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VALIDITY AND RELIABILITY OF FARSI VERSION OF DIABETES TREATMENT SATISFACTION QUESTIONNAIRE (DTSQ)

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ABSTRACT

Introduction: In Diabetes Mellitus patient satisfaction and compliance with the treatment is crucial for a desired outcome. Diabetes treatment satisfaction questionnaire (DTSQ) is one of the most frequently used instruments in order to measure patient satisfaction with the current treatment. We aimed at translating and validating the Farsi version of DTSQ among Iranian population.
Materials and Methods: The original English DTSQ was translated to Farsi. Back translation has been made and checked by an expert group. Then, another expert group including eight endocrinologists and internists were asked to review its content validity. Content validity index was used to determine quantitative content validity. To measure formal validity, 20 patients with diabetes were asked about the test. For measuring reliability, 184 questionnaires have been filled by the patients and analyzed using Cronbach's alpha.
Results: once modifications were made, content validity of the questionnaire was estimated at 75% or higher level. Item impact indicates that all the questions had 1.5 points or higher. Reliability of the questionnaire was estimated at 0.784.
Conclusion: the results showed that validity and reliability of our Farsi version of DTSQ were acceptable; this version is a good instrument for measuring satisfaction with diabetes treatment among Farsi speaking people.

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Introduction

Diabetes mellitus is the most common metabolic disorder. Hyperglycemia caused by diabetes causes secondary pathophysiologic changes in multiple organs in the body, which may lead to by many problems for patients as well as health care system (1, 2). Common complications include increased risk of death (3, 4), heart disease and stroke, renal failure (4-5), foot ulceration, and eye problems, reduced life expectancy, and mental, interpersonal, social and familial problems, sexual dysfunction and poor perception of health (6-8). In 2014, the global prevalence of diabetes was estimated at 9% among adults population (9). A study conducted in 2008 estimated prevalence of diabetes at 7.7% in Iran (10). Patient satisfaction with treatment and cooperation in treatment is an important factor in quality of care and it has a crucial in role in achieving the desired outcome (11). On the other hand treatment of diabetes is practical when the patient identifies self as a member of the treatment team, not someone taken care of by treatment team.

DTSQ was first developed and introduced in the early 1980s by Professor Clare Bradley (12-13). It is now available in as many as 100 languages. Although DTSQ is mostly used in research projects, it is also suitable clinical assessment and monitoring. This questionnaire can be used for both patients with diabetes type 1 and 2 (13).

DTSQ includes eight items which are scored on a seven (0-6) point scale. Six questions (the items 1, 4, 5, 6, 7 and 8) measure different aspects of treatment satisfaction. Item 1 assesses the person's satisfaction with the treatment, item 4 shows convenience of the current treatment, item 5 is for treatment flexibility, item 6 shows the person's degree of understanding of diabetes, item

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7 is for recommending the current treatment to other patients and item 8 shows satisfaction for continuing the current treatment. Sum of these items shows a total treatment satisfaction score. It can be a number between 0 (very dissatisfied) to 36 (very satisfied). Questions 2 and 3 are about the patients' own understanding of frequency of hyperglycaemia and hypoglycaemia. These two questions are scored independently. For these two items, low score shows understanding of a better blood glucose control in patients.

In published data the Cronbach's alpha estimated for the 6-item English and German forms used for patients receiving insulin was 0.82 and 0.86, respectively. Moreover, the alpha estimated for the 5-item French form used for patients receiving insulin was 0.81 (14). DTSQ has been recognized by the World Health Organization and the International Diabetes Foundation as a useful instrument in evaluating outcomes of diabetes care (11). Validity and reliability of DTSQ are acceptable. It has been widely used and has been validated in more than 100 countries (12-13,16).

In a study of 176 Bantu-speaking (95 person) and African-speaking (81 person) outpatients with diabetes, investigators reported that internal consistency of the questionnaire was high in both cultures and languages. Gender, age and employment status, and other demographic variables did not influence treatment satisfaction. This shows a good construct validity (17).Studies in other cultures, including a study on 1000 older adults with diabetes (18) and another study with 423 people showed that DTSQ could be considered as a culture-free scale (16). Arabic and French form of DTSQ were evaluated in Algeria (because many Algerians are fluent in both languages) and has shown its validity (13). Analyses of the World Health Organization demonstrated validity of the scale; however, there is no information on the scale concurrent validity (14).

