Original Article

The Effect of Educational Intervention Based on BASNEF Model on Self-Medication Behavior of Type 2 Diabetic Patients

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Abstract

Background: Diabetes is one of the main reasons of the increase of morbidity and mortality around the world. Considering the burden of disease, self-medication can result in irrecoverable consequences. The aim of this study is to investigate the effect of educational intervention based on Beliefs, Attitudes, Subjective Norms and Enabling Factors (BASNEF) model on self-medication behaviors of type 2 diabetic patients in Fasa, Fars province, Iran, in 2017–2018. **Materials and Methods:** In this quasi-experimental study, 200 type 2 diabetic patients under cover of the diabetes center of Fasa were investigated (100 patients for experimental group and 100 patients for control group). A questionnaire investigating demographic information and BASNEF Model constructs (knowledge, attitude, enabling factors, subjective norms, and behavioral intention) was used for evaluating self-medication behaviors of patients before and 3 months after intervention. **Results:** The average age of experimental group was 53.25 ± 8.42 and the average age of control group was 54.18 ± 8.13. Three months after intervention, experimental group showed significant enhancement in knowledge, attitude, enabling factors, subjective norms, and behavioral intention and their self-medication behaviors reduced, while control group showed no significant changes in mentioned factors. **Conclusion:** The present study indicated the efficiency of BASNEF model on reduction of self-medication behaviors of diabetic patients. Hence, this model can act as a framework for designing and implementing educational interventions in this field.

Keywords: BASNEF model, diabetic patients, self-medication, subjective norms

Introduction

Diabetes is a metabolic disease which can be diagnosed by chronic increase of blood glucose or hypoglycemia due to the disorder in secretion or function of insulin. It is also considered as a general health problem and is responsible for 9% of whole deaths around the world.[1,2] According to World Health Organization, up to 2025, population of diabetic patients will reach to 300 million people.[3] Studies performed in Iran indicate the 2% and 3% prevalence of diabetes in general population and 7.3% prevalence in people older than 30 years of age.[4] Evidence show that there is a wide gap between what patients are supposed to do and what they really do in treatment process.[5] Unfortunately, ignoring the prescribed treatment process by patients is one of the important problems in therapeutic trends.[6] Self-medication is a behavior by which a patient tries to treat his/her health problem without considering the prescriptions of related doctors.[7] Self-medication is performed in various ways around the world. Self-medication prevalence in America is higher than 20%, including using herbal medicines and massage therapy.[8] In Iran, there are different statistic reports about self-medication: from 35.7% among university students[9] to more than 45% in diabetic patients[10] and 77.6% among elderlies.[11] Half of diabetic patients use herbal medicines and related combinations and 27% of them ignore the main prescribed medicines.[12] By performing self-medication behaviors, patient's fluctuating blood pressure enhances which results in diabetes complications (73.6% neuropathy, 32.2%

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retinopathy, and 12.3% nephropathy).[13] In numerous studies, various reasons were reported about the tendency of patients to self-medication behaviors, including underestimating the severity and symptoms of diabetes, unreliability or unavailability of doctors, high treatment costs, difficulty in following doctor's prescriptions, being busy, and solidity.[14] It seems that, in order to change self-medication behaviors, recognizing and analyzing factors for preventing these behaviors may help researchers to design and perform efficient educational interventions. Therefore, using theories and models for changing patients' behaviors and defining the problem based on different constructs of these theories will help the researchers to reach their goals.[15] BASNEF model is one of the useful patterns in health education and promotion which is the combination of behavioral intention model and precede pattern.[16] This model considers the effect of knowledge and attitude on a specific action and also includes the effect of other factors such as enabling factors and subjective norms on performing a specific behavior. According to this model, for doing a new behavior, intention is not sufficient, hence, enabling factors (availability of appropriate treatment, low-cost treatment, and so on) and important subjective norms encouraging patients to follow the appropriate behaviors and avoid previous incorrect behaviors (such as self-medication) should be considered.[16]

Results of Kabodi *et al*.[17] revealed that more than half of type 2 diabetic patients perform self-medication behaviors and the constructs of attitude, subjective norms, and enabling factors are the important factors predicting patients' self-medication behaviors. Therefore, holding educational sessions about complications of diabetes and self-medication for these patients is suggested.[17] The purpose of the present study is to investigate the effect of educational intervention based on the BASNEF model on self-medication behaviors of type 2 diabetic patients in Fasa, Iran.

