Original Article

Psychometric Properties of the Turkish Version of the Diabetes Self-Management Instrument

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Abstract

Background: Diabetes Self-management Instrument, differently from other scales, evaluates medical practices, healthy nutrition, healthy weight loss, and the status of regular exercise as well as the patient's physical, social, and psychological status. It is thought that researching the psychometric properties of the scale in a different cultural environment will provide evidence regarding cultural characteristics in diabetes self-management.
Objectives: In this study, psychometric properties of the Turkish version of the Diabetes Self-management Instrument were assessed.
Methodology: The study sample consisted of 175 diagnosed type 2 diabetes people living in the Marmara region of Turkey. In order to obtain of data, a questionnaire was designed containing demographic questions and Diabetes Self-management Instrument. The psychometric properties of the scale were studied through a methodological, descriptive and correlational design.
Results: Reviewing the internal consistency of the Diabetes Self-Management scale produced a reliability value of $\alpha = 0.950$. The RMSEA fit measurement was 0.086 and exhibits acceptable fit. While RFI, another fit measurement, exhibited good fit, the NFI, NNFI, CFI, IFI, and SRMR measurements exhibit acceptable fit. Based on this, the adaptation of the good fit and acceptable fit by the fit measurements and the adaptation of acceptable fit by the correction chi-share value demonstrate that our data has acceptable fit and that our model is statistically meaningful and valid.
Conclusions: In this study, we concluded that the Turkish version of the Diabetes Self-management Instrument is a suitable instrument for measuring self-management in the Turkish population.

Key Words: Self-management, self-management instrument, Turkey, type 2 diabetes

Introduction

Diabetes is a chronic disease that is serious in terms of incidence and resulting complications. Diabetes is a chronic metabolic disease which requires constant medical care and in which an organism is unable to adequately utilize carbohydrates, fat, and proteins due to insulin deficiency or defects in the effect of insulin (Turkey Endocrinology and Metabolism Society, 2019). The International Diabetes Federation (IDF) (International Diabetes Fedaration, 2017) estimates that approximately 9% (425 million people) of the global adult population has diabetes. The prevalence of diabetes has reached epidemic proportions and is expected to gradually increase by 2045 (International Diabetes Fedaration, 2017). In Turkey, it is

known that there are approximately 7 million diabetes patients (14 %) between the ages of 20-79 (Satman et al., 2013).

Diabetes is classified as type 1 diabetes, type 2 diabetes, gestational diabetes, and other special subtypes (American Diabetes Association, 2017; Turkey Endocrinology and Metabolism Society, 2019). Type 1 diabetes generally emerges in childhood and adolescence and constitutes 3-5% of diabetes patients, while type 2 diabetes is the most common type of diabetes, emerges at later ages, and is responsible for approximately 95% of all cases of diabetes in our country (International Diabetes Leadership Forum, 2013).

Diabetes is a metabolic disease characterized by hyperglycemia, and long-term hyperglycemia leads to serious problems. It can cause problems in various organs such as the kidneys, nerves, heart, blood pressure, and eyes (Maitra, 2015). The prevent the development of chronic complications in individuals with diabetes therefore requires the provision of metabolic control. Patients must prioritize lifestyle changes to reduce blood sugar to the desired level and maintain them there (Copeland et al,. 2013; Dungan, 2016).

Studies emphasize the importance of self-management in diabetes to successfully ensure metabolic control and for the prevention of serious complications in diabetic individuals (Funnel et al.,2009; Powers et al.,2015). Self-management is the art of managing the chronic disease, including symptoms, treatment, and physical, social, and lifestyle changes regarding the disease. It is a system of care based on collaboration in which individuals find themselves and which includes a series of professionals working jointly with them (Lawn, McMillian, Pulvirenti, 2011; Inkaya ve Karadag, 2017). Self-management in diabetes is a process used to gain the knowledge and skills necessary to manage crises and make lifestyle changes. This process requires the active participation of diabetic individuals. The goal with self-management in diabetic individuals is to ensure metabolic control, to protect from acute and chronic complications, and to optimize the quality of life (Norris, Engelgau, & Narayan, 2001; Funnel et al., 2009).

