

Is a Bilingual Vocal Education Program Effective on Diabetes Patients' Self-Efficacy?

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ABSTRACT

Objectives: The present study was carried out to compare a bilingual (Balouchi & Persian) vocal patient education program and routine education on patient's self-efficacy in type 2 diabetes patients suffering from visual impairments.

Materials and methods: This semi-experimental study was conducted on patients with type 2 diabetes mellitus (T2DM) suffering from visual impairments. A total number of 90 participants were divided into two equal groups: 45 patients in the intervention group and 45 controls in the routine care group. A permuted block randomization (AB) using a random number generator by default was implemented to organize the two groups. One of the researchers collected the demographics and self-efficacy data through face to face interviews. The diabetes management self-efficacy scale (DMSES) was used for self-efficacy assessment. Patients in the intervention group received an MP3 Player including 90 minutes of vocal education.

Results: There were no significant differences in participants' demographic characteristics between the two study groups. However, a remarkable rise was observed in the self-efficacy score ($P < 0.0001$) as well as HA_{1c} and FBS levels among patients in the intervention group after vocal education ($P < 0.001$).

Conclusions: The findings of the present research suggest nursing and public health policy makers to reconsider their traditional patient education programs, particularly for diabetes patients with visual impairments among indigenous people.

Keywords: diabetes, patient education, vocal education.

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INTRODUCTION

Diabetes is globally known as one of the most common chronic diseases. In 2013 it affected 422 million people worldwide. It is most frequently encountered in Middle Eastern and northern African populations. In Iran, a Middle Eastern country, diabetes has a prevalence of 10.9%. The number of patients with diabetes increased by 35% between 2005 and 2011, when the prevalence of the disease was 11.4%, and an estimated number of 592 million people with diabetes was predicted by 2035 around the world (1). Chronic conditions such as diabetes are well known for interrupting patients' lives. According to study outcomes, about 2% of people with diabetes experienced blindness after 15 years of developing the disease. Almost 10% developed severe visual impairments and 50% suffered from neuropathic complications (2, 3). Diabetes patients are 25 times more likely to develop blindness comparing to normal people, which is commonly due to progressive diabetic retinopathy (4).

Self-efficacy defined as the ability of influencing environmental events could widely predict and control consequences caused by diabetes. Self-care and behaviors have a pivotal role in chronic conditions like diabetes. Patients with diabetes are expected to be involved in a wide range of self-care processes in order to avoid serious impairments in their quality of life (5). Studies on diabetes patients indicated a strong association between self-efficacy and the quality of life, glycosylated hemoglobin levels, stress and expecting consequences of diabetes (6-8). When compared to diabetes patients with low self-efficacy, self-efficient diabetes patients develop less complications overall (9). By reducing complications caused by chronic diseases, patient education could build and sustain a firm health condition for patients. Patient's well-being is more likely to hinder in those who are not involved in patient education practices (10). Numerous nursing interventions and practices, including individual training, group education, team counseling, internet tutorials, teaching through camps, membership in training clubs, telephone consultants and home visits, are implemented worldwide in order to strengthen self-care behaviors and to improve treatment adherence and health promotion

among chronic patients (11). A large number of studies were conducted on diabetes patient education practices, but the ability of minimum reading and writing skills was considered as an inclusion criterium in most of them. This fact caused missing the low literate patient's population in many studies (12). Despite the literacy, culture based care programs seem to be more efficient (13). Thus, our study was carried out to compare a bilingual (Balouchi & Persian) vocal patient education program and routine education on patient's self-efficacy in T2DM patients suffering from visual impairments. □

MATERIALS AND METHODS

This semi-experimental study was conducted from October to November 2019 on patients with T2DM suffering from visual impairments in the main ophthalmology clinic of Zahedan city after obtaining ethical permissions (Ethical Code: IR.ZAUMS.REC.1398.135). Patients were selected using the following inclusion criteria: being over 30 years old, having no hearing complications, not to be pregnant, living in Zahedan, confirmation of T2DM by an internal medicine specialist and having visual impairments (patient's best vision with best optical correction be between 70/20 to 20/200 or the patient's angle of vision be narrowed to 20 degrees). Patients were excluded from the study if they either developed an acute illness with the need of hospitalization or were unwilling to participate in the study any more (Table 1). The sample size was calculated based on a previous study (14); thus, the estimated number of patients to be included in each of the two study groups was 41. Finally, an equal number of 45 patients was included in the intervention group and the control (routine care) group, respectively. So, a total number of 90 pa-

TABLE 1. Patient selection, inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Age over 30 years	Acute illness with the need of hospitalization
No hearing impairments	Unwilling to contribute to the study any more
Not to be pregnant	
Living in Zahedan	
Diagnosed as type 2 diabetes mellitus by a specialist	
Having visual impairments	

tients participated in the study using convenience sampling method. A permuted block randomization (AB) using a random number generator by default – A) vocal education group, and B) control (routine care) group – was implemented to organize the intervention and control (routine care) groups.