Materials and Methods

The present research is a quasi-experimental and interventional study performed on 200 type 2 diabetic patients under cover of diabetes center of Fasa, Iran. The inclusion criteria of this research had health case in diabetes center, not being infected by mental diseases, passing at least 1 year from diagnosis and being older than 30 years of age. Furthermore, the exclusion criteria were not being interested in participation and being absent in more than 2 educational sessions.

Based on study criteria, 300 type 2 diabetic patients having health case in the diabetes center of Fasa were invited to participate in this study. Some of them refused and at the end, 200 patients were randomly selected and divided into experimental and control groups (100 participants for each group).

The tool used for gathering information was a questionnaire designed based on other similar studies.[13,17-20] The first section of the questionnaire included items evaluating demographic information such as age, sex, marital status, job status, educational level, diabetes duration, family history in diabetes, and being infected or not infected by diabetes complications. The second section evaluated BASNEF Model constructs. Patients' knowledge about self-medication and diabetes complications was examined by 20 questions with "Yes," "No," and "No ideas" answers. The correct answer had 1 score and incorrect or no idea answer had zero score (ranging from 0 to 20 scores). Attitude was evaluated by 15 questions in five-point Likert scale from "completely agree" (5) to "completely disagree" (1) ranging from 15 to 5 scores. In this section, higher score indicated negative attitude of participants toward self-medication behaviors. Enabling factors were evaluated by ten questions with "Yes" (2), "Somehow" (1), and "No" (0) answers ranging from 0 to 20 scores and higher score indicated enabling factors preventing self-medication behaviors. Subjective norms were evaluated by eight questions in five-point Likert scale from "completely agree" (5) to completely disagree (1) ranging from 8 to 40 scores. Furthermore, behavioral intention was evaluated by ten questions in five-point Likert scale from "completely agree" (5) to "completely disagree" (1) ranging from 10 to 50 scores and higher score indicated lack of intention for doing self-medication. In addition, self-medication behaviors of patients were investigated by ten questions with "Yes" (1) and "No" (0) answers. Here, the meaning of self-medication is doing behaviors such as arbitrary use of medicines, herbal medicines, herbal essences, opium, and following other's suggestions.

For determining face validity of used tool, a list of arranged items was considered by 40 type 2 diabetic patients with similar demographic, economic, and social characteristics with studied participants. For determining content validity, the ideas of 12 specialists (out of research team) in health education and promotion (n = 9), pharmacologist (n = 1), endocrinologist (n = 1), and vital statistics specialist (n = 1) were utilized. Based on Lawshe's table, items with Contingent Value Rights (CVR) value higher than 0.56 for 12 people were considered acceptable and retained for subsequent analysis. In this study, the calculated values for most of the items were higher than 0.70. By calculating Cronbach's alpha, total consistency of research tool was obtained 0.87. Furthermore, the consistency of knowledge was 0.84, attitude was 0.86, subjective norms were 0.80, enabling factors were 0.85, behavioral intention was 0.88, and self-medication behavior was 0.85. Because the calculated Cronbach's alpha for each studied construct was higher than 0.70, it can be said that tool consistency is appropriately evaluated. This study was approved by the Ethics Committee of Fasa University of Medical Sciences (IR.FUMS.REC.2017.57). In addition, the aims and importance of this study were explained to participants, and they were assured that their information would remain confidential.

