International Journal of Advanced Biotechnology and Research (IJBR)
ISSN 0976-2612, Online ISSN 2278–599X,
Vol-8, Issue-4, 2017, pp152-157
http://www.bipublication.com

Research Article

Cognitive Determinants of Diabetes Preventive among At Risk Group: an Application of the Health Belief Model

Naser Hatamzadeh[1], Touraj Ahmadi Jouybari[2*], Mostafa Nasirzadeh[3], Abbas Aghaei[4], Hassan Gharibnavaz[2] and Shiva Khashij[2]

[1]Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
[2]Clinical Research Development Center, Imam Khomeini Hospital,
Kermanshah University of Medical Sciences, Kermanshah, Iran.
[3]Department of Health Services and Health Promotion,
School of Health, Rafsanjan University of Medical Sciences, Rafsanajn, Iran
[4]Department of Epidemiology, School of Health,
ShahidBeheshti University of Medical Sciences, Tehran, Iran.
Corresponding Author: TourajAhmadiJouybari;
Clinical Research Development Center, Imam Khomeini Hospital,
Kermanshah University of Medical Sciences, Kermanshah, Iran

ABSTRACT

Diabetes is the most common chronic disease with devastating complications. The objective of this study was to determine determinants related to diabetes preventive behaviors among sample of Iranian at risk group based on health belief model (HBM), in west of Iran, Kermanshah. In this cross-sectional studyconducted among a total of 200 male and female aged more than 30 years old referred to health centers, during 2016, which randomly selected to participate voluntarily. Participants filled out a questionnaire including the HBM constructs. Data were analyzed by SPSS version 21 using bivariate correlations and linear regression at 95% significant level. The mean age of respondents was 40.6 years [95% CI: 39.28, 42.06], ranged from 31 to 79 years. HBM variables were accounted for 10% of the variation in diabetes prevention behaviors, F= 9.277, p< 0.001. As well as, perceived barrier and cues to action were the most influential predictors on diabetes preventive behaviors. Based on our result, it seems that planning and implementation of programs to reduce barrier and increase cues to action may be usefulness of the results in order to promotion of diabetes preventive behaviors.

Keywords: Fear, Perceived Barrier, Cues to Action, Behavior Change.

INTRODUCTION

Diabetes is the most common disease caused by metabolic disorders and is one of the most important healthcare issues in societies (1). According to the statistics of World Health Organization, the number of people suffering from diabetes will be double by 2030 (2). According to the 2016 reports of the World Health Organization, prevalence rate of diabetes in the adult population of Iran is 10.3%, which is stated as 9.3% among men and as 11.1% among women (3); Furthermore, the prevalence rate of diabetes in people older than 30 is reported as more than 14% in Iran (4). After 15 years, almost 2% of people suffering from diabetes will become blind and approximately 10% will endure visual impairment, and 50% will suffer from neuropathy. Overall, the risk of death for people with diabetes is twice as non-diabetic people (5). 90-95% suffers from type 2 diabetes and its major factors are genetics and behavioral and environmental risk factors (6). Although genetics is considered the major cause of this disease, there are strong

evident indicating that changeable risk factors such as obesity and lack of physical activity are among the major non-genetic determinants of this disease (6 and 7). Given the increasing rate of this disease throughout the world, one of the main and important methods of fighting it is preventing this disease in individuals who are at risk by increasing awareness and understanding towards predisposing factors, complications and the course of this disease in these individuals (2); Recent studies have also shown that people who are at risk can prevent this disease or at least delay it by making changes in their lifestyles (8). Therefore, it is necessary to have information about beliefs and to be aware of people who are at risk in order to develop preventive strategies; given the facts mentioned above, and for determining and explaining the condition of type 2 diabetes preventive behaviors in individuals at risk, health belief model was used. In this regard, it should be mentioned that this model is one of the behavior analysis theories which has been utilized in various studies and in different contexts of preventive behaviors such as type 2 diabetes(9). This model emphasizes how personal beliefs and perceptions regarding fear of health problems and how evaluation of benefits and barriers in the preventive behavior could affect the adoption of that behavior; according to this model, in order to adopt preventive behaviors, people should first feel threaded by the specific problem (perceived susceptibility) and then comprehend the depth of this threat and its seriousness (perceived severity) and in case of positive benefits evaluation for the preventive behavior, and nonexistence of serious barriers for adopting that preventive behavior, they will adopt that behavior (10). This study, was conducted with the objective of determining the condition of behaviors preventing type 2 diabetes in individuals who are at risk in the city of Kermanshah using the framework of health belief model.

