Predicting Adherence to Diet Regimen Based on Health Locus of Control: A Cross Sectional Study

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Abstract

Objective: Psychological factors such as the health locus of control play an important role on health behaviors such as adherence to diet regimen. The purpose of this study was to examine the role of health locus of control in predicting adherence to diet regimen among a group of patients with type 2 diabetes.

Materials and Methods: Research sample was recruited from several clinics in Shiraz using convenient sampling method. Participants consisted of 140 patients with type 2 diabetes. Patients completed the Multi-dimension Health Locus of Control Scale (MHLC: Internal, External, Chance) and the Summary of Diabetes Self-Care Activities Questionnaire (SDSCA).

Results: Nearly half of the patients with type 2 diabetes adhered to their diet regimen. The results also showed that external locus of control significantly predicted adherence to diet regimen ($P<0.05$). Furthermore, chance locus of control predicted non-adherence to diet regimen significantly ($P<0.001$). Internal locus of control, age, education and illness duration had no significant role in predicting adherence to diet regimen.

Conclusion: Patients with type 2 diabetes who perceived their illness as a destiny or fate were less likely to adhere to diet regimen, while those believed that powerful others such as doctors determine their health were more likely to adhere to recommended diet regimen. The present study highlighted the role of perceived control on adherence to diet regimen.

Keywords: Diet adherence, Health locus of control, Internal, External, Powerful others, Chance, Type 2 diabetes

Introduction

Diabetes mellitus is a major health problem in Iran (1). According to a survey, 7.7% of Iranian adults aged 25 to 65 have diabetes mellitus (2). Adherence is necessary for the quality of life of patients with diabetes (3). Adherence has been defined as the degree to which a patient's voluntary behavior corresponds with the clinical recommendations of health care providers (4). The locus of control concept (5) refers to the extent to which individuals believe that they can control events that affect them. Some people believe that events in their lives are caused by their own behavior, while others believe that they are controlled by forces outside themselves (6). This concept proposes

that people with diabetes can be characterized by the degree to which they believe diabetes-related health status can be attributed to personal effort (internal locus) vs. environmental factors (external locus) (7). Psychological factors such as locus of control have been applied in health context. The health locus of control theory has been applied the concept of control to adherence in a number of studies. According to a study, patients with high perceived control may have better health because they are more likely to take health-enhancing actions (8). Most studies have documented that patients with internal locus of control may be more likely to follow diet recommendations (9). These studies have concluded that individuals who believe that their condition is determined largely by chance or by other people and not by their own actions may be less likely to adhere to therapy (10). On the other hand, some other studies have not found positive relationship between internal control and adherence (11) or have reported positive association between external control and medication adherence (12). The concept of control may be perceived differently with regard to cultural context. Therefore, it is important to examine the role of the perceived control on adherence within Iranian context to see whether patients' perception of control over their condition impacts their adherence to a diet regimen. This research aims to determine which components of health locus of control including internal, chance and powerful others predict adherence to diet regimen among patients with type 2 diabetes.

Materials and Methods

The current study had a correlational design. Data were collected from a sample of 140 patients with type 2 diabetes using convenient sampling. This study was conducted between October 2012 and March 2013. The research sample was recruited from several diabetes outpatient clinics such as Shahid Motahari and Nader-Kazemi Clinics in Shiraz, Iran. With regard to sample size, 10-15 cases for each