Before educational intervention, mentioned questionnaire was filled out by experimental and control groups and then, based

on obtained results, educational intervention was performed for experimental group in seven educational sessions (for 50–55 min) by giving presentation, asking and answering questions, group discussions, and presenting educational films, images, and PowerPoints. In these sessions, diabetes and its complications, efficient treatments, the effect of proper diet, regular use of medicines, side effects of arbitrary use of medicines, herbal medicines, herbal essences, and opium were explained, and it was suggested that patients use medicines only based on the prescriptions of related doctors and health center officials. At the end, an educational booklet was given to the experimental group, and a WhatsApp group was provided for exchanging information. Two follow-up sessions were also held 1 and 2 months after intervention for investigating patients' activities and 3 months after educational intervention, mentioned questionnaire was filled out by both groups. To analyze the obtained information, SPSS-22 software (IBM Software Group's ,USA), Chi-square test, independent *t*-test, and paired *t*-test were used.

Results

In the present research, 200 diabetic patients under cover of the diabetes center of Fasa were investigated. The average age of experimental group was 53.25 ± 8.42 and the average age of control group was 54.18 ± 8.13 ($P = 0.214$). The average diabetes duration in experimental and control groups was 16.22 ± 5.53 and 16.94 ± 5.12 years, respectively ($P = 0.315$). Before educational intervention, paired *t*-test showed no significant differences in two groups and Chi-square test indicated that, experimental and control groups have no significant differences in educational level ($P = 0.188$), job status ($P = 0.298$), family history in diabetes ($P = 0.355$), marital status ($P = 0.182$), complications of diabetes ($P = 0.124$), and sex ($P = 256$) [Table 1]. The results showed that 46% of experimental group and 49% of control group were suffering from diabetes complications.

Based on independent *t*-test, before educational intervention, there was no significant difference in average scores of knowledge ($P = 0.214$), attitude ($P = 0.187$), enabling factors ($P = 0.210$), subjective norms ($P = 0.126$), behavioral intention ($P = 0.184$), and self-medication behaviors ($P = 0.139$) in experimental and control groups. However, 3 months after the intervention, significant differences were seen ($P < 0.05$) and paired *t*-test showed that, the average scores of BASNEF model constructs enhanced in experimental group and their self-medication behaviors reduced ($P < 0.05$). However, control group showed no significant changes in mentioned factors ($P > 0.05$) [Table 2].

Discussion

Performing self-medication behaviors by diabetic patients lead to the fluctuation of blood glucose and earlier infection by diabetes complications.[13] The results of this research showed significant enhancement in average score of the knowledge of experimental group 3 months after educational intervention, while control group showed no changes. Presenting educational contents in group discussions and giving educational booklet caused significant enhancement in knowledge of experimental group. Omran *et al*.[21] indicated that educational intervention has a great effect on patients' treatment adherence. In a study performed in India, 92% of patients had performed self-medication, 23% were not aware of the use of medicines, 5% had sufficient experiences, and 64% had suggested self-medication to other patients.[22] In other studies, educational intervention caused the increase of patients' knowledge which is in a good agreement with the results of the present study.[23-28]

The results of this investigation indicated significant enhancement in attitude of experimental group 3 months after educational intervention. The meaning of attitude toward a behavior is that how much a considered behavior is favorable, pleasant, and useful, and it is related to the judgment of an individual about the effects and consequences of that behavior on his/her life.[29] In this study, educational intervention using BASNEF model by using educational images, film showing, discussion group, questions and answers and providing necessary explanations about the effects of medications and side effects of self-treatment increased the negative attitude of patients about self-medication. In study of Afshari *et al*.,[30] educational intervention caused the improvement of diabetic patients' attitude. Zhong *et al*.[31] and Khattab *et al*.[32] indicated positive attitude of patients toward prescribed treatment. They also emphasized on positive attitude as an effective factor in treatment adherence of patients.

