



Comparing the Effect of Teach Back and Video Tape Education on Self-efficacy and Self-care in Type 2 Diabetes Patients

Mahboubeh Hosaini Zare ¹, Fahimeh Nikraftar ², Farah Madarshahian ¹ and Gholamhossein Mahmoudirad ^{1,*}

¹Birjand University of Medical Science, Birjand, Iran

²Nursing Department, Faculty of Nursing and Midwifery, Birjand University of Medical Sciences, Birjand, Iran

*Corresponding author: Faculty of Nursing and Midwifery, Birjand University of Medical Sciences, Birjand, Iran. Email: mahmoudirad@gmail.com

Received 2019 January 15; Revised 2021 May 29; Accepted 2021 May 30.

Abstract

Background: Self-efficacy is the basis for improved self-care in diabetic patients, and self-care is the most important strategy to control diabetes. Therefore, it is important to choose an appropriate educational method to provide patients information to achieve these goals.

Objectives: This study aimed to compare the impacts of teach back and video tape education methods on self-efficacy and self-care abilities of patients with type 2 diabetes.

Methods: In this semi-experimental controlled study, 105 patients with type 2 diabetes were randomly divided into the three groups of teach back, video tape training, and control. The data were collected using Orem's nursing assessment form and two researcher-made questionnaires of self-care and self-efficacy. In the teach back group, based on the extent of self-care disability in the areas of physical activity, foot care, and glycemic control, educational sessions were held for each patient individually. In the video tape group, three films were shown in those areas for patients. The control group received no intervention. Questionnaires were re-completed seven days and one and three months after the intervention through interviews. Data were analyzed using SPSS version 16.

Results: The mean total score of self-care in the teach back group was significantly higher seven days and one and three months after the intervention ($P < 0.00$). The mean scores of self-care and self-efficacy in the teach back group (before the intervention and seven days and one and three months after the intervention) significantly increased compared to the mean variation of scores in the video tape and control groups ($P < 0.001$).

Conclusions: Applying the teach back method is more effective than the video tape method, and it is suggested that more extensive studies be conducted to promote self-care and self-efficacy in these patients.

Keywords: Type 2 Diabetes, Self-care, Self-efficacy, Education, Video Tape, Teach Back

1. Background

Diabetes is considered as one of the most common chronic metabolic diseases (1). The incidence of diabetes have been reported as 285 million in 2010, and this rate is estimated to increase to 439 million patients by 2030 (2). The World Health Organization reported that 1.5 million people died due to complications of diabetes in 2012, and it is predicted that diabetes will become the seventh leading cause of mortality by the year 2030 (3). It is also estimated that diabetic patients in Iran will reach 9.2 million by 2030 (4). Therefore, lack of proper control of the disease, by imposing huge costs on the health care system, will have detrimental effects on patients' individual and social lives (5).

Patients need to learn self-care methods to control and prevent disease progression and delay its complications (6). In this context, the American Diabetes Association states that self-care education should be provided to patients with diabetes to delay complications (7).

One of the models affecting patient's self-care is the Orem's self-care model. According to this model, self-care activities are those that people do on their own behalf for the survival and improvement of their quality of life and well-being and the prevention and treatment of their diseases (8). She also believes that people have the ability to do self-care activities to maintain their health (9, 10).

Osborn et al. (2010) concluded that self-efficacy is associated with self-care behaviors to the extent that higher self-efficacy may lead to better control of diabetes melli-

tus and its complications (11). Self-efficacy means the confidence and beliefs of people to succeed in their own self-care activities and is known as a main factor contributing to behavior modification (12).

Educating diabetic patients can ensure their participation in self-care activities (13). Using patient-centered approaches could result in more permanent effects (14). One of the interactive methods of training (15) approved by health care organizations is known as the teach back method that aims to understand and maintain what is being explained to learners (16).

The teach back method is considered as a direct method of teaching being practiced individually, face-to-face with eye contact and body language (17). This method benefits from repetition to achieve knowledge retention and promotes peer to peer coaching (16). In the teach-back method, the educator provides patients with clarified or modified information and then reassesses what is already thought to confirm the patient's understanding and comprehension. Doing so, patients should be able to clearly describe or explain the information provided to them, otherwise the healthcare provider gives complementary information (16, 18).

On the other hand, using documentary films as an educational tool can improve training in different levels (i.e., basic to advanced levels). The advantages of this method can be name as the creation, storage and maintenance of information, ease of use, and cost-effectiveness. However, the virtual nature of this method and lack of an active and lively educational setting can be considered as the primary disadvantages of this method. Indeed, active and real communication plays an undeniable role in achieving educational goals (19). The results of a study by Albert et al. showed improved self-care in patients with heart failure who received training in the form of videos (20).

