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Predictors of Self-Management Behaviors among Type 2 Diabetes Patients

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ABSTRACT

Background: Considering the importance and necessity of adopting self-management behaviors in diabetes, this study was conducted to analyze some determinants of adopting self-management as predictor.
Patients and Methods: An analytical cross-sectional study was conducted among 140 type 2 diabetic patients affiliated to Omolbanin Diabetes Center in Isfahan .Data collection tool was a multidimensional questionnaire which comprised of 4 sections as following: demographic and health-related questions (12 items), diabetes distress scale (17 items), scale of self-efficacy (8 items) and self-management scale (35 items). Finally, the collected data was analyzed with SPSS version 11.5 using statistical tests.
Results: Findings showed that the variables of age ($p=0.004$), disease duration ($p<0.001$), gender ($p=0.003$), comorbidity ($p=0.004$), BMI ($p=0.02$), education level higher than diploma ($p=0.02$), type of treatment ($p<0.001$), health status ($p<0.001$), diabetes distress ($p<0.001$) and self- efficacy ($p<0.001$) all correlated with diabetes self-management significantly. $R^2=0.46$. Multivariate regression model showed that effective variables on modified self-management with others were variables such as age (ß= - 0.155, p=0.02), health status (ß= 0.238, p=0.009), diabetes distress (ß= - 0.243, p=0.001), self-efficacy (ß= 0.372, p<0.001), and BMI (ß= - 0.17, p=0.01). With removing the effect of the variables of diabetes distress and self-efficacy, the variables of BMI (β= -0.71, P= 0.01), health status (β= 0.28, p<0.001) and disease years (β= -0.78, p<0.001) correlated with diabetes self-management independently.
Conclusions: We noted that the best proposed regression model for interventional planning in adopting self-management behaviors was to focus on decreasing diabetes distress and enhancing self-efficacy in our type 2 diabetic patients.
KEYWORDS: Type 2 diabetes, Predictor, Self-management, Diabetes distress, Self-efficacy.

INTRODUCTION

Although infectious diseases are still the most common cause of death in developing countries, WHO has identified non-infectious diseases like diabetes as the main causes of disability and death in the next 25 years. Epidemiologic studies have reported that the increase in the prevalence of diabetes in developed and developing countries is concerning (1).

Diabetes is considered a threat to global health and WHO has called all countries to fight this disease since 1993 (2). This organization estimates that developing countries in the 21st century will face diabetic epidemics as 70% of all new cases of diabetes are diagnosed in developing countries. It is estimated that the number of affected individuals will increase from 171 million in 2000 to 366 million in 2030 (3). Currently, according to the surveys of the WHO, more than three million people are diabetic in Iran and unless effective interventions are undertaken, the number will increase to 7 million by the year 2030 (4). Azizi et al estimated the prevalence of diabetes in adults as 2-10% (6); the Deputy for Health of the Iranian Ministry of Health and Medical Education reported a prevalence rate of 2.3% for diabetes (7) and Isfahan Endocrinology Research Center estimated the prevalence of diabetes to be 2-3% and 7.3% in the whole population and individuals above 30 years of age, respectively (2).

Although health care professionals in health systems are primary decision makers in controlling and treating diseases, diabetes, as a chronic disease, requires a self-management approach as well. There are different definitions of self-

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management in chronic conditions but the following encompasses almost all of the concepts of self-management: "individuals are persuaded to perform activities that enhance health, control and treat the signs and the symptoms of the disease and affect the effects of the disease on function, emotions, interpersonal relations and compliance with treatment regimen" (8).

Self-management is a complex process which facilitates the required knowledge, skills and capabilities to employ self-management behaviors. The main objectives of diabetes self-management are to persuade making informed decisions and active cooperation with the health care team in order to enhance the clinical outcomes, health status and the quality of life. Determining behavioral objectives is a fundamental strategy to persuade self-management behaviors (9). The following principles should be observed in adopting self-management behaviors: emphasis on patient-centered care based on analysis of the needs and capabilities of the patients with respect to their experience and knowledge (9). Considering the aforementioned points, this study was designed to determine some predictors of self-management as predictor in diabetic patients to facilitate planning interventional programs in order to promote health.

PATIENTS AND METHODS

This descriptive-analytical study was conducted on 140 type 2 diabetic outpatients affiliated to one of the diabetes centers of Isfahan. During 4 months from April to July 2011, the participants were selected through a convenience sampling which was as follows: two days a week (Saturdays and Tuesdays) at a definite time, one of the researchers attended the diabetes center and interviewed eligible patients. Participation in the interview was quite voluntary, and the objective and the purpose of the study were presented to the individuals prior to the interview. Each patient was only interviewed once. Inclusion criteria were 1) having type 2 diabetes confirmed by the center's specialist, 2) being diabetic for at least 1 year, 3) having no psychological problems confirmed by the center's specialist, and 4) age above 30 years old.

