

Effect of Audio-Visual Education on Self-Efficacy Toward Marriage in Single People With Type 1 Diabetes

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Abstract

Background: People with diabetes report that diabetes affects particular aspects of their marital life and leads to other problems in their lives. Moreover, the self-efficacy of diabetic patients is affected by their disease in various respects. There is a significant relationship between self-efficacy and health behaviors.

Objectives: This study was conducted to determine the effect of audio-visual education on self-efficacy toward marriage in single people with type 1 diabetes.

Methods: This randomized, controlled trial study was carried out on 100 unmarried patients with type 1 diabetes visiting Iran's diabetes society in 2015 - 2016. The convenient sampling method was used in this study. Samples were divided into two groups (50 patients in each group) with a simple, randomized sampling method. The data collecting tool was a researcher-made questionnaire that patients completed before the intervention and eight weeks afterwards. The intervention was an educational CD about improving self-efficacy toward marriage in diabetics. Using descriptive statistics, inferential statistics (i.e., chi-square, t-test, paired t, Fisher, and co-variance tests), and SPSS software version 16, the self-efficacy toward marriage in both the intervention and control groups was compared. A significant level was considered less than 0.05.

Results: The mean of the self-efficacy score improved significantly in the intervention group (84.14 ± 16.29 to 105.82 ± 5.49 , $P < 0.001$). However, this score decreased in the control group (92.92 ± 12.33 to 86.48 ± 11.54 , $P < 0.001$). In addition, the self-efficacy in the control group was higher than in the intervention group before the study ($P = 0.003$), although the score of the intervention group significantly increased after the study ($P < 0.001$).

Conclusions: This study showed that audio-visual training can have a significant effect on the self-efficacy of people with type 1 diabetes. Providing audio-visual equipment to referral centers of type 1 diabetics, such as hospitals, health centers, and clinics, as well as informing related officials, can be of benefit to managers.

Keywords: Diabetes Mellitus, Type 1, Self-Efficacy, Education, Marriage

1. Background

Diabetes mellitus is one of the most common diseases of the endocrine. It is caused by a disorder in the production or function of insulin or the inability of cells to respond to insulin, and it is recognized by an elevated level of blood sugar. There are two types of diabetes: type 1 and type 2 (1). Almost 5% of diabetics have type 1 diabetes (2). The prevalence of type 1 and type 2 diabetes is on the rise worldwide. In 2011, approximately 366 million individuals in the world had diabetes, and it is estimated that, by 2030, this number will increase to approximately 522 million. Most people with diabetes live in low- and middle-income countries, and these countries also will have the

highest increase in the number of diabetes patients over the next 19 years (3, 4).

Results of previous studies have shown that diabetes can influence almost all aspects of life in diabetic people and reduce their level of life satisfaction and quality (5-8), including affecting their kinship and marriages (6).

One of the main issues related to marriage is society's culture (9), and views of society toward chronic disease are among the cultural barriers to marriage (10). In two studies in Iran and Japan, it was shown that diabetes is one of the factors that delays marriage (11, 12). Women with diabetes stated that diabetes affects particular aspects of their marital lives and leads to other problems in their lives (10).

The concept of self-efficacy was introduced by Cana-

dian psychologist Albert Bandura in 1977 and has been defined as a person's confidence to perform required actions to achieve the desired objectives (13). Self-efficacy refers to people's beliefs about their ability to organize motives, gain control over a certain event, sense of self-esteem and self-worth, and sense of efficiency in dealing with life (14, 15) and is a powerful structure in health promotion (16) and an important internal factor for long-term control of chronic diseases (17).

There is a significant relationship between self-efficacy and health behaviors (18). High self-efficacy increases people's confidence and belief about their abilities and perceived self-trust and causes people to undertake activities that promote health (16). Meanwhile, various studies have shown that the self-efficacy of diabetic patients is affected by their disease in various respects. Therefore, it is necessary to implement specific interventions and education regarding marriage for people with type 1 diabetes in order to increase their self-efficacy. We selected type 1 diabetes, not type 2, because the majority of unmarried diabetics have type 1.