According to the literature, the level of knowledge, self-care and self-efficacy in diabetic patients is low (5, 21). Also, patients with diabetes mellitus deliver most of their own care due to the fact that it is not possible for them to be under the care of health institutions at all hours of the day. On the other hand, because conventional methods of patient education are not effective enough, it is necessary to identify efficient methods of education in these patients (22).

2. Objectives

This study aimed to compare the effects of the teach back and video tape training methods on self-efficacy and self-care abilities of patients with type 2 diabetes.

3. Methods

In this semi-experimental controlled study, 105 patients with type 2 diabetes visiting Diabetes Research Center in the city of Birjand (southeast of Iran) were recruited. According to the study of Jalilian et al. (2010) and taking into account the confidence level of 95% and power of 80%, the sample size was calculated as 18. However, due to sample attrition and to improve the accuracy of the study, 35 samples were entered into the study (23).

The inclusion criteria were 30 - 55 years of age, at least one year elapsed since the diagnosis of type 2 diabetes, no history of type 1 or gestational diabetes, having the ability to read and write, lack of speech, mental and hearing problems, no history of participation in training courses, and not having diseases such as renal failure, stroke, malignant tumors, or psychiatric disorders.

Participants were selected from the diabetes research center using the connivance sampling method, then they were randomly allocated into three groups of 35 participants, namely teach-back, video tape training, and control.

A daily drawing method was applied to select the groups. This was conducted according to the following procedure: the names of groups were written on a piece of paper on a daily basis. The first name was randomly picked by the investigator. Following this, the patients were alternately placed in the control and intervention groups. This procedure would continue until the number of participants in each group reached to 35. The participants received sufficient information about the study objectives and the procedures, and then informed consent forms were filled out by them. The training sessions were held in the educational classes of the Diabetes Research Center.

To collect data the following three questionnaires were employed: (1) Orem's nursing assessment form developed by Memarian with targeted questions in the six areas of demographic data, clinical data, history of previous diseases, public self-care requisites, common health patterns, health deviation, and self-care requisites (15, 21). (2) The researcher-made questionnaire of self-care behaviors assessment developed based on the summary of Diabetes Self-Care Activity (SDSCA) measure (22) in which the two areas of diet and medication were removed. Indeed, to cover the research objectives, two questions were added to the area of physical activity and four additional ones were added to the areas of foot care. The current tool is expected to assess the adherence behaviors of subjects in three areas of physical activity, glycemic control, and foot care during the recent seven days. The questionnaire included four items related to physical activity, two questions designed to assess glycemic control, and six other questions

addressed the area of foot care. On this scale, a score of zero to seven was dedicated to each behavior, and the total score of self-care was the sum of the item scores and could vary between 0 and 84. The internal consistency of the study was established with the Cronbach's alpha of 0.71. Content and face validity of the scale was confirmed by five faculty members of Birjand University of Medical Sciences (departments of internal surgery, management, and public health). (3) A self-Efficacy questionnaire was developed based on the diabetes management self-efficacy scale (DMSES) (23, 24). Considering the research objectives, questions related to the areas of physical activity, glycemic control, and foot care were introduced. This questionnaire included eight items designed to assess the ability of patients in the areas of foot care, physical activity, and glycemic control. The items were rated on a 5-point Likert-type scale (5 = I definitely can do, 4 = I can probably do, 3 = I'm not sure I can do, 2 = I can't probably do, 1 = I can't definitely do). The total score of self-efficacy can vary between 8 and 40. The internal consistency was calculated using Cronbach's alpha as 0.82. Face and content validity were confirmed by five faculty members of Birjand University of Medical Sciences (departments of internal-surgery, management, and public health).

The diabetes self-care assessment questionnaire was used to determine the mean score of self-care in all the three groups, such that if the mean score was less than 70%, a need for training was raised and the patient was enrolled in the study. Following this, the intervention group was examined by the existing Orem's form. Then, the training program was developed based on the training needs of the intervention group.

The number of training sessions in the teach back group was determined based on the extent of self-care disability in the areas of physical activity, foot care, and glycemic control. Accordingly, 2 - 3 sessions were held for each patient individually using the face to face approach of learning. A glucometer was used to determine the approximate concentration of glucose in the blood. Each session lasted approximately 30-45 minutes.

By the end of each session, the individual patient was asked to explain what he/she had learned. For example, they were asked how to shorten their nails? or how to warm up their feet in winter?

If they could provide the instructor with a satisfying answer, the session was terminated, otherwise that discussion would continue with more clarity until sufficient understanding was achieved.

Afterwards, the participants of the video tape group were divided into four groups of 8 and 9 members. Three half-hour video films prepared by the Endocrinology and Metabolism Institute of Tehran University of Medical Sci-

ences were presented to the subjects. These videos were elicited based on self-care deficits regarding physical activity, foot care, and glycemic control.