The data collection tool was a multidimensional questionnaire which comprised of 4 sections as following: First, demographic and health-related questions such as age, gender, marital status, family income, disease duration, patient's self-report of his / her health status, family history, comorbidity and diabetic complications through 12 item. The second section assessed diabetic patients' distress level through a 6-point Likert scale (17 items). In this scale, response were scored from 1 (never) to 6 (always) and the total score varied between 17 and 102 (10). The third section evaluated self-efficacy of the patients through 8 items with scores ranging from 1 (I am not sure at all) to 10 (I am completely sure). Acquiring a higher total score indicated a higher level of self-efficacy (11).The fourth section evaluated patients' self-management through 35 items using a 5-point Likert scale. The choices ranged from "total agreement" (5 scores) to "total disagreement" (1 score) and the total score was between 35 and 175 (12). To determine reliability of the tool, the questionnaire was completed by 30 diabetic patients of the center who were later excluded from the study and using test-retest method, alpha of the different sections of the questionnaire was measured. The obtained alpha for the scales varied from 0.75 to 0.98 which was acceptable. The calculated alpha for diabetes related distress, self-efficiency and self-management were 0.75, 0.98, and 0.88, respectively. The required time to complete this questionnaire was 15-20 minutes. Finally, collected data was analyzed with SPSS version 11.5 using the chi square test, independent T-test, one-way ANOVA, Pearson correlation coefficient and multivariate regression model. P-value <0.05 was considered significant.

RESULTS

The response rate was 100%. The mean age and disease duration of the participants were 53±7.82 and 7.1±5.63 years, respectively. Of all the participants, 54.3% were female, 97.1% were married, 57.11% had comorbidity, 73.6% had diabetic complications, and 71.4% had a history of diabetes. Also, 53.6% of the participants had education less than diploma and 65.7% were receiving oral drug agents. About 51.4% of the participants reported their health status to be moderate (Table1). Regarding anthropometric characteristics, BMI was 29.37±4.20 and waist Circumference was 97.55±12.52 cm, respectively. The mean score of diabetes distress, self-efficiency and self-management in the participants were 2.69±0.83, 32.171±8.26 and 108.27±16.35, respectively.

Findings showed that the variables of age ($p=0.004$), disease duration ($p<0.001$), gender ($p=0.003$), comorbidity ($p=0.004$), BMI ($p=0.02$), education level higher than diploma ($p=0.02$), type of treatment ($p<0.001$), health status ($p<0.001$), diabetes distress ($p<0.001$) and self- efficacy ($p<0.001$) all correlated with diabetes self-management significantly. $R^2=0.46$. Multivariate regression model showed that effective variables on modified self-management with others were variables such as age (ß= - 0.155, $p=0.02$), health status (ß= 0.238, $p=0.009$), diabetes distress (ß= - 0.243, $p=0.001$), self-efficacy (ß= 0.372, $p<0.001$), and BMI (ß= - 0.17, $p=0.01$) (Table 2). With removing the effect of the variables of diabetes distress and self-efficacy, the variables of BMI (β= -0.71, P= 0.01), health status (β= 0.28, $p<0.001$) and disease years (β= -0.78, $p<0.001$) correlated with diabetes self-management independently. On the other hand, Pearson correlation coefficient showed an

inverse correlation with diabetic patients' age (r= - 0.243, p=0.004) and a direct relationship with disease duration (r= 0.44, p<0.001).

Table1. Sociodemographic and health- related characteristics of the study population

Variable	Number (%)	Variable	Number (%)
Gender		**Diabetes complications**	
Female	76 (54.3%)	yes	103 (73.6%)
Male	64 (45.7%)	No	37 (26.4%)
level of education		**General health status**	
Illiterate	20 (14.3%)	Very favorable	36 (25.7%)
Lower than diploma	75 (53.6%)	Favorable	72 (51.4%)
diploma	39 (27.0%)	Unfavorable	32 (22.9%)
Higher than diploma	6 (4.3%)		
Marital status	4 (2.9%)	**History of diabetes**	100 (71.4%)
Single		Yes	40 (28.6%)
Married	136 (97.1%)	No	
comorbidity	80 (57.11%)	**Type of treatment**	
yes		Oral Agents	92 (65.7%)
No	60 (42.9%)	Insulin	20 (14.3%)
		Oral Agents & Insulin	28 (20%)

Table 2. Self-management related variables in multivariate regression model

Variable	Regression Coefficient	P -value
Age	- 0.15	**0.02**
Health Status		
favorable vs. very favorable	-	-
favorable vs. not favorable	0.238	**0.009**
BMI	-0.17	**0.01**
Self-efficacy	0.372	**<0.001**
Diabetic distress	-0.243	**0.001**

DISCUSSION

This study was conducted to identify some predictors of self-management as predictor in type 2 diabetic patients. Considering the fact that different variables affect self-management programs in diabetic patients, this study tried to determine and analyze related effective variables and propose the best regression model. Identification and focusing on of the modifiable predictors of adopting self-management behaviors plays a key role in planning appropriate intervention programs to achieve the best possible outcomes (13).

