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COMPARING THE LIFE STYLES OF PATIENTS WITH AND WITHOUT NONALCOHOLIC FATTY LIVER DISEASE REFERRING TO HOSPITALS AFFILIATED TO MEDICAL SCIENCES UNIVERSITIES IN TEHRAN IN 2016

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ABSTRACT

Background: life style is a combination of behavioral patterns and personal habits throughout life that Non Alcoholic Fatty Liver (NAFLD) is one of the life style-dependent diseases. This study aimed to compare the life styles of patients with and without NAFLD referring to medical sciences universities in Tehran.
Methods and materials: this case-control study was conducted with the participation of 300 patients aged between 18 and 65 who referred to sonography ward. According to the results of sonography, these patients were assigned into experimental (100 patients) and control (200 patients) groups and were monitored using Demographic Information Questionnaire, Physical Activity Questionnaire, Food Frequency Questionnaire, and Pittsburgh Sleep Quality Index. To analyze data, descriptive and inferential statistics tests were used.
Results: the means of healthy subjects were determined in life quality (46.33±5.39), BMI (22.47±1.97), and waist circumference (83.84±8.61) while in patients with NAFLD, different means were obtained for life quality (47.20±7.96), BMI (26.10±1.22), and waist circumference (98.83±28.7) where a significant difference was observed (p=0.001). Also, healthy subjects had more desirable physical activities and had low-cholesterol diets compared with patients with NAFLD (p=0.001).
Conclusion: according to the prevalence of nonalcoholic fatty liver as lifestyle-dependent disease, some aspects such as change in lifestyle and implementation of instructional interventions to increase awareness and improve attitudes of people to prevent and treat fatty liver are necessary.

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Introduction

One of the common chronic liver diseases dependent on life style is Non-Alcoholic Fatty Liver Disease (NAFLD) that is one of the main reasons for the referrals to hepatologic clinic [1]. This disease emerges with a vast range of simple liver steatosis and can lead to nonalcoholic steatohepatitis, fibrosis, cirrhosis, and liver failure or cancer [2]. NAFLD indicates a range of clinical and pathological conditions and is characterized by macrovesicular steatosis in the absence of alcohol consumption and includes a range of simple steatosis and liver diseases such as nonalcoholic steatohepatitis, fibrosis, cirrhosis, and hepatocellular carcinoma [3]. The prevalence of NAFLD is 2-3 times more than Hepatitis B and Hepatitis C and alcohol-dependent liver diseases and by now, it is the most common factor for liver tests disorders [4]. In Asia, the prevalence of this

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disease based on age, gender, region, and race is between 12% and 24%. Recent studies in eastern countries state that the prevalence of this disease is due to change in lifestyle (fatty diet, limited physical activities, obesity, and diabetes mellitus type II), so that only the prevalence of liver steatosis is estimated as 16-30% that is comparable with western countries [5].
In term of etiology, NAFLD is a multidimensional disease that several factors including genetic and lifestyle such as diet and physical activities cause it [6]. Decreased physical activity is one of the health problems in different societies that implicitly causes chronic diseases such as NAFLD [7]. So that according to different studies, high prevalence of this disease is related to obesity and lifestyle [8] and increased inactivity can play a potential role in the development of fatty liver disease [7]. For this reason, the treatment of this disease concentrates on behavioral interventions and lifestyle including diet, increased physical activity, and decreased weight. However, according to recent studies in Iran, physical activities are decreasing [9]. On the other hand, obesity and overweight among Iranian men and women is significant [10]. Therefore, it seems that in near future, the prevalence of fatty liver disease will increase in our society. Since low physical activity and increased obesity are among factors that influence NAFLD, they are considered among changeable risk factors [7].
Regarding treatment, fatty liver disease responds to behavioral changes, so that in most of people with fatty liver, the only treatment is to increase physical activities, decrease energy intake (e.g. fatty foods), and elimination of certain food items that all of the stated strategies are designed to decrease weight and obesity [11]. So far, many studies are conducted to investigate diets of patients with NAFLD and comparing them with healthy people. Although the results of these studies are different in certain aspects, it can be said that patients with NAFLD have low levels of cereals [12, 13] and dairy products in their diets compared with healthy people [14]. Also, according to these studies, patients with NAFLD use more meat compared with healthy people. Moreover, fruit and vegetable consumption in patients is lower than healthy people [12, 15].
According to what was said, with decreased physical activity and increased unhealthy diets and use of fast foods, Iranian society is moving toward overweight and obesity among most of people and it is predicted that Iranian society may suffer from complications resulted from obesity. Understanding the lifestyle of people with NAFLD in Iranian society may provide solutions to prevent the prevalence of this disease. This study aimed to investigate the lifestyle of patients with and without NAFLD referring to medical sciences universities in Tehran. In this study, physical activity, BMI, waist circumference, diets, and sleep pattern of NAFLD patients and healthy subjects were compared.