The control group received no intervention. The self-care and self-efficacy questionnaires were recompleted by interviews after 7 days and 1 and 3 months, respectively.

Data were analyzed using SPSS version 16. Chi-square, Fisher's exact test, and Student's t-test were run to analyze the demographic data. To assess variation in the mean scores of self-care and self-efficacy, one way ANOVA and Kruskal-Wallis tests were used. In addition, to compare the mean total score of self-efficacy and self-care in the area of foot care, intra-group analysis of variance was used during four stages, and due to abnormality of self-care variables in the areas of physical activity and glycemic control, the Friedman and Wilcoxon tests. A P-value of less than 0.05 was considered significant.

The study protocol was approved by the Ethics Committee of Birjand University of Medical Sciences, Birjand, Iran (IR.BUMS.REC.1394.405). Informed consent was obtained from the patients. The participants were ensured that their names and other information would remain confidential. Participation in the study was based on willingness and the participants were allowed to withdraw from the study at any time.

4. Results

In this study, 105 diabetes patients were enrolled. The participants were assigned into three groups of 35 patients, namely teach back, video tape, and control. The results revealed similar demographic data before the intervention (Table 1).

The intra-group analysis of variance in all the groups showed a significant difference in the mean total score of self-care in at least two stages ($P < 0.001$). Although self-care score of the control group had increased during one and three months after the intervention, the comparison of the mean variations before, seven days and one and three months after the intervention showed that the variation in the teach back group was more pronounced (Table 2).

In the area of foot care, intra-group analysis of variance of the teach back and video tape groups showed a significant difference between the mean scores of self-care in the area of foot care in at least two stages ($P < 0.001$), and the control group showed a significance difference between the mean scores of self-care in the area of foot care in at least two stages ($P = 0.003$; Table 2).

In the area of physical activity in the teach back, video-tape, and control groups, the Friedman test results showed a significant difference in the mean scores of self-care in

Table 1. Demographic Data of Participants

Variable	Teach Back Group, N = 35	Film Group, N = 35	Control Group, N = 35	χ^2/I	P
Age	51.79 \pm 4.18	51.14 \pm 5.05	50.06 \pm 5.62	1.30	0.28
Sex, No. (%)				0.11	0.95
Female	27 (77.1)	27 (77.1)	26 (74.3)		
Male	8 (22.9)	8 (22.9)	9 (25.7)		
Married, No. (%) ^a				0.69	1
Married	33 (94.3)	34 (97.1)	34 (97.1)		
Other	2 (5.7)	1 (2.9)	1 (2.9)		
Education, No. (%)				0.28	1
Illiterate	9 (25.7)	9 (25.7)	8 (22.9)		
High school	21 (60)	21 (60)	22 (62.9)		
Higher	5 (14.3)	5 (14.3)	5 (14.3)		

^aFisher's exact test.**Table 2.** Comparison of the Mean Scores of Self-care, Foot Care, Physical Activity and Glycemic Control (7 Days and 1 and 3 Months) After the Intervention To Prior To The Intervention^a

Variable	Teach Back, N = 35	Video Tape, N = 35	Control Group, N = 35	Statistical Test
Self-care scores				
Mean variations of self-care scores prior to and seven days after the intervention	30.71 \pm 9.75	20.74 \pm 9.77	-0.60 \pm 1.12	F = 140.17, P < 0.001
Mean variations of self-care scores prior to and one month after the intervention	27.34 \pm 10.29	17.94 \pm 9.93	3.20 \pm 3.44	F = 71.86, P < 0.001
Mean variations of self-care scores prior to and three months after the intervention	25.86 \pm 10.70	15.66 \pm 9.72	6.11 \pm 4.21	F = 45.09, P < 0.001
Foot care scores				
Mean variations of foot care scores prior to and seven days after the intervention	19.97 \pm 7.68	12.63 \pm 7.61	-0.46 \pm 0.7	F = 95.91, P < 0.001
Mean variations of foot care scores prior to and one month after the intervention	18.02 \pm 8.14	11.11 \pm 7.79	0.97 \pm 2.95	F = 56.96, P < 0.001
Mean variations of foot care scores prior to and three months after the intervention	17.03 \pm 8.57	9.66 \pm 7.86	2.34 \pm 3.39	F = 38.60, P < 0.001
Physical activity scores				
Mean variations of physical activity scores prior to and seven days after the intervention	9.91 \pm 3.94	7.71 \pm 3.93	-0.06 \pm 0.76	χ^2 = 70.86, P < 0.001
Mean variations of physical activity scores prior to and one month after the intervention	8.63 \pm 4.01	6.66 \pm 3.80	1.80 \pm 1.76	χ^2 = 52.17, P < 0.001
Mean variations of physical activity scores prior to and three months after the intervention	8.17 \pm 4.25	5.91 \pm 3.70	3.17 \pm 2.13	χ^2 = 70.37, P < 0.001
Glycemic control scores				
Mean variations of glycemic control scores prior to and seven days after the intervention	0.83 \pm 1.54	0.40 \pm 1.64	-0.09 \pm 0.70	χ^2 = 14.42, P = 0.001
Mean variations of glycemic scores prior to and one month after the intervention	0.69 \pm 1.79	0.17 \pm 1.69	0.42 \pm 1.19	χ^2 = 4.49, P = 0.11
Mean variations of glycemic control scores prior to and three months after the intervention	0.66 \pm 1.81	0.09 \pm 1.70	0.60 \pm 1.83	χ^2 = 3.94, P = 0.14