In the current study, regression model showed that the related variables were age of the diabetic patients, their health status from their own view point, BMI, self-efficacy and diabetes distress which are further discussed hereunder. It should be noted that numerous reports have confirmed the direct relationship between adopting self-management behaviors and the quality of life, compliance with the treatment regimen and diabetes control (14).

The findings of the current study showed a decrease in BMI following adopting self-management behaviors; the same was also noted by Nichols et al (2000). The findings of our study showed that with the decrease in BMI, diabetic control improved in a way that the decrease in BMI could serve as a strong predictor of diabetic control (15).

In addition to physical effects of diabetes, diabetic patients also suffer diabetic distress. Factors such as diagnosis, signs and symptoms, and care plan can be sources of diabetic distress (16). Disease-related emotional distress ranges from limited psychological problems to constant diabetes-related self-care behaviors such as regular blood sugar control, medications administration, insulin injection, following special diets and regular physical activity (17). Researchers have found that distress can significantly affect diabetes-related health outcomes, especially patients' self-management (18).

Regarding diabetic distress, a comprehensive survey was conducted in 13 countries and the findings showed that psychological problems such as diabetes distress were very prevalent in diabetic patients and significantly affected the self-care function of the diabetic patients (19). It is necessary that health experts and professionals take steps to better understand the nature of this distress and its effects on health outcomes. Many researchers believe that stress and its method of management are strong predictors of adopting self-management behaviors and affect the success rate of diabetes control (20). The results of the current study showed that diabetic distress decreased after adopting self-management behaviors; this finding was also noted by Nichols et al (2000) who reported that emotional distress measured through the PAID (Problem Areas In Diabetes) instrument was a strong predictor of diabetic control (15). Another study by Whittermore et al (2004) similarly reported that diabetic distress was a strong predictor of diabetic control which can be helpful regarding social support assessment and self-confidence during setting goals setting and strategies planning in women with type 2 diabetes (18).

Our findings showed that adopting self-management behaviors increased as the patients' age decreased which was in contrast to the report of Nichols et al (2000); the results revealed that young age of the diabetic individuals was a strong predictor of diabetic control (15). In the current study, the young age of the diabetic patients was found to be a strong predictor of adopting self-management behaviors which may be due to the fact that younger individuals have lived with diabetes for a shorter time and the problems and limitations of the living with diabetes are new to them; therefore, they are more willing to adopt self-management behaviors.

Regarding the self-efficiency construct, the results of this study showed that it was a predictor of self-management behaviors. It has been well-proven that self-efficiency causes behavior modification and enhances the process of self-management in chronic diseases. Researches about diabetes have shown the positive effects of perceived self-efficacy on adopting self-management behaviors (21) and diabetic control (22). In this regard, Morovati et al (2009) showed that self-efficiency had a positive association with self-care behaviors and stated that self-efficiency had a prominent role as the most important determinant of self-care behaviors in diabetic individuals (23).

Since according to self-efficiency theory, the sources of self-confidence are enhanced through adopting behaviors , past experiences, verbal persuasion and psychological self-assessment (24), studies have shown that planning interventions with focusing on different sources of self-efficacy are more effective (25). Mishalia et al (2010) showed that self-efficacy enhanced compliance with treatment and should therefore be regarded in the first stage of designing self-efficacy evaluation interventions (26). Examples of such strategies include setting goals, doing skills, peer s' support, stress management and problem solving in personal, physical and psychological issues. To confirm the above-mentioned, Kanbara et al (2008) evaluated the effect of self-efficacy on enhancing social support and decreasing psychological stress response and reported that enhancing emotional support significantly increased active coping in diabetes (27). Goals of self-management in diabetes compromise informed decision making and active cooperation with health care team in order to improve clinical outcomes, health status and quality of life (28). Focus on changeable variables can be helpful in intervention planning programs and set appropriate strategies in diabetic patients as findings of current study revealed.

Some of the limitations of our study are as follows: this analytical cross-sectional study had rather similar and homogeneous samples, a limited sample size and employed self-report tools.

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