METHODS

Procedure and Sampling

This cross-sectional study was conducted among 200 male and female aged more than 30 years old referred to health centers in Kermanshah city, the west of Iran, during 2016. The sample size was calculated at 95% significant level according to the results of a previous study (2) and a sample of 200 was estimated. To enroll the subjects and data collection the following stages were done. First, areas of the city were classified based on the division of the geographical region, next for each social class one health centers were randomly selected (a total of eight health centers were selected). Then, subjects referred to the health centers for taking health care, were enrolled into this study voluntarily. Only the subjects aged more than 30 years oldwere eligible to participate in this study. Finally, the volunteers were given the questionnaire.Of the population of 200, 158 (79%) signed the consent form and voluntarily agreed to participate in the study This study has been support by the department of public health at the Kermanshah University of Medical Sciences..

Pilot study

Prior to conducting the main project, a pilot study was carried out. Initially the relevant questionnaires were administered to 30 participants who were similar to study population in order to estimate the duration of the study conduction and to evaluate the reliability of the questionnaire. Estimated reliability using alpha Cronbach coefficient for each HBM constructs questionnaire were as follows: susceptibility (α= 0.74); severity (α= 0.86); barrier (α= 0.81); benefit (α= 0.77); cues to action (α= 0.68) and self-efficacy (α= 0.88).

Scales

Background variables

The background variables assessed in this study included: age (years), sex (male, female), and family history of diabetes(yes/no).

HBM constructs scale

HBM scale was designed based on a standard questionnaire (2, 9) and included 31 items under six constructs including (a) perceived susceptibility; (b) perceived severity; (c) perceived barrier; (d) perceived benefit; (e) cues to action; and (f) perceived self-efficacy. In order to facilitate participants' responses to the items, all items were standardized to a 5-point Likert scale,

ranging from 1 (strongly disagree) to 5 (strongly agree).Four items were designed to measure perceived susceptibility (e.g. "If I do not control my dates, I may get diabetes."). Six items were designed to measure perceived severity a (e.g., "I think that diabetes is a serious disease."). Five items were designed to perceived benefit to diabetes prevention behaviors (e.g., "undergoing regular physical activity is effective on diabetes prevention."). Four items were designed to evaluate perceived barrier to diabetes prevention behaviors (e.g., "adherence to diet in party is very difficult to me."). Four items were designed to cues to action to doing diabetes prevention behaviors (e.g., "My family encourages me to do diabetes prevention behaviors such as regular physical activity or adherence to diet"). Eight items were designed to self-efficacy to doing diabetes prevention behaviors (e.g., "Are you confidence to doing regular physical activity?; or adherence to diet?").

Behaviors

To assess whether or not the participants doing diabetes prevention behaviors, we used eight questions about the important behaviors to prevention of diabetes (e.g., "do doing regular physical activity during the last week?"). For which the response category was yes or no. The reliability coefficient (split-half analyses) for the behaviors scale in our study was 0.80, suggesting that the internal consistency was adequate.

DATA ANALYSES

Data were analyzed by SPSS version 21 using appropriate statistical tests including bivariate correlations and linear regression at 95% significant level.

RESULTS

The mean age of respondents was 40.6 years [95% CI: 39.28, 42.06], ranged from 31 to 79 years. 40.5% (64/158) of participant's male and 59.5% (94/158) were female. Furthermore, 21.5% (34/158) of participants reported positive family history of diabetes.

Table 1 shows the Zero-order correlations. Significance levels at the 0.01 and 0.05 were the criteria for the analysis. The findings indicate that for the sample, doing diabetes prevention behaviors was significantly related to susceptibility (r = 0.175), benefit (r = 0.176), cues to action (r = 0.229), and self-efficacy (r = 0.265), while inversely correlated with barrier (r = -0.273). Self-efficacy was significantly related to susceptibility (r = 0.306), benefit (r = 0.320), and cues to action (r = 0.268), while inversely correlated with barrier (r = -0.480). Cues to action was significantly related to susceptibility (r = 0.329), severity (0.196), benefit (r = 0.282), while inversely correlated with barrier (r = -0.191). Barrier was significantlyinversely related to susceptibility (r =-0.237), benefit (r = -0.238), and severity (r = 0.302). Benefit was significantly related to susceptibility (r = 0.434), and severity (r = 0.245). Finally, susceptibility was significantly related to severity (r = 0.239).