($S_2 = 35.4$, $\bar{X}_2 = 130$, $s_1 = 10.9$, $X_1 = 177$).

$$Z_{1-\frac{\alpha}{2}} = 1.9 \quad \alpha = 0.05$$

$$Z_{1-\beta} = 0.84 \quad \beta = 0.2$$

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta} \right)^2 \times [S_1^2 + S_2^2]}{d^2} = \frac{7.8 \times [10.9^2 + 35.4^2]}{16^2} = 41$$

One of the researchers (SS) collected the demographics and self-efficacy data through face to face interviews. The diabetes management self-efficacy scale (DMSES) for the assessment of self-efficacy was used in the present study. Developed by a team of researchers working for the international partnership in self-management and empowerment (IPSE) for the first time in 1999, the scale is composed of 20 queries. It is designed to assess T2DM patients' management self-efficacy in terms of four factors, including specific nutrition and weight, general nutrition and medical treatment, physical exercise, and blood sugar monitoring (15). The DMSES was translated and psychometrically evaluated by Haghayegh *et al*, who reported that the Iranian version of the scale was valid and reliable (16, 17). Patients were welcomed by a brief explanation about the study, and their informed consent was obtained. Subjects in the intervention group received a MP3 Player including 90 minutes of vocal education (in Persian for Persian speakers and in Balouchi with Sarhadi accent for Balouch people), which was provided through a number of smaller tracks about various topics such as diabetes and its complications, how to prevent diabetic complications, exercise and activity in diabetes, visiting a doctor and performing tests, glucometers manual, symptoms of hypoglycemia and hyperglycemia. A 30-minute face to face session was held to explain glucometer manuals and define diabetes as a chronic disease for patients as well. One telephone follow-up was arranged for the intervention group, while the routine clinical education was performed for the control group by the nursing staff during this study. The DMSES was filled out for the second time for both groups after a

period of six weeks. Data were analyzed using SPSS version 19. Both descriptive and inferential statistics were implemented to perform data analysis. Descriptive statistic outcomes were revealed as mean $\pm$ SD for continuous data and as frequencies and percentages for categorical ones. Kolmogorov-Smirnov test was performed ($p > 0.05$) to check the normality of collected data. Paired t-test was done to compare the means in each group before and after intervention, while independent t-test was used in both groups. Chi-square test was used to compare the frequency of qualitative variables between the two groups. A P value less than 0.05 was considered statistically significant in this study. $\square$

RESULTS

No significant differences were reported between the two study groups in demographic characteristics including age, duration of illness, gender, marital status, employment status, ethnicity and having a medical staff in the family (Table 2). Also, there were no considerable differences in self-efficacy score before intervention between the two groups. However, a remarkable rise in the self-efficacy score was noticed among patients in the intervention group

TABLE 2. Comparing demographics between intervention and routine groups

Variable		Routine group N=45 (%)	Intervention group N=45 (%)	P-value
Age		11 (12.58)	54.93 (10.27)	0.19*
Illness duration		35 (6.75)	11.26 (6.9)	0.19*
Gender	Male	22 (48.9)	21 (46.7)	0.83**
	Female	23 (51.1)	24 (53.3)	
Marital status	Single	5 (11.1)	5 (11.1)	0.74**
	Married	28 (62.2)	28 (62.2)	
	Widow	12 (26.7)	9 (20)	
Job status	Working	14 (31.1)	17 (37.8)	0.55**
	Workless	9 (20)	8 (17.8)	
	House keeper	15 (33.3)	17 (37.8)	
	Retired	7 (15.6)	3 (6.7)	
Ethnicity	Persian	20 (44.4)	21 (46.7)	0.83**
	Balouch	25 (55.6)	24 (53.3)	
Having a medical staff in the family	Yes	13 (28.9)	15 (33.3)	0.64**
	No	30 (66.7)	32 (71.1)	

*Independent t-test

**Chi-squared test

TABLE 3. Self-efficacy score report in intervention and control groups

Variable		Intervention group (mean $\pm$ SD)	Control group (mean $\pm$ SD)	P-value
Self-efficacy	Before intervention	89.75 $\pm$ (41.10)	87.51 $\pm$ (38.9)	0.79*
	After intervention	150 $\pm$ (29.51)	88.02 $\pm$ (39.71)	0.000*
P-value		0.000**	0.39**	