Methods And Materials

This case-control study was conducted on patients with and without nonalcoholic fatty liver referring to medical sciences universities in Tehran. In this study, subjects were selected by the available sampling method including 18-65 years old referrals to sonography ward in medical sciences universities in Tehran with positive and negative fatty liver. Those with positive sonography response were assigned into experimental group and those with negative sonography response (without fatty liver) were assigned into control group. The sample size according to the formula for each group considering drops was considered as 100 and the number of control group's samples was considered as 200. Those who entered the study were willing to participate in it including 18-65 years old outpatients without history in alcohol, no Cushing's syndrome, no chronic pancreatitis, no Wilson's disease and thyroid disorder, and did not have hepatitis and liver cancer. Data were collected by demographic information questionnaire that was as self-report form. This questionnaire included individual characteristics such as age, gender, height, weight, increased weight throughout the past year, waist circumference, income, education, occupation, marital status, number of children, place of residence, insurance, smoking, disease duration, hospitalization history, medication, and chronic disease.
International physical activity questionnaire includes 14 questions about physical activities over last week, occupational activities, and person's activities in workplace, house, movements, and activities in leisure time as well as exercise. Questions about physical activity were estimated based on the assessment of physical activity or metabolism per minute for different activities. Physical activities were based on three levels: 1. Lack of physical activity: no physical activity was mentioned or energy consumption was lower than 600; 2. sufficient physical activity: energy consumption between 600 and 1500 per week; 3. Physical activity: energy consumption more than 1500. Food Frequency Questionnaire includes person's food pattern over the past year. At first, 125 items were classified into 27 groups. This classification was based on the similarity of macro-nutrients that make up food items with respect to previous studies. This questionnaire incudes grains, refined grains, potato, dairy products, vegetables, fruits, beans, meat, solid oils, liquid oils, tea, coffee, salt, pickles, sugars, honey, jam, soft drinks, desserts, and snacks. Pittsburg Sleep Quality Index includes 9 questions about sleeping habits. This questionnaire investigates people's attitudes about sleep over past four weeks. It includes seven scales that each scale receives scores between 0 (lack of problem) and 3 (serious problem). In each scale, 0-1-2-3 show natural condition, mild problem, average problem, and severe problem, respectively. Finally, the scores of different components are collected and a general score is prepared (0 to 21). High score in each component or the total score indicate low sleep quality. BMI was measured through direct observation and estimation as well as use of formula. The researcher measured the waist circumference of the subjects by 1 m irresistible band based on centimeter and the liver profile examination was confirmed by radiologist. To determine content validity, the questionnaire was studied by ten faculty members of Faculty of Nursing and Midwifery, Shahid Behenshti University of Medical Sciences. Reliability of instruments was examined by Cronbach's

alpha for Pittsburg Sleep Quality Index (88%), Physical Activity Questionnaire (87%), and Food Frequency Questionnaire (82%).

After obtaining Code of Ethics and License from Deputy of Education of Shahid Beheshti University of Medical Sciences, the researcher referred to sonography ward of therapeutic centers for 30 days and after carrying out sonography for outpatients, subjects were assigned into two groups of NAFLD and healthy subjects. In this study, subjects in control group were two times more than the experimental group and those who used to be exposed to risk factor (experimental group) were compared with healthy subjects who did not have NAFLD (control group). To observe ethical aspects about the study and its objectives, subjects were provided by necessary information about the objectives and after obtaining their consent, data were gathered. After instruction regarding how to answer the questions, the obtained data were analyzed using SPSS 16. In descriptive statistics section, mean, standard deviation, and frequency were used and in inferential statistics section, independent t-test and Mann-Whitney test (to compare quantitative data in two groups), chi-square (to investigate the relationship between variables), chance ratio (the relationship between exposure and consequences), and logistic regression (predicting the relationships between variables) were used.

