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Analyzing the Impact of Empowerment Model-based Education on Self-efficacy and Self-esteem of Patients with Diabetes

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aims: Traditional education fails to effectively treat patients with chronic diseases. Therefore, educating patients through a more comprehensive approach is required to encourage patients to actively participate in the management of the chronic disease. Empowering the patient is considered as a program for self-care and a change in behavior while caring the diabetics. Self-efficacy and self-esteem are the most important components of empowerment. The rise in self-efficacy and self-esteem has been effective in diabetes care improvement. The current study was conducted to determine the effects of empowerment-based education on self-efficacy and self-esteem in diabetic patients referred to diabetes clinic.

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Methodology: This is an interventional study of a randomized clinical trial control type. In this study, 90 diabetic patients were randomly selected and divided into two case and control groups according to the random numbers table. Data collection was carried out by demographic information questionnaire and self-efficacy questionnaire (20 questions) and Cooper Smith's self-esteem questionnaire (35 questions) with Cronbach's alpha coefficients of respectively 94.3% and 93% before training for both Case and Control groups. Then, for the case group, training was performed based on the empowerment model and the control group received the only common care in the diabetes clinic. Six weeks after the intervention, self-efficacy and self-esteem were measured again by Cooper Smith's adult self-esteem questionnaire and diabetes' self-efficacy. Data were analyzed by SPSS 19 software using Chi-square, and T-plus statistic tests.

Results: The two groups were matched in terms of demographic characteristics and mean scores of self-esteem and self-efficacy before intervention, and there was no significant difference between them, but after intervention, the findings showed that the mean score of patients' self-esteem in the case group has been 83.24 before training the empowerment model and it increased to 111.69 (P = 0.000) after implementing empowerment training. Also, the mean score of self-efficacy of patients in the case group before the empowerment model was 100.49, which increased to 139.49 after training (P = 0.000). The findings showed a significant difference between the mean self-esteem (P = 0.000) and self-efficacy (P = 0.000) of patients in the case group before and after the training. However, there was no significant difference in the control group before and after training, so educating patients about empowerment model could increase self-esteem and self-efficacy in diabetic patients.

Conclusion: Empowerment model-based education has increased self-esteem and self-efficacy in diabetic patients. According to the findings of this research, it seems that empowerment is feasible for patients with diabetes and it is associated with improvement of self-efficacy and self-esteem in patients.

Keywords: Empowerment model; self-efficacy; self-esteem; diabetes.

1. INTRODUCTION

Chronic and non-communicable diseases account for a large part of health problems in the developed and developing countries today [1]. According to studies, the Middle East accounts for 47 percent of the world's all chronic diseases, where 80 percent of the deaths in low- to middle-income countries take place. Among chronic diseases, diabetes is one of the most common types of disorders [2]. Diabetes is referred to as a group of metabolic diseases whose common feature is an increase in blood glucose levels due to defective insulin secretion or a defect in its function or both [3]. The prevalence of diabetes, along with other chronic conditions, is constantly increasing, and in recent decades the problem has been aggravated by the spread of other chronic diseases, including psychiatric disorders, such as depression [4]. According to the WHO, diabetes is seen as a silent epidemic in the world [5]. One of the concepts of empowerment model is self-efficacy, which is a key variable in clinical, educational, social, developmental, health and personality psychology. Self-efficacy has been shown to have an impact on behavioral change, in addition to adapting the disease and treatment to health-related activities. Self-efficacy is a cognitive concept and it compares behavioral needs with individual capacities [6]. Self-efficacy as described by, a well-known psychologist, Albert Bandura's social recognition theory includes one's beliefs or judgments about his ability to perform duties and responsibilities. The social cognition theory is based on a three-way model of behavior, environment, and person. This model emphasizes the interrelationship between behavior, environmental effects and individual factors (cognitive, emotional, and biological factors) that refer to individual perceptions for describing psychological functions. According to this theory, people in a triple causality system affect their motivation and behavior. Self-efficacy is a degree to which an individual enjoys a sense of ability to perform the desired actions. In other words, self-efficacy is the assurance upon which a person carries out a particular behavior according to a given position and expects the desired results [7]. Indeed, self-efficacy is a vital factor in success or failure throughout human life [8]. Self-efficacy is described as one's consciousness about the fact that he/she can be effective and he/she could have control over his/her actions and consequences. On this basis, self-efficacy is a self-regulating system of behavior which is

formed based on cognitive (thinking), emotional and motivational routines [9].

