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Comparison of the Effect of Family-centered and Patient-centered Education on Healthy Lifestyle Behaviors in Patients with Non-alcoholic Fatty Liver Disease

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ABSTRACT

Aims Non-alcoholic fatty liver disease is a common disorder that is increasing due to unhealthy lifestyle. This study aimed to compare the effect of family-centered and patient-centered education on healthy lifestyle behaviors in patients with non-alcoholic fatty liver.

Materials & Methods This semi-experimental study was performed between October and February 2021 on 81 patients with fatty liver disease referred to Shahid Mofatteh Clinic affiliated to Yasuj University of Medical Sciences, Yasuj, Iran. The subjects were randomly divided into three control, patient-centered, and family-centered intervention groups. The data collection tool was Walker's Lifestyle Questionnaire, which was completed virtually by three groups before the intervention and three months after the intervention.

Findings Before the intervention, there was no significant difference between the mean scores of variables (except for the exercise subscale) in the three groups ($p>0.05$). However, after the intervention, the mean scores in the subscales of nutrition, exercise and health responsibility showed a significant difference between the three groups ($p<0.05$). In the two-by-two comparison of the groups, the significant difference in the nutrition was related to the difference between the control group and patient-centered group ($p=0.009$), and in the health responsibility, it was related to the difference between the control group and family-centered group ($p=0.018$). Also, the mean scores of lifestyle behaviors and their subscales increased significantly in the two intervention groups after the intervention ($p<0.05$).

Conclusion Both family-centered and patient-centered education methods improve the lifestyle behaviors in patients with non-alcoholic fatty liver and there is no signiant difference between them.

Keywords Lifestyle; Education; Family-Centered Nursing; Patient-Centered Care; Non-Alcoholic Fatty Liver

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Introduction

Non-alcoholic fatty liver disease is a common disorder and refers to the fat accumulation in the liver [1]. The importance of non-alcoholic fatty liver disease is due to the destruction of liver cells, and if not diagnosed early and treated, it can lead to advanced liver cirrhosis [2] and even death. Recent studies have reported the prevalence of non-alcoholic fatty liver disease due to lifestyle changes, including a high-fat diet, low physical activity, obesity, and type 2 diabetes mellitus [3].

Lifestyle is a way of life and its components are eating habits, sleep and rest, physical activity and exercise, weight control, smoking and alcohol consumption, immunization against diseases, coping with stress, and family and community support [4]. Most countries, including Iran, are changing the traditional lifestyle to an industrial one, and the change in lifestyle has increased the prevalence of overweight and obesity [5].

There are many pharmacological and non-pharmacological strategies to eliminate non-alcoholic fatty liver disease. However, no pharmacotherapy has been approved for the long-term treatment of non-alcoholic fatty liver [6]. These patients need to change their lifestyle by focusing on nutrition and physical activity [7]. Macronutrients such as saturated fatty acids, trans fats, simple sugars, and animal proteins have detrimental effects on the liver. On the other hand, unsaturated fats, omega-3 fats, plant proteins, and dietary fiber are considered beneficial for the liver [8]. Epidemiological studies have shown that regular exercise prevents fat accumulation in fatty liver [9]. In addition to dietary modification and regular physical activity and exercise, gradual weight loss, no alcohol consumption, stress reduction, medication, and general lifestyle modification are the main recommendations and the first step for managing and preventing the development of non-alcoholic fatty liver [10, 11].

Chronic patients are treated with different approaches. The disease and its treatment are considered in a disease-centered approach focusing on physical examination. Whereas, the patient-centered approach examines the patient as a whole [12] and focuses on health partnerships between patients and health care professionals while emphasizing their values and preferences [13]. Patient-centered care reduces the duration of hospitalization, hospital costs, increases patient satisfaction, and improves the health outcomes and quality of life of patients [14].

Although patient-centered care has been part of nursing since the 1970s, recognition of patients' families' role in providing support, assistance, and care to patients, especially adult patients is newer. Family-centered care as an "innovative approach" to health care planning, providing, and evaluation is based on a beneficial collaboration between patients, families, and care providers. [15]. The role of the family in patients' adaptation to lifestyle changes and disease control and its complications is considerable. The family is responsible for providing proper and appropriate care to the patient [16]. Family-centered education is one of the main concepts of nursing, and its purpose is to increase family awareness and the ability to provide proper care to each patient [17].