Subjective norms are effective social pressures for doing or not doing a behavior. By increasing social pressures and supports from family members, doctors, health center officials, and friends for performing healthy behaviors, patient's tendency for doing healthy behaviors increases.[33] In the present research, before educational intervention, the level of subjective norms of participants was low; however, after educational intervention, significant enhancement was observed in experimental group. In this research, we tried to provide demanded support for type 2 diabetic patients by engaging specialists and diabetes center officials and one of family members as subjective norms. For this reason, some educational sessions were held with the presence of doctor and nutritionist, and one educational session was held with the presence of one of family members of patients. Rothschild *et al*.[34] revealed that, by engaging health center officials, educational intervention leads to the improvement of glycemic index of diabetic patients and having good relationship with health center officials has a great effect on health promotion of patients suffering from chronic diseases. In a study of Movahed *et al*.,[35] doctors, families, and relatives were the most important guides of patients for performing self-medication behaviors. Engaging families are an important part of treatment process, and occupational therapy plays

Table 1: Demographic information of studied participants

Variables	Experimental group (n=100), n (%)	Control group (n=100), n (%)	P
Educational level			
Illiterate	2 (2)	2 (2)	0.188
Elementary	6 (6)	8 (8)	
Guidance school	28 (28)	26 (26)	
High school	40 (40)	42 (42)	
University	24 (24)	22 (22)	
Sex			
Female	58 (58)	55 (55)	0.256
Male	42 (42)	45 (45)	
Marital status			
Single	8 (8)	6 (6)	0.182
Married	84 (84)	85 (85)	
Divorced	5 (5)	4 (4)	
Widow	3 (3)	5 (5)	
Family history in diabetes			
Yes	22 (22)	20 (20)	0.355
No	78 (78)	80 (80)	
Job status			
Employed	52 (52)	56 (56)	0.298
Unemployed	48 (48)	44 (44)	
Come down with diabetes complications			
Neuropathy	12 (12)	11 (11)	0.124
Retinopathy	10 (10)	9 (9)	
Cardiovascular diseases	8 (8)	9 (9)	
Nephropathy	6 (6)	8 (8)	
Others	10 (10)	12 (12)	
Not being infected by side effects	54 (54)	51 (51)	

Table 2: Comparison of average scores of knowledge, attitude, enabling factors, subjective norms, behavioral intention, and self-medication behavior of experimental and control groups before and 3 months after educational intervention

Variables	Group	Before intervention	3 months after intervention	Paired t-test
Knowledge (0-20)	Experimental	6.40±2.28	16.56±2.48	0.001
	Control	7.12±2.44	7.86±2.50	0.166
	Independent t-test	0.214	0.001	
Attitude (15-75)	Experimental	31.16±4.43	66.82±4.24	0.001
	Control	30.67±4.73	32.08±4.25	0.236
	Independent t-test	0.187	0.001	
Enabling factors (0-20)	Experimental	7.22±2.23	16.92±2.34	0.001
	Control	7.10±2.57	7.99±2.62	0.182
	Independent t-test	0.210	0.001	
Subjective norms (8-40)	Experimental	16.20±2.28	34.30±2.65	0.001
	Control	15.54±2.74	16.61±2.11	0.179
	Independent t-test	0.126	0.001	
Behavioral intention (10-50)	Experimental	18.32±2.57	41.18±2.74	0.001
	Control	18.96±2.42	19.85±2.09	0.161
	Independent t-test	0.184	0.001	
Self-medication behaviors (0-10)	Experimental	7.25±1.32	2.40±0.86	0.001
	Control	7.68±1.24	7.62±1.26	0.205
	Independent t-rest	0.139	0.001	

an important role in treatment adherence of patients.[36,37] Didarloo *et al*.[38] and Omondi *et al*.[39] figured out that, by increasing pressure from spouses, children, specialists, and performing occupational therapy for taking proper treatment behaviors by patients, their behaviors can be improved. In other studies, the role of social supports (subjective norms)

in self-management of diabetic patients was mentioned.[40-43] In study of Chlebowy and Garvin,[44] there observed no significant relationship between social supports, self-efficacy, and control of blood glucose by patients which was due to the social and cultural differences.