Self-esteem is a concept essentially followed by self-efficacy. Self-esteem means the degree of approval, impact, acceptance, and a sense of valuability a person feels towards himself. Self-esteem and self-efficacy are two essential components of learning that are interrelated and a two-way relationship exists between them. Studies have shown that people with lower self-esteem, who belittle themselves, undesirably take care of their health, and encourage others to do the same. These people experience disappointment, depression, inappropriate nutritional habits, feelings of victimization and inability to expand communication with others [10]. Self-efficacy and self-esteem are among the most important components of empowerment because, in the beginning, both of them have multifaceted features whose various dimensions interact. Second, their dimensions are measurable by various tools. Therefore self-efficacy and self-esteem measurements can provide a reliable tool to predict the possibility of completing the empowerment behavior [11]. Studies have shown that increasing self-efficacy and self-esteem has been effective in improving diabetes care [12]. Self-efficacy progress is closely connected with experience, competence, and fulfillment of the individual's duties in life [13].

Self-efficacy theories show that mood, emotional states, and stress could affect self-efficacy. Negative emotional symptoms are referred to as the leading causes of self-efficacy control in patients with diabetes. Studies show that emotional symptoms play an important role in the self-efficacy of patients with diabetes [14].

An empowerment program is a collaborative approach to diabetes care and patient education which was introduced by Anderson and his colleagues at the Center for Diabetes Research and Education at the University of Michigan at the beginning of 1990 [15]. Education as an important driving force constitutes one of the manifestations of empowerment. Evidence suggests that educational activities and empowerment strategies in the individual and social spheres not only prevent diseases but also reduce inequalities and promote social justice in the developing countries. Educational interventions play an important role in empowering people through providing the necessary knowledge to do the job [16]. The empowerment of a person with diabetes is aimed at creating awareness, hope, active and continuous participation in care and treatment [17]. Empowerment skills include problem solving, self-confidence and self-confidence strategies [10]. Marcus et al conducted a study entitled the impact of a curriculum on the empowerment of caregivers in Hong Kong. The results of this study showed that the implementation of this curriculum reduced the concern and discontent and the level of depression of caregivers and also increased self-esteem and empowerment. Given the aforementioned cases, the main goal of the current study was to investigate the effect of empowerment model-based education on self-efficacy and self-esteem in diabetic patients referred to the diabetes clinic in Abhar city hospitals in 2016.

2. MATERIALS AND METHODS

This is an interventional study of a randomized controlled clinical trial type which was carried out in diabetes clinic of Omid and Emdadi hospitals in Abhar city. From among the statistical population of this study which included all diabetic patients referred to diabetes clinics in Abhar hospitals, samples consisting of 90 eligible patients with diabetes who had been referred to diabetes clinic were randomly selected. Sample admission criteria included: that the patient had a follow-up case in the diabetes clinic, had at least one year of definite diabetes status, the patient had to give consent to the study, the patient must enjoy the least reading and writing skills, and the patient should not have certain cognitive and psychological problems. Patients who were excluded from the study included those patients who were unwilling to cooperate, those whom, for any reason, failed the possibility to follow the predicted program and those did not have the proper conditions to answer questions.

As part of the study, after obtaining permission from the relevant authorities by referring to diabetes clinics, the researcher reassured the patients and their relatives that the questionnaire remains nameless and their information confidential. After receiving written consent from patients and dividing them into two case and control groups by using random numbers, the questionnaires were completed before the empowerment training program by both groups. The control group received the usual care at the diabetes clinic. After 6 weeks of empowerment

training. The purpose of empowerment in this research is to have 6 sessions of 90-minute attendance sessions. The empowerment based on the three steps of threat perception, problem-solving and evaluation for diabetes patients was conducted in this research. The first step was to increase the perceived threat The risk of failure is necessary, as a result of which the severity of the perception of patients increased by knowing the nature and complications of late diabetes, such as retinopathy, nephropathy, neuropathy, hypoglycemia, and hyperglycemia (one session).

In the second step, which is problem-solving, the problem is identified by the research samples, the solution, and the implementation, along with the promotion of self-efficacy through discussion and practical presentation. In this way, the skills needed to better control diabetes, such as blood glucose monitoring, foot care, physical activity, maintenance, insulin and dietary intake, were first described by the researcher both theoretically and practically, and each of these patients also has these skills Repeated on their own. The desired behavior was up to the level of full mastery of practice and it was repeated to improve self-efficacy and self-esteem. At the end of each session, the pamphlets were also provided to the patients (each session is meticulous).

Step Three, The evaluation was done in two steps. The evaluation of the first stage in all sessions was done by verbal questioning regarding the observance of the items mentioned in the previous sessions and considering the extent of the willingness to continue to attend the meetings by the researcher. The final evaluation was carried out six weeks after intervention using self-efficacy and self-esteem questionnaires.

