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Research Paper

The role of the food pattern in predicting weight, lifestyle and quality of life of students of Mohaghegh Ardabili University

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ABSTRACT

Objective: The food pattern in clinical practice has been considered in weight loss, lifestyle, and quality of life, which can lead in weight loss and affect lifestyle and quality of life. The aim of this study was to investigate the role of food pattern in predicting students' weight, lifestyle and quality of life.

Methods: The research method was descriptive-correlational and the statistical population was all students of Mohaghegh Ardabili University in the academic year of 2016-2017. The sample size was considered 280 students selected randomly from the statistical population. To collect data, the Quality of Life Questionnaire World Health Organization's 1996 (IRQOL), Health Promotion Lifestyle Questionnaire Walker, Kerr, Pender and Sachrist (1990), and Nutrition Table were used, and SPSS 22 software was used to analyze the data. Pearson correlation and regression correlation tests were also used to analyze the data.

Results: The results showed that there was a significant correlation between food pattern and weight, lifestyle and quality of life (r=0.258, sig = 0.027, r = 0.057, sig = 0.000, and r=0.677, sig= 0.012 respectively).

Conclusion: The finding showed that the component of food pattern can predict 60% of weight, but cannot be a good predictor of lifestyle and quality of life due to the insignificance of regression model.

1. Introduction

The student life is one of the vital periods in youth, which is a dynamic transition period full of multidimensional experiences (Pournagash Tehrani, Seyed Saeed, Amini Tehrani, 2019). During student, an individual acquires the physical, cognitive, emotional, social, and economic resources that are the foundation for later life health and wellbeing. These same resources define trajectories into the next generation. Investments in adolescent health and wellbeing bring benefits today, for decades and the next generation (Blakemore SJ, Mills KL, 2014). One of the factors that is expected to affect the diet is quality of life. In recent years, the concept of quality of life has been an important indicator for assessing individual health, making decisions and judging the general health of society and finding the main problems in various aspects of people's lives in the field of mental health. (Bongers PJ, Greenberg CA, Hsiao R, Vermeer M, Vriens MR, et al., 2020). In a comprehensive definition of quality of life, the World

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Health Organization defines an individual's understanding of his or her current situation in terms of the culture and value system in which he or she lives and the relationship of these perceptions to goals, expectations, standards, and priorities (Kahn, Julian, Kearon, Gu, Cohen, et al, 2020). Therefore, the quality of life is completely individual and cannot be seen by others and is based on people's understanding of their life situation (Fredriksen, et al, 2019). Quality of life is one of the important aspects and dimensions of every person's life that cannot be measured through clinical and physiological measurements and quality of life has a multidimensional structure that includes physical, emotional, social and educational functions (Lamsal, Finlay, Whitehurst, & Zwicker, et al., 2019). Considering the role of health-related quality of life in assessing the individual lives of different groups in society, we can mention the issue of overweight and obesity. Overweight and obesity are increasingly becoming a major public health concern in today's industrialized world. (World Health Organization, 2018). The results of the studies of Parivash Noor et al. (2015) showed that the mean score of physical health dimensions, physical limitation, social performance and general health in people with overweight and obesity was significantly lower. The results of Baharizadeh et al.'s (2013) study showed that the score of physical, psychological and total performance of overweight children was low compared to the control group. Lifestyle is a common daily activity that people have acceptably recognized in their lives in a way that these activities affect their health (Yoost, Crawford, R., & Castaldi, 2019). Lifestyle is closely related to mental and physical health of people (Atadokht, Rahimi, Valinejad, 2018). By choosing a lifestyle to protect the patient from prevention and self-improvement, the person performs activities such as following a proper diet, sleep and activity, exercise, weight control, non-smoking and alcohol, and immunization. Against some diseases that make up this lifestyle (Potter, Perry, Stockert, Hall, 2016). Health requires promoting a healthy lifestyle (Fang, 2019). Health-promoting lifestyle is one of the types of lifestyles and includes behaviors that lead in empowering people to increase control over their health and ultimately improve the health of the individual and society (Atadokht, et al, 2018). A healthy lifestyle is a valuable resource for promoting health, adapting to life stressors, improving quality of life and reducing the prevalence of problems associated with risky behaviors such as smoking, physical inactivity, etc (Chen, Zhang,, & Fu . 2018). To maintain and improve health, it is necessary to correct and improve the lifestyle (Doyle, Freedland, Carney, De Jonge, Dickens et al., 2019).