According to the present research, there was significant difference in average score of enabling factors before and after educational intervention in experimental group; however, control group showed no significant differences. In this study, enabling factors were the availability of specialists and health officials, providing free glucometers, holding educational classes, familiarizing patients with the supports of diabetes associations, and giving educational booklet to patients. Furthermore, phone tracking, sending SMS, and WhatsApp group were other facilitating factors. In the study of Kabodi *et al*.[17] on type 2 diabetic patients based on BASNEF model, constructs of this model determined 24% variance in self-medication behavior and enabling factors were the most important predictors of doing self-medication by patients. In the study of Rahaei *et al*.,[45] enabling factors were the strongest predictors of self-controlling behavior in patients suffering from high blood pressure. In the study of Pourjalil *et al*.,[46] attitude and enabling factors predicted self-care behaviors of patients suffering from high blood pressure. In the study of Asefzadeh *et al*.,[47] the most important factor in arbitrary use of medicines was underestimating the disease and high treatment costs. In the study of Hazavehei *et al*.[26] performed on type 2 diabetic patients in Shiraz, Iran, educational intervention based on BASNEF model caused significant enhancement in average score of enabling factors and other constructs of BASNEF model in experimental group.[48-50]

In this research, before the educational intervention, the average score of behavioral intention for reducing self-medication behavior had no significant differences in experimental and control groups; however, 3 months after intervention, significant enhancement was observed in experimental group. Researchers believe that, when the intention of an individual for doing a specific behavior is high, the probability of doing that behavior increases.[33] According to similar studies,[51,52] behavioral intention is an important factor for changing a behavior. In a study of Ferreira and Pereira[53] on 120 type 2 diabetic patients, intention for performing physical activity was the only predictor of doing physical activities by patients. In the studies of Pooreh and Hosseini Nodeh[54] and Maleki *et al*.,[55] educational intervention caused the enhancement of behavioral intention of patients.

In the current study, 3 months after educational intervention, self-medication behavior of experimental group reduced, while control group had no changes. The increase of knowledge, attitude, enabling factors, and subjective norms caused the promotion of patients' intention for preventing self-medication behaviors. When diabetic patients have sufficient knowledge and positive attitude for preventing self-medication and the effective subjective norms (such as family members, doctors, diabetes center officials, and optometrists) encourage them, their intention for preventing self-medication increases. In the study of Kabodi *et al*.,[17] 50.5% of studied diabetic patients had performed self-medication. In a study performed in Kuwait, 13% of patients used medicines without consulting with related doctors.[56] In the study of Karimi *et al*.,[23] educational intervention caused the reduction of self-medication behavior of experimental group. In the study of Movahed *et al*.,[35] by using health belief model, self-medication behavior of studied participants decreased. In the study of Kouhpayeh *et al*.,[57] educational intervention caused the increase of participants' knowledge and their self-medication behaviors reduced. Rezaei Jaberee *et al*.[58] investigated the effect of educational intervention based on health belief model for preventing arbitrary use of medicines on 180 women and indicated that educational intervention caused the reduction of self-medication behavior among patients.

Conclusion

Results of the present research revealed that, by increasing the knowledge of diabetic patients, creating positive attitude, facilitating conditions, improving enabling factors, engaging effective subjective norms, and reducing treatment costs, patients' intention for reducing self-medication behaviors can be enhanced. Therapeutic team needs more information and facilities to encourage patients for taking appropriate self-care behaviors, preventing self-medication, and reducing the complications of this disease.

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Conflicts of interest

There are no conflicts of interest.

References

1. Ahmadi A, Hasanzadeh J, Rajaeifard A. Metabolic control and care assessment in patients with type 2 diabetes in Chaharmahal & Bakhtiyari Province 2008. Iran J Endo Metab 2009;11:33-9.
2. Hu FB. Globalization of diabetes: The role of diet, lifestyle, and genes. Diabetes Care 2011;34:1249-57.
3. Rahimi M, Dinari Z, Najafi F. Prevalence of gestational diabetes and its risk factors in Kermanshah 2009. J Kermanshah Uni Med Sci 2010;14:244-50.
4. Vazini H, Barati M. The health belief mode land self-care behaviors among type 2 diabetic patients. Iran J Diabetes Obes 2014;6:107-13.
5. Al-Rowais NA. Herbal medicine in the treatment of diabetes mellitus. Saudi Med J 2002;23:1327-31.
6. Purreza A, Khalafi A, Ghiasi A, Mojahed F, Nurmohammadi M. To identify self-medication practice among medical students of Tehran university of medical science. Iran J Epidemiol 2013;8:40-6.

