

Health-Promoting Lifestyle in Patients with and without Diabetes in Iran

Hamid Vahedi,¹ Ahamd Khosravi,² Zakieh Sadeghi,³ Roqayeh Aliyari,⁴ Alihassan Shabankhamseh,⁵

Maryam Mahdavian,⁶ Ehsan Binesh,⁷ and Mohammad Amiri^{8,*}

¹Internist and Gastroenterologist, Shahroud University of Medical Sciences, Shahroud, IR Iran

²Center for Health Related social and Behavioral Sciences Research, Shahroud University of Medical Sciences, Shahroud, IR Iran

³Analytical Chemistry, Shahroud, IR Iran

⁴Department of Biostatistics, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, IR Iran

⁵Management Specialist Assistant Professor in Deputy of Current Affairs (Moh & Me) Ministry of Health and Medical Education, Tehran, IR Iran

⁶Imam Hossein Hospital, Shahroud University of Medical Sciences, Shahroud, IR Iran

⁷Department of Infection Disease, Imam Hossein Hospital, Shahroud University of Medical Sciences, Shahroud, IR Iran

⁸Department of Public Health, School of Public Health, Shahroud University of Medical Sciences, Shahroud, IR Iran

*Corresponding author: Mohammad Amiri, Department of Public Health, School of Public Health, Shahroud University of Medical Sciences, Shahroud, IR Iran. Tel: +98-2332374350, Fax: +98-2332335588, E-mail: m_amiri_71@yahoo.com

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Abstract

Background: Diabetes is among the prevalent chronic non-communicable diseases, which in recent decades has dragged much attentions toward improving care of patients in Iran.

Objectives: The current study aimed to compare the health-promoting lifestyle of patients with and without diabetes.

Methods: In the current study, 150 patients with diabetes and 150 patients without diabetes referred to the Imam Hossein sub-specialty Clinic in Shahroud in 2014 were enrolled. Data collection tools included a 52-item lifestyle questionnaire and a 22-item nutritional behavior and dietary habits questionnaire. Data were analyzed using ANOVA and conditional multiple logistic regression.

Results: The mean score of nutritional behavior in patients with and without diabetes were 20.9 ± 3.9 and 19.9 ± 4.1 , respectively. Over 75% of the patients with diabetes had not passed the training course. The results of multivariate model showed the odds of having diabetes in people with obesity was 2.6 times more than that of the people with normal weight. Interpersonal relationship, stress management, physical activity and nutrition scores in patients with diabetes were significantly lower than those of the patients without diabetes ($P < 0.05$). Negative relationship was observed between physical activity and diabetes (odds ratio (OR) = 0.916; 95% confidence interval (CI) = 0.850-0.987).

Conclusions: Patients with diabetes need more attention and care to manage diabetes to change their lifestyle to adjust with their conditions. Stress management, improved interpersonal relationships, physical activity and diet in this group can have a role to control the disease.

Keywords: Diabetes Mellitus, Knowledge, Attitude, Lifestyle

1. Background

With the epidemiological transition of diseases in recent decades, the prevalence of non-communicable diseases including diabetes is rising in the developing countries and in the Middle East (1). Diabetes is a chronic disease which inflicts short-term and long-term complications on the individual (2).

The studies in Iran report prevalence of diabetes in the general population 3.5% to 4.5% and in the population over 30 years even up to 14%, and in all provinces its prevalence is higher in females than males (3-5). According to the report of deputy of health at Shahroud University of Medical Sciences, the prevalence of diabetes in the over 30 years rural population is 6.25%.

Diabetes causes various complications related to some vital organs in body. In fact, diabetes is the most common cause of kidney failure, blindness, non-traumatic amputations and neuropathy (6, 7). Experts believe that the recent outbreak of type 2 diabetes is not characterized by changes in the genetic and ethnic characteristics of individuals in the community, but changes in the lifestyle of people and modernization of the society have the greatest impact on the increased incidence of diabetes (8). Lifestyle is a highly important factor related to development and control of diabetes in patients (9). Lifestyle includes behaviors such as eating habits, sleep and rest, physical activity and exercise, weight control, smoking and alcohol use, immunization against diseases, coping with stress and the ability to use family and community support; optimum

lifestyle can prevent many diseases and is a way to improve the health, quality of life and coping with stress (10, 11). Physical inactivity is associated with an increased prevalence of diabetes and metabolic syndrome (12). Regular physical activity is lower in females than in males, and its amount also decreases with aging. Low level of activity is related to many diseases and conditions such as loss of muscle strength and flexibility, weight gain and obesity, impotence, premature mortality (caused by cardiovascular diseases) and non-insulin dependent diabetes (13).