Increasing the health and ensuring the health of people in society is one of the most important issues in the development of human societies. (De, Tijhuis, Koelen, Wagemakers, 2022). Studies show that the prevalence of obesity increases with unhealthy lifestyles, especially poor diet and sedentary lifestyle. Obesity has short-term and long-term effects. Impaired fat metabolism often manifests itself as a chronic disease called obesity. If the body mass index (weight divided by kilograms squared in meters squared) is greater than or greater than 25, the person is overweight, and if it is equal to or greater than 30, the person is obese. (Wadden, Tronieri, Butryn, 2020). By choosing a lifestyle to maintain and promote their health and prevent disease, the person takes actions and activities such as proper diet, sleep and activity, exercise, weight control, Non-smoking and alcohol and immunization that makes up opposite of this lifestyle. Health requires improving a healthy lifestyle (Garrido, Oliveira, Cavero, Álvarez, Pozuelo, et al. 2019). Lifestyle is a determining factor in the development and progression of cardiovascular disease. In fact, poor lifestyle and neglect of health behaviors are factors that can lead in cardiovascular disease such as acute coronary syndrome (Kapelio, Kyriazis, Ioannidis, Dimosthenopoulos, Hatziagelaki, et al. 2017). Another factor which can predict the role of eating habits is weight. Dietary habits, physical activity level, genetics, environmental factors, and socioeconomic status have contributed to over- weight and obesity (Dagne, Gelaw, Abebe,Wassie,, 2019). Overweight and obesity increase the risk of numerous chronic diseases such as cardiovascular diseases, type 2 diabetes, sleep apnea, some musculoskeletal conditions, and certain types of cancer (Dai, Alsalhe, Chalghaf, Riccò,Bragazzi, et al, 2020) According to the World Health Organization (WHO), overweight and obesity are global public health problems that have become global epidemics. (World Health Organization, 2021). A study on diet-related factors, physical activity, and weight status in Polish adults showed that, in 2016, the prevalence of overweight/obesity was almost 1.5 times higher among men (60.2%) than women (39.8%) (Jezewska, ebski, Plichta, Guzek, Kosicka, 2019). Obesity was proven to have an impact on both life expectancy levels and trends in Europe. The observed differences in the increase in the impact of obesity across countries and between the sexes reflect differences in the onset and the progression of the obesity epidemic, and can be linked to contextual factors (economic conditions, obesogenic environment, energy supplies), as well as to differences in people’s ability and capacity to adopt

