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Assessment of Self-Management Behaviors in Type 2 Diabetes Patients to Develop Tailor- Made Theory- Based Interventions

Azar Tol[1], Golamreza Sharifirad[2], *Davoud Shojaeezadeh[3], Fatemeh Alhani[4], Ahmadali Eslami[5], Mohamadreza Mohajeri Tehrani[6]

[1.]PhD Candidate, Health Education and promotion, Dept. of Health Education and promotion, School of Public Health, Isfahan University of Medical Sciences
[2.] PhD, Professor, Dept. of Education and promotion, School of Public Health, Isfahan University of Medical Sciences
[3.*] PhD, Professor, Dept. of Health Education and Promotion, School of Public Health, TUMS; Phone: +98 (21) 88989128; 4th Floor, School of Public Health, Poursina Ave, Tehran P.O. Box:1417613191, Iran, Fax: +98 (21) 88989129
[4.] PhD, Associate Professor, School of Medicine, Tarbiat Modarres University
[5.] PhD, Assistant Professor, Dept. of Education and promotion, School of Public Health, Isfahan University of Medical Sciences
[6.] MD, Endocrinologist, Assistant Professor, Endocrine and Metabolism Research Centre, TUMS

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ABSTRACT

In this study, we aimed to assess the subscales of self-management behaviors of type2 diabetes in an outpatient diabetes clinic in Isfahan, a major city in Iran. This study was a cross-sectional one carried out using convenience sampling. In total, 350 type 2 diabetes patients who met the eligibility criterion were recruited. The mean total of self-management score was in the middle-score range.
The domains self-integration and adherence to recommended regime had the highest and least mean score, respectively. These findings indicate that health intervention programs should be tailor-made to address individual domains in order to promote better self-management behaviors type 2 diabetic patients.

Keywords: Type 2 diabetes, Self-management behavior, Diabetic patients, Theory –based intervention

INTRODUCTION

Type 2 diabetes is major current health problem worldwide; its prevalence and burden is rapidly increasing (World Health Organization [WHO], 2008). Diabetes epidemiological transition is a major health concern in both developed and developing countries (Spinaci, Currat, Shetty, Crowell, & Kehler, 2006). According to the National Survey of Risk Factors for Non-Communicable Diseases of Iran, 2005, the prevalence rate of diabetes mellitus among 25–64-year-old Iranian citizens was estimated to be about 7.7% (Esteghamati et al., 2008). Although this disease is complex, it can be controlled by some factors (Cooper, Booth, & Gill, 2008). To this effect, first, diabetes mellitus needs to be understood completely by taking into account all the dimensions of the disease. Second, diabetes control requires the patient's active involvement in diabetes care and management (Anderson & Funnell, 2000). Gruman and Von Korff (1996) stated that in self-management, "the individual engages in activities that protect and promote health, monitors and manages symptoms and signs of illness, manages the impacts of illness on functioning, emotions and interpersonal relationships and adheres to treatment regimens" (Gruman & Von Korff, 1996). There are 5 major domains of diabetes self-management domains, self-integration, self-regulation, interaction with health professionals and significant others, self-monitoring blood glucose, and adherence to recommended regime (Lin, Anderson, Chang, Hagerty, & Loveland-Cherry, 2008). Self-management behaviors help overcomes the challenges faced in diabetes control (Anderson & Funnell, 2000). In this study, we aimed to determine the total self-management behaviors scores and its domains in type 2 diabetes patients in an outpatient diabetes clinic in Isfahan, a major city in Iran. We hope that the findings of this study will help public health officers plan appropriate intervention programs for educating diabetes patients about self-management behaviors.

MATERIALS & METHODS

Sample and Setting

The study sample was selected using convenience sampling; type 2 diabetes patients who attended a diabetes center (an outpatient clinic) in Isfahan between December 2010 and May 2011 were recruited. To estimate the sample size, we considered a prevalence rate of 0.5% with an accuracy of 0.05. Some patients refused to participate on the grounds of lack of time and being mentally unprepared. The inclusion criterion was a confirmed diagnosis of type 2 diabetes within the last 1 year, and the selected patients were asked to sign an informed consent form. Thus, of 398 patients, 350 patients ≥30 years of age were enrolled in the study.

