Original Article

# The effect of computer-based education on attitude towards marriage in single people with type 1 Diabetes

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## ABSTRACT

**Introduction:** The attitude of people with type 1 diabetes may be affected by the disease. The purpose of this study was to determine the effect of computer-based education on attitude towards marriage in single girls and boys with type 1 diabetes. **Method:** This quasi-experimental study was performed on 100 single individuals who had been diagnosed with type 1 diabetes for at least one year and were attending the Iranian Diabetes Association centers. Samples were divided into intervention and control groups. The intervention in this study included an educational CD to promote the attitude of people with type 1 diabetes towards marriage. The data collection tool was a researcher-made questionnaire that contained questions about personal characteristics of the participants and their attitude toward marriage that was completed by both groups once before the intervention and once eight weeks after the intervention. The maximum score of attitude was 125 and the minimum score was 25. The collected data were analyzed using descriptive and inferential statistics, including Chi-Square, T-test, Paired T-test, Fisher, and covariance tests. **Result:** The mean score of attitude in the intervention group after the training (105.42 ± 6.28) was higher than before the training (78.24 ± 15.66), ($p < 0.001$). But in the control group, the mean score of attitude after the study (80.22 ± 8.26) was lower than before (85.26 ± 10.08), ($p < 0.001$). Moreover, before the study, the score of attitude in the control group was higher than the intervention group ($p = 0.009$), but after the study, the score of attitude in the intervention group was higher than the control group ($p < 0.001$). **Conclusion:** Computer-based education significantly improved the attitude of people with type 1 diabetes towards marriage. The use of this educational method is recommended to improve the attitude of diabetic patients towards marriage.

**Keywords:** Computer-based education, marriage, attitude, type 1 diabetes, educational CD

## Introduction

Diabetes Mellitus is one of the most common chronic diseases that result from a defect in the production or function of insulin in the body or/and the inability of cells to respond to insulin, which is characterized by the elevated glucose level in the blood. Diabetes Mellitus is divided into two types, Type 1 and Type 2 [1]. About 5% of diabetics have Type 1 diabetes. The prevalence of type 1 and type 2 diabetes is increasing in many parts of the world. In 2011, 366 million people were diagnosed with diabetes, which is expected to increase to 522 million by 2030. Most people with diabetes live in low and middle-income countries, and these countries will have the highest increase in the prevalence of diabetes over the next 19 years [2].

The results of previous studies have shown that almost all aspects of life can be influenced by diabetes, which leads to a reduced level of life satisfaction and quality of life [3, 4], and can even affect people's family function, marital relationship and marriage [3].

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Researchers believe that the attitude of these patients affected by their disease negatively [5]. Two studies in Iran and Japan showed that diabetes is one of the factors that delay marriage [6, 7]. Women with diabetes have acknowledged that diabetes has affected certain aspects of their marital life and has caused some problems in their lives [8]. Marriage and family formation are among the most important events in every person's life, which has important implications for people's personal and social health [9]. One of the important issues related to marriage is society's culture [10], and society's view of chronic patients is one of the cultural barriers of marriage [8].

A qualitative study conducted by Ahmadi et al (2009) in West Azarbaijan to determine the problems of marriage and family formation from the viewpoint of adolescents with diabetes showed that marital problems from the girls' point of view were affected by three factors, including the attitude of young girl towards the inappropriate effect of the disease, the attitude of family and society towards the illness, and psychological problems caused by the disease. Regarding the attitude of patients, negative effects of diabetes, including its effect on appearance, physical and physiological problems caused by the disease, the effect of diabetes on fertility, and the effects of diabetes on the children of a diabetic mother were among the factors the girls considered problems of marriage and family formation. In this study, negative attitudes toward marriage, concern about inferiority, and low self-esteem were determined to be some of the psychological problems of diabetic people [3].

Since different societies have different attitudes and beliefs and changing them is difficult and time-consuming, and also considering the chronic nature of diabetes, the implementation of appropriate interventions and correction of adaptation models in diabetic people seem necessary. However, several factors must be considered first, including family and society's view on diabetes and age characteristics of adolescents as in our country, most marriages take place in this age group.