However, in a study by Keogh *et al*., patient- and family-centered education had the same effect to improve the diet, physical activity, and blood pressure in hypertensive patients [18]. Also, Galie *et al*. found no significant difference between patient-centered and family-centered methods based on the empowerment model in the level of glycosylated hemoglobin [19]. There was no study to compare the effect of family-centered and patient-centered education on the lifestyle of patients with fatty liver. Therefore, this study aimed to compare the effect of the components of healthy lifestyle education in family-centered and patient-centered methods on lifestyle behaviors of patients with fatty liver.

Materials and Methods

This semi-experimental study was performed between October and February 2021 on patients with fatty liver disease referred to Shahid Mofatteh Clinic affiliated to Yasuj University of Medical Sciences, Yasuj, Iran. Subjects were selected by purposive sampling method based on the inclusion and exclusion criteria. The inclusion criteria included the diagnosis of non-alcoholic fatty liver disease by a physician using ultrasound and clinical tests; acquiring minimum and maximum scores of 25 and 208, respectively, from filling out the Walker lifestyle questionnaire; being literate; mobile access with the possibility of installing an application; incompatibility of family-centered and patient-centered groups; and patient participation in the patient care process. Exclusion criteria were patients with chronic disease, behavioral and mental disorders, and physical disability.

The sample size was determined to be 24 subjects in each group, considering the similar previous studies [20], calculating first type error 0.05 and mathematical power 0.95, and mean of self-efficacy in intervention and control groups by 116.97±18.51 and 91.26±28.51, respectively. G*Power 3.1.9.4 software was used in the study. Due to the statistical decline and prevention errors, the sample size for each group was determined to be 27 people. 81 eligible subjects were allocated into the three groups of control (n=27), patient-centered intervention (n=27), and family-centered intervention (n=27) by randomized block design.

A demographic questionnaire was used to collect information such as age, sex, marital status, education level, occupation status, and duration of fatty liver disease.

Walker's lifestyle questionnaire consists of 52 items and its purpose is to investigate effective behaviors to improve a healthy lifestyle. The subscales of the questionnaire are nutrition, exercise, health responsibility, stress management, interpersonal support, and self-actualization. The questionnaire is scaled with a 4-point Likert scale including never (1 point), sometimes (2 points), usually (3 points) and always (4 points). The points of the items of each dimension are added to obtain the score of each dimension.The total scores of all items are added to calculate the total score of the questionnaire [21]. The reliability and validity of the questionnaire were confirmed in Iran and Spain by Mohammadi Zeidi [22] and Kuster and Fong [23], respectively. Cronbach's alpha coefficient of this questionnaire was 83% [23].

The research objectives and methods and the role of subject in the intervention were explained to the eligible patients by phone call. Walker's lifestyle questionnaire was provided to the subjects with a confidential virtual link in the first session. The eligible subjects with a score higher than 52 completed the written consent form to participate in the study.

The independent variable in the study was lifestyle components education of family-centered and patient-centered, and the outcome variables were lifestyle behaviors.

Patient-centered interventions: First, the steps and process of education, the necessity of studying the materials, confirming the study, and the necessity of action were explained to the subjects by phone call. The content of the educational intervention was prepared and approved based on the components of lifestyle (including nutrition, exercise, health responsibility, stress management, and support) and experts' opinion. The intervention content was adjusted for 11 sessions. Educational materials were provided to subjects by sharing videos, photos, clips and text through the WhatsApp platform. Since patient-centered education examines the values, needs, and desires of patients, a combination of Question-and-Answer (Q&A) teaching methods were used through WhatsApp, phone calls, educational videos and clips, and related books. The input information of the subjects was determined and considered through training based on the pre-test stage [24, 25].

The first and second sessions were performed according to the protocol by a researcher (community health nurse). Nutrition training sessions were provided by a nutritionist through videos and Q&A in 5 sessions. Physical activity and exercise training was provided by a sports specialist in two sessions. Stress management training was provided by a psychologist in the form of training clips and photos in two sessions (Table 1).