The questionnaires were completed again by both groups, and the information was collected and coded. The data collection tools included demographic information questionnaire, Cooper Smith's self-esteem questionnaire, and DMSES self-efficacy questionnaire. Demographic data included age, sex, marriage, education, employment, and income. Cooper Smith's self-esteem questionnaire included 35 questions each of which was graded in a four-part spectrum completely disagree with 1 point to fully agree 4 points. The DMSES self-efficacy questionnaire includes 20 questions, each of which was scored from 0 (not at all I can) to 10 (definitely can).

The validity of the Cooper Smith self-esteem questionnaire has been examined by content validation method in various researchers [18-19] which enjoyed a highly credible validity. The validity of self-efficacy questionnaire for diabetes has also been considered in previous studies [20-22] which enjoyed a high validity too. The reliability of the Cooper Smith self-esteem questionnaire was confirmed in previous studies [18-19] with Cronbach's alpha of 0/943 and 88%. The reliability of self-efficacy questionnaire in diabetes has also been confirmed in other studies [20-22] with Cronbach's alpha between 83% and 93%.

3. RESEARCH FINDINGS

Central indices such as mean and standard deviation were used to describe the data, and in the inferential section to test the variables normality Kolmogorov Smirnov test, Levine's test for homogeneity of variance of pain in both groups, multi-variance qMANOVA, K2 test, t-test were used for the independent group. Data were analyzed using the SPSS19 statistical software.

The table shows the minimum age in the case and control group is 40 and the maximum is 60 years old. The mean age in the control group was 51.78 and in the case group was 51.62. A t-test was used to compare the two groups, which according to the P value greater than 0.05 shows that there is no significant difference between the two groups in terms of age. The minimum income in the control group is 450,000 and the maximum income is 2,000,000. The average income in the control group was 562511 and in the case group was 541377. The results of the two groups show that there is no significant difference between the two groups in terms of income. Also, the minimum period of the disease in the case and control groups was 2 years and the maximum duration of the disease in the control group was 7 years and in the case group was 10 years. The mean duration of the disease in the control group was 4.67 and in the case group was 4.82. The results of the two groups showed that there was no significant difference between the two groups in terms of the duration of the disease. The minimum number of admissions in the case and control groups is once a year, and the maximum number of admissions is 5 times a year. The results of the comparison of the two groups indicate that there is no significant difference between the two groups in terms of hospitalization per year.

Table 1. Mean and standard deviation of the studied units according to age, income, duration of illness and hospitalization rate in the year

P value	-test t	df	Case group				Control group				Variables
895/0	127/0	88	**Maximum**	**Minimum**	**Std. deviation**	**Mean**	**Maximum**	**Minimum**	**Std. deviation**	**Mean**	
			60	40	5.820	51.62	60	40	5.815	51.78	age
541/0	746/0	88	2000000	45000	384223	541377	2000000	45000	369660	562511	income
791/0	266/0	88	10	2	1.749	4.82	7	2	1.595	4.67	Duration of illness
751/0	276/0	88	5	1	1.314	3.00	5	1	1.313	3.16	Number of admissions per year

Table 2. Kolmogorov-Smirnov test to examine the normalities of the research variables in the two groups before and after the intervention

Case group		Control group		Variables	Test
Sig	k.s	Sig	k.s		
.427	.876	.933	.539	Self-esteem	Before intervension
.719	.695	.860	.603	Self-efficacy	
.522	.814	.576	.781	Self-esteem	After intervension
.931	.542	.819	.632	Self-efficiacy	

Kolmogorov-Smirnov test was used to compare the dependent variables of the research, which shows the data were distributed at the level of 0.05 according to the results of Table 2, sig>0/05 (significance level for self-esteem and self-efficacy in the two groups was more than 0.05 before intervention and after intervention). Therefore, to describe self-esteem and self-efficacy in the two groups, the mean and standard deviation and parametric tests are used to answer the research hypotheses before and after the intervention.

Independent T-test was used to compare the two groups. If the P value was less than 0.05, then there is a significant difference between the variables before and after the intervention in the case and control groups. And if the P-value statistic was greater than 0.05 there was no significant difference.