healthier lifestyles. It is likely that in the future obesity will have a larger impact on mortality and life expectancy in Europe, as obesity prevalence and obesity-attributable mortality continue to increase in the majority of countries. These trends will have important health, economic and social implications. Specifically, the increasing prevalence of obesity among European populations, and especially at younger ones, will lead in an increased prevalence of obesity-related disorders, as well as to increases in the mortality rate associated with obesity and in obesity's effects on life expectancy and quality of life (Nikoletta, Sergi, Llimós, Fanny, 2019). The prevalence of obesity has been increased in recent decades, and this change is more evident at younger ages. According to the latest data in the United States, the prevalence of childhood obesity has increased by 25 to 30 percent (Sodaei, Magboo, Payghambardoost, Aslrahimi, 2013). In general, the results of various studies in Iran have reported the prevalence of obesity in children between 7 and 16% (Esna, Shafiean, Torkashvand, 2016). The relationship between obesity and mental health problems as well as behavioral disorders and emotional problems, especially in adolescents, has also been well demonstrated (Chang, Alderman, Chu, Hung, Liu, 2020). The global prevalence of obesity is higher in women than men in all continents, in both developed and developing countries (Blüher, 2019). Obesity is not the only cause of physical problems. Rather, as one of the interactions between body and mind that has been observed in the research literature, it is one of the causes of behavioral problems (Sobol, Rabinowitz, 2016). In another study of obese and overweight people, Bustil (2017) found that these people experienced a poorer state of physical function and mental health than people who were not overweight. The nutritional status of each individual and society depends on several factors, including physical, physiological, and cultural factors as well as income and educational level of people. The type and amount of food consumed by different races and social cultures is various. Industrialized countries have a dietary pattern that is characterized by high consumption of animal foods, while in developing countries, the main food consumed is plant-based foods and vegetable diets. (Fontes, Rodrigues, Ferreira-Pêgo, 2022). Having a proper diet and regular physical activity can help prevent cardiovascular disease, stroke, high blood pressure, insulin-dependent diabetes mellitus, osteoporosis, obesity, and some cancers as well as dental health problems (Isiozor et al., 2019). The acceptability of and desirability for sustainable healthy diets will be influenced by sociocultural factors (Eva, Monterrosa, Edward, Frongillo, Adam, 2020). People with different social systems and cultures have different types and amounts of food consumption (Mawroh, Dixit, 2022). Dietary and food consumption actions of individuals and communities have a profound impact on individual, societal, and health (Steck, Murphy. 2020). The results of studies in the Spanish in 2022 show that all members of society made some changes to their dietary patterns, but those with lower incomes made the least changes to their eating patterns (Rubini, Vilaplana-Prieto, Flor-Alemany, Yeguas-Rosa, Hernández-González. et al,2022). At present, Iran is one of the leading countries in the world in terms of variety food consumption, and this indicates the high usage of high-fat and high-calorie foods. For this reason, a proper eating pattern is needed to help the person neither become overweight nor malnourished. Therefore, according to the mentioned, the question of the present study was whether the food pattern can predict the weight, lifestyle and quality of life of students.

2. Materials and Methods

The research method of the present study was descriptive-correlational and the statistical population was all students of Mohaghegh Ardabili University studying in the academic year of 2016-2017. Among them, 280 participants were selected through random sampling (Delavar, 2001). The researcher referred to 4 faculties of educational sciences and psychology, natural and agricultural resources, basic sciences, and humanities to complete the questionnaires.

Participants and Procedure

To conduct this research, first the purpose of the research was explained to the students and their satisfaction was obtained to participate in the study. The participants were assured that the extracted information and their names would be kept confidentially. At all stages of the research, ethical considerations were observed. People who were interested in participating in the study were admitted in the study. The questionnaires were simple and were not harmful to the individual and did not incur any costs or expenses to the participants. Data analysis was performed using SPSS-22 software with Pearson correlation tests and multiple regression. The food pattern was calculated based on the pattern used in the research of Aghapour et al. (2012) and the pattern was determined by the respondents. In this way, the two healthy and unhealthy food pattern groups were examined separately on weight, lifestyle and quality of life. Data were collected by following scales. Conscious consent to completing the questionnaire and

the age range of 30 to 31 years old were inclusion criteria. Unwillingness to complete the questionnaire, and overweight causing other reasons were exclusion criteria and people are more than 31 years old.

***IRQOL Quality of Life Questionnaire*:**

The World Health Organization's short form questionnaire of Quality of Life has 26 questions and 4 subscales of physical health, mental health, social relationships, and environmental health, each of which includes 6, 3, 7, and 8 questions, respectively. The first two questions do not belong to any of the subscales and assess the state of health and quality of life as a whole. Research on psychometric characteristics of the short form questionnaire shows the differential validity, content validity, and internal reliability (Cronbach's alpha for Physical Health, Mental Health, Social Relations, and Environmental health are 0.80, 0.76, 0.66, and 0.80, respectively (WHQOL Group, 1998; Squington et al., 2004). The scoring is on the five point Likert scale. This questionnaire evaluates the quality of life in 4 domains of life. Test-retest validity of this test was 0.67, half split validity was 0.87, and internal consistency was 0.84 (Nasiri, 2006).