Table 1) Patient-centered and family-centered education protocol

Sessions	Contents
1	Introduction and expression of research goals; evaluation of patients' information about the fatty liver disease; identifying patients' beliefs, thoughts, and feelings about non-alcoholic fatty liver disease and its complications; assessing the feeling of threat in patients
2	Fatty liver disease, complications, disease control and treatment methods; the importance of the following treatments; self-care behaviors to maintain health and control disease effects
5 to 7	Diet
8 and 9	Physical activity and exercise
10 and 11	Teaching stress management techniques

Family-centered group interventions: The only difference between family-centered and patient-centered approaches was that in addition to the patient, an active family member participated in the training sessions, who was involved in the patient's care processes and introduced by the subjects.

Training sessions were conducted online every other day for 4 weeks and each session lasted 45 to 60 minutes. Participants shared their questions or comments on WhatsApp. A nutritionist, psychologist and physical activity specialist were added to the WhatsApp group to answer questions. At the beginning of the sessions, patients were asked about the training of the previous sessions and the necessity of diet and physical activity, especially walking, was emphasized.

The control group received usual care and training. During the interventions, none of the subjects were deprived of their routine medical treatments and care.

The post-test stage for the intervention and control groups was conducted by the researcher and the link of Walker's lifestyle questionnaire was shared in the groups and completed by the subjects.

Data were analyzed by SPSS 19 software. Shapiro-Wilk test was used to check the normality of data distribution; for data with normal distribution, parametric tests of one-way analysis of variance (ANOVA), paired t-test, and Bonferroni post hoc test were used, and for data with non-normal distribution, non-parametric Kruskal-Wallis test was used. Chi-square test was also used to compare the three groups in terms of frequency distribution of demographic characteristics.

Findings

Out of 81 subjects, 3 left the study and 78 subjects stayed until the end. There was no significant

difference between the patient-centered, family-centered and control groups in terms of demographic characteristics (p>0.05; Table 2).

Before the intervention, there was no significant difference between the mean scores of lifestyle behaviors and their subscales (except for the exercise subscale) in the three groups (p>0.05). However, 3 months after the intervention, the mean scores in the subscales of nutrition, exercise and health responsibility showed a significant difference between the three groups (p<0.05; Table 3).

In the two-by-two comparison of the groups, the significant difference in the nutrition subscale was related to the difference between the mean scores of the control group and the patient-centered group (p=0.009), and in the health responsibility subscale, it was related to the difference between the mean scores of the control group and the family-centered group (p=0.018).

Also, the mean scores of lifestyle behaviors and their subscales increased significantly in patient-centered and family-centered groups after the intervention compared to before the intervention (p<0.05), but no significant difference was found in the control group between before and after the intervention (p>0.05; Table 3).

Table 2) Comparing the frequency distribution of demographic characteristics between the study groups before the intervention (n=27 in each group)

Variable		Control group	Patient-centered group	Family-centered group	P-value*
Age, years	20-50	19 (70.4)	18 (66.7)	21 (77.8)	0.746
	51-80	8 (29.6)	9 (33.3)	6 (22.2)	
Gender	Male	16 (59.3)	15 (55.6)	16 (59.3)	0.951
	Female	11 (40.7)	12 (44.4)	11 (40.7)	
Occupation	Self-employment	8 (29.6)	4 (14.8)	6 (22.2)	0.695
	Retrieved	4 (14.8)	3 (11.1)	3 (11.1)	
	Unemployed	0 (0.0)	2 (7.4)	3 (11.1)	
	Housekeeper	7 (25.9)	9 (33.3)	5 (18.5)	
	Employee	8 (29.6)	9 (33.3)	10 (37.0)	
Education level	Diploma	7 (25.9)	12 (44.4)	5 (18.5)	0.510
	High school	2 (7.4)	2 (7.4)	3 (11.1)	
	Bachelor	13 (48.1)	11 (40.7)	15 (55.6)	
	Master and higher	5 (18.5)	2 (7.4)	4 (14.8)	
Marital status	Married	19 (70.4)	23 (85.2)	23 (85.2)	0.328
	Single	8 (29.6)	4 (14.8)	4 (14.8)	
Duration of fatty liver disease, month	1	12 (44.4)	13 (48.1)	9 (33.3)	0.829
	2	6 (22.2)	1 (3.7)	9 (33.3)	
	3	3 (11.1)	4 (14.8)	4 (14.8)	
	4	2 (7.4)	1 (3.7)	0 (0.0)	
	5	4 (14.8)	8 (29.6)	5 (18.5)	