predictor variable in the model were enough for multiple regression analysis (13). Since there were six predictor variables, 120 participants were required for the analysis. Inclusion criteria for participation in the study were: a diagnosis of diabetes type 2 for at least three months confirmed by a physician, having a medical file in the clinic and the ability to understand the questionnaires. This study was approved by Research Committee of the Heath Center of Shiraz. The data were collected by the second author in two clinics in Shiraz. All the respondents consented to participate in the study. Health locus of control was measured using the Multi-Dimension Health Locus of Control-Form C (MHLC-C) scale (14). This scale is comprised of 18 statements with three components of health locus of control including internal control (the belief that one's behaviors will have an effect on one's health status); powerful others control (the belief that powerful other people, such as doctors, nurses, family, and friends have control over one's health status); and chance control (the belief that one's health condition is a matter of fate, luck, or chance). Each subscale consists of six items and the answers are rated based on a 6-point Likert scale. The score on each item ranges from 1 for "strongly disagree" to 6 for "strongly agree". Higher scores indicate a stronger control orientation. The Cronbach's alpha reliability coefficients of the scale ranged from 0.60 to 0.75 (14). This scale has been used in Iran and found to have an acceptable validity and reliability (15). Adherence to diet regimen was assessed by the Summary of Diabetes Self-Care Activities Questionnaire (SDSCA) (16). This self-report scale assesses healthy behaviors over the past week and consists of 10 items including five components (diet, insulin, blood glucose testing, food care, exercise and smoking behavior). For the purpose of the current study, the component of healthy diet was used. This subscale includes 5 items (example: how many of the last seven days have you followed a healthful eating plan?). Respondents' answers are rated based on a scale of 0-7.

Scoring for each item includes the mean number of day. High score on this scale indicates that participants comply with their regimens. Several studies have reported a good validity and reliability for the SDSCA (3). This scale has also been used in Iran and found to have an acceptable reliability and validity. The researchers have reported a Cronbach's alpha reliability coefficient of 0.68 for this scale in an Iranian sample (17).

Statistical Analysis

Data were analyzed using descriptive statistics such as mean and standard deviation and Spearman's correlation to examine the relationship between the components of health locus of control and diet regimen adherence. To examine the prediction of adherence to diet regimen, a simultaneous multiple regression analysis was utilized. The components of locus of control scale were considered as the independent variables and diet regimen score was entered into the model as the dependent variable. All statistical analyses were performed using SPSS (version 16) and a P-value < 0.05 was considered significant.

Results

Mean age of the participants was 40.70 (SD=14.07) ranged from 20 to 76 years. Furthermore, the average duration of illness was 4.9 years. The majority of respondents were married (Table 1). The mean score for diet adherence was 13.74 on the scale midpoint. In terms of health locus of control, the mean scores on the components of HLOC were 26.02, 20.92 and 24.99 for internal, chance and powerful others, respectively. Descriptive statistics on adherence to diet regimen and the dimensions of health locus of control are presented in Table 2. As seen in Table 2, the score on internal control was higher than the two other components of the health locus of control. The results on locus of control with diet adherence indicated a significant association of powerful others and chance with diet regimen adherence (Table 3).

Table 1- Demographic Characteristics and Clinical-related Factors of the Participants (N= 140)

Variable	Frequency (%)
Age (year- Mean, SD)	40.70 (14.07)
Duration of Illness (year- Mean, SD)	4.90 (1.25)
Gender	
Male	71 (50.7)
Female	69 (49.3)
Marital Status	
Single	36 (25.8)
Married	104 (74.2)
Education Level	
Less than high school	32 (22.8)
High school	38 (27.2)
Undergraduate	67 (47.8)
Post-graduate	3 (2.2)

SD = Standard Deviation

Table 2- Means and Standard Deviations of the Summary of Diabetes Self Care Activities Scale and the Subscales of Health Locus of Control Scale

Variable	Mean	SD
SDSCA*	13.74	5.30
Internal HLOC**	26.02	4.29
Chance HLOC	20.92	5.90
Powerful Others HLOC	24.99	4.63

*Summary of Diabetes Self Care Activities
**Health locus of control

Using the multiple regression analysis, a significant model emerged: $F (7, 92) = 5.87$, $P<0.001$ which explained 25% of the variance of adherence (Adjusted $R^2=0.25$). The findings demonstrated that the components of chance ($\beta=0.56$, $P<0.001$) and powerful others ($\beta=0.22$, $P<0.02$) predicted adherence to diet regimen significantly. The strongest contributor in predicting adherence was chance. In other words, patients who believed in powerful others were more likely to comply with their diet regimen. On the other hand, patients who believed in chance were less likely to adhere to their diet regimens. Age, education, illness duration and internal control did not predict adherence to diet regimen (Table 4).