***Health-Promoting Lifestyle Scale*:**

This questionnaire was developed by Walker, Kerr, Pender and Sachrist (1990) and includes 52 questions that evaluates health-promoting behaviors based on the basis of health promotion model in 6 subscales of spiritual excellence, health responsibility, nutrition, physical activity, stress management, and interpersonal relationships. Walker et al. (1990) set and confirmed the reliability of the questionnaire by Cronbach's alpha for six scales as 0.86, 0.86, 0.80, 0.85, 0.79, 0.87, respectively, and 0.94 for the whole questionnaire (Lee and Luke, 2005). Dubiz (2006) also reported a validity coefficient of the questionnaire as 0.94. In Iran, Fathi Ashtiani and Jafari Kandovan (2011) standardized the questionnaire and reported Cronbach's alpha coefficient as 0.96.

3. Results

In this study 43% of respondents were men (13 people) and 56% were women (17 people).

Descriptive statistics of life quality and lifestyle variables showed the mean and standard deviation of the variables of food pattern, weight, lifestyle and quality of life were 0.6 and 0.498, 7.97 and 13.71, 2.12 and 0.03252, 3.334 and 0.021, respectively.

Table 1. Pearson correlation test for quality of life, lifestyle, weight and food pattern

		Quality of Life	life style	Food pattern	Weight
Quality of Life	Pearson correlation	1	0/347	0/067	0/121
	Significance level		0/027	0/012	0/002
	Number	280	280	280	280
life style	Pearson correlation	0/347	1	0/057	0/038
	Significance level	0/027		0/000	0/000
	Number	280	280	280	280
Food pattern	Pearson correlation	0/067	0/057	1	0/258
	Significance level	0/012	0/000		0/000
	Number	280	280	280	280
Weight	Pearson correlation	0/121	0/038	0/258	1
	Significance level	0/002	0/000	0/000	
	Number	280	280	280	280

According to the results of Pearson correlation test, it is observed that there was a significant correlation between quality of life and lifestyle (r = 0.347, sig = 0.027), a significant correlation between quality of life and food pattern (r = 0.067, 012, Sig = 0.1), significant correlation between weight and quality of life (r = 0.121, sig = 0.002), significant correlation between weight and lifestyle (r = 0.038, sig = 0.000), between weight and food pattern (r = 0.258, sig = 0.000027), and significant correlation between lifestyle and food pattern (r = 0.057, sig = 0.000) (Table 1).

Table 2. Investigating the role of the food pattern in weight, quality of life and lifestyle through regression test

Model		R	R^2	R Square	Sd
1		0/774	0/600	0/585	9/8147
	sum of the squares	**degree of freedom**	**mean of squares F**	**F**	**Significance level**
regression	4042/272	1	4042/272	41/963	0/000
left over	2697/194	28	41/328		
Total	6739/467	29			

	Non-standard coefficients		Standard coefficients	t	significance level
	B	Sd	Beta		
(Constant)	38/556	6/121		6/299	0/000
Food pattern	23/694	3/685	0/774	6/478	0/000

As seen in table 2, the value of R was 0.774 that indicates a simple correlation between the two variables, in other words, showed the intensity of the correlation between the two variables. As can be seen from the value of R (Pearson correlation between the two variables), there was a very strong correlation between the two variables of food pattern and weight. The value of R2 indicated how much of the dependent variable of weight can be explained by the independent variable of food pattern. The food pattern variable could explain 60% of the variable weight changes, which was actually a significant degree.

Table 3 shows that the regression model could significantly predict the changes of variable weight. As it is observed, the significance level of the test was less than 0.05, which indicated the significance of the regression model and we concluded that the model used was a good predictor for the weight variable.

Table 3 shows information about predictor variables. As can be seen, the constant and variable values of the food pattern were both significant in the model. The standardized regression coefficient, or Beta was 0.774, which indicated the high effect of the food pattern variable on the variable of weight.

Table 3. Regression test of the role of food pattern to predict quality of life and One-way analysis of variance

Model	R	R^2	R Square	Sd
1	0/142	0/020	-0/024	0/32942

	sum of the squares	degree of freedom	mean squares F	F	Significance level
regression	0/049	1	0/049	0/455	0/507
left over	2/387	22	0/109		
Total	2.437	23			

	Non-standard coefficients		Standard coefficients	T	sig
	B	Sd	beta		
(Constant)	3/584	0/226		15/846	0/000
Food pattern	-0/092	0/136	-0/142	-0/675	0/507

As seen in table 4, the value of R was 0.142. As can be seen from the value of R, there was a weak correlation between the two variables of food pattern and quality of life. According to the amount of R2 in the food pattern variable, it can explain 2% of the changes in quality of life.