Education is the best way to increase the quality of life of diabetic patients (19). Among modern educational methods, computers are especially significant. Advantages of computer-aided education include not being restricted to a specific time and place, better retention of information, multimedia capability, greater access, individualized education, concurrent delivery of lessons, active participation of the audience, more adaptability to the needs of learners, lower costs, and the ability to store and retrieve high volumes of data that can help learners' motivation. Computers also provide efficient and timely access to content and learning, in comparison to traditional training (20). On the other hand, it is clear that young people, compared to other age groups, have the highest rate of computer use (21). Therefore, using computers for education to improve the views of young diabetic people appears to be a sound approach.

Helping to improve the quality of life of people with type 1 diabetes is a worldwide priority. Marriage being one important factor related to quality of life, a successful marriage can lead to increased quality of life for all people, including diabetics. Moreover, it has been proven that marriage, for diabetic people, is influenced by their disease.

2. Objectives

This study was conducted to answer the question can designing of an educational CD-DVD lead to increased self-efficacy toward marriage in people with type 1 diabetes?

3. Methods

3.1. Study Design

This randomized, controlled trial study was carried out on 104 single patients with type 1 diabetes visiting Iran's Diabetes Society from July 2015 to February 2016 in Tehran, Iran. Iran's diabetes society is a well-known, non-governmental organization with many members. Typically, personnel from hospitals and medical centers refer patients with diabetes to this society for education and other services.

The data collecting tool was a researcher-made questionnaire, which was composed of two parts. The first part was related to the demographic characteristics of the participants, and the second part contained questions related to self-efficacy toward marriage in patients with diabetes. After obtaining informed consent from the subjects, questionnaires were completed by them before the intervention and eight weeks after the intervention. Data was then analyzed. If any of the participants had not watched and studied the DVDs and educational content, their reasons for doing so were recorded, and they were excluded from the study.

3.2. Sampling

Convenient sampling method was used for selecting the patients. Samples were divided into control and intervention groups (50 patients-25 females and 25 males in each group) with a simple, randomized sampling method. The sample size was calculated using the following formula:

Equation 1.

$$n = \frac{(z_{1 - \frac{\alpha}{2}} + z_{1 - \beta})^2 \times (\sigma_1^2 + \sigma_2^2)}{(\mu^2 - \mu^1)^2} \quad (1)$$

We accepted a value of $P < 0.05$ as significant, power of the study %80, expected effect size of 10, and underlying event rate in the population from 25 to 125, with a standard deviation of 16.7

Equation 2.

$$\sigma = \frac{125 - 25}{6} = 16.7 \quad (2)$$

Inclusion criteria included unmarried males and females, access to computers, computer literate, having had type 1 diabetes for at least one year, and lack of known physical and mental diseases. The researcher visited Iran's diabetes society and, after introductions, explained the aim of the study and presented an introductory letter from

Tehran nursing and midwifery school. The researcher obtained a list of diabetic patients referred to the diabetes society, then selected those who best met the inclusion criteria. Potential participants were contacted and, after the aim and method of study were explained, necessary arrangements were made with those who were interested in participating in the study. To ensure the lack of information exchange between the two groups (i.e., intervention and control), samples were selected separately from two different diabetes society centers. Since self-efficacy might be different in females and males, equal numbers of each gender were allocated to each group.