Diabetes self-management must be integrated into the daily life of the patient, because successful integration helps the individual manage this chronic illness in the context of personal anxieties that form these goals, priorities, health problems, family demands, and their lives. The prevention of the negative impacts of diabetes requires an integrated approach not only with medical practices, healthy nutrition, healthy weight loss, and regular exercise but also that supports the individual physically, socially, and psychologically. Diabetic individuals make decisions each day regarding their illness while monitoring their medications, diets, physical activity, and stress. Psychological barriers thus make diabetes management a struggle for individuals. Diabetic individuals must therefore specify that it is important for them to receive the support of healthcare service providers, families, friends, and employers in the management of their illness. Accordingly, diabetes self-management transcends the management of blood sugar levels and taking of medications and generally requires adjustments in other areas of the patient's life such as work, leisure, meals, relationships, and self-esteem (Lin, Anderson, Chang, Hagerty, & Loveland-Cherry, 2008; Khunti, Davies, Kalra, 2013).

Diabetes management is an active, flexible process in which patients develop strategies to reach desired goals by organizing their own actions, in which healthcare service providers and other important individuals are in collaboration, and which conducts research regarding therapeutic health (Lin, Anderson, Chang, Hagerty, & Loveland-Cherry, 2008). It is important in this process for healthcare workers to set patients' levels of management and, in this regard, to assist patients and their families.

There are various questionnaires and scales that determine self-management in the treatment of diabetes in the literature (Wallston, Rothman & Cherrington, 2007; Wong, Stewart & Furler, 2009; Clark, Utz & Hollen, 2011; Schmitt et al., 2013). The Diabetes Self-Management Instrument (DSMI-35) is one of these. This scale, differently from other scales, evaluates medical practices, healthy nutrition, healthy weight loss, and the status of regular exercise as well as the patient's physical, social, and psychological status. Adaptation, validity, and reliability studies of the scale have been conducted in Taiwan, Iran and Vietnam (Lin, Anderson, Chang, Hagerty, & Loveland-Cherry, 2008; Tol et al., 2012; Dao-Tran, Anderson, Chang, Seib, & Hurst, 2017). No

validity reliability studies exist, however, for the Turkish language. It is thought that researching the psychometric properties of the scale in a different cultural environment will provide evidence regarding cultural characteristics in diabetes self-management. And although there exist scales that determine the general self-sufficiency, self-care, and treatment compliance of Turkish patients, the compliance of individuals with diabetes treatment in existing scales is aimed more at physical approaches (Karakurt, 2008; Demirtas, 2014). A gap prevails in the evaluation of the self-management of the disease in an integrated manner in diabetic individuals. DSMI-35 will have various advantages that include serving as a self-management guide with an integrated approach for healthcare professionals who work in this field. In addition to this, it can be used to measure the results of training provided in studies and training programs (individual discussions, patient school, etc.) designed for diabetic individuals. Therefore, the confirmation of the Turkish version of the DSMI-35 will contribute to both practices and research to evaluate self-management in the treatment of diabetes for diabetic individuals in Turkey.

Aim: The aim of the current study was determined the reliability, validity and psychometric properties of the Turkish version of DSMI-35. The research question was; "what are the psychometric properties of DSMI-35 in Turkish Population?"

Methods

The study was conducted between October 2016 -September 2017 in a diabetes outpatient clinic of education and research hospital in Istanbul, Turkey. The study was conducted as methodological, descriptive and correlational study. The STROBE checklist was used.

Ethics: Chiu-Chu Lin, the original designer of the DSMI-35, gave her consent for use of the scale. Study methods were approved by ethical committee. The purpose and benefits of the research were explained; written and verbal consent was obtained from all participants. Participant anonymity was guaranteed.

Initial Instrument Development

Participants: When calculating the sample size of the study, we used predicted sample size calculation for scale development studies. Five to 30 observations per item is recommended for this calculation. In this study, we planned at least 5 diabetes people for each item in the scale. (Karakoc ve Donmez, 2014). The sample of this study was consisted of 175 patients with type II diabetes. The inclusion criteria were as follows: willingness to participate in the interview, > 18 years old >3 months diagnosed with type 2 diabetes.

Data Collection: Data were collected using the Questionnaire Form and the Diabetes Self-Management Instrument (DSMI-35). Diabetic individuals participating in the study were asked to fill out the Questionnaire Form and DSMI-35. The time taken to complete the questionnaire ranged between 10 and 15 min.

Questionnaire Form: The questionnaire form was developed by researchers. Questions about the individual's background (age, sex, size-weight, marital status, education, job, economic status, people with whom he/she lives), and diabetes characteristics (length of diabetes , history of type 2 diabetes in the family, hospitalization in the past year for diabetes or complications, complications, regular check up, diabetes therapy, treatment compliance and regular drug use),), habits (exercise status, smoking, alcohol), and perception of health (effect of disease on work and family life, health status within the past year, general health status) were included.