Materials and Methods

Translation and application of a questionnaire developed in another culture requires numerous steps to ensure consistency of the new version and its fidelity to the original concepts. It is also necessary to ensure the validity and reliability of the new translated questionnaire (19). Farsi (Persian) is the first language of most people in Iran, and is spoken as the official language in Iran, Afghanistan, and Tajikistan.

In our work DTSQ Farsi version linguistic correctness as well as test validity and reliability was evaluated through the following steps:

Two English experts separately translated the English questionnaire into Farsi. The two translations were compared by the third person who had a doctorate degree in English and was converted to a single version. Two people separately did back-translation of this text from Farsi to English. These two translations were compared by a person with doctorate in English and converted to a single text by eliminating differences. This final English version was compared with the original text. No significant difference was found between the re-translated form and the original form.

Eight endocrinologists and internists were asked to review the content qualitatively and suggest their modifications. Then, content validity index was used to determine quantitative content validity; the experts were asked to rate the questions as necessary, not necessary but useful and not necessary an standard process. The responses were calculated by content validity ratio (CVR) formula and matched with Lawshe table (20). In this formula, n_e is the number of experts who recognized the question as necessary and N is the total number of experts. CVR ranged from zero to 99% when more than half of the experts chose the option necessary. CVR was a negative value when less than half of the experts chose the option necessary. CVR=1 is adjusted to 99% when all the experts chose the option necessary (21).

$$\mathrm{CVR} = \frac{n_e - N_2}{N_2}$$

Item impact was used to determine formal validity quantitatively. For this purpose, 20 patients with diabetes were asked to determine importance of questions in a 5-point Likert scale including very important (5), important (4), moderately important (3), slightly important (2) and not at all important (1). Then, impact score was calculated by following formula. To accept formal validity of an item, impact score of that item should not be less than 1.5. Only those questions had acceptable formal validity of which impact score was>1.5 (21).

Impact score = frequency (%) × importance

Cronbach's alpha was used to evaluate reliability of the questionnaire. For this purpose, 184 patients with diabetes filled a researcher-made questionnaire which measured their age, gender and education as well as DTSQ.

Results

Through qualitative and quantitative analysis of content validity, endocrinologists and internists removed 2 items (items 2 and 3 in the original questionnaire), because CVR≥0.75 for all the items except items 2 and 3 (Table 2). According to Lawshe table, only questions with CVR>0.75 are included in the questionnaire if eight experts are used.

Impact score of 6 remaining items was equal to or higher than 1.5 (Table 3). To accept formal validity of an item, impact score of that item should not be less than 1.5. Only those questions had acceptable formal validity of which impact score was >1.5. To obtain these results, 20 patients with diabetes were asked to determine importance of each item on a 5-point Likert scale. Moreover, Cronbach's alpha was estimated at 784%, which indicates good reliability of the questionnaire (Table 4).

Discussion and Conclusion

The results of translation and using Farsi version of DTSQ to a sample of patients with diabetes mellitus is consistent with previous studies which showed that DTSQ can provide valid evaluations of diabetes treatment satisfaction.

Formal validity determined by surveying patients ensures the experts that DTSQ is a good instrument for measuring patient satisfaction with the treatment received. Reliability of the questionnaire is also acceptable. According to our findings, DTSQ can be used for Farsi speaking people.

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Table 1. Demographic characteristics (N=184)

		Age		Married		Education		Sex	
		30 to 60	Under30	Married	Single	University Degree	High School	Male	Female
		160	24	152	32	106	78	104	80

Table 2. Content Validity Ratio (N=8)

Questions	**CVR**
1. How satisfied are you with your current treatment?	.75
2. How often have you felt that your blood sugars have been unacceptably high recently?	-.25
3. How often have you felt that your blood sugars have been unacceptably low recently?	-.25
4. How convenient have you been finding your treatment to be recently?	.99
5. How flexible have you been finding your treatment to be recently?	.75
6. How satisfied are you with your understanding of your diabetes?	.99
7. Would you recommend this form of treatment to someone else with your kind of diabetes?	.75
8. How satisfied would you be to continue with your present form of treatment?	.99

Table 3. Impact Score (N=20)

Questions	Frequency (%)					Impact Score
	Score 1	Score 2	Score 3	Score 4	Score5	
1	.00	.00	.00	.25	.75	4.75
2	.00	.10	.05	.30	.55	4.30
3	.00	.00	.00	.10	.90	4.90
4	.00	.00	.10	.10	.80	4.70
5	.00	.00	.00	.15	.65	4.24
6	.00	.00	.00	.05	.95	4.95

Table 4. Reliability Statistics

Cronbach's Alpha	N	Items
0.784	184	6