Table 3- Correlation of Age, Education, Illness Duration and Subscales of Health Locus of Control with Adherence to Diet Regimen

Variable	1	2	3	4	5	6	7
Age	1						
Education	28**	1					
Duration of Diabetes	58**	16	1				
Internal HLOC	001	13	10	1			
Chance HLOC	16	09	03	24*	1		
Powerful Others HLOC	02	01	07	30**	36**	1	
Adherence to Diet Regimen	01	02	05	07	45**	25*	1

*$P < 0.05$
**$P < 0.001$

Table 4- Multiple Regression Analysis for Predicting Adherence to Diet Regimen

Variable	B	SE	β	t	P
Age	0.04	0.04	0.11	0.98	0.33
Education	-0.12	0.41	-0.03	-0.30	0.76
Illness Duration	-0.002	0.02	-0.03	-0.22	0.82
Internal HLOC	0.05	0.12	0.04	0.42	0.67
Chance HLOC	-0.50	0.09	-0.56	-5.78	0.001
Powerful Others HLOC	0.25	0.11	0.22	2.25	0.02

B= Unstandardized coefficient
ß= Beta (Standardized coefficient)
SE= Standard Error
T= T test
P= P-value

Discussion

The results of the present study indicated that participants' mean score on diet regimen adherence was less than midpoint in the scale. The relatively poor adherence of the participants in this study is similar with those in other studies in developing countries (18) and also in Iran (17,19). Several explanations may contribute to poor adherence to a diet regimen, namely the lack of knowledge about the consequences of being non-adherent to diets. Social pressure may also impact patients and they may not be able to reject the inappropriate food offered from the others. This study also showed that patients perceiving chance were less likely to adhere to diet regimen, while patients with powerful others control were more likely to adhere to diet regimen. The finding of this research on internal HLOC is inconsistent with most previous research indicating a positive association between internal HLOC and diet regimen adherence (20). The reason on disagreement may be related to different demographic characteristics of the research sample. The literature on applying the locus of control in chronic patients has yielded mixed results. Findings on powerful others HLOC were in accordance with most previous studies on this issue. Many studies have demonstrated that powerful others HLOC (e.g., doctor or nutrition) were significantly related to adherence in health context. The strong powerful others control orientation obtained in the participants showed that patients consider others' advice and instruction to be important for preventing the disease from progressing. These patients believe that the outcome of their illness is determined by their doctor or surgeon and generally leave their care in the hands of a medical professional; basically doing only what they are told (21). In societies such as Iran, social status and power are very important. The results of the present study on predicting low diet adherence by chance was also in agreement with other studies indicating that beliefs on external locus of control such as chance are associated with poor outcomes

(22). In most chronic diseases, external locus of control such as chance are considered as maladaptive since they are frequently associated with false hope. Only in case of a terminal illness that is entirely beyond the medical control, believe in luck, fate or chance can be adapted (6). This finding supports literature on traditional societies in which external factors such as, fate, destination, chance and the others (doctors) have an important role on people's decision to comply with the treatment (23). The finding also highlights the importance of perceiving locus of control on regimen adherence and in part supports the theory of locus of control. This study adds more evidence to our existing knowledge on the role of health locus of control in adherence of patients with chronic illnesses such as diabetes mellitus. This study has some implications for clinical practitioners to improve compliance among diabetic patients. This study has a number of limitations including the small sample size and ignoring other important variables such as socio-demographic and clinical variables influencing diet adherence which need to be considered in future studies.

Conclusion

This study highlighted the importance of perceiving control such as powerful others (e.g., expert recommendation) on adherence to diet regimen. The study indicated that belief to chance has a negative effect on adherence to diet regimen. The results of this study also showed that the recommendations by healthcare providers can be beneficial in improving patients' regimen compliance. An effective communication between health professionals and patients may enhance diet regimen adherence. Educational interventions involving patients and family members may also be effective in improving adherence.

Acknowledgement

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