^aValues are expressed as SD \pm mean unless otherwise indicated.

at least two stages ($P < 0.001$). Although the mean score of self-care in the area of physical activity in the control group showed an increasing trend one and three months after the intervention, the comparison of average variations showed that the mean score of self-care in the area of physical activity in the teach back group had a further increase (Table 2).

The results of the Friedman test in the area of glycemic control exhibited a significant difference in the mean scores of self-care between the teach back and control groups in at least two stages ($P < 0.05$). However, no significant result was found for the video tape group ($P > 0.05$; Table 2).

The results of intra-group analysis of variance in comparison in terms of mean score of self-efficacy revealed a significant difference between the teach-back and video tape groups in at least two stages ($P < 0.001$). However, no significant result was found for the control group ($P > 0.05$; Table 3).

5. Discussion

In this study, we aimed to compare the impacts of teach back and video tape training methods on the self-efficacy and self-care abilities of patients with type 2 diabetes. The results showed that the teach back and video tape methods were effective in promoting self-care behaviors in patients with type 2 diabetes. Moreover, the results indicated a higher level of success in the teach back group in achieving the objectives of the study and enhancing the self-care ability.

To our knowledge, no similar studies exist comparing teach back and video tape training methods. Therefore, the results of similar studies were discussed. Howie-Esquivel et al. (2011) in their study where self-care behaviors were taught to hospitalized patients with a history of heart failure concluded that teach back training of patients improved their self-care behaviors during hospitalization and after discharge (24).

Mahramus et al. (2014) noted that the teach back method of training improved the knowledge of nurses regarding the self-care principles of heart failure three months following the intervention (25). Oshvandi et al. (2015) also found that the teach back method of training promoted self-care behaviors one month after the intervention in patients with type 2 diabetes (15). The results of a study conducted by Negarandeh et al. (2013) showed that the teach back and pictorial methods increased awareness and adherence to food and drug regimens in patients at six weeks following the intervention, and there was no significant difference between the two groups (26). Wilson et al. studied the effect of education based on the teach back

method on pregnant women's knowledge of vaccination and found similar results with our study (18, 27).

Based on the results of this study, the mean self-care score of patients in the teach back group showed a significant increase prior to and after the intervention. In addition, this score rose significantly compared to the video tape and control groups one and three months following the intervention.

The follow-up results of our study showed that training using the teach back method contributed to a better persistence and resistance of information, and it has been more effective in preserving information compared to the video tape group after three months. White et al. (2013) also evaluated the effects follow-up of self-care education using the teach back training method in patients with heart failure. Persistency of information was reported as being significantly higher using this method compared to other methods (28).

Among factors that could probably explain these results, we can elaborate on the impact of individual and face-to-face interaction of the researcher and patients. For example, eye contact and body language are incorporated to provide the learner with a comprehensive understanding of the educational contents. On the other hand, most medical information received by patients is immediately forgotten, and approximately half of the remaining information is misunderstood. Thus, one of the best ways to fill the gap between the physician and the patient is to apply the teach back method. This is mainly due to the direct and active nature of this approach, which stabilizes the information about the treatment and care of patients (29). Psychological investigations have also shown that the repetition of specific information in human mind would boost short-term memory (30). As described, the teach back method uses the repetition of educational contents (18). It seems that this feature had led to a better performance in the preservation of self-care information given to the patients in this study.

On the other hand, Chan et al. (2008) concluded that video tape education may improve knowledge in the stroke patients. However, this contradiction may be partly due to the severity of disease (31). In parallel with the present study, they indicated that the video tape method of training was not effective in preserving the information. Albert et al. (2007) evaluated the impact of this educational method on the incidence of symptoms and self-care behaviors in heart failure patients. The video tape group demonstrated lower drug intake compared to a control group and had a lower rate of phone call contacts with health workers to lessen their health problems. Also, self-care score was higher in the control group, and they showed a better self-care behavior and more adherence to their care (20). This

Table 3. Comparison of the Mean Variations of Self-efficacy Scores (7 Days and 1 and 3 Months) After the Intervention with Those Prior to the Intervention ^a

