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Determinants of Health-Promoting Behaviors among Type 2 Diabetic Patients: Voice of Iran

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Abstract

Introduction: The aim of this study was to determine Health-Promoting Behaviors among type 2 diabetic mellitus patients. Patients and Methods: A cross-sectional study was conducted on 440 diabetic patients referred to selected teaching hospitals affiliated to Tehran University of Medical Sciences (TUMS) during six months in 2013. A two section 40-items self-report Questionnaire with demographic variables (12 items) and Health-Promoting Behaviors scale (28 items) included exercise (7 items), risk reducing (7 items), life enjoyment (3 items), stress management (5 items), responsibility (3 items) and healthy eating (3 items) domains. Data was analyzed using SPSS software version 11.5. Level of significance was set at $p < 0.05$ level. Results: Mean scores of total health promoting behaviors in participants were (55.88 ± 18.09) and in domains of exercise, risk reducing, life enjoyment, stress management, responsibility and healthy eating were (8.2 ± 6.5), (12.2 ± 6.1), (7.8 ± 2.6), (12.3 ± 3.8), (3.3 ± 3.1) and (6.9 ± 2.8) respectively. Life enjoyment was emphasized as the most significant domain in health promoting behaviors scale (65 percent). Study results revealed that there was a significant association among total health promoting behavior and age ($p = 0.01$), occupation ($p = 0.01$), family income ($p < 0.001$), BMI ($p = 0.01$) and HbA$_1$C ($p < 0.001$). Conclusion: Study findings revealed the necessity of tailoring specific intervention programs to promote exercise and responsibility domains posit.

Keywords

Health-Promoting Behaviors, Type 2 Diabetes, Patients

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1. Introduction

Diabetes type 2 is a common chronic condition nearly in the world [1]-[3]. It is highly prevalent in developing countries [2] [3] including Iran [4] [5] which estimated about 2% - 10% prevalence in 2008 [6] [7]. Regarding epidemiologic transition with rapid changes of dietary habits and tendency to high calorie food with low nutritional value, physical inactivity, and smoking non-communicable disease prevalence are increasing in which one of the most of them is type 2 diabetes [8]. Lifestyle and human behaviors are responsible for majority of non-communicable disease [9]. Approximately 53% of death causes are related to Lifestyle and human behaviors [1] [2].

The nature of diabetes type 2 and its biopsychosocial determinants of onset, progress and complications [8] [9] highlighted the importance of addressing Diabetes Health-Promoting Behaviors (DHPB). Health promoting behaviors are one of the most effective ways for personal health control and maintenance [10]. Some daily behaviors, social and psychosocial factors are challenges to adhere treatment regimen as a barrier for self-care adaptation [11]-[13]. Sloan *et al.* (2004) indicated self-care behaviours adherence decreased hospitalization rate among patients with type 2 diabetes [14]. Studies concluded adopting healthy lifestyle in pattern of self-care would be effective to diabetes control [15]. Implementation multidisciplinary interventions and intersectoral participation are recommended to overcome self-care barriers [11] [12]. Since the importance of Health-Promoting Behaviors adherence and necessity of understanding influential factors among type 2 diabetic patients, this study aimed at determining Health-Promoting Behaviors among type 2 diabetic patients.

2. Patients and Methods

A cross-sectional study was performed for a period of six months in 2013. The participants were selected by continuous sampling of patients with type 2 diabetes referred to four selected teaching hospitals affiliated to Tehran University of Medical Sciences (TUMS) in Tehran, Iran. The inclusion criteria were diabetes confirmation by endocrinologists and patients who agreed to sign a written informed consent to study participation. Confirmed psychological conditions, gestational diabetes and lack of interest to participate were exclusion criteria in the study. In this research signed up 440 patients on the basis of a p ratio between diabetic patients (0.7%) at 95% confidence level and 80% power test, considering 25% sample size reduction.

A two section 40-items self-report Questionnaire with demographic variables (12 items) and Health-Promoting Behaviors scale (28 items) including exercise (7 items), risk reducing (7 items), life enjoyment (3 items), stress management (5 items), responsibility (3 items) and healthy eating (3 items) domains. The responses to each item in domains were rated between 0 and 4 on a measurement scale based on a Likert scale [0: Never, 1: Rarely, 2: Occasionally, 3: Usually, 4: Always]. Therefore, in each of domains, higher scores meant better Health-Promoting Behaviors.