Education is the best intervention method for improving the quality of life of diabetics [11]. Among the modern teaching methods, one can refer to the use of computers. The computer-based education has many advantages as it is not limited to time and place, it has better information storage, multimedia capabilities, more accessibility, it can be used individually, it can present the lessons the same each time, it encourages the active participation of the audience, it has more adaptability to the needs of individuals at a lower cost, and the ability to store and retrieve a large amount of information that enhances learners' motivation, and it provides timely and efficient access, which leads to increased learning in comparison to traditional methods [12]. On the other hand, it seems that young people tend to use a computer more than other age groups [13]. Therefore, one can conclude that using a computer for education to improve the attitude of young diabetics would be a good idea.

Thus, paying attention to the quality of life of patients with type 1 diabetes is a global priority. On one hand, marriage is one of the important factors associated with the quality of life and a successful marriage will improve the quality of life of people with diabetes. On the other hand, it is known that the process of marriage in people with diabetes is affected by the disease. Therefore, the present study aimed to answer the question of whether, according to the existing conditions, the design of a computer-based educational CD can increase the positive attitude toward marriage in patients with type 1 diabetes.

## Method

### Study design:

This quasi-experimental study was conducted on 100 individuals with type 1 diabetes who were attending the Iranian Diabetes Association. The convenient sampling method was used to select the sample and then, they were divided into two intervention and control groups (50 participants in each group consisting of 25 girls and 25 boys). The data collection tool was a researcher-made questionnaire consisting of two parts. The first part was used to obtain the demographic characteristics of the research units and the second part included several questions that helped the researcher to assess the attitude of participants towards marriage. After obtaining informed consent from the research units, the questionnaires were completed by them, which was done once before the intervention and once eight weeks after, then, the data was analyzed.

Those participants, who did not use the CD to learn about its educational content, were excluded from the study but their reason for not using the educational CD was recorded. At the end of the data collection, the variables were evaluated to find out whether they were normal or not using the Kolmogorov-Smirnov test. Then, according to their normal distribution, chi-square, t-test, paired t-test, Fisher, co-variance tests and SPSS Software Version 16 were used to compare the attitude of participants toward marriage in both intervention and control groups. The significance level was considered to be less than 0.05.

### Sampling method:

The convenient sampling method was used in this study. Being single girls or boys, having access to computers, having computer literacy, being diagnosed with type 1 diabetes for at least one year, and not having any other types of physical and psychological illnesses were among the inclusion criteria for entering the study. The researcher visited the Diabetes Association of Iran and after introducing and explaining the purpose of the research and presenting an approval letter from Tehran University of Medical Sciences, obtained a list of diabetic people who were attending the Iranian Diabetes Association. Then, those who met the inclusion criteria were selected for entering the study. The potential samples were contacted by telephone, and after explaining the purpose of research, they were asked if they wished to participate in the study. To prevent the exchange of information between the samples, two intervention and control groups were selected separately in two separate centers of the Iranian Association for Diabetes. Since the attitudes of girls and boys seemed to be different, they were sampled equally in both groups of males and females. There were 50 patients in the

control and 50 patients in the intervention groups, comprising of 25 girls and 25 boys in each group.

### Intervention:

In this study, the intervention included computer-based training to modify the attitude of people with type 1 diabetes concerning the negative effects of the disease and improve their attitude toward marriage, which was designed in the form of an educational CD with the duration of 61 minutes that was given to the intervention group. The educational CD included videos, pictures and educational materials about marriage with diabetes. The educational content included a summary of the physiology of type 1 diabetes, its optimal control methods, how to correctly adapt to the type 1 diabetes, how diabetes affects normal life, the importance of good marriage in mental health, marital challenges and type 1 diabetes, how people with type 1 diabetes can adopt to marital issues (marriage, sexual relations, relationship with the husband's family and the marriage of diabetic girls and boys), and how to adapt to pregnancy and childbirth-related issues (relationship between diabetes and infertility, complications of diabetes in pregnancy, inheritance to children, breastfeeding and me child care). To make the CD more attractive, a discussion took place with the well-known and popular teachers and experts from the Association of Iranian Diabetes, including the head of the association, physician and counselor, and the community psychologist, and they were invited to deliver a speech about the research objectives. The lecturers' speeches were broadcasted in several parts, and interesting and relevant educational materials and pictures were used during the speeches. This educational CD was given only to the participants in the intervention group and they were asked to watch it individually as soon as possible at their convenient time.