Variable	Mean Variations of Self-efficacy Scores Prior to and Seven Days After the Intervention	Mean Variations of Self-efficacy Scores Prior to and One Month After the Intervention	Mean Variations of Self-efficacy Scores Prior to and Three Months After the Intervention
Teach back, n = 35	12.66 ± 4.39	11.71 ± 4.38	11.49 ± 4.46
Video tape, n = 35	9.80 ± 5.28	8.66 ± 5.35	8.26 ± 5.30
Control group, n = 35	0.20 ± 0.83	1.60 ± 1.22	2.54 ± 1.77
Statistical test	F = 93.55, P < 0.001	F = 57.34, P < 0.001	F = 42.42, P < 0.001

^aValues are expressed as SD ± mean unless otherwise indicated.

may probably be due to distance and virtual education and lack of live and interactive educational setting. Hence, it appears that direct and face-to-face education is more effective in comparison with indirect and distance learning.

One of the aspects of self-care investigated in this study is foot care. Diabetic foot is a common problem in diabetic patients and is one of the main causes of disability in these patients (32). This study indicated a significant increase in the mean self-care score in the area of foot care in the teach back group compared to the control and video tape groups. This result is consistent with the findings of Cross et al. study, where they concluded that two weeks of diabetic foot self-care education and a three-months follow up significantly reduced the readmission of patients (33). Vatankhah et al. assessing the impact of face-to-face training on raising patients awareness and performance came to the conclusion that this method is an effective way to improve diabetic foot care knowledge and increase the motivation and behaviors of diabetic patients (34). Vatankhah's study was similar to ours in that teach back method was also considered as a type of face-to-face method of education.

Glycemic control as the second area of this study was evaluated during our investigation. No significant increase in the mean score of self-care in the area of glycemic control was reported in the teach back group compared to the video tape and control groups. This can be explained by the lack of financial ability to buy a glucometer and the inability to utilize it. Habboushe reported lower self-efficacy related to the glycemic control behaviors of patients. He explained that regular glycemic control requires knowledge, skills, and financial resources (35). Patients need to know how and when to control their blood glucose, and they also should have the appropriate tool (glucometer) to check their glucose. Therefore, patients' self-efficacy was not reported as being improved during the course of this study.

Also, Simmons showed that a number of patients did not have the financial ability to pay the costs of buying glycemic control devices (36). Similarly, in this study pa-

tients also asserted that they could not afford the costs of buying devices.

In contrast to our findings regarding glycemic control, Oshvandi et al. applying the teach back method reported a significant difference in the area of glycemic control between the intervention and control groups (15). However, in another study conducted by Khezrlou, similar findings to ours were reported (37).

The third area assessed in this study was physical activity. In an Australian research on diabetic and pre-diabetic patients conducted by Hordern, it was found that physical activity plays a crucial role in the prevention of type 2 diabetes and reduces blood glucose in patients with prediabetes (38). Comparing different groups, the results of this study revealed a significant difference in the mean score of physical activity in the teach back, video tape, and control groups seven days and one and three months after the intervention, such that teach back group achieved a higher score compared to the other ones. These findings are consistent with the results of Oshvandi et al. in that the educational intervention applying the teach back method led to a higher self-care score in the area of physical activity one month after the intervention (15). In the study of Jalilian, educational intervention increased self-care score in the area of physical activity (23).

Another finding of this study was the effect of teach back method of education in the promotion of self-efficacy in patients with type 2 diabetes, as the mean score of self-efficacy in Teach back group of patients significantly increased after the intervention. This score also significantly increased compared to the control and video tape groups during one-month and three-month follow-ups. Wilson et al. in their study showed that about 25% of variations in self-care behaviors can be explained by psychosocial variables (39). Shi et al. in a study of 160 patients with type 2 diabetes conducted an educational intervention applying two-hour training sessions once a week for a month and with a four-months follow-up found that self-efficacy in diabetic patients increased after intervention (40). Also, in their semi-experimental study on 28 diabetic patients

referred to the clinic of diabetes in Canada, Stipanovic reported similar results, confirming that educational interventions can increase self-care and self-efficacy scores one month after the intervention (41). Since direct education is considered as an active face-to-face method and considering that changes in attitude requires different steps, one of which being active training and suitable relationship with learners, it seems that direct training methods may be more effective in changing attitudes than passive ones. On the other hand, those who enjoy higher self-efficacy are generally more motivated to show persistency in a special behavior and are more inclined to change their behaviors. That attitude change can contribute to behavior change in the long term (42). In this study, the teach back training method led to better performance in the preservation of information and improved self-efficacy in diabetic patients.

5.1. Conclusions

Based on the findings of this study, the teach back training method is more effective in the maintenance and stability of learning, and it is recommended to apply this method for a wide range of educational purposes to promote patients' self-care and self-efficacy.