7. Masoudi-Alavi N, Alami L, Taefi S, Sadafi Z. Self-treatment in diabetes mellitus in Kashan. Iran J Endocrinol Metab 2010;12:237-42.
8. Shrifirad GR, Mohebbi S, Motalebi M, Abbasi MH, Rejati F. The prevalence and effective modifiable factors of self-medication based on the health belief model among elderly adults in Gonabad in 2009. J Health Syst Res 2011;7:411-21.
9. Tan MY, Magarey J. Self-care practices of Malaysian adults with diabetes and sub-optimal glycaemic control. Patient Educ Couns 2008;72:252-67.
10. Compeán Ortiz LG, Gallegos Cabriales EC, González González JG, Gómez Meza MV. Self-care behaviors and health indicators in adults with type 2 diabetes. Rev Lat Am Enfermagem 2010;18:675-80.
11. Winslow LC, Kroll DJ. Herbs as medicines. Arch Intern Med 1998;158:2192-9.
12. Abbasian M, Delvarian-Zadeh M. Evaluation of diabetes complications among the diabetic pa-tients visiting the Shahroud diabetic's clinic. Knowl Health 2008;2:15-9.
13. American Diabetes Association. Statistics about Diabetes. American Diabetes Association; 2015. Available from: http://www.diabetes.org/diabetes-basics/statistics/?loc=db-slabnav. [Last updated on 2014 Sep 10; Last accessed on 2015 Jan 01].
14. Masoudi Alavi N, Izadi F, Ebadi A, Hajbagheri A. Self-treatment experience in diabetes mellitustype 2. Iran J Endocrinol Metabol 2009;10:581-8.
15. Safari M, Shojaizade D, Ghofranipour F, Hydrn-ya A, Pakpur A. Theories, Models and Methodsof Health Education and Health Promotion. Tehran: Asare Sobhan Publisher; 2010.
16. Singh J, Singh R, Gautam CS. Self-medication with herbal remedies amongst patients of type 2 diabetes mellitus: A preliminary study. Indian J Endocrinol Metab 2012;16:662-3.
17. Kabodi S, Hazavehei SM, Rahimi MA, Roshanaei GH. Application of BASNEF model in analyzing self-treatment behavior among type 2 diabetic patients in 2014. J Edu Commun Health. 2015;2:38-49.
18. Sharifirad G, Najimi A, Hassanzadeh A, Azadbakht L. Application of BASNEF educational model for nutritional education among elderly patients with type 2 diabetes: Improving the glycemic control. J Res Med Sci 2011;16:1149-58.
19. Khani Jeihooni A, Kashfi SM, Hazavehei SM. Effects of the BASNEF model-based educational programs on blood sugar control, (Type 2 Diabetes). Health Edu Health Promo 2013;1:33-49.
20. Gonzalez JS, Tanenbaum ML, Commissariat PV. Psychosocial factors in medication adherence and diabetes self-management: Implications for research and practice. Am Psychol 2016;71:539-51.
21. Omran DM, Guirguis L, Simpson SH. Systematic review of pharmacist interventions to improve adherence to oral antidiabetic medications in people with type 2 diabetes. Can J Diabetes 2012;36: 292-9.
22. Badiger S, Kundapur R, Jain A, Kumar A, Pattanshetty S, Thakolkaran N, *et al*. Self medication patterns among medical students in South India. AMJ 2012;5:217-20.
23. Karimi M, Shamsi M, Zareban I, Kouhpaye ZadEsfahani J, Baradaran H. The effect of education based on the parallel process model developed on self-therapy status elderly nursery monthly. J Kermanshah Uni Med Sci 2013;17:501-8.
24. Alavi NM, Alami L, Taefi S, Sadafi Z. Self treatment in diabetes mellitus in Kashan. Iran J Endocrinol Metabol 2010;12:237-12.
25. Chubbs DO. Primary Care Provider Adherence to the Canadian Diabetes Association Clinical Practice Guideline for Chronic Kidney Disease. Doctor of Nursing Practice (DNP) Projects; 2017. p. 112.
26. Hazavehei SM, Khani Jeihooni A, Hasanzadeh A, Amini S. The effect of educational program based on BASNEF model for eye care in non-insulin dependent diabetic patients. J Res Health Sci 2010;10:81-90.
27. Wolf G, Müller N, Busch M, Eidner G, Kloos C, Hunger-Battefeld W, *et al.* Diabetic foot syndrome and renal function in type 1 and 2 diabetes mellitus show close association. Nephrol Dial Transplant 2009;24:1896-901.
28. Borhani M, Rastgarimehr B, Shafieyan Z, Mansourian M, Hoseini SM, Arzaghi SM, *et al.* Effects of predisposing, reinforcing and enabling factors on self-care behaviors of the patients with diabetes mellitus in the Minoodasht city, Iran. J Diabetes Metab Disord 2015;14:27.