4. DISCUSSION

As far as the research objectives were concerned, the results showed that there was no significant difference between the two groups in terms of self-esteem before the intervention. Sanaei's 2013 study [11] entitled the impact of family-centered empowerment on self-efficacy and self-esteem of patients under coronary artery bypass surgery the case group's self-esteem was 28.98 before intervention and it was 29.49 in the control group. Soheilizad et al. [23] carried out a study in 2015 entitled the examination of the links between self-esteem and tolerance to the quality of life in patients with type 2 diabetes whose self-esteem was recorded at 36.85. Samadi et al. [24] conducted a study in 2011 entitled "Examining the quality of life and its relationship to self-esteem in patients with type 2 diabetes whose self-esteem was 43.9. Separately Torkashvand et al. performed a research in 2010 entitled the effect of educational group therapy on the self-esteem of adolescent girls, whose self-esteem before the group therapy sessions was 65.3 in the case group and 75.7 in the control group.

It was also found that the mean of self-esteem in the case group was 111.69 after intervention while the control group had an 85.58 self-esteem after the intervention. There is a significant difference between the two groups as far as the level of self-esteem after the intervention is concerned, and the level of self-esteem has increased in the case group. In Sanaei's study of [11] the mean self-esteem of the control group was 29.49 in the pre-test and it increased to 29.82 in the post-test, which has no significant difference and the results of the research are consistent with the current study. The results also showed that there was a significant difference between the level of self-esteem in the pre- and post-intervention of the case group which means the level of self-esteem increased. In Sanaei's 2013 study [11] the effect of family-centered empowerment on self-efficacy and self-esteem of patients under coronary artery bypass surgery, the case group's self-esteem was 46.52 after intervention and it was 29.82 for the control group which is consistent with the current study. The study by Turkish and et al. in 2010 [25] entitled the effect of educational group therapy on self-esteem in adolescent girls, showed their self-esteem was 84.7 in case group and 74 in control group after the group therapy sessions were held. The use of group therapy program increased the level of self-esteem among teenage girls and improved their mental health improvement. In the study conducted by Rahimi et al. in 2005 [26] which examined the effect of follow-up care model on self-esteem in hemodialysis patients, the mean of self-esteem in hemodialysis patients before the intervention was 63.6 and after intervention, it was 79.6 which indicates that continuous care model increases self-esteem in hemodialysis patients. Studies have shown that increasing self-efficacy and self-esteem has been effective in improving diabetes care. The results of the current study are in line with those studies and indicate that implementation of the empowerment program has increased the self-esteem of diabetic patients.

Table 3. Mean and standard deviation of self-esteem and self-efficacy before and after intervention in two groups of case and control

P value	-test t	df	Case group		Control group		Time	Variables
			Std. deviation	Mean	Std. deviation	Mean		
589/0	542/0	88	309/7	83.24	461/7	84.09	before intervention	Self-esteem
001/0	748/18	88	644/5	111.69	445/7	85.58	After intervention	
928/0	091/0	88	536/13	100.49	842/5	100.69	before intervention	Self-efficacy
001/0	516/17	038/61	982/12	139.49	827/5	102.33	After intervention	

Table 4. Mean and standard deviation of self-esteem before and after the intervention in the case and control groups

P value	T-test	df	After intervention		Before intervention		Group	Variable
			Std. deviation	Mean	Std. deviation	Mean		
352/0	942/0	88	445/7	58/85	461/7	84.09	Control	**Self-esteem**
000/0	471/21	88	644/5	111.69	309/7	24/83	Case	

Table 5. Mean and standard deviation of self-efficacy before and after the intervention in the case and control groups

P value	T-test	df	Case group after intervention		Case group before intervention		Group	Variable
			Std. deviation	Mean	Std. deviation	Mean		
188/0	337/1	88	827/5	33/102	842/5	100.69	Control	Self-efficacy
000/0	033/15	88	982/12	139.49	536/13	49/100	Case	

The results showed that there was no significant difference between the two groups regarding the level of self-efficacy after the intervention. A study carried out by Rashidi et al. in 2015 [20] investigated the effect of peer support on the self-efficacy of patients with type 2 diabetes, the mean of self-efficacy of the case group was 107 before the intervention and 114.6 in the control group. In a study by RezasefatBlasanbeh in 2013 that investigated the relationship between self-efficacy and self-care in adolescents with type 1 diabetes, the unit's self-efficacy was measured at 32.9. The findings of this study showed that self-efficacy in diabetic patients is not optimal. Also in 2011, Habibzadeh et al. [27] studied the effect of using Orem care model on self-efficacy in hemodialysis patients, which showed that the level of self-efficacy in the control and case groups was the same before and after the intervention, and did not show a significant difference which is consistent with the current study.