***Correspondence Author:** Davoud Shojaeezadeh, PhD, Professor, Dept. of Health Education and Promotion, School of Public Health, TUMS; Phone: +98 (21) 88989128; 4th Floor, School of Public Health, Poursina Ave, Tehran P.O. Box:1417613191, Iran, Fax: +98 (21) 88989129; E-mail: shojae5@yahoo.com

Questionnaire

In this study, a questionnaire on the sociodemographic characteristics and health-related issues of the patients and the Diabetes Self-Management Instrument (DSMI) (Lin et al., 2008) were employed. The DSMI consists of 5 domains and 35 items: self-integration, which has 10 items related to the "ability of diabetic patients to integrate diabetes care into day-to-day activities like appropriate diet, physical activity and control of weight;" self-regulation, which has 9 items related to the "self-regulation of the patients behavior via monitoring of physical symptoms about diabetes;" interaction with health professionals and significant others, which has 9 items related to the aspect that appropriate diabetes care need to participate health care provider and important others;" self-monitoring blood glucose, which has 4 items related to the "monitoring of blood glucose reaction in order to accommodate self-care behaviors;" and adherence to recommended regime, which has 3 items related to "diabetic patients' adherence to medication and clinic visit" (Lin et al., 2008). The responses to each item were rated on a 5-point Likert scale (1 = never, 2 = rarely, 3 = sometimes, 4 = usually, and 5 = always). Therefore, the maximum and minimum obtainable scores of the DSMI were 175 and 35, respectively. The ranges of the scores for each domain were as follows: self-integration, 10–50; self-regulation, 9–45; interaction with health professionals and significant others, 9–45; self-monitoring blood glucose, 4–20; and adherence to recommended regime, 3–15. The reliability (Cronbach's α) of the DSMI, measured by the test-retest method, was 0.88. The Cronbach's α for each domain was >0.7. Content validity was confirmed by experts in diabetes management. The data collected were analyzed by descriptive and inferential tests performed using the Statistical Package for Social Sciences (SPSS) version 11.5. A p value <0.05 was set to be statistically significant.

RESULTS

Table 1. Sociodemographic and Health- related Characteristics of study population

Variables	Frequency (%)	Variables	Frequency (%)
Age		Family Income	
≤ 50	105(30)	low	58(16.6)
50-60	157(44.9)	Middle	216(61.7)
≥ 60	88(25.1)	High	76(21.7)
Sex		Duration of Diabetes(Years)	
Male	179(51.1)	≤ 3	97(27.7)
Female	171(48.9)	3-8	162(46.3)
		≥ 8	91(26)
Level of education		Type of treatment	
Illiterate	52(14.9)	Oral Agents	277(79.1)
Up to diploma	109(31.1)	Insulin	16(4.6)
Diploma	156(44.6)	Oral Agents & Insulin	57(16.3)
Postgraduate	33(9.4)		
Marital Status		History of Type2 Diabetes	
Married	286(81.7)	Yes	244(69.7)
Unmarried	64(18.3)	No	106(30.3)
Occupation		Metabolic control(HbA1C)	
employed Governmental	39(11.1)	Optimal control (< 7.0%)	32(9.1)
employed Nongovernmental	97(27.7)	Borderline control (7.0- 8.5%)	190(54.3)
household	156(44.6)	Poor Control (> 8.5%)	128(36.3)
Retired	58(16.6)		
Diabetes Complication		Co morbidity	
Yes	207(59.1)	Yes	155(44.3)
No	143(40.9)	No	195(55.7)
General health status			
Very favorable	87(24.9)		
Favorable	148(42.3)		
Unfavorable	115(32.9)		

The majority of the patients were between 50 and 60 years of age (55.52 (8.42), [mean (SD)]), and 54.3% demonstrated borderline metabolic control according to the World Health Organization criteria [7.72 (1.30)] (World Health Organization [WHO], 1995). Table (1) enlists the sociodemographic and health-related characteristics of the patients. The global DSMI has 5 subscales. As seen in Table (2), self-integration and adherence to recommended regime had the highest and least mean score, respectively. Higher the scores of the total DSMI and its domains, better are the self-management behaviors of type 2 diabetes patients. The total self-management score, which was divided into 3 levels (high, middle, and low) was analyzed based on the sociodemographic and health-related characteristics of the study population, such as sex, age, marital status, level of education, type of occupation, history of type 2 diabetes, duration of diabetes, comorbidity, diabetes-related complications, general health status, type of treatment, family income, and HbA1C level (Table 3). On analyzing the scores of DSMI, we found significant relations between the total self-management score and all sociodemographic and health-related variables ($p \leq 0.001$), except for history of type 2 diabetes. Furthermore, each domain of DSMI had significant relations with all sociodemographic and health-related

variables ($p \leq 0.001$), except for the following: self-integration and duration of diabetes, interaction with health professionals and significant others and sex and history of diabetes, self-monitoring blood glucose and age, and adherence to recommended regime and history of diabetes.

