±5.42	16.61±3.78	0.032
Total HPL	127.14±13.43	128.69±18.39	0.384	123.61±9.01	128.44±17.50	0.322

In our present study, 12.9% of male students and 11.8% of female students had abnormally low BMI. It is possible that some students, including females, consider a normal BMI as obesity and try to always keep their BMI lower than normal for the sake of a favorable perception of their body by others. Cash et al. (2004) reported that the quality of body perception in female students was significantly more favorable with a lower BMI [43]. Besides, abnormally low weight can have its own complications. In Mohapatra et al. study, there was a statistically significant direct relationship between dysmenorrhea and low BMI [44]. In the study by Dey et al. (2013), there was a significant relationship between underweight and adverse QoL [45].

In our study, the mean score of HPL was moderate, in the study of Alzahrani et al. (2019) among medical students in Saudi Arabia [19] and in the study of Nacar et al. (2014) in Turkey, it was higher [46]. In the study by Al-Kandari et al. (2008), there was poor HPL in Kuwaiti nursing students [47]. In the study by Musić et al. (2021), dentistry students in Croatia exhibited a moderate HPL [48]. In the study by Al-Momani, the total HPL score of Saudi Arabia students was quite favorable [26]. Medical students are a significant investment of the society, and promotion of their better health maintains this investment [49]. Medical students are particularly expected to play an important role in health promotion in their near future as doctors, and health science experts should be promoters of healthy lifestyles [19].

In the present study, we observed statistically significant differences of BMI status and the total HPL score In the study of Al-Kandari et al. (2008), there was a significant relationship between nutrition subcategory of HPL and BMI status [47]. However, in the study by Nacar et al. (2014) performed on Turkish medical students [46] and in Wei's study (2012) on Japanese students, no statistically significant difference was found in the total score of HPL between BMI groups [50].

In the current study, there was a statistically significant difference in the dimensions of HPL between obese and nonobese students: interpersonal support (p=0.022), exercise (p=0.010) and nutrition (p=0.032). In the study by Musić et al. (2021) in Croatia, a higher body mass index (BMI) was associated with a smaller responsibility for health [49]. In the study of Köse et al. (2019) on Turkish students, the authors found a correlation between decreasing BMI and increasing stress management score [51]. In Alzahrani's study, there was an inverse relationship between increasing BMI and interpersonal relationships [19].

Regarding the difference in HPL dimensions between genders, our results elucidated responsibility for health (p=0.049), stress management (p=0.004), exercise (p=0.001) and nutrition (p=0.049). There was a statistically significant difference between male and female students, so that the mean scores of nutrition and responsibility for health were higher in female students, while the mean scores of stress management and exercise were higher in male students.

In the study by Núñez-Rocha et al. (2020) in Mexican students, males had a healthier lifestyle with more exercise and better stress management [52]. In the study by Azami Gilan et al. (2021) conducted in Kermanshah, Iran, males had better HPL scores [53]. In our study, all obese students were female. Currently, female students generally lack leisure activities and sleep, the proportion of those involved in regular fitness workouts is low, while the number of snacks and mean daily online time are generally high. The rates of overweight and body fat in female students are generally very high, while the standard rate of muscle mass is generally very low. Typically, the worst scores associated with HPL among female students are related to their participation in sports [54].

Taking health-related courses at university can facilitate HPL awareness. In Can et al. (2008) study that compared HPL between nursing and social science students, the former had more positive HPL styles than the latter. In addition, fourth-year nursing students had higher scores in most HPLP II subscales than lower-year students. On the contrary, fourth year non-nursing students had lower grades [55].

The limitations of our study include low participation of male students. Anthropometric measurements and the completion of questionnaires were time consuming procedures due to the canceled classes, which was partially related to the COVID-19 pandemic.

Conclusion

It can be concluded that in accordance with the role model of medical students, it is necessary to plan multiple interventions, especially in the form of continuous and short-term training courses, and to encourage medical students to adopt a healthy lifestyle, particularly in terms of nutrition, physical activity and stress management. There is also a need to integrate healthy lifestyle programs into medical and health sciences curricula to meet the growing needs of students in their future roles in health promotion and disease prevention. It appears that psychological distress is common among medical students, so the psychological well-being of medical students should be considered more closely. Greater attention to addressing risk factors is needed to prevent subsequent adverse outcomes. Intervention studies are suggested to examine the impact of educational and non-educational healthy lifestyle interventions on favorable BMI status and consequently QoL in medical students.

Ethical approval and consent to participate

All participants were informed that studies involving human participants followed the ethical standards of the Institutional Research Committee and the 1964 Declaration of Helsinki and its latest amendments. All study participants signed the informed consent statement before participating in the study. This study was supported and approved by Jiroft University of Medical Sciences (Code: IR.JMU.REC.1399.010).

Availability of data and materials

The datasets used or analyzed in the course of this study are available from the corresponding author on a reasonable request.

Competing interests

None declared.

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Author contributions

RF and SD were involved in all aspects of study concept and design, data collection and analysis, interpretation of the results, draft manuscript preparation, and critical revision of the manuscript; DPM and TR helped with general design of the study, data analysis, interpretation of the

results, co-authoring draft manuscript, and final editing. All authors read and approved the final version of the manuscript.

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