### Tools:

In this study, a self-made questionnaire containing two parts was used. The first part of the questionnaire was related to the demographic characteristics of the research units and the second part contained several questions about the attitude of diabetic people towards marriage. The second questionnaire included 25 questions based on the Likert scale (totally agree, agree no comment, disagree, and totally disagree. A higher attitude score indicated a more positive attitude toward marriage. The maximum attitude score was 125 and the minimum score was 25. The attitude scoring for each question was such that, higher scores belonged to the options, which indicated a more positive attitude. For example, the option (totally agree) sometimes scored 5 and sometimes scored 1. Attitudes scores were categorized into 3 categories, including negative attitudes (25-60), neutral attitudes (61-90), and positive attitudes (91-125).

Content validity was used to determine the scientific validity of the Attitude Questionnaire, so the researcher developed the questionnaire using library studies and available resources, including valid books, magazines, websites, and researches conducted on this subject. Then, the questionnaire was given to 5 faculty members of Tehran School of Nursing and Midwifery who were experts of questions related to attitude, and 5 experts and psychologists who were involved with diabetes and marriage issues. For each question in the attitude questionnaire, CVR and Spearman's correlation coefficient were calculated and the questions with a score of less than 0.5 were removed. The highest coefficient was 0.76 and the lowest coefficient was 0.25 were. A test re-test was used to investigate the scientific reliability of the questionnaire, which its correlation coefficient was 80%.

## Result:

In total, 100 eligible people completed the original questionnaire. After the intervention, three individuals in the control group (two people due to long distances between their home and research setting and one person due to lack of interest to continue participating in the study) and one person in the intervention group (due to lack of interest to continue participating in the study) were excluded. Participant's demographic information is listed in table 1. As shown in Table 1, the two groups were homogeneous in terms of demographic characteristics. The mean attitude score in the intervention group after the training ($105.42 \pm 6.28$) increased more than the time before the study commenced ($78.24 \pm 15.66$), ($p < 0.001$). However, in the control group, the mean score of the attitude after the study ($80.22 \pm 8.26$) decreased less than the time before the study commenced ($85.26 \pm 10.08$), ($p < 0.001$). Also, before the study, the attitude score in the control group was higher than the intervention group ($p = 0.009$), but after the study, the attitude score in the intervention group was higher than the control group ($p < 0.001$), (Tables 2-4).

## Discussion:

The mean score of the attitude of the subjects at the beginning of the study was different in the control and intervention groups and increased after the intervention. The present study showed that computer-based education can improve the attitude of diabetics towards marriage. Several studies have been conducted on the impact of education on the attitude of people with diabetes. In most of these studies, the positive effects of training on diabetes are similar to the present study. Studies of Bhutani et al (2015) [14], Amini et al (2013) [15], Bidi et al (2013) [16] and Goodarzi et al (2012) [17], showed that education has a positive impact on people's attitudes. Also, Malathy et al (2011) showed that the mean scores of attitudes among diabetic patients improved in the post-test phase [18]. For example, Amini et al (2012) and Muchiri et al (2016) showed that, after the implementation of training, a significant increase in nutritional attitudes of patients with Type 2 diabetes was observed [15, 19]. However, some studies yielded different results. For example, Rodrigues et al in their study in 2009 showed that after their intervention and follow up, no significant difference was seen between the intervention and the control groups in terms of their attitude [20].

## Conclusion:

Due to the importance of the attitude of people with type-1 diabetes towards marriage, diabetes education planners must pay more attention to this issue in their education planning. According to the results of this study, the use of computer-aided training has a significant effect on increasing the attitude of people with type 1 diabetes. Using this approach in the education of diabetics can continuously improve the quality of life of the affected people. Based on the results of this research, developing computer-based tools and using them in the clinical setting where people with type 1 diabetes attend, including hospitals, health centers, and clinics, and also informing the authorities of relevant settings about the benefits of these tools can be immensely beneficial

### What is known about this topic

- Almost all aspects of life can be influenced by diabetes, which leads to a reduced level of life satisfaction and quality of life and can even affect people's family function, marital relationship, and marriage.
- The attitude of these patients affected by their disease negatively.
- The computer-based education has many advantages as it is not limited to time and place, it has better information storage, multimedia capabilities, more accessibility, it can be used individually, and it provides timely and efficient access, which leads to increased learning in comparison to traditional methods.