Table 3 shows that the significance level of the test was greater than 0.05, which indicated that the regression model was not significant and we concluded that the model used was not a good predictor for the quality of life variable.

As can be seen in Table 4, the significant constant and inconstant value of food pattern in the model was not significant. The standardized regression coefficient, or Beta was -0.142, which indicated the effect of the food pattern variable on the quality of life variable, which was a very low amount.

Table 4. Regression test of the role of food pattern for lifestyle prediction and One-way analysis of variance

Model	R	R^2	R Square	Sd
1	0/057	0/003	-0/049	0/38214

	sum of the squares	degree of freedom	mean of squares F	F	Significance level
regression	0/009	1	0/009	0/061	0/808
left over	2/775	19	0/146		
Total	2/783	20			

	Non-standard coefficients		Standard coefficients	t	sig
	B	Sd	beta		
(Constant)	2/703	0/290		9/312	0/000
Food pattern	0/042	0/172	0/057	0/247	0/808

According to Table 4, the value of R was 0.057. As can be seen from the value of R, there was a weak correlation between the two variables of food pattern and quality of life. According to the amount of R2 in the food pattern variable, it can explain 0.3% of the variations in quality of life.

The significance level of test was greater than 0.05, which indicated that the regression model was not significant and we concluded that the model used was not a good predictor for lifestyle variables.

The constant and variable value of the food pattern in the model was not significant. The standardized

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regression coefficient, or Beta was 0.057, which indicated the effect of the variable food pattern on the lifestyle component is very low.

4. Discussion and Conclusion

The findings showed that the food pattern can predict more than half the weight, but because the regression model is insignificant, it cannot be a good predictor of lifestyle and quality of life. Statistical results showed that there was a significant correlation between quality of life and lifestyle, quality of life and diet, significant correlation between weight and quality of life, significant correlation between weight and lifestyle. Also, there was a significant relationship between lifestyle and diet. The regression results also showed that the regression model could significantly predict changes in variable weight. The significance level of the test was reported less than 0.05, which indicated the importance of the regression model, and we concluded that the predictive model is good for variable weight. The food pattern did not predict quality of life and lifestyle due to the low amount in regression model. In general, the results of this study showed that the food pattern was associated with higher body mass index in obese people. The results are in line with the results of the following studies and have achieved similar results, (Mailey, Mullen, Mojtahedi, Guest, Evans, et al. 2012; Byrne, LeMay-Russell, Tanofsky-Kraff, 2019). The results of Parivash Noor et al (2015) showed that the average scores of dietary pattern in predicting the lifestyle of overweight and obese people are significantly lower. Also, the research results of Ghanbari et al. (2015) showed that there is a significant and effective relationship between obesity, style and quality of life. Results of the study of Baharizadeh et al. (2013) showed that the lifestyle and quality of life scores of all overweight individuals were low compared to the control group. These findings are inconsistent with Dunkel & Tanner (2012), Bahrami & Bahrami (2013), Grote & Melvile. (2010), Littleton, et al., (2007), Najafi & Kiani (2016) showed that the food pattern was negatively correlated with body mass index and obesity. These inconsistencies can be attributed to cultural reasons such as the type of nutrition in a particular culture, the symptoms of decreased appetite in depression, the low percentage of participants with severe anxiety and stress, the specific duration of psychological distress, and the randomness of the selected sample. Another finding of this study was the significant relationship between food pattern and quality of life and lifestyle. These results are consistent with the findings of Frederickson, Chavro, Yoshikata, and Zhang, (2019). Healthy lifestyle habits and regular consumption of a wide range of foods may be helpful in maintaining a healthy environment. Also, following a good eating pattern can have a positive effect on people's lives. In addition, most health disorders can be prevented through diet and lifestyle modifications (Chavro, 2019). The findings of Garruti et al, (2019) showed that the important effect of dietary pattern and lifestyle on maintaining and improving life is confirmed. Another study found that lifestyle changes, including diet and physical activity, may help prevent or limit the progression of these diseases, (Kopp, 2019). Also, the results of the study of Sodagar et al. (2019) showed that there is a significant relationship between quality of life and life orientation. One of the problems of societies like Iran is the unhealthy pattern of food consumption. The number of obese people and non-communicable diseases such as hyperlipidemia, hypertension, heart attacks and strokes in the country is increasing day by day, which not only causes human suffering, but also imposes great costs on the style and quality of life. One of the problems in the field of dietary pattern is people's diet and how they are consumed. In this regard, health organizations should warn against the consumption of high-fat, high-salt and harmful foods along with the health system and encourage people to use vegetables, grains, legumes and a healthy eating pattern to change their lifestyle to the middle ground, for example, is that 40% of cancers are preventable. The pattern of food consumption from the time of eating and processing food to receive energy during the day to the type of food includes carbohydrates, proteins, fats, vitamins, antioxidants and minerals, long-term and short-term. It has a significant effect on increasing and maintaining a healthy weight and ultimately physical health and quality of life. On the other hand, the lifestyle and pattern of each person is one of the most important factors in the implementation of personal diet that determines how to select, prepare, cook, consume and store food. A person's dietary pattern is rooted in various factors such as social, economic, cultural, religious and many other factors that are transmitted from person to person and are rooted in human beliefs. Therefore, recognizing the dietary pattern and its impact on human lifestyle and quality of life is a very effective step in forming a proper and appropriate dietary pattern, as well as having adequate, balanced and varied nutrition. In general, over the past decade or two, with the transition from the traditional lifestyle to the Western lifestyle, the transition from a healthy eating pattern to an unhealthy diet (Western diet) has been increasing. Consumption of meat, dairy,