One of the limitations of this study was the lack of direct observation of self-care behaviors such as, walking, glycemic control, and foot care. Another was that data was collected according to the patients' own statements. Hence, it is recommended to provide patients with a daily checklist to collect data on their performance.

Acknowledgments

This paper was extracted from a master's thesis in Nursing Education with the registry number of 9305. The study team would like to acknowledge all the staff of Birjand Diabetes Research Center and patients who contributed to this study.

Footnotes

Authors' Contribution: All authors contributed equally.

Conflict of Interests: The authors declare that they have no competing interests.

Ethical Approval: The Ethics Committee of the Birjand University of Medical Sciences approved this study (code of ethics: IR.BUMS.REC.1394.405).

Funding/Support: This study was supported by the Birjand University of medical sciences, Iran.

Informed Consent: Informed consent was obtained from all the patients for being included in the study.

References

1. Nagelkerk J, Reick K, Meengs L. Perceived barriers and effective strategies to diabetes self-management. *J Adv Nurs*. 2006;**54**(2):151-8. doi: [10.1111/j.1365-2648.2006.03799.x](#). [PubMed: [16553701](#)].
2. Shaw JE, Sicree RA, Zimmet PZ. Global estimates of the prevalence of diabetes for 2010 and 2030. *Diabetes Res Clin Pract*. 2010;**87**(1):4-14. doi: [10.1016/j.diabres.2009.10.007](#). [PubMed: [19896746](#)].
3. Vongpatanasin W. Cardiovascular morbidity and mortality in high-risk populations: epidemiology and opportunities for risk reduction. *J Clin Hypertens (Greenwich)*. 2007;**9**(11 Suppl 4):11-5. doi: [10.1111/j.1524-6175.2007.07722.x](#). [PubMed: [17978602](#)].
4. Javanbakht M, Mashayekhi A, Baradaran HR, Haghdoost A, Afshin A. Projection of diabetes population size and associated economic burden through 2030 in Iran: Evidence from micro-simulation markov model and bayesian meta-analysis. *PLoS One*. 2015;**10**(7). e0132505. doi: [10.1371/journal.pone.0132505](#). [PubMed: [26200913](#)]. [PubMed Central: [PMC4511591](#)].
5. Sharfifard GR, Azad Bakht L, Feizi A, Mohebi S, Kargar M, Rezaei AR. The role of self-efficacy in self-care among diabetic patients. *J Health Syst Res*. 2012;**7**(6):648-59.
6. Jordan DN, Jordan JL. Self-care behaviors of Filipino-American adults with type 2 diabetes mellitus. *J Diabetes Complications*. 2010;**24**(4):250-8. doi: [10.1016/j.jdiacomp.2009.03.006](#). [PubMed: [19615920](#)].
7. Gerber BS, Brodsky IG, Lawless KA, Smolin LI, Arozullah AM, Smith EV, et al. Implementation and evaluation of a low-literacy diabetes education computer multimedia application. *Diabetes Care*. 2005;**28**(7):1574-80. doi: [10.2337/diacare.28.7.1574](#). [PubMed: [15983303](#)].
8. Dashiff CJ, McCaleb A, Cull V. Self-care of young adolescents with type 1 diabetes. *J Pediatr Nurs*. 2006;**21**(3):222-32. doi: [10.1016/j.pedn.2005.07.013](#). [PubMed: [16713512](#)].
9. George JB. *Nursing theories: The base for professional nursing practice*. 6th ed. Pearson Education India; 2011.
10. Macabasco-O'Connell A, Crawford MH, Stotts N, Stewart A, Froelicher ES. Self-care behaviors in indigent patients with heart failure. *J Cardiovasc Nurs*. 2008;**23**(3):223-30. doi: [10.1097/01.JCN.0000317427.21716.5f](#). [PubMed: [18437064](#)].
11. Osborn CY, Cavanaugh K, Wallston KA, Rothman RL. Self-efficacy links health literacy and numeracy to glycemic control. *J Health Commun*. 2010;**15** Suppl 2:146-58. doi: [10.1080/10810730.2010.499980](#). [PubMed: [20845200](#)]. [PubMed Central: [PMC3082364](#)].
12. Bandura A. Self-efficacy mechanism in human agency. *Am Psychol*. 1982;**37**(2):122-47. doi: [10.1037/0003-066x.37.2.122](#).
13. Holmstrom IM, Rosenqvist U. Misunderstandings about illness and treatment among patients with type 2 diabetes. *J Adv Nurs*. 2005;**49**(2):146-54. doi: [10.1111/j.1365-2648.2004.03274.x](#). [PubMed: [15641947](#)].
14. Shirazi M, Anoosheh M, Rajab A. [The effect of self care program education through group discussion method on knowledge and practice in diabetic adolescent girls referring to Iranian Diabetes Society]. *Iran J Med Sci*. 2011;**10**(5):982-93. Persian.
15. Oshvandi K, Jokar M, Khatiban M, Keyani J, Yousefzadeh MR, Sultanian AR. [The effect of self care education based on teach back method on promotion of self care behaviors in type ii diabetic patients: A clinical trial study]. *Iranian Journal of Diabetes and Lipid Disorders*. 2014;**13**(2):131-43. Persian.
16. Sudore RL, Schillinger D. Interventions to improve care for patients with limited health literacy. *J Clin Outcomes Manag*. 2009;**16**(1):20-9. [PubMed: [20046798](#)]. [PubMed Central: [PMC2799039](#)].