A study in North of Iran indicates a positive effect of lifestyle on type 2 diabetes (14). Marker et al. (15) believe that patients with diabetes have an inappropriate lifestyle. de Groot et al. (16) showed that patients with diabetes had incorrect lifestyles, inappropriate diet and no exercise. Results of researches in Iran showed that self-management interventions, increasing physical activity, improving diet, family-centered empowerment and training programs were effective in improving lifestyle and diabetes control (17, 18). Another study found that 95.5% of patients had intermediate-risk lifestyle (19).

Lifestyle interventions such as physical activity, proper diet, self-care, awareness raising and people empowerment and the quality of life improvement play roles in decreasing the morbidity and mortality associated with diabetes (20, 21).

Since diabetes is a chronic disease which imposes heavy costs on the healthcare system, awareness of the relevant factors in different populations is necessary and makes it possible to plan for feasible preventive and therapeutic measures (22, 23). According to the above mentioned relationship of lifestyle and control of diabetes complications (17, 18), and since there were no studies on the relationship between individual health aspects of lifestyle and diabetes in Shahroud, the current study was conducted.

2. Objectives

The study aimed to compare the health related lifestyle between the patients with and without diabetes in Shahroud, Northeast of Iran.

3. Methods

In the current study, 150 patients with diabetes who referred to diabetes clinic of Imam Hossein hospital in Shahroud were selected and each patient was matched for age with a patient without diabetes selected from specific clinics. The controls were selected from the same age range with five years tolerance. Simple random sampling

method was employed to select the subjects. Out of the 840 registered patients with diabetes (prevalent cases) in the diabetes clinic, 170 patients were selected according to their medical records. Of these selected patients, finally 150 patients were interviewed and completed the questionnaire. For every case, an age matched patient without diabetes was selected from the admitted patients in Imam Hossein hospital as control. The controls were selected from orthopedics, urology, ear, nose and throat (ENT), cardiology, dermatology, internal medicine, and surgery clinics.

3.1. Inclusion and Exclusion Criteria

The patients with active medical records of diabetes were selected for the case group. Active medical record was defined as a patient with diabetes that had at least one visit to diabetes clinic in the past year. The protocol of this study was approved by the ethical board review of Shahroud University of Medical Sciences (No. 9209). Subjects signed a written informed consent after explaining the goals to them.

Blood pressure was measured using a mercury sphygmomanometer on the right arm, in sitting position after five minutes rest, by a trained nurse. Blood pressure was measured twice with an interval of three minutes. Hypertension is defined as systolic blood pressure ≥ 140 and/or diastolic blood pressure ≥ 90 mmHg or current use of antihypertensive medication (24). Smoking was defined as smoking one or more cigarette per day. The history of cardiovascular and kidney diseases and stroke was measured interviewing and assessing the patients' medical records. Body-weight was measured to the nearest 0.05 kg by a digital scale. Body height was measured by means of a tape-line to the nearest 0.001 m. After measuring the weight and height of patients, the body mass index (BMI) was calculated by dividing weight (in kilograms) on the square of height (in meters). Overweight was defined as a BMI greater or equal to 25 kg/m², and obesity was defined as a BMI ≥ 30 kg/m² (25).

The health-promoting lifestyle questionnaire consists of 52 items in six areas of nutrition (8 items), physical activity (8 items), health responsibility (13 items), stress management (5 items), interpersonal relationships (8 items) and spiritual growth (10 items). Reliability and validity of this inventory is confirmed in Iran (26) and its reliability was reported 0.82. A researcher-made questionnaire was used, which included 34 items that sought awareness and attitudes of patients about diabetes; the reliability of the questionnaire was 0.71.

The independent variables in the study were health-promoting lifestyle (with six dimensions), knowledge and attitude about diabetes, and questions about history of

high blood pressure, stroke, cardiovascular diseases and kidney diseases and demographic variables (gender, education level and marital status). Four valid questions about knowledge and four valid questions about attitude toward diabetes were used. These questions were designed according to the surveillance system protocols (27). The total score for knowledge ranged between 0-8 and for attitude was 1 to 20. The score greater and equal to 7 and 15 respectively showed the desirable knowledge and positive attitude.

The collected data were analyzed using SPSS ver. 16. First, by contingency tables, distribution of explanatory variables (independent) was divided into two groups. According to the matching of cases and controls on age, conditional logistic regression model was used. In this model, the effects of life-style, smoking, knowledge, attitude, hypertension, BMI, educations, marital status, along with matched variable of age were used to prevent bias in case-control due to the matching.

