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.3 Unfortunately, ignoring the prescribed treatment process by patients is one of the important problems in therapeutic trends.5 Self-medication is a behavior by which a patient tries to treat his/her health problem without considering the prescriptions of related doctors.6 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.7 In Iran, there are different statistic reports about self-medication: from 35.7% among university students8 to more than 45% in diabetic patients9 and 77.6% among elderly.10 Half of diabetic patients use herbal medicines and related combinations and 27% of them ignore the main prescribed medicines.11 By performing self-medication behaviors, patient’s fluctuating blood pressure enhances which results in diabetes complications (73.6% neuropathy, 32.2%
retinopathy, and 12.3% nephropathy). 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. 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. BASNEF model is one of the useful patterns in health education and promotion which is the combination of behavioral intention model and precede pattern. This model considers the effect of knowledge and attitude on a specific action and also 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.

Results of Kabodi et al. 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. 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. 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. 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
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 Pourjailil 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.[39] 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.[51,52] According to similar studies,[53,54] 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 Nodel,[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.,[55] 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 Jaberei 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.

Acknowledgment

The present research is a part of General Medical Student Thesis performed at Fasa University of Medical Sciences with the number of 96219. The authors thank and appreciate the financial and spiritual supports of the Research and Technology Deputy of Fasa University of Medical Sciences and also the participation of respectful patients in this research.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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