17. Hasanzadeh F, Shamsoddini S, Moonaghi HK, Ebrahimzadeh S. [A comparison of face to face and video-based education on attitude related to diet and fluids adherence in hemodialysis patients]. *Horizon Med Sci*. 2011;**17**(3):34–43. Persian.
18. Wilson FL, Baker LM, Nordstrom CK, Legwand C. Using the teach-back and Orem's Self-care Deficit Nursing theory to increase childhood immunization communication among low-income mothers. *Issues Compr Pediatr Nurs*. 2008;**31**(1):7–22. doi: [10.1080/01460860701877142](https://doi.org/10.1080/01460860701877142). [PubMed: [18300059](https://pubmed.ncbi.nlm.nih.gov/18300059/)].
19. Moemennasab M, Rahemi S, Ayatollahi A, Aeen M. The effect of video-based instruction on students' cognitive learning. *Journal of medical education*. *J Med Edu*. 2002;**1**(3). e104956. doi: [10.22037/jme.v1i3.948](https://doi.org/10.22037/jme.v1i3.948).
20. Albert NM, Buchsbaum R, Li J. Randomized study of the effect of video education on heart failure healthcare utilization, symptoms, and self-care behaviors. *Patient Educ Couns*. 2007;**69**(1-3):129–39. doi: [10.1016/j.pec.2007.08.007](https://doi.org/10.1016/j.pec.2007.08.007). [PubMed: [17913440](https://pubmed.ncbi.nlm.nih.gov/17913440/)].
21. American Diabetes Association. Standards of medical care in diabetes. *Diabetes Care*. 2004;**28**(Supplement 1):S4–S36. doi: [10.2337/di-acare.28.suppl_1.S4](https://doi.org/10.2337/di-acare.28.suppl_1.S4).
22. Karimi Moonaghi H, Hasanzadeh F, Shamsoddini S, Emami-moghadam Z, Ebrahimzadeh S. A comparison of face to face and video-based education on attitude related to diet and fluids: Adherence in hemodialysis patients. *Iran J Nurs Midwifery Res*. 2012;**17**(5):360–4. [PubMed: [23853648](https://pubmed.ncbi.nlm.nih.gov/23853648/)]. [PubMed Central: [PMC3703076](https://pubmed.ncbi.nlm.nih.gov/PMC3703076/)].
23. Jalilian F, Zinat Motlagh F, Solhi M. [Effectiveness of education program on increasing self management among patients with type II diabetes]. *J Ilam Univ Med Sci*. 2012;**20**(1):26–34. Persian.
24. Howie-Esquivel J, White M, Carroll M, Brinker E. Teach-back is an effective strategy for educating older heart failure patients. *Am Heart Assoc*. 2011;**124**(suppl_21).
25. Mahramus T, Penoyer DA, Frewin S, Chamberlain L, Wilson D, Sole ML. Assessment of an educational intervention on nurses' knowledge and retention of heart failure self-care principles and the Teach Back method. *Heart Lung*. 2014;**43**(3):204–12. doi: [10.1016/j.hrtlng.2013.11.012](https://doi.org/10.1016/j.hrtlng.2013.11.012). [PubMed: [24559753](https://pubmed.ncbi.nlm.nih.gov/24559753/)].
26. Negarandeh R, Mahmoodi H, Noktehdan H, Heshmat R, Shakibazadeh E. Teach back and pictorial image educational strategies on knowledge about diabetes and medication/dietary adherence among low health literate patients with type 2 diabetes. *Prim Care Diabetes*. 2013;**7**(2):111–8. doi: [10.1016/j.pcd.2012.11.001](https://doi.org/10.1016/j.pcd.2012.11.001). [PubMed: [23195913](https://pubmed.ncbi.nlm.nih.gov/23195913/)].
27. Wilson FL, Mayeta-Peart A, Parada-Webster L, Nordstrom C. Using the teach-back method to increase maternal immunization literacy among low-income pregnant women in Jamaica: a pilot study. *J Pediatr Nurs*. 2012;**27**(5):451–9. doi: [10.1016/j.pedn.2011.05.004](https://doi.org/10.1016/j.pedn.2011.05.004). [PubMed: [22920656](https://pubmed.ncbi.nlm.nih.gov/22920656/)].
28. White M, Garbez R, Carroll M, Brinker E, Howie-Esquivel J. Is "teach-back" associated with knowledge retention and hospital readmission in hospitalized heart failure patients? *J Cardiovasc Nurs*. 2013;**28**(2):137–46. doi: [10.1097/JCN.0b013e31824987bd](https://doi.org/10.1097/JCN.0b013e31824987bd). [PubMed: [22580624](https://pubmed.ncbi.nlm.nih.gov/22580624/)].