4. Results

In the current study, 150 patients with diabetes and 150 patients without diabetes participated; 27.3% were male, 10.7% were smokers and 31.3% had obesity in the group with diabetes and in the group without diabetes 39.3% were male, 10.7% were smokers and 13.3% had obesity. The mean duration of involvement with diabetes was 7.59 ± 5.97 years and the mean of age was 46.6 ± 16.4 years.

Table 1 presents the univariate comparison of some baseline variables between diabetetic and non-diabetic groups. As indicated, there was a significant difference between the two groups in terms of gender, marital status, education levels, hypertension, history of cardiovascular disease, history of kidney disease, history of stroke, daily physical activities, training experience in the field of diabetes, BMI, knowledge and attitude ($P < 0.05$).

Comparison of health-promoting lifestyle subscale scores between the patients with and without diabetes is presented in Table 2. As indicated, the mean score of interpersonal relations, stress management, physical activity and nutrition scores in patients with diabetes are lower than that of those without diabetes ($P < 0.05$).

In a multiple logistic model, independent variables such as gender, marital status, education levels, history of hypertension, cardiovascular disease and kidney disease, training experience in the field of diabetes, BMI, knowledge, attitude and dimensions of health-promoting lifestyle were assessed. The odds ratio for diabetes in people who had completely positive attitude in the field of diabetes was 7.6 times higher than those of the ones with a negative attitude. Chance of having diabetes for subjects

with obesity was 2.6 times higher than those of the ones with normal weight. The odds of having diabetes for those who had a relatively positive attitude about diabetes were 0.13 times higher than those of the ones with positive attitudes toward diabetes. Also the model showed negative relationship between physical activity and diabetes ($P = 0.021$) (Table 3).

5. Discussion

Based on the findings of the current study (in terms of health-promoting lifestyle subscales) stress management, physical activity, nutrition and interpersonal relationship scores in patients with diabetes are significantly lower than those of patients without diabetes. Another study showed that improving lifestyle reduces the incidence of diabetes (28). Therefore, with respects to positive impact of life-style on the control of complications of diabetes, it is necessary to pay more attention to this issue.

Most of the participants of this study were females (gender ratio = 2), which was consistent with the findings of some studies (17, 29-31) but was inconsistent with the results of other studies (14, 32, 33). In the current study, design and method used to select patients from a subspecialty clinic showed that females had more visits and received care services.

The proportion of married people was more prevalent in patients with diabetes than the ones without diabetes, which was consistent with the results of some other studies (4, 30, 31, 34). In univariate analysis a significant relationship was observed between marital statuses in the two groups, but in the multivariate model, the marital status was not related to diabetes condition.

Education level based on years of education in patients with diabetes was lower than that of patients without diabetes; a significant difference was observed between the two groups in terms of education levels. It was in line with the results of Kheirjoo et al. and Shojaeizadeh et al. (14, 34), but not with those of some other studies (14, 31). Probably, higher education makes the importance of health clearer to people and encourages them to take health-promoting measures.

Obesity in patients with diabetes was more than ones without diabetes and the difference was statistically significant, which was consistent with the results of Shojaeizadeh et al. (14).

Mean level of knowledge in patients with diabetes was higher than that of the patients without diabetes, which was consistent with the results of Shamsi et al., and Hosseini et al. (4, 17), but inconsistent with the results of Goodarzi et al. and Bayat et al. (30, 31).

Table 2. The Comparison of Health-Promoting Lifestyle Between the Case and Control Groups

Health-Promoting Lifestyle Subscales	Patients With Diabetes	Patients Without Diabetes	P Value
Spiritual growth	27.3 ± 6.15	28.05 ± 5.46	0.263
Health responsibility	33.68 ± 7.14	33.42 ± 7.40	0.757
Interpersonal relations	20.66 ± 5.17	22.81 ± 4.76	0.001
Stress management	11.13 ± 2.84	12.19 ± 2.98	0.002
Physical activity	10.08 ± 3.57	13.27 ± 5.19	0.001
Nutritional habits	19.92 ± 4.12	20.92 ± 3.89	0.031

Table 3. The Multivariate Association Between Some Variables in the Two Groups by Forward Stepwise Logistic Regression Model^a

Variables	β	P Value	OR	95% CI for OR	
BMI (reference group: obese)					
Overweight	-0.132	0.754	0.876	0.385	1.998
Normal	-0.940	0.014	0.391	0.185	0.827
Physical activity	-0.088	0.021	0.916	0.850	0.987
Attitude (reference group: positive)					
Fairly positive	-2.035	0.000	0.131	0.052	0.331
Constant	-2.431	0.003	0.088		

Abbreviations: OR, odds ratio; CI, confidence interval.