Table 2. Mean score of five subscales of DSMI in study population

Subscales	Number of items	Means± SD	Range
Self-integration	10	33.67±6.36	10-50
Self-regulation	9	29.09±5.9	9-45
Interaction with health professionals and significant others	9	27.08±4.81	9-45
Self-monitoring blood glucose	4	11.71±3.91	4-20
Adherence to recommended regime	3	11.46±2.9	5-15
Total	35	113.2±16.89	35-175

Table 3. Distribution of Self-management score based on sociodemographic variables

Self-management score variables	High		Middle		Low		Total		P value
	number	%	number	%	number	%	number	%	
Male	49	53.8	92	56.8	38	39.2	179	51.1	0.01
Female	42	46.2	70	43.2	59	60.8	171	48.9	
Illiterate	3	3.3	19	11.7	30	30.9	52	14.9	<0.001
Up to diploma	10	11	64	39.5	35	36.1	109	31.1	
Diploma	55	60.4	69	42.6	32	33	156	44.6	
Postgraduate	23	25.3	10	6.2	0	0	33	9.4	
Married	76	83.5	132	85.2	72	74.2	286	81.7	0.07
Unmarried	15	16.5	24	14.8	25	25.8	64	18.3	
Age ≤50	43	47.3	50	30.9	12	12.4	105	30	<0.001
50 – 60	35	38.5	82	50.6	40	41.2	157	44.9	
Age ≥60	13	14.3	30	18.5	45	46.4	88	25.1	
Duration of diabetes ≤3	15	16.5	46	28.4	36	37.1	97	27.7	<0.001
3 – 8	63	69.2	76	46.9	23	23.7	162	46.3	
≥ 8	13	14.3	40	24.7	38	39.2	91	26	
Occupation employed Governmental	28	30.8	11	6.8	0	0	39	11.1	<0.001
employed Nongovernmental	17	18.7	68	42	12	12.4	97	27.7	
household	39	42.9	58	35.8	59	60.8	156	44.6	
Retired	7	7.7	25	15.4	26	26.8	58	16.6	
Metabolic control optimal control(<%7)	18	19.8	13	8	1	1	32	9.1	<0.001
borderline control (%7- % 8.5)	73	80.2	101	62.3	16	16.5	190	45.3	
poor control(>%8.5)	0	0	48	26.9	80	82.5	128	36.6	
Family income Low	15	16.5	24	14.8	19	19.6	58	16.6	<0.001
Middle	27	29.7	113	69.8	76	78.4	216	61.7	
High	49	53.8	25	15.4	2	2.1	76	21.7	

DISCUSSION

In order to tailor appropriate and effective intervention programs based on empowerment for promoting self-management behaviors in type 2 diabetes patients, it is vital to have a sound understanding of self-management, its domains, and related factors (Arnolds, Butler, Anderson, Funnel, & Feste, 1995). The results of the present study showed that self-management behaviors had significant relations with sociodemographic and health- related factors (Table 3), as several studies focused on them (Minet, Møller, Vach, Wagner, & Henriksen, 2010). The main agenda of the present study was to focus on the individual self-management domains and its related factors. Any diabetes self-management studies conducted in Iran structure their interventions on the basis of the 5 domains of DSMI. It is crucial to consider the low scores of the domains self-monitoring blood glucose and adherence to medication and clinic visit. The reasons underlying these low scores need to be investigated.

The study by Lee and Lin (2008) provided some data regarding the importance of trust patients placed in the physician during diabetes control; this can be compared with the interaction with health professionals and significant others, and adherence to recommended regime domain s of self-management scale. They also showed that the patients' trust in the physician can result in better diabetes control by enhancing self-efficacy, adherence, and diabetes outcomes, indicating that better communication between the patient and the health care provider can improve diabetes outcomes.

The studies by Anderson et al. (2005) and King et al. report that the empowerment model is beneficial in enhancing self-management behaviors and in bettering diabetes outcomes (Anderson et al., 2005; King et al., 2010). The present study showed that adherence to recommended regime and self-monitoring blood glucose were the domains where patients failed in self-management. Thus, to overcome this problem and enhance self-efficacy of diabetes patients, it is vital to focus on the promotion of appropriate educational programs and encourage health care workers to use tailor-made strategies for changing the knowledge; attitude; self-efficacy; and ultimately, the self-management behavior of each patient (Lee & Lin, 2009). Mulvaney's study focused on eliminating the barriers of self-management in diabetes patients by problem solving, which is considered to be the cornerstone of diabetes education for adults and their families. Mulvaney pointed out that low adherence to diabetes care plan and treatment regimes was a combination of inadequate coping strategies and barriers of self-management behavior (Mulvaney, 2009). Thus, it appears that situation analysis in individual diabetes patients would play a central role in accurate and efficient care.

Tang's study showed that diabetes self-management education can be implemented using several educational methods and theories, but she focused on empowerment-based group education programs for diabetes patients. Empowerment-based programs are patient-centered, problem-based, consolidative, and evidence-based. These characteristics distinguish this program from the others. These strategies and theories can be applied in different settings according to the needs of each diabetes patient (Tang, Funnell, & Anderson, 2006).

As devised by previous researchers (Mulvaney, 2009; Tang et al., 2006), in our next study, we plan to design an empowerment-based intervention for enhancing self-management behaviors in an effort to measure diabetic outcomes in this center. This study had 2 limitations. First, the study was conducted in a single diabetes clinic in Isfahan. Second, the study population had low health literacy that might have hindered data collection; however, we were able to collect the questionnaire data because of the study design used.

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