Finally, by determining and comparing the self-efficacy of diabetic patients referred to diabetes clinics in Abhar city, in the case and control groups after the implementation of education based on an empowerment model, the result was that there is a significant difference between the two groups in terms of self-efficacy after intervention, and that self-efficacy has increased in the case group. This result demonstrates the positive role of empowerment-based education on increasing self-efficacy in diabetic patients. In the study of Rashidi et al. in 2015 [20] which investigated the effect of peer support on self-efficacy in type 2 diabetic patients, the mean of self-efficacy of the case group after the intervention was 171 and it was 117.2 in the control group, which is consistent with the current study. In this study, they found that self-efficacy increased significantly with patients' education. City et al. [28] concluded that the level of self-efficacy of patients was significantly correlated with the amount of received training. They

investigated the link between self-efficacy and the level of self-care behaviors diabetic patients enjoy.

Randy et al. also concluded in a study in 2014 entitled the examination of the relationship between self-efficacy and the quality of life in patients with chronic obstructive pulmonary disease that self-efficacy leaves an important impact on the quality of life of the patients. Tale et al. in a 2011 study entitled Self-efficacy: A Functional and Effective Concept for Type 2 Diabetes Control found that 58.6% of diabetic patients had low self-efficacy levels. Also, Sheila et al. [29] carried out a research in 2015 in Oman, entitled "The Impact of Understanding the Empowerment Program on Diabetes Control and Self-Care in Diabetics". This cross-sectional study was conducted on 300 Arab adults with type 2 diabetes who referred to a flying clinic. The study used the empowerment scale proportionate to diabetes and HbA1c measurement and BMI which was a body mass. The results of the empowerment scale analysis indicated good control of diabetes in adults with diabetes in Oman.

4. CONCLUSION

Based on the findings of this study, empowerment-based education affected the self-efficacy and self-esteem of diabetic patients. The findings of the research could be used in such areas as education, clinical research, and the field of chronic disease of diabetes. The empowerment model could be considered as among those models that that has been used in health education and health promotion for chronic diseases, and the results of these studies have shown that interventions based on this model were acceptable. Given the fact that chronic diseases affect other family members and even the community other than the patients, he/she must be empowered to better control the disease and enjoy a better quality of life. Empowerment helps the patients, caregivers and all people involved to increase their decision-making power, control, accountability, better interaction with health authorities, satisfaction, better response to treatment, prevention, reducing the cost of treatment and a positive look to the disease. Patient education is a complementary part of diabetes care and it plays an important role in controlling diabetes, but despite the training programs for these patients, there is a misunderstanding of the disease in terms of various care issues among people with diabetes. And these programs do not necessarily lead to successful diabetes management by improving metabolic control in diabetic patients. Therefore, one of the most important factors in the educational quality is selecting appropriate educational methods. Among various methods, empowerment is considered as an effective educational method for changing behavior to control diabetes.

Developing self-esteem and high self-efficacy increase the ability, capability, competency and quality and the person feels he/she is living a useful and effective life. Based on the findings of the research, the use of education based on the empowerment model could enhance self-efficacy and self-esteem of people with diabetes. It is recommended that the Ministry of Health, Treatment and Medical Education and hospital in general pay attention to this educational method in health education-related activities and use this approach in providing training programs for patients as well as in-service training. It is a necessity to change the approach to the in-service training of people involved in the education of diabetic patients in health care settings. It is hoped that health system staff will shift the line from traditional education to modern educational approaches to this new field, which, by itself, will reduce the burden of disease on the affected person, the family, and the community. On the other hand, today, in many cases, there are founding associations to support chronic diseases, such as the Diabetes Association, which pay particular attention to educating patients. Using the empowerment model in these associations will increase the quality and sustainability of education. As a result, it is suggested that the relevant authorities in the Association of Diabetic Patients also consider this educational approach with regard to its many benefits. It is also recommended that empowerment model education is included in the education curriculum of nursing students at nursing schools.

5. RESEARCH LIMITATIONS

The limitations of the current study are included in two broad categories:

A. Limitations under the discretion of the researcher
   * The noise in the environment could affect the level of students' learning and how it could affect answering the research questions, which was

somewhat contained by providing a relaxed and appropriate environment.

* Tiredness and reluctance to continue to work together could have been constraining the research. But the prevent such a situation the meetings were held once a week and a special reception was also conducted using healthy and diabetic diets.

B- Restrictions outside the discretion of the researcher

* The probability of the impact of the samples' mental states when answering questions beyond the control of the researcher.
* Individuals' social and economic differences may affect their response.
* Obtaining information from other sources may also affect patients' self-esteem or self-efficacy during the study, which has been beyond the control of the researcher.

CONSENT AND ETHICAL APPROVAL

It is not applicable.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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