^aIndependent variables: gender, marital status, education levels, history of hypertension, cardiovascular disease and kidney disease, training experience in the field of diabetes, body mass index, knowledge, attitude and dimensions of health-promoting lifestyle.

The score of positive attitude towards diabetes control was higher among people with diabetes than people without diabetes. Results of Hosseini et al. (17) also showed higher scores of attitude in cases than controls. In a study by Goodarzi et al. (30) the attitude of the participants was also positive, which was consistent with the current study results. Shamsi et al. (4) pointed to lower scores of patients with diabetes compared to those of the controls, which was not consistent with the current study results. One possible reason for the positive attitude of patients with diabetes toward diabetes control was the hardship and pains experienced by such patients during their disease and this makes them aware of its serious consequences.

The mean scores of dimensions of health-promoting lifestyle in the accountability aspect and spiritual growth and self-actualization were not significantly different in the two groups, which were not consistent with results of Kheirjoo et al., and Asadnia et al. (34, 35).

The mean score of health-promoting lifestyle in physical activities and nutrition dimensions in the two groups had significant differences, which was consistent with the results of some studies (14, 31, 34, 35). Patients with diabetes are recommended to be more active and have proper diet to improve their health-promoting lifestyle.

The mean score of health-promoting lifestyle in interpersonal relationships dimension in the two groups

showed no significant difference, which was consistent with the results of Kheirjoo et al. and Asadnia et al. (34, 35).

The mean score of health-promoting lifestyle in stress management dimension in the two groups showed significant differences, which was consistent with the results of other studies (14, 35) but inconsistent with results of Kheirjoo et al. (34). Perhaps stress management and self-management training measures could help to manage stress and control the disease in patients with diabetes.

However, age adjustment of the two study groups can improve the statistical efficiency. Hospital based selection of controls can inflate the study estimation because it can be different from normal population.

5.1. Conclusion

Patients with diabetes need more attentions and care to manage diabetes and need interventions to change the lifestyle to adjust with their conditions. Stress management, improved interpersonal relationships, physical activity and diet in this group can have a role to control the disease.

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Table 1. The Univariate Comparison of Some Baseline Variables Between the Case and Control Groups

Variables	Patients With Diabetics	Patients Without Diabetes	P Value
Food habits	6.63 ± 1.83	7.03 ± 1.57	0.040
Gender			
Male	41 (27.3)	59 (39.3)	0.027
Female	109 (72.7)	91 (60.7)	
Marital status			
Married	136 (90.7)	110 (73.3)	< 0.0001
Single	14 (9.3)	40 (26.7)	
Years of education			
Illiterate	64 (42.7)	20 (13.3)	< 0.0001
< 12 yrs.	60 (40)	64 (42.7)	
≥ 12 yrs.	26 (17.3)	66 (44.0)	
Smoking			
Smoker	16 (10.7)	16 (10.7)	0.574
Nonsmoker	134 (89.3)	134 (89.3)	
Hypertension			
Yes	81 (54.0)	25 (16.7)	0.001
No	69 (46.0)	125 (83.3)	
History of cardiovascular disease			
Yes	44 (29.3)	14 (9.3)	0.001
No	106 (70.7)	136 (90.7)	
History of kidney disease			
Yes	32 (21.3)	15 (10.0)	0.010
No	118 (78.7)	135 (90.0)	
History of stroke			
Yes	9 (6.0)	6 (4.0)	0.598
No	141 (94.0)	144 (96.0)	
Daily physical activities			
Yes	60 (40.0)	86 (57.3)	0.004
No	90 (60.0)	64 (42.7)	
Training experience in the field of diabetes			
Yes	37 (24.7)	21 (14.0)	0.028
No	113 (75.3)	129 (86.0)	
BMI^a			
Normal	45 (30.0)	65 (43.3)	0.001
Overweight	58 (38.7)	65 (43.3)	
Obese	47 (31.3)	20 (13.3)	
Knowledge			
Desirable	100 (66.7)	76 (50.7)	0.003
Undesirable	50 (33.3)	74 (49.3)	
Attitude			
Positive	137 (91.3)	109 (72.7)	0.001
Fairly positive	13 (8.7)	41 (27.7)	

^aBMI, body mass index.