Since the lack of specific instrument about health promoting behaviors for patients with type 2 diabetes, in Iranian literature, we found an article about this important subject [10]. Therefore, instrument was translated from English to Persian and vice versa. This process was done by two expert teams of endocrinologists and Health Education and Promotion professionals. The final version of instrument was extracted after comparing primary versions. The final version obtained validity and reliability after following process. Content validity method was performed by ten members of academic board of TUMS, who were experts on diabetes and health education and promotion fields. Internal reliability of the original scale and its subscales showed adequate agreement ($α = 0.90$). To determine internal reliability in this study, a test-retest method was performed. The final version of instrument filled out twice in two weeks interval. Chronbach's alpha was 0.89. The internal reliabilities of domains were between 0.65 and 0.90. The results of the pilot study were not contained in the main study. Regarding ethical consideration, permission was achieved from TUMS Research Ethical Committee, all patients were informed about study objectives in detail by skilled interviewer and they filled written informed consent. Data was analyzed by using SPSS software version 11.5 through descriptive [mean and (SD)] and inference [x^2, independent t-test, ANOVA] statistical tests. According to histogram and normalization of data, parametric tests were used. Results were considered significant at the conventional $p < 0.05$ level.

3. Results

Four hundred forty were participated in the study. Demographic and health related variables of participants were

demonstrated in **Table 1**. Mean scores of total health promoting behaviors in participants were (55.88 ± 18.09) and in domains of exercise, risk reducing, life enjoyment, stress management , responsibility and healthy eating were (8.2 ± 6.5), (12.2 ± 6.1), (7.8 ± 2.6), (12.3 ± 3.8), (3.3 ± 3.1) and (6.9 ± 2.8) respectively. Life enjoyment was emphasized as the most significant domain in health promoting behaviors scale (65 percent). It notes that study participants achieved 49.8 percent of total health promoting behavior score. **Table 2** presents mean score and standard deviation of health promoting behavior dimensions of participants. Patients with age less than 50 years old received higher mean scores of others. Physical activity was the only domains which had significant association with gender as male ($p = 0.02$). Patients with more than 10 years disease duration and Insulin therapy had significant association with responsibility and healthy eating. Mean scores of civil servant in some domain were higher than other occupation groups. Higher education and good family income revealed significant association with some HPB domains. Obese, smokers and poor diabetes patients received lee mean scores of majority HPB domains. **Table 3** represented relation between mean scores in health promoting behavior domains based on socio demographic and health related variables in details among study participants.

Table 1. Demographic and health related variables of participants.

Variable	Number/Percent	Variable	Number/Percent
Gender		*Marital status*	
Male	170 (38.6%)	Single	12(2.7%)
Female	270 (61.4%)	Married	428 (97.3%)
Age Groups (yrs)		*BMI*	
< 50	118 (26.8%)	<25	122 (27.7%)
50-65	219 (49.8%)	25 - 30	186 (42.3%)
>65	103 (23.4%)	>30	132 (30%)
Educational Levels		*Type of Occupation*	
Illiterate	144 (23.7%)	Housewife	243 (55.2%)
Primary	178 (40.5%)	Civil Servant	33(7.5%)
Secondary & Diploma	73 (16.6%)	Non-Civil Servant	91(20.7%)
Higher than Diploma	45 (10.2%)	Retired	56(12.7%)
		Unemployed	17(3.9%)
Disease Duration (yrs)		*Family Income*	
<3	125 (28.4)	Low	101(23%)
3 - 10	202 (45.9)	Moderate	252(57.3%)
>10	113 (25.7)	Good	87(19.7%)
Type of Treatment		*History of Diabetes*	
Oral Agents	274 (62.3%)	Yes	311 (70.7)
Insulin	91 (20.7%)	NO	129 (29.3)
Both	75 (17%)		
HbA_1c (%)		*Smoking*	
<7	139 (31.6%)	Yes	65 (14.8)
7 - 8.5	126 (28.6%)	NO	375 (85.2)
>8.5	175 (39.8%)		

Table 2. Mean score and standard deviation of health promoting behavior dimensions of participants.

Dimensions	Mean ± SD	Score Range	Percent
Exercise	8.2 ± 6.5	0 - 28	30
Risk Reducing	12.2 ± 6.1	0 - 28	43.5
Life Enjoyment	7.8 ± 2.6	0 - 12	65
Stress Management	12.3 ± 3.8	0 - 20	61.5
Responsibility	3.3 ± 3.1	0 - 12	27.5
Healthy Eating	6.9 ± 2.8	0 - 12	57.5
Total HPB	55.88 ± 18.09	0 - 112	49.8

Table 3. Relation between mean scores in health promoting behavior domains based on socio demographic and health related variables among study participants.