3.3. Intervention Program

In this study, interventions included multimedia (audio and visual) training to improve self-efficacy in people with type 1 diabetes regarding negative effects of the disease and increasing of self-efficacy toward marriage. The multimedia training was a 61-minute DVD that was given to participants. The educational DVD contained video, images, and educational articles about marriage in diabetic patients. The educational content included a summary of the physiology of diabetes, optimal diabetes control methods, how to adopt correctly with type 1 diabetes, how diabetes relates to normal life, the importance of marriage in terms of mental health, the challenges of marriage and type 1 diabetes, how people with diabetes cope with issues related to marriage (e.g., marital life, sex, relationship with spouse, and marriage of diabetic males and females), and how to manage pregnancy and newborn issues (e.g., the relationship of diabetes to infertility, complications in pregnancy, inheritance, breastfeeding, and infant care).

To make the DVD more interesting, well-known and popular lecturers and experts from the Iranian diabetes association, including the president, a doctor, counselor, and psychologist from the Society, were invited to speak in relation to the research objectives. The lectures were divided into several parts, and relevant images and training statements were used in each part. The educational DVD was given only to the intervention group, and they were asked to watch it as soon as possible, individually, at a convenient time.

3.4. Instruments

A self-made questionnaire was used in this study, which consisted of two parts. The first part of the questionnaire related to demographic characteristics of the subjects, and the second part included self-efficacy questions for diabetic people about marriage. The second part consisted of 24 questions based on a Likert scale (e.g., strongly agree, agree, no comment, disagree, and strongly

disagree). Higher self-efficacy scores indicated more self-efficacy. The maximum self-efficacy score was 120, and the minimum score was 24. Self-efficacy for each question was scored in such a way that a higher score indicated greater self-efficacy. For example, the option totally agree sometimes scored 5 and other times scored 1. Classification of self-efficacy scores included three categories, including low self-efficacy (scores of 24 - 56), average self-efficacy (57 - 88), and high self-efficacy (89 - 120).

To determine the scientific validity of the self-efficacy questionnaire, the content validity method was used. The researcher made the questionnaire using library studies and resources, including books, magazines, valid websites, and studies that had been done on the subject. Then, the questionnaire was presented to five faculty members of the nursing and midwifery school of Tehran, who were experts in the design of self-efficacy questionnaires, as well as five experts and psychologists who were knowledgeable about issues surrounding diabetes and marriage. The content validity index (CVI) and content validity ratio (CVR) scores for the questionnaire, as the indicators for content validity, were calculated as 0.85 and 0.91, respectively, and three questions were excluded. The Cronbach's alpha coefficient for the questionnaire was 0.85. To assess the reliability, test-retest was used, with a correlation coefficient of 80%. Also, the construct validity, based on the results of exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), was confirmed.

3.5. Ethical Considerations

Ethical issues (e.g., plagiarism, informed consent, misconduct, double publication and/or submission, data fabrication and/or falsification, redundancy) were totally observed by the authors. The study protocol was approved by the ethics committee of Tehran University of Medical Sciences. In addition, informed consent (oral and written) of all participants was obtained. This study was registered with the registration code IRCT201405105918N6 in the clinical trial website.

3.6. Statistical Analysis

Finally, after data collection, the normality of the variables was checked using the Kolmogorov-Smirnov test and, based on their normal distribution, parametric tests were used. Using descriptive statistics (i.e., absolute and relative frequency, mean and standard deviation), inferential statistics (i.e., chi-square, t-test, paired t, Fisher, and co-variance tests), and SPSS software version 16, the self-efficacy toward marriage in both the intervention and control groups was compared. Significant level was considered less than 0.05.

4. Results

Overall, 100 patients, eligible for inclusion, completed the primary questionnaire. After the intervention, three participants from the control group (two participants due to long travel and one due to unwillingness to continue the study), and one participant from the intervention group (due to unwillingness to continue participating in the study) were excluded. Although we had five missing values before randomization and four missing after intervention (Figure 1), there was no significant difference between the demographic characteristics of the missing patients and the participants. In addition, according to the reasons for excluding the study, we suggest that the missing value had no effect on the results. Therefore, we excluded these four patients from the analysis and replaced them with another four patients for analysis.