Table 1: Correlation between HBM constructs

Component	Mean (SD)	Range	X1	X2	X3	X4	X5	X6
X1. Susceptibility	15.20 (2.94)	4-20	1					
X2. Severity	21.42 (4.95)	6-30	0.239**	1				
X3. Benefit	20.58 (2.67)	5-25	0.434**	0.245**	1			
X4. Barrier	10.81 (3.97)	4-20	-0.237**	0.302**	-0.238**	1		
X5. Cues to action	3.00 (1.24)	0-4	0.329*	0.196*	0.282**	-0.191*	1	
X6. Self-efficacy	31.91 (4.97)	8-40	0.306**	-0.091	0.320**	-0.480**	0.268**	1
X7. behaviors	4.19 (1.72)	0-8	0.175*	-0.055	0.176*	-0.273	0.229**	0.265**

* Correlation is Significant at the 0.05 Level (2-Tailed). ** Correlation is Significant at the 0.01 Level (2-Tailed).

A hierarchical multiple regression analysis was performed to explain the variation in diabetes prevention behaviors, using the HBM variables. As can be seen in Table 2, were statistically significant predictors of the outcome measure. Collectively, they were accounted for 10% of the variation in diabetes prevention behaviors, $F = 9.277$, $p < 0.001$.

Table 2: Predictors of the safe road-crossing behaviors, n = 158

Model		Un-standardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
5	(Constant)	4.548	0.546		8.336	0.001
	Barrier	-0.103	0.034	-0.238	-3.074	0.002
	Cues to action	0.255	0.107	0.184	2.374	0.019

DISCUSSION

The aim of this study was to determine factors related to doing diabetes preventive behaviors among male and female aged more than 30 years old in the west of Iran. The results of the present study indicated that participants was received about half of score of doing diabetes preventive behaviors. This result is similar to the results reported by other studies in Iran (2, 11). For example, Abedini et al carried out a research on diabetic's patients with aim study status of knowledge and practice of patient self-directed care in Qom and reported that diabetic patients had average of self-care behavior (11). Our finding indicated doing diabetes preventive behaviors was not suitable; in other hand, several studies indicated comprehensive preventative health education programs need to emphasize on cognitive factors that mediate and predict health-related behaviors (12-18) .Our findings indicated that doing diabetes preventive behaviors was significantly related to susceptibility, benefit, cues to action, self-efficacy and while inversely correlated with barrier.

In this regards, studies have shown that lack of awareness leads to reduced beliefs in understanding the susceptibility of the issue and consequently understanding the severity of the disease's complications. On the other hand, poor understanding of the benefits resulted from adopting disease preventive behaviors along with increased level of barriers for adopting preventive behaviors in itself leads to reduced understanding in people towards self-efficacy of adopting preventive behaviors. Ultimately, this weakness in cognitive principles of the individuals leads to reduced adoption rate for preventive behaviors (2). In this study, adoption of preventive behaviors was significantly reduced by increasing perceived barriers, which means the more people perceive barriers for adopting preventive behaviors, the less they adopt that behavior. This study was also confirmed in other studies (19). Furthermore, in the present study, perceived susceptibility and self-efficacy had a significant correlation with increased type 2 diabetes preventive behaviors, which was consistent with the study conducted by Mazloomy et al. (2), in which the significant relationship between self-care behaviors and perceived susceptibility and self-efficacy was indicated. In addition, Tan, in his study, reported that poor adoption of preventive behaviors in people suffering from diabetes is related to perceived susceptibility and severity (20).

One of the limitations of this study was data collection using questionnaires. In this regard, it should be noted that in studies that employ questionnaire for data collection, the base assumption is that the respondent will provide correct and actual information. However, there's always the possibility of dishonesty from some of the respondents or it may be possible that some participants have not stated the actual information. Also, another limitation was a relatively large drop in samples. For this, we suggest that other studies should be conducted in other communities using larger sample sizes so that there will not be any problems in the generalizability of the results.

CONCLUSION

The results of the present study indicated that HBM variables were accounted for 10% of the variation in diabetes preventive behaviors. As well as, perceived barrier and cues to action were the most influential predictors on doing diabetes preventive behaviors; so based on our findings barrier and cues to action were

mediators for promoting effectiveness of the diabetes preventive behaviors promotion programs.

ACKNOWLEDGEMENT

This article is a part of research project supported by the department of public health, Kermanshah University of Medical Sciences, Iran. The researchers appreciate all male and femaleparticipants in the study.

CONFLICT OF INTEREST

The authors declare that there was no conflict of interest.