vegetables and fruits has declined, replaced by starch, fat and sugar. In fact, this shift has had negative aspects in terms of food quality and meeting cellular needs, and abdominal satiety has replaced cellular satiety. Abdominal satiety is the removal of hunger, but cellular satiety is the actual supply of food and physiological needs of the body and the provision of nutritional health, which inadequate attention to cellular satiety can increase the prevalence of a number of non-communicable diseases, such as cancer and cardiovascular disease, diabetes and fatty liver. In addition to genetic predisposition, changes in diet and nutrition pattern are involved in at least one-third of all diseases and lifestyles. Following an unhealthy diet, including high levels of fat (mostly saturated fats such as solid fats, meat and poultry fats, tail fat and high-fat dairy products), puts people at risk for certain cancers such as colon, breast and kidney cancers. Increase adherence to the Western diet as a result of eating rich foods such as processed red meat (such as processed meats and sausages), butter, hydrogenated fats, French fries, refined grains (such as white and fancy breads) Is defined., Desserts, sweets and chocolates, high-fat dairy and soft drinks. The effect of unhealthy eating patterns is that foods with high energy density and low nutritional value with large amounts of refined grains (without bran), sugar, saturated and trans fats, low fiber and natural antioxidants lead in greater activation of the immune system. According to the results of the present study and other researches, if a person's lifestyle is such that he consumes less healthy foods and consumes more fast food, canned foods and generally unhealthy eating patterns, increase the risk of disease and bad habits. It is recommended that overweight people be monitored by a nutritionist and follow a healthy eating pattern.

Research limitations

Like any research, this study had some limitations, the most important of them was the lack of follow-up phase, which some researchers were advised to increase it to one to two years to explain the findings with more validity.

Further suggestions

It is recommended that researchers consider other aspects of overweight and use other tools to measure variables related to this issue.

5. Ethical Considerations

Compliance with ethical guidelines

Ethical considerations were determined in the study; the ethical code of human studies was identifier ir.arums.rec.1397.094 from Ardabil University of Medical Sciences.

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Authors' contributions

All authors have participated in the design, implementation and writing of all sections of the present study.

Conflicts of interest

The authors declared no conflict of interest.

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