As shown in Table 1, the two groups were homogeneous in terms of demographic characteristics. Self-efficacy scores in the control and intervention groups, before and after intervention, are shown in Figure 2. Paired t-test showed significant differences in the before and after scores in both the control ($P < 0.001$) and intervention ($P < 0.001$) groups. In the control group, self-efficacy scores decreased, but the scores increased in the intervention group from before to after the intervention. T-test showed that the comparison of self-efficacy score differences before and after intervention, between the two groups, was significant ($P < 0.001$).

5. Discussion

After the intervention, the mean score of self-efficacy increased. In fact, the present study showed that audio-visual training can improve the self-efficacy of diabetics regarding marriage. Many studies have been conducted in connection with the relationship between teaching methods and self-efficacy of diabetic patients in regard to various aspects of health. In most of these studies, as in this study, the positive impact of education on self-efficacy is shown (15, 22-25). However, the types of training and diabetic population in these studies were different.

Eskicioglu et al. (2014) studied the effect of education by peer as mentor on diabetic patients and showed that patients' waist circumference and BMI index were reduced, and their knowledge and self-efficacy associated with glycemic control was increased (26). Vorderstrasse et al. (2015) examined the effect of creating a virtual learning environment with peers and educational aids dealing with metabolic control, diet, and physical activity of diabetic patients in New York. In their study, an educator in a virtual classroom was used, and the peer had only a supporting

role. The results demonstrated the positive effect of combined training (27). Shi et al. (2008) study also showed that educational intervention based on the models of self-efficacy and the use of health education strategies resulted in statistically significant changes in self-efficacy and control of diabetes in the intervention group (28).

The results of a study by Mohamadinejad et al. (2015) showed that, after the implementation of the training program, a significant increase was observed in the average self-efficacy in the intervention group (23). Another study by Ghotbi et al. (2013) showed that, after training, scores of self-care behaviors were significantly increased in the intervention group (29). The study of Rasouli et al. (2014) also found that an educational program in the form of either packages or workshops improved the self-efficacy of diabetic patients (30).

The strong point of this study was the novelty in title. To our knowledge, there is no other study about the effect of an intervention on self-efficacy toward marriage in single people with diabetes. The chief weakness of the study was the non-standard questionnaire. However, its validity and reliability were tested and confirmed. The self-reported questionnaire was a limitation of our study. It may be that the participants hid their privacy issues about marriage.

Iran's diabetes society is a well-known diabetic society with many members of different backgrounds. Thus, it would appear that the findings of this study can be generalized to similar communities.

5.1. Conclusion

According to the results of this study, which showed that audio-visual training can have a significant effect on the self-efficacy of people with type 1 diabetes, the use of this approach in educational planning can have positive results on the quality of life of these patients. The results of this study showed that providing audio-visual equipment to referral centers of type 1 diabetics, such as hospitals, health centers, and clinics, as well as informing related officials, can be used by managers.

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Footnotes

Authors' Contribution: Fatemeh Vasegh Rahimparvar and Shiva Khodarahmi participated in all parts of the