*Chi-square test

Table 3) Comparing the mean scores of lifestyle behaviors and its subscales in the studied groups before and after the intervention

Variable	Patient-centered group	Family-centered group	Control group	Test results
Nutrition				
Pre-intervention	26.92±7.95	26.0±9.04	29.74±5.88	F=1.88; p=0.159*
Post-intervention	34.36±5.32	33.31±4.31	31.11±6.11	χ^2=8.84; p=0.012**
Test results	t=3.80; p<0.01***	t=3.61; p<0.01***	Z=0.62; p=0.54	-
Exercise				
Pre-intervention	30.76±9.38	27.00±8.21	34.78±6.98	F=6.17; p=0.003*
Post-intervention	39.24±5.41	37.50±5.94	36.41±7.61	-
Test results	t=4.17; p<0.0001***	t=5.47; p<0.0001***	Z=0.99; p=0.32	-
Health responsibility				
Pre-intervention	20.36±5.75	17.88±6.60	21.74±4.28	χ^2=5.22; p=0.074**
Post-intervention	24.00±3.93	24.92±3.75	22.26±4.53	χ^2=8.23; p=0.016**
Test results	t=2.81; p=0.01***	t=5.24; p<0.0001***	Z=3.82; p=0.09	-
Stress management				
Pre-intervention	12.36±3.08	11.73±4.18	14.22±4.45	χ^2=1.84; p=0.398**
Post-intervention	15.20±3.29	14.61±2.65	15.18±4.42	χ^2=0.54; p=0.764**
Test results	t=3.05; p=0.006***	t=2.86; p=0.008***	Z=1.58; p=0.11	-
Interpersonal support				
Pre-intervention	15.84±4.57	14.80±5.38	16.44±7.22	χ^2=1.16; p=0.560**
Post-intervention	18.60±4.68	18.57±4.88	18.59±7.38	χ^2=0.85; p=0.855**
Test results	t=1.94; p=0.064***	t=2.61; p=0.015***	Z=1.79; p=0.073	-
Self-actualization				
Pre-intervention	14.56±4.38	14.84±5.25	17.48±3.69	χ^2=2.37; p=0.306**
Post-intervention	17.68±3.17	18.03±2.40	18.74±3.65	χ^2=1.07; p=0.586**
Test results	t=3.27; p=0.003***	t=2.98; p=0.006***	Z=2.01; p=0.07	-
Total Score				
Pre-intervention	120.80±3.83	112.26±35.04	134.41±31.06	χ^2=3.96; p=0.138**
Post-intervention	149.08±18.48	146.96±17.04	142.30±31.98	χ^2=4.85; p=0.089**
Test results	t=4.05; p<0.0001***	t=4.59; p<0.0001***	Z=1.31; p=0.191	-

*One-way ANOVA, **Kruskal-Wallis test, ***Paired t-test

Discussion

Since there has been no study comparing the effect of family-centered and patient-centered education on the lifestyle behaviors of patients with non-alcoholic fatty liver disease, this research aimed to compare the effect of teaching lifestyle components by family-centered and patient-centered methods on lifestyle behaviors of patients with fatty liver.

The results of the present study showed that both patient-centered and family-centered methods are effective in increasing healthy lifestyle behaviors including nutrition, exercise, health responsibility, stress management, interpersonal support, and self-actualization.

Consistent with our study, Centis *et al*. stated since non-alcoholic fatty liver disease stems from excess calorie intake and lack of physical activity, the correction of unhealthy lifestyles is the background of any prevention and treatment strategy; however, prescriptive diets have a limited long-term efficacy and increasing the physical activity in these patients is very difficult [26]. George *et al*. concluded that behavior change in patients with nonalcoholic fatty liver improved their physical activity and metabolic parameters after intervention [27]. In Piatt *et al*.'s study [28], patient-centered lifestyle modification interventions were effective in weight loss, which could be due to dietary adherence, as was done in the present study. In Sanaeinasab *et al*.'s study [29], all lifestyle subscales improved after 6 training sessions for diabetic patients compared to the control group. Although the training sessions in the mentioned study were fewer than in this study, the intervention affected all subscales of lifestyle, which may be due to the in-person training. In addition, the different nature of diabetes as a known debilitating disease for diabetics can lead to greater adherence to a healthy lifestyle.