Results

This study was conducted with the participation of 300 patients aged between 18 and 65 where 204 subjects were males (82 patients with fatty liver and 122 without fatty liver) and 94 subjects were females (18 with fatty liver and 78 without fatty liver). Average age of subjects with fatty liver was 46.33±5.39 and average age of subjects without fatty liver was 47.20±7.96. Also, BMI in experimental group was 26.10±1.22 and in control group was 22.47±1.97. Average waist circumference in experimental group was 98.83±28.7 and in control group was 83.84±8.68. Most of research participants were married (84%) with education level below diploma (32%), sufficient income (54.5%), job without physical activity (69%), under insurance coverage (90%), without hospitalization history (70.5%), no chronic disease (70%), no medication (84.5%), and smoking history (64%).

In the first part of the findings, demographic characteristics (age, gender, medication, marital status) were studied in experimental and control groups that the results are presented in Table (1). As can be seen in findings, two research groups are different in terms of marital status, gender, medication, and job and this difference is significant using chi-square test (P=0.001). Also, Table (1) showed that two groups of the study are different in terms of age, waist circumference, and BMI and the experimental groups showed a significant difference compared with the control group in terms of these variables (P=0.001).

Table 1. Descriptive characteristics of gender, marital status, medication, job, age, waist circumference, and BMI and comparing them in research groups

Variable (nominal)	Level	Healthy, frequency (percentage)	Fatty liver, frequency (percentage)	**P**
Gender	Male	122 (61%)	82 (82%)	0.001
	Female	78 (9%)	18 (18%)	
Marital status	Single	34 (17%)	5 (5%)	0.001
	Married	138 (69%)	84 (84%)	
	Divorced	20 (10%)	6 (6%)	
	Died	8 (4%)	5 (5%)	
Medication	Yes	31 (15.5%)	73 (73%)	0.001
	No	169 (84.5%)	27 (27%)	
Job	With physical activity	127 (63.5%)	31 (31%)	0.001
	Without physical activity	73 (36.5%)	69 (69%)	
Variable (distance)	Groups	Mean	SD	**P**
Age	Healthy	46.33	5.39	0.001
	Fatty liver	47.20	7.96	
Waist circumference	Health	83.84	8.61	0.001
	Fatty liver	98.83	7.28	
BMI	Healthy	22.47	1.97	0.001
	Fatty liver	26.10	1.22	

Table (2) investigates physical activity and sleep quality. Also, using independent t-test, means in research groups are compared.

The results of Table (2) show that people with fatty liver and people without fatty liver show a significant difference in terms of sleep quality and physical activity (P=0.001), so that sleep quality and physical activity in people without fatty liver was higher than people with fatty liver.

Table 2. Mean and SD of sleep quality and physical activity and comparing the means in research groups

Variable	Groups	Mean	SD	P
Sleep quality	Healthy	46.33	5.39	0.001
	Fatty liver	47.20	7.96	
Physical activity	Healthy	41.77	20.39	0.001
	Fatty liver	35.40	28.48	

In Table (3), some of food frequency variables are investigated using Mann-Whitney test to compare means in research groups.

The results of Table (3) show that healthy subjects have used more fish, poultry, grains, fruit, and vegetables over past year compared with subjects with fatty liver while healthy subjects used less meat, egg, dairy, snack, sweets, and drinks compared with subjects with fatty liver and these differences were significant.

Table 3. Mean and SD of some of food frequency variables and comparing the means in research groups

Variable	Groups	Mean	SD	P
Meat	Healthy	1.78	0.66	0.001
	Fatty liver	2.59	0.76	
Fish	Healthy	2.39	0.67	0.001
	Fatty liver	1.44	1.10	
Poultry	Healthy	2.67	0.73	0.001
	Fatty liver	1.29	0.70	
Egg	Healthy	1.32	0.98	0.001
	Fatty liver	2.44	1.08	
Dairy products	Healthy	1.20	0.82	0.001
	Fatty liver	2.64	1.14	
Grains	Healthy	3.86	4.00	0.001
	Fatty liver	1.53	3.00	
Snack	Healthy	0.75	1.35	0.001
	Fatty liver	0.97	1.92	
Sweet and drink	Healthy	0.86	0.86	0.001
	Fatty liver	0.95	2.39	
Fruit and vegetable	Healthy	1.45	4.28	0.001
	Fatty liver	1.41	3.09	

Finally, in order to predict these variables, logistic regression analysis was used. Variables were selected according to significant difference between research groups in terms of research variable and the results are presented in Table (4).