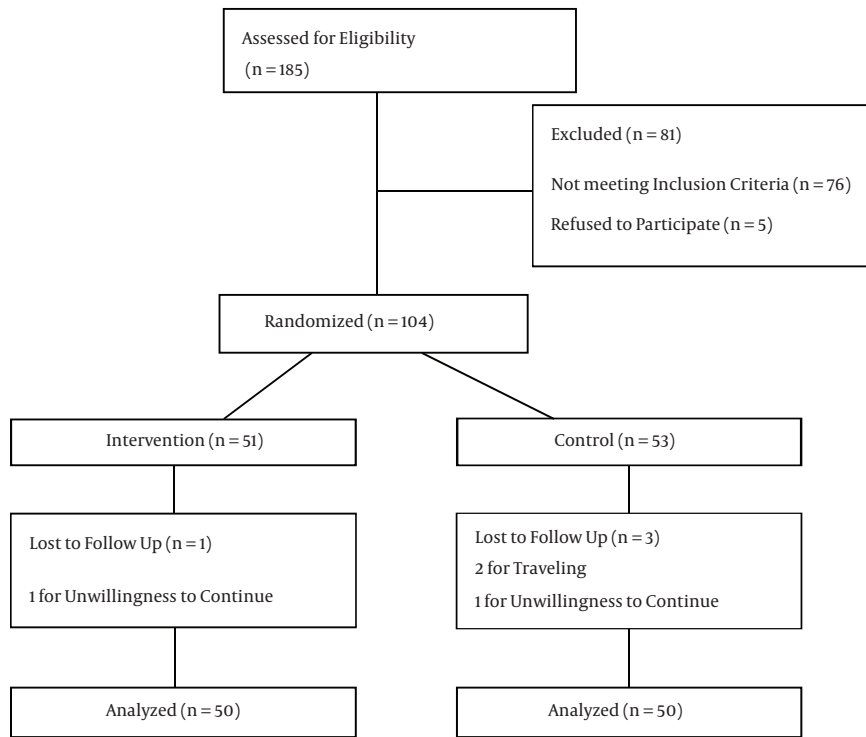


Figure 1. Flow Chart of the Study Like Consort

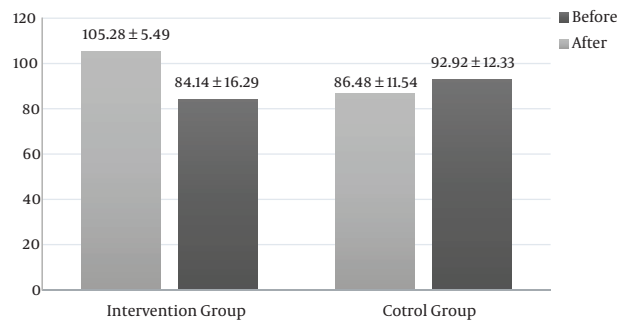


Figure 2. Comparison of the Mean and Standard Deviation of Self-Efficacy Scores Before and After Intervention in the Control and Intervention Groups

study; Fatemeh Oskouie participated in designing the study; Mohammad Ghahremani participated in designing the study and collecting data; Abbas Rahimi and Zeinab Tavakol participated in analyzing data; All of the authors participated in writing the manuscript.

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Table 1. Demographic Characteristics of Patients With Type 1 Diabetes Who Participated in the Study

Type of variable	Control		Intervention		Test Result
	No.	Percent	No.	Percent	P
Age, y					0.75
17-19	14	28	14	28	
20-26	22	44	23	46	
27-38	14	28	13	26	
Job					0.4
Employee	14	28	12	24	
Worker/Other	6	12	7	14	
Student/no job	30	60	31	62	
Education level					0.9
Up to Diploma	24	48	25	50	
Academic level	26	52	25	50	
Income status					0.83
Independent of parents	20	40	21	42	
Dependent on parents	30	60	29	58	
Monthly income					0.69
Up to 5000000 Rls	30	60	32	64	
More than 5000000 Rls	20	40	18	36	
Type of life					0.89
With parents	46	92	44	88	
Without parents	4	8	6	12	
Duration of diabetes, y					0.93
1-6	13	26	10	20	
7-14	24	48	26	52	
15-31	13	26	14	28	
Completions of diabetes					0.76
Yes	6	12	7	14	
No	44	88	43	86	
History of Diabetes in Close Family					1
Yes	15	30	15	30	
No	35	70	35	70	
No. of insulin injections, daily					0.88
Up to 3	41	82	40	80	
4-6	9	18	10	20	
No. of uses of glucometer, daily					0.77
1-2	15	30	10	20	
3	25	50	32	64	
4-6	10	20	8	16	
Level of HbA_{1c}					0.25
3-7	23	46	25	50	
7.1-8	12	24	9	18	
8.1-19	15	30	16	32	

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