### What this study adds

- According to the results of this study, the use of computer-aided training has a significant effect on increasing the attitude of people with type 1 diabetes.
- Using this approach in the education of diabetics can continuously improve the quality of life of the affected people.

### Competing of interest

All of the authors have no competing interests.

### Authors' contributions

SFVR developed the research design, supervised sampling and data collection and analysis, also drafted the paper. ShKh collected data, ran the research intervention, was involved in the conception of the study, carried out the analyses and prepared the paper. ARF contributed to the research design and intervention. All of the authors read and approved the final paper.

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This research was approved by the Ethics Committee of Tehran University of Medical Sciences and was registered on the clinical trial website with the IRCT201405105918N6 registration code. I would like to thank the Iranian Diabetes Association and all those who helped us with this research.

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**Table 1: comparing the demographic characteristics of the participants**

| Variable | | Control group | | Intervention group | | Result |
|---|---|---|---|---|---|---|
| | | Number | Percentage | Number | Percentage | |
| Age (year) | 17-19 | 14 | 28 | 14 | 28 | P=0.75 |
| | 20-26 | 22 | 24 | 23 | 46 | |
| | 27-38 | 14 | 28 | 13 | 26 | |
| Occupation | Office worker | 14 | 28 | 12 | 24 | P=0.4 |
| | Laborer/self-employed | 6 | 12 | 7 | 14 | |
| | Student/unemployed | 30 | 60 | 31 | 62 | |
| Education | Diploma and lower | 24 | 48 | 25 | 50 | P=0.9 |
| | Associate diploma/above | 26 | 52 | 25 | 50 | |
| Income status | Independent | 20 | 40 | 21 | 42 | P=0.83 |
| | dependent | 30 | 60 | 29 | 58 | |
| Monthly income (Toman) | 500000/less | 30 | 60 | 32 | 64 | P=0.69 |
| | 501000/more | 20 | 40 | 18 | 36 | |
| Life style | With family | 46 | 92 | 44 | 88 | P=0.89 |
| | Other | 4 | 8 | 6 | 12 | |
| Duration of diabetes (year) | 1-6 | 13 | 26 | 10 | 20 | P=0.93 |
| | 7-14 | 24 | 48 | 26 | 52 | |
| | 15-31 | 13 | 26 | 14 | 28 | |
| Diabetes' complication | Yes | 6 | 12 | 7 | 14 | P=0.76 |
| | No | 44 | 88 | 43 | 86 | |
| Diabetes of first degree family member | Yes | 15 | 30 | 15 | 30 | P=0.1 |
| | No | 35 | 70 | 35 | 70 | |
| Number of insulin injection (daily) | 3 times &less | 41 | 82 | 40 | 80 | P=0.88 |
| | 4-6 times | 9 | 18 | 10 | 20 | |
| Number of glucometer use (daily) | 1-2 times | 15 | 30 | 10 | 20 | P=0.77 |
| | 3 times | 25 | 50 | 32 | 64 | |
| | 4-6 times | 10 | 20 | 8 | 16 | |
| Level of HbA1c | 3-7 | 23 | 46 | 25 | 50 | P=0.25 |
| | 7.1-8 | 12 | 24 | 9 | 18 | |
| | 8.1-19 | 15 | 30 | 16 | 32 | |

**Table 2: Normality analysis of the attitude scores before and after the intervention**

| Result | Attitude scores before the intervention | Attitude scores after the intervention |
|---|---|---|
| Kolmogorov- Smirnov Z | 0.997 | 1.363 |
| p-value | 0.273 | 0.049 |

**Table 3: Comparing the mean and standard deviation (SD) of the attitude scores before and after the intervention in the intervention and control groups**

| Group | | Intervention | | Control | | Result of the test |
|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | |
| **Attitude** | Before the intervention | 85.26 | 10.08 | 78.24 | 15.66 | *p=0.009 |
| | After the intervention | 80.22 | 8.62 | 105.42 | 6.58 | *p<0.001 |
| | | **p<0.001 | | **p<0.001 | | |

* t-test
** paired t-test

**Table 4: Comparing the differences between the attitude score before and after the intervention in the intervention and control groups**

| Attitude Score | Mean | SD | Test result |
|---|---|---|---|
| **Intervention group** | 27.18 | 12.37 | *p<0.001 |
| **control group** | -5.04 | 2.81 | |

* t-test