The results of Table (4) show that among the variables, age, gender, job, medication, BMI, and sleep quality significantly predict fatty liver or lack of fatty liver but waist circumference, marital status, and physical activity do not have statistical power to predict fatty liver. The results of this table show that for each unit increase in sleep quality score, 27% chance of not getting the disease is increased. A unit increase in BMI score increased the chance for getting the disease by 64%. Also, 69% of subjects with fatty liver had jobs without physical activity while 31% of subjects with physical activity had fatty liver. Those with jobs without physical activity are exposed to fatty liver 66% more than others. Moreover, 82% of males suffer from fatty liver while 18% of females have fatty liver. Males suffer from fatty liver 46% more than females. Average age of healthy subjects in this study was 46.33 and average subjects with fatty liver was 47.20. Finally, with a unit increase in age, 25% chance for getting fatty liver increases.

Table 4. The results of logistic regression for predictive variables of fatty liver disease

Variables	Estimate	Standard error	Wald	(p-value)	(OR)
Age	-0.22	0.06	5.25	0.02	1.25
Gender	6.31	2.05	9.43	0.001	5.46
Waist circumference	0.21	0.14	2.11	0.14	1.23
Job	1.29	0.59	4.70	0.03	3.66
Medication	-2.56	0.70	13.24	0.001	0.07
BMI	1.73	0.64	7.24	0.001	5.64
Sleep quality	0.24	0.11	4.36	0.03	1.27
Marital status	-0.53	0.57	0.85	0.35	0.58
Physical activity	0.02	0.01	1.49	0.22	1.02

Discussion

The objective of the present study was to investigate and compare lifestyles of patients with and without NAFLD referring to medical sciences universities in Tehran in 2016. For this purpose, variables including age, gender, waist circumference, job, medication, BMI, sleep quality, marital status, and physical activity were selected and were investigated in research groups. According to previous studies, NAFLD has a close relationship with age and gender. For example, Doryani et al. concluded that age may cause nonalcoholic steatohepatitis disease [16]. On the other hand, gender may indirectly influence the development of nonalcoholic steatohepatitis disease. In the present study, it was determined that the prevalence of NAFLD in males is more than females. Such conclusion can be due to pressures from job, family, and society [13]. Excessive pressures in males influence the activities of the central nervous system that may lead to metabolic diseases [17]. About age, it can be concluded that maybe with increased age in people, physical activities decrease and this decreases metabolism [18]. In a study by Hallsworth et al., a comparison was made between physical activity of patients with fatty liver and healthy people and it was concluded that healthy people carry out regular physical activities. Also, their physical activities are more than those with fatty liver [19]. About food habits, Dehghan et al. confirm these findings [20]. About BMI, numerous studies introduced obesity as a predictive factor for NAFLD. In a study by Moradi et al., a significant relationship was observed between BMI and fatty liver, so that with increased BMI, prevalence of fatty liver increased [21]. Also, a study by Sookoien and Pirola confirmed the findings related to sleep quality and predicting fatty liver disease. They found that a significant relationship exists between fatty liver and sleep disorders, so that a significant relationship was found between sleep disorder and fatty liver [22]. Peng et al. investigated the effects of short-term sleep during day and sufficient sleep during night in NAFLD. They found that people with fatty liver have better sleep compared with healthy people and sufficient sleep is an important factor beside other effective variables [23]. Kim et al. investigated the duration and quality of sleep regarding NAFLD in patients with fatty liver. They stated that those who have high quality sleep will suffer from fatty liver compared with those with weak sleep quality.

Conclusion

This study with retrospective approach investigated factors and variables that influence NAFLD. In descriptive section, it was determined that patients with fatty liver had normal conditions in terms of sleep quality, BMI, and waist circumference while people with fatty liver were suffering from obesity. Also, quality and duration of sleep were not normal compared with healthy people. Also, healthy people had higher level of physical activity compared with those with jobs that demanded physical activity. Healthy people had low fat and low cholesterol diets while those with fatty liver had diets with high levels of sugar. In summarizing the results of this study, it can be stated that among variables of this study, age, gender, job, medication, BMI, and sleep quality significantly predict fatty liver in people while other variables such as waist circumference, marital status, and physical activity did not show any significant prediction but according to the differences in these variables between healthy people and those with fatty liver, these variables can be taken into consideration as important variables. This study suffered from limitations. Crowded hospitals and many pages in questionnaire that may cause mistakes in recording information are among the limitations of this study. The findings of this study can be used in different aspects. For example, the findings of this study can be presented to families as information brochures to let them identify the main variables that influence fatty liver. Information can be provided for those with fatty liver based on all variables that are important regarding fatty liver to change their diets, physical activities, and sleep.

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