29. Ajzen I. The theory of planned behavior. Organ Behav Human Deci Proces 1991;50:179-211.
30. Afshari M, Azartol M, Taghdisi K. The effect of BASNEF-based blended educational program on on diabetes control among type 2 diabetic patients referred to diabetes clinic of Samirom city. RJMS 2015;22:56-62.
31. Zhong X, Tanasugarn C, Fisher EB, Krudsood S, Nityasuddhi D. Awareness and practices of self-management and influence factors among individuals with type 2 diabetes in urban community settings in Anhui province, China. Southeast Asian J Trop Med Public Health 2011;42:185-6, 184, 187-96.
32. Khattab M, Khader YS, Al-Khawaldeh A, Ajlouni K. Factors associated with poor glycemic control among patients with type 2 diabetes. J Diabetes Complications 2010;24:84-9.
33. Dydarlu A. Effect of Educational Intervention Based on The Theory of Developed Reasoned Action to Promote of Self Management in Women with Type 2 Diabetes. Tehran: Tehran University of Medical Sciences; 2011.
34. Rothschild SK, Martin MA, Swider SM, Tumialán Lynas CM, Janssen I, Avery EF, *et al.* Mexican American trial of community health workers: A randomized controlled trial of a community health worker intervention for Mexican Americans with type 2 diabetes mellitus. Am J Public Health 2014;104:1540-8.
35. Movahed E, Shojaeizadeh D, Zareipour MA, Arefi Z, Shaahmadi F, Ameri M. The effect of health belief model-based training on self-medication among the male high school students. J Health Edu Health Promo 2014;2:65-72.
36. Ciechanowski P, Russo J, Katon W, Von Korff M, Ludman E, Lin E, *et al.* Influence of patient attachment style on self-care and outcomes in diabetes. Psychosom Med 2004;66:720-8.
37. Meneilly GS, Tessier D. Diabetes in elderly adults. J Gerontol A Biol Sci Med Sci 2001;56:M5-13.
38. Didarloo A, Shojaeizadeh D, Ardebili HE, Niknami S, Hajizadeh E, Alizadeh M, *et al.* Factors influencing physical activity behavior among Iranian women with type 2 diabetes using the extended theory of reasoned action. Diabetes Metab J 2011;35:513-22.
39. Omondi DO, Walingo MK, Mbagaya GM, Othuon LOA. Understanding physical activity behavior of type 2 diabetics using the theory of planned behavior and structural equation modeling. Int J Soc Sci 2010;5:160-7.
40. Lee LT, Bowen PG, Mosley MK, Turner CC. Theory of Planned Behavior: Social support and diabetes self-management. The Journal for Nurse Practitioners. 2017;13:265-70.
41. Oftedal BF. Motivation for Self-management among Adults with Type 2 Diabetes. Stavanger: Faculty of Social Sciences University of Stavanger; 2011.
42. Fortmann AL, Gallo LC, Philis-Tsimikas A. Glycemic control among Latinos with type 2 diabetes: The role of social-environmental support resources. Health Psychol 2011;30:251-8.
43. Shaya FT, Chirikov VV, Howard D, Foster C, Costas J, Snitker S, *et al.* Effect of social networks intervention in type 2 diabetes: A partial randomised study. J Epidemiol Community Health 2014;68:326-32.
44. Chlebowy DO, Garvin BJ. Social support, self efficacy andoutcome Exeptions: Impact on selfcare behaviors and glycemic control in caucasian and African American adults with type 2 diabetes. Diabetes Educ 2006;32:777-86.
45. Rahaei Z, Baghianimoghadam MH, Morovat-Isharifabad MA, Zareian M, Fallahzadeh H, Vakili Mahmoodabad M. Determinants of self-monitoring of blood pressure among hyperten-sive patients using on path analysis of basnef model. Payesh 2012;11:621-7.
46. Pourjalil F, Abedini S, Mohseni S. Self-care behavior predictors in patients with high blood pressure admitted to comprehensive health services centers of Bastak city based on BASNEF model. J Res Med Dent Sci 2018;6:6-11.
47. Asefzadeh S, Anbarloei M, Habibi Sh, Rezaei M. Self medication among the in-patients of Qazvin teaching hospitals. J Qazvin Uni Med Sci Health Serv 2002;20:48-54.
48. Jeihooni AK, Kashfi SM, Hatami M, Avand A, Bazrafshan MR. The effect of educational program based on PRECEDE model in promoting prostate cancer screening in a sample of Iranian men. J Cancer Educ 2019;34:161-72.
49. Kashfi SM, Jeihooni AK, Rezaianzadeh A, Karimi S. The effect of