Ateshzadeh-Shoorideh *et al*. [30] found that the family-centered empowerment model significantly improves lifestyle, self-efficacy and HbA1c in diabetic patients and the family-centered empowerment model was more effective than the non-family-based empowerment model. The difference between the mentioned study and our study is the use of training and empowerment models. Maybe, due to the increase in motivation in the model stages of this study, the family-centered empowerment model has been more effective than the family-centered virtual education.

Hacihasanoğlu and Gözüm found that individual education improved nutrition more than family-centered education [31]. However, contrary to this study, Cohen [32] mentioned that a family-centered approach focusing on the family environment, growth stage, and diet and activity preferences has a positive effect on weight loss.

Duncan *et al*. [33] concluded that a brief family-centered intervention targeting physical activity and nutrition can reduce an obesity-induced fat compared to routine care alone. Family-centered care strategies typically create a structured relationship between family members and prepare them to make decisions and care a patient [34].

According to our study, self-actualization and stress management subscales improved in the intervention groups after the intervention, but there was no significant difference between the two intervention groups.

Bjorklund *et al*. [35] showed that the mean score of stress management and mental health of pregnant women did not improve with group education. These results suggest that educational interventions are less likely to improve mental health, and psychological and counseling approaches may need to change in this area.

In this study, no significant difference was observed between patient-centered and family-centered education methods in the lifestyle of patients with fatty liver.

Consistent with our study, Heidari *et al*. [36] found no significant difference between family and patient-centered educational programs, and both groups reduced obsessive-compulsive symptoms. Shaafi *et al*. [37] showed the effect of family and patient-centered educations methods on the lifestyle of the elderly is the same. Also, Windram *et al*. [38] demonstrated a similar effect of patient-centered education and training programs on blood glucose control in patients with chronic type 2 diabetes. Although in the above study, patient-centered education was compared with conventional education, there was no significant difference between the two methods.

However, contrary to our findings, Bahramnezhad *et al*. [39] found that family-centered care decreased complications of dialysis more than patient-centered care.

Asgari *et al*. [40] concluded that family-centered education significantly reduced the frequency and symptoms of heart disease in patients with myocardial infarction compared to patient-centered education. The difference between our study and Asgari *et al*.'s study [40] could be due to the virtual nature of the training in the family-centered and patient-centered intervention groups. On the other hand, the nature of heart disease and fatty liver is different due to the asymptomatic nature of fatty liver and it may not be according to the wishes of the family.

Training may not be a proper approach to improve the lifestyle and its subscales in these patients, and behavioral change approaches such as behavior change models or psychological interventions are needed. As in Mazzotti *et al*.'s study, lifestyle improvement and reduction of fat and liver enzymes in two groups under group motivational counseling and web-based motivational counseling were equal and significant [41].

This study had some limitations, including holding virtual training sessions for intervention groups due to the COVID-19 epidemic, the impossibility of researcher presence in the subject families, the possibility of sharing information between intervention and control groups due to the common platform of the subjects, and the possibility of introducing a non-key member of the family due to the necessity of having a mobile phone equipped with WhatsApp application. By removing the limitations of the research and repeating the study, it is possible to improve the lifestyle of patients using educational methods with higher effectiveness.

It is suggested to perform similar studies after controlling the COVID-19 pandemic. It is also suggested to use other psychological interventions or behavior change models in patients with non-alcoholic fatty disease.

Conclusion

Both family-centered and patient-centered education methods improve the lifestyle behaviors in patients with non-alcoholic fatty liver and there is no Signiant difference between them. Therefore, both educational approaches can be recommended to improve the lifestyle of patients with fatty liver.

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Ethical Permission: This study was approved by the Research Ethics Committee of Yasuj University of Medical Sciences with code IR.YUM.REC.1399.044. Conscious consent was obtained from patients to participate in the study. Questionnaires were distributed anonymously and all information remained confidential. Patients had the right to leave the study. This study had no cost to patients, hospitals, or insurance companies.

Conflict of interest: There is no conflict of interest.

Authors' contribution: Ahmadinezhad S. (First author), Original researcher/ Introduction author/ Methodologist/ Discussion author (35%); Hassanzadeh S. (Second author), Methodologist/ Discussion author/ Statistical analyst (15%); Roustaei N. (Thirst author), Methodologist/ Discussion author/ Statistical analyst (15%); Hosseini N. (Fourth author), Methodologist/ Introduction author/ Discussion author (35%)

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