29. Bradke PM, Brinker E, Peter D, Robinson P. To reduce heart failure readmissions use the teach-back method. *Patient Educ Manag*. 2011;**18**(10):109–20.
30. Mahmoudirad G, Hoseini MS, Madarshahian F. The effect of teach-back education on foot self-care among patients with type II diabetes mellitus. *Mod Care J*. 2015;**12**(1):1–7.
31. Chan YF, Lavery R, Fox N, Kwon R, Zinzuwadia S, Massone R, et al. Effect of an educational video on emergency department patient stroke knowledge. *J Emerg Med*. 2008;**34**(2):215–20. doi: [10.1016/j.jemermed.2007.04.003](https://doi.org/10.1016/j.jemermed.2007.04.003). [PubMed: [17976815](https://pubmed.ncbi.nlm.nih.gov/17976815/)].
32. Aghakhani N, Torabi M, Alinejad V, Broomand A, Nikoonejad A. The effect of education on quality of life in patients with diabetic foot in educational hospital of Urmia. *Nurs Midwifery J*. 2016;**14**(4):380–8.
33. Cross H, Newcombe L. An intensive self care training programme reduces admissions for the treatment of plantar ulcers. *Lepr Rev*. 2001;**72**(3):276–84. doi: [10.5935/0305-7518.20010034](https://doi.org/10.5935/0305-7518.20010034). [PubMed: [11715273](https://pubmed.ncbi.nlm.nih.gov/11715273/)].
34. Vatankhah N, Khamseh ME, Noudeh YJ, Aghili R, Baradaran HR, Haeri NS. The effectiveness of foot care education on people with type 2 diabetes in Tehran, Iran. *Prim Care Diabetes*. 2009;**3**(2):73–7. doi: [10.1016/j.pcd.2009.05.003](https://doi.org/10.1016/j.pcd.2009.05.003). [PubMed: [19524494](https://pubmed.ncbi.nlm.nih.gov/19524494/)].
35. Habboushe DF. *Coping style and locus of control: predicting daily adherence to self-monitoring of blood glucose in women with gestational diabetes mellitus*. MCP Hahnemann University; 2000.
36. Simmons D. Personal barriers to diabetes care: Is it me, them, or us?: Preface. *Diabetes Spectr*. 2001;**14**(1):10–2. doi: [10.2337/diaspect.14.1.10](https://doi.org/10.2337/diaspect.14.1.10).
37. Khezerloo S, Feizi A. A survey of relationship between perceived self-efficacy and self-care performance in diabetic patients referring to Urmia Diabetes Center. *J Urmia Nurs Midwifery Fac*. 2012;**10**(3).
38. Hordern MD, Dunstan DW, Prins JB, Baker MK, Singh MA, Coombes JS. Exercise prescription for patients with type 2 diabetes and pre-diabetes: a position statement from Exercise and Sport Science Australia. *J Sci Med Sport*. 2012;**15**(1):25–31. doi: [10.1016/j.jsams.2011.04.005](https://doi.org/10.1016/j.jsams.2011.04.005). [PubMed: [21621458](https://pubmed.ncbi.nlm.nih.gov/21621458/)].
39. Wilson W, Ary DV, Biglan A, Glasgow RE, Toobert DJ, Campbell DR. Psychosocial predictors of self-care behaviors (compliance) and glycemic control in non-insulin-dependent diabetes mellitus. *Diabetes Care*. 1986;**9**(6):614–22. doi: [10.2337/diacare.9.6.614](https://doi.org/10.2337/diacare.9.6.614). [PubMed: [3803153](https://pubmed.ncbi.nlm.nih.gov/3803153/)].
40. Shi Q, Pothiban L, Wonghongkul T, Panya P, Ostwald SK. Effect of a hospital-based clinic intervention on glycemic control self-efficacy & glycemic control in chinese patients with type 2 diabetes mellitus. *J Nat Sci*. 2008;**7**(1):1–11.
41. Stipanovic AR. *The effects of diabetes education on self-efficacy and self-care of adults with type 2 diabetes*. University of Manitoba; 2003.
42. Rezasefat Balesbaneh A, Mirhaghjou N, Jafri Asl M, Kohmanee SH, Kazemnejad Leili E, Monfared A. Correlation between self-care and self-efficacy in adolescents with type 1 diabetes. *J Holist Nurs Midwifery*. 2014;**24**(2):18–24.