Variables	Exercise	Risk Reducing	Life Enjoyment	Stress Management	Responsibility	Healthy Eating	Total HPB
Age group	0.02	<0.001	<0.001	<0.001	NS	NS	<0.001
Gender	0.02	NS	NS	NS	NS	NS	NS
Disease Duration	NS	NS	NS	NS	<0.001	0.008	NS
Level of Education	<0.001	<0.001	<0.001	<0.001	0.06	0.002	<0.001
Occupation	0.03	0.01	0.03	0.002	NS	NS	<0.001
Family Income	0.005	0.01	<0.001	<0.001	0.01	0.07	<0.001
BMI	0.01	0.02	0.01	NS	NS	NS	0.01
Type of Treatment	NS	NS	NS	NS	<0.001	<0.001	NS
HbA$_1$c	NS	0.05	0.06	0.01	<0.001	<0.001	<0.001
Smoking	0.01	0.03	0.01	0.06	<0.001	<0.001	<0.001

NS: Not Significant; BMI: Body Mass Index.

4. Discussion

The aim of this study was to determine Health-Promoting Behaviors among type 2 diabetic mellitus patients. Study results presented physical activity domain had significant association with age less than 50 years old, being male, better socioeconomic status (SES) and BMI less than 30. This result is in the line of Norouzi *et al.* study (2010) which conducted determinants of regular physical activity in women referee to Karaj Diabetes institute [16]. However, Wu *et al.* (2004) indicated that diabetes patients were more to engage in health-promoting behaviors if they were physically well, but their study results showed that demographic and illness variables were unrelated to health practices [17]. The differences age of participants in two studies might be justify the variety of results. McDonald *et al.* (2002) study represented the level of education had association with health-promoting behaviors [18]. Nothwehr *et al.* (2000) indicated that 66% of diabetic patients engaged in some physical activity [19].

Study results indicated that civil servant, education more than diploma, better income, BMI less than 30 and non smoker participants were less in risk reduction and more life enjoyment domains. It seems that better physical fitness, life expectancy, job security, and better social class because of income satiability higher education. Chen *et al.* (2013) represented that participants younger than 50 years reported a higher score in risk reducing behaviors than the other age groups [10]. In the stress management domain, those younger than 50 years, civil servant, education more than diploma, better income, HbA$_1$c less than 8.5 (poor diabetic control) and non smoker participants had better performance in the named domain. Yi *et al.* (2008) results suggested that higher levels

of anger coping might promote poorer diabetes control in diabetes patients. This result confirmed our study findings [20]. In the health responsibility dimension revealed higher score of disease duration more than 10 years, moderate and better income, Insulin therapy, HbA$_1$c less than 8.5 (better diabetic control) and non smoker participant. It might be because of more diabetes duration time had a positive impact in using appropriate coping strategies and dealing with disease [21]. On the other hand, participants with high income and good economic position might have better nutrition behaviors and also good adherence to treatment regimen in type 2 diabetes [5]. In several studies confirmed that desirable adherence of diabetes treatment can resulted good diabetes control [22].

Study results revealed that mean score of healthy eating domain was higher in participants with education more than diploma, HbA$_1$c less than 8.5 and non smokers. Tol *et al*. (2014) suggested family concern about healthy dietary habits among type 2 diabetic patients is very influential [5]. It seems that the more educated family, the more adopting healthy diet which can be resulted in better diabetes control. Also, Mangou *et al*. (2012) confirmed the association between adequate diet quality and desirable diabetes control [23]. Marcy *et al*. (2011) reported that presenting diet barriers in the study population which had borderline HbA$_1$c in developing country in their qualitative study [24]. This result confirmed that decreasing nutrition diabetes barriers can promote diabetes control. Participants less than 50 years old, civil servant, education more than diploma moderate and good income, BMI less than 30, HbA$_1$c less than 8.5 and non-smoking participants had higher total HPB in diabetes scores. In this line, Wang *et al*. (2008) highlighted educational level as an influential factor on adoption HPB in patients with diabetes [25]. In sum up studies showed HPB in patients with diabetes is effective in promoting diabetes control [26] [27].

This study had some limitations as followed: 1) patients' HPB instrument was a self-report questionnaire and it is possible that the results might not have contributed to accurate estimation, and 2) a few available researches in the literature had used HPB instrument, therefore it was a limitation for comparing the results and previous studies.

5. Conclusion

Study findings highlighted that SES and clinical characteristics and adopting some behaviors like smoking had influential role in adopting HPB in patients with diabetes. Being relatively low obtained scores (up to mean) of all HPB domains, it seems to need specific attention to promote all dimensions especially the lowest ones such as exercise and responsibility to maintain health using educational interventional programs.

Acknowledgements

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