mothers education program based on the precede model on the mean weight in children (6-12 months) at health centers in Shiraz, Fars ProvinceMed J Islam Repub Iran 2014;28:95.
50. Jeihooni AK, Heidari MS, Harsini PA, Azizinia S. Application of PRECEDE model in education of nutrition and physical activities in obesity and overweight female high school students. Obesity Medicine 2019;14:100092.
51. Arshad SM, Khani-Jeihooni A, Moradi Z, Kouhpayeh SA, Kashfi SM, Dehghan A. Effect of theory of planned behavior-based educational intervention on breastfeeding behavior in pregnant women in Fasa city, Iran. JECH 2017;4:55-63.
52. Biranvand S. Fayazi S. Asadi zaker M. Latifi M. Evaluation of patients with type II diabetes foot care: Theory planned behavior. J Clinic Nurs Midwifery 2014;2:57-66.
53. Ferreira G, Pereira MG. Physical activity: The importance of the extended theory of planned behavior, in type 2 diabetes patients. J Health Psychol 2017;22:1312-21.
54. Pooreh S, Hosseini Nodeh Z. Impact of education based on theory of planned behavior: An investigation into hypertension-preventive self-care behaviors in Iranian girl adolescent. Iran J Public Health 2015;44:839-47.
55. Maleki F, Hosseini Nodeh Z, Rahnavard Z, Arab M. Effectiveness of training on preventative nutritional behaviors for type-2 diabetes among the female adolescents: Examination of theory of planned behavior. Med J Islam Repub Iran 2016;30:349.
56. Awad A, Al-Rabiy S, Abahussain E. Self-medication practices among diabetic patients in Kuwait. Med Princ Pract 2008;17:315-20.
57. Kouhpayeh A, Jeihooni AK, Kashfi SH, Bahmandoost M. Effect of an educational intervention based on the model of health beliefs in self-medication of Iranian mothers. Invest Educ Enferm 2017;35:59-68.
58. Rezaei Jaberee S, Hassani L, Aghamolaei T, Mohseni S, Islamic H. Study on the effect of educational intervention based on health belief model to prevent the arbitrary use of drugs in women referring to health centers of Bandar Abbas. Iran J Health Educ Health Promot 2018;6:1-11.