*Independent t-test

**Chi-squared test

TABLE 4. HbA_{1c} and FBS levels before and after intervention among both groups

Variable		Routine (mean $\pm$ SD)	Intervention (mean $\pm$ SD)	P-value
Hemoglobin A1c	Before intervention	6.70 $\pm$ 0.86	6.67 $\pm$ 0.73	0.69
	After intervention	6.69 $\pm$ 0.91	6.19 $\pm$ 0.64	0.05 >
	P-value	0.87	0.001 >	
FBS	Before intervention	197.45 $\pm$ 92.23	202.09 $\pm$ 86.32	0.59
	After intervention	190.05 $\pm$ 83.49	58.33 $\pm$ 48.98	0.1
	P-value	0.372	< 0.001	

after vocal education ($P < 0.0001$), while this score did not change significantly among controls (routine education) ($P > 0.05$) (Table 3).

In the Baluchi vocal education group, glycosylated hemoglobin (HbA_{1c}) and fasting blood sugar (FBS) levels were significantly reduced. Although there was no significant difference in fasting blood sugar between the two groups after the intervention, the mean fasting blood sugar in the intervention group was further reduced. There was no significant effect on glycosylated hemoglobin (HbA_{1c}) and fasting blood sugar (FBS) in the routine training group after the intervention (Table 4). $\square$

DISCUSSION

The vocal patient education program considerably enhanced the self-efficacy score as well as HbA_{1c} and FBS levels in the intervention group, while the routine patient education program was found to be inefficient on patient's self-efficacy, HbA_{1c} and FBS levels, which was an unexpected result in this study. The self-efficacy score and the levels of HbA_{1c} and FBS prior to

the intervention used in the present research were similar to those reported in other studies (18-21), indicating the necessity of effective education in this field.

Our results showed that the education provided in the control (routine education) group was ineffective, which was in accordance with other investigations (22-26). Factors such as rising the costs of hospitalization and early discharge policies made patients discharge with an unstable health condition (22). In addition, shortage of nurses in the ward, the increasing number of patients, lack of tariffs in nursing services and lack of motivation of nurses are affecting patient education services today. In some cases, patients are incompletely educated, with pamphlets and educational booklets provided to them and their family not matching their level of education and understanding. Patients' literacy level is an important factor for their involvement in health care. Low literate people cannot acquire the knowledge and skills needed to take care of themselves, because the capacity to acquire, process and understand information partly depends on an individual's literacy level (23). Therefore, education with pamphlets regardless of the status of patients (in the present study, patients' blindness) and their level of literacy (in the present study low literate patients) is practically ineffective. The results of this study are similar to those of several other studies about ineffective patient education due to weak considerations (24, 25). On the other hand, cultural issues are also effective in patient education. Language is one of the components of any culture that must be considered (27). In Iran, a large number of Baluch indigenous populations living in Sistan and Baluchistan states talk in different languages and accents specific to their geographical location (28). Although Persian is the formal education language in Iranian schools, low literate Baluch patients seem to remain marginalized in routine provided education. Blind patients who are low literate and do not even understand Persian well are vulnerable people who need special attention. In the intervention group, which was educated using MP3 players (based on patients' language), self-efficacy scores were significantly increased, which was similar to several previous studies in this field (29, 30). Although the intervention method used by us is different from that described in other studies, the adaptation of education to patients' level of literacy and culture

leads to similar results. Our findings showed that the vocal education method was effective in increasing the self-efficacy of patients with diabetes suffering from visual impairments, but the routine training methods have not been sufficiently effective. Effective care includes the cultural context of patients and is based on cultural sensitivity. The local language is one of the cultural components of any ethnic group. Investigations show that care combined with cultural sensitivity results in effective communication, patient satisfaction, lifestyle changes, and adherence to the recommended diet and treatment (13, 31). Since education with pamphlets and manuals requires minimal literacy, and training through video needs visual observation, these methods are practically not applicable to patients with diabetes who have visual complications. Therefore, it is recommended that education for diabetes patients should be based on their physical and cultural situation. □

CONCLUSIONS

The present study demonstrated that vocal education program considerably alleviated

the self-efficacy in diabetes patients in comparison to the control group. Considerable changes in clinical tests indicated surprising results as well. As a vulnerable segment of population, diabetes patients with visual impairments are exposed to various health issues. Education through booklets and pamphlets may not be effective for them anymore. In conclusion, our research suggests nursing and public health policy makers to reconsider their traditional patient education programs, particularly for diabetes patients with visual impairments among indigenous populations. □

Ethics approval: The study was approved by the ethical committee of Zahedan University of Medical Sciences, Iran (Ethical Code: IR.ZAUMS.REC.1398.135) on the 26th of June 2019. All procedures followed were in accordance with the ethical standards of Zahedan University of Medical Sciences ethical committee on human experimentation.

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