REFERENCES:

1. Shaw JE, Sicree RA, Zimmet PZ. Global estimates of the prevalence of diabetes for 2010 and 2030. Diabetes research and clinical practice. 2010; 87(1):4-14.
2. Mazloomy SS, Hajizadeh A, Alaei MR, MirzaeiAlavijeh M, Afkhami AM, Fatahi M.Status of Preventive Behavioral in at Risk Persons Type II Diabetes: Application of the Health Belief Model. 2012; 11 (6):544-550 (Persian)
3. http://www.who.int/entity/diabetes/country-profiles/irn_en.pdf?ua=1.
4. Lotfi MH, Saadati H, Afzali M. Prevalence of diabetes in people aged≥ 30 years: the results of screening program of Yazd Province, Iran, in 2012. Journal of research in health sciences. 2013; 14(1):88-92.
5. Huang ES, Laiteerapong N, Liu JY, John PM, Moffet HH, Karter AJ. Rates of complications and mortality in older patients with diabetes mellitus: the diabetes and aging study. JAMA internal medicine. 2014; 174(2):251-8.
6. American Diabetes Association. 2. Classification and diagnosis of diabetes. Diabetes Care. 2016; 39(Supplement 1):S13-22.
7. Lourida I, Kuzma E, Henley WE, Thompson-Coon J, Dickens CM, Langa KM, Llewellyn DJ. Lifestyle, treatment, and cognitive decline in elderly diabetics. Alzheimer's & Dementia: The Journal of the Alzheimer's Association. 2015; 11(7):P451.
8. Dunkley AJ, Bodicoat DH, Greaves CJ, Russell C, Yates T, Davies MJ, Khunti K. Diabetes Prevention in the real world: Effectiveness of pragmatic lifestyle interventions for the prevention of type 2 diabetes and of the impact of adherence to guideline recommendations. Diabetes care. 2014; 37(4):922-33.
9. Courcoulas AP, Belle SH, Neiberg RH, Pierson SK, Eagleton JK, Kalarchian MA, DeLany JP, Lang W, Jakicic JM. Three-year outcomes of bariatric surgery vs lifestyle intervention for type 2 diabetes mellitus treatment: a randomized clinical trial. JAMA surgery. 2015 Oct 1; 150(10):931-40.
10. Jalilian F, Motlagh FZ, Solhi M, Gharibnavaz H. Effectiveness of self-management promotion educational program among diabetic patients based on health belief model. J Edu Health Promot 2014; 3:14
11. Eldredge LK, Markham CM, Kok G, Ruiter RA, Parcel GS. Planning health promotion programs: an intervention mapping approach. John Wiley & Sons; 2016
12. Abedini Z, ShouriBidgoli A, Ahmari Tehran H. Study of Knowledge and Practice off Patient Self-directed Care among Diabetics Patients. Qom University of Medical Sciences Journal 2008; 2 (2) 37-41. (Persian)
13. Mirzaei-Alavijeh M, Kok G, Niknami S, Motlagh ME. Family-based cognitive factors effective on preventing the onset of substance use in Iranian society's children: applying the intervention mapping protocol. ActaMedicaMediterranea. 2016; 32:1015-20
14. Jalilian F, Joulaei H, Mirzaei-Alavijeh M, Samannezhad B, Berimvandi P, Karami-Matin B, Mahboubi M. Cognitive factors related to cigarettes smoking among college students: An application of theory of planned behavior. Social Sciences. 2016; 11(7):1189-93
15. Hosseini SN, Mirzaei-Alavijeh M, Karami-Matin B, Hamzeh B, Ashtarian H, Jalilian F. Locus of Control or Self-Esteem; Which One is the Best Predictor of Academic Achievement in Iranian College Students. Iranian journal of psychiatry and behavioral sciences. 2016; 10(1)
16. Mirzaei-Alavijeh M, Karami-Matin B, Jalilian F, Hamzeh B, Haghighi M, Ahmadpanah M,

Mahboubi M. Relapse preventative intervention among Iranian addicts based on theory of planned behavior results. Res. J. Appl. Sci. 2016; 11:138-43

17. KaramiMatin B, Jalilian F, MirzaeiAlavijeh M, Ashtaria H, Mahboubi M &Afsar A. Using the PRECEDE Model in Understanding Determinants of Quality of Life among Iranian Male Addicts. Global Journal of Health Science; 2014; 6(6): 19-27
18. Morowatishaifabad M, Sakhvidi MJ, Gholianavval M, Boroujeni DM, Alavijeh MM. Predictors of hepatitis B preventive behavioral intentions in healthcare workers. Safety and health at work. 2015; 6(2):139-42
19. Baghiani-Moghadam M, Mirzaei-Alavijeh M, Zolghadr R. Knowledge, risk perceptions and behavioral intentions among elementary school teachers of Yazd regarding hepatitis A. Govaresh. 2012; 17(2):84-90
20. Tan MY. The relationship of health beliefs and complication prevention behaviors of Chinese individuals with Type 2 diabetes mellitus. Diabetes Res ClinPract 2004; 66 (1): 71–7.
21. Tan MY. The relationship of health beliefs and complication prevention behaviors of chinese individuals with Type 2 diabetes mellitus. Diabetes Res ClinPract 2004; 66 (1): 71–7.