Diabetes Self-Management Instrument (DSMI-35): The Diabetes Self-Management Scale (DSMI-35) developed by Lin, Anderson, Chang, Hagerty, & Loveland-Cherry (2008), is a self-report instrument with 4-point responses to each item to determine the frequency with which adults with T2DM have undertaken 35 self-management practices during the last three months. The answers range from 1(never) to 4 (always). The total scores for the instrument range from 35 to 140. The higher scores represent greater frequency of self-management activities. This instrument is divided into five subscales: self-regulation (10 items- 1, 2, 3, 4, 6, 7, 18, 29, 31, 32); self-integration (9 items- 8, 9, 10, 11, 12, 13, 14, 16, 34); collaboration with health professionals and other significant people (9 items- 5, 20, 21, 22, 23, 24, 25, 26, 27); blood glucose monitoring (4 items- 15, 17, 19, 28); and adherence to recommended regimens (3 items- 30, 33, 35). Initially developed in English for verification in Taiwan and translated into Chinese. The validation of the Chinese version of

this instrument on 634 adults with T2DM in Taiwan achieved a Cronbach's alpha coefficient of .94 and a test-retest correlation of .73 ($p < 0.01$; (Lin, Anderson, Chang, Hagerty, & Loveland-Cherry, 2008).

Research Process

Translation of the DSMI-35: The standard forward–backward procedure was applied in the translation of the DSMI-35 from English to Turkish (Gjersing, Caplehorn, & Clausen, 2010). The first phase was the forward translation, in which three bilingual nurse academicians independently translated the DSMI-35 into Turkish. The second phase consisted of backward translation (from Turkish to English), which was carried out by a professional bilingual translator. The principal investigators then compared the translated Turkish questionnaire and the original DSMI-35, and made minor revisions with the help of a language expert.

Content Validity of the DSMI-35: Item relevance and content validity of the translated version of the DSMI-35 was tested by an expert panel (Grant & Davis, 1997). The panel analysed the applicability of the content to the local Turkish culture and the linguistic clarity of the phrasing (Erefe, 2002). The expert panel consisted of 4 doctor and 6 nurse academicians. Davis's (1992) technique was used to evaluate the content validity index (CVI). The experts were asked to rate each scale item on a four-point Likert scale, ranging from 1 (not relevant) to 4 (very relevant). The accepted rate for scale is 0.80. (Polit & Beck, 2006). Final form was attained in line with expert views. The CVI was found to be 0.99.

Pilot Testing: A pilot study was carried out with 30 participants. The alpha coefficient for the Turkish version of the DSMI-35 was 0.76 for the pilot study. No changes were made on the DSMI-35 after the pilot study.

Data Analysis: In the study, validity (CVI, confirmatory and exploratory factor analysis) and reliability (cronbach alpha) analyzes were used. Descriptive statistics were used to examine the distribution of the scores on each item and Mann Whitney U test was used to compare two groups of variables that did not show normal distribution when comparing quantitative data. The Kruskal Wallis test was used in the comparison of three and more groups that did not display normal distribution, and the Mann Whitney U Test was used in the paired comparison. Spearman's Correlation Analysis was used to evaluate inter-variable relationships. Significance was assessed at $p < 0.05$ level.

Results

Demographic information: The average age of the participants was 55.98±9.08 (31-83), and 61.1% (n=107) were female and 38.9% (n=68) were male. Of the individuals, 89.1% (n=156) were married, 73.7% (n=129) were primary/secondary school graduates, 54.3% (n=95) did not work at any job, 92.0% (n=161) were of a middle-class economic status, and 63.4% (n=111) lived with their spouse and children (Table 1). The span of the individuals' diabetes was 9.84±6.76 (1-32) years, 80.0% (n=140) have a family history of diabetes, and 6.3% (n=11) were hospitalized within the past year due to diabetes or complications. Of these hospitalizations, 45.5% (n=5) were due to CVS. Of the individuals, 76.0% (n=42) do not have regular health check-ups, and it is seen that 11.4% (n=20) take OAD for diabetes, 13.1% (n=23) take insulin, and 75.4% (n=132) take both insulin and OAD. The fit score for diabetes treatment was 2.70±1.89 (0-10) , and 67.4% (n=118) regularly take their medication (Table 1).

Confirmatory Factor Analysis (CFA): The RMSEA fit measurement was 0.086 and exhibited acceptable fit. While RFI, another fit measurement, exhibits good fit, the NFI, NNFI, CFI, IFI, and SRMR measurements exhibit acceptable fit (Table 2). Confirmatory Factor Analysis Model results for the scale are shown in Figure 1. For the Diabetes Self-Management scale, the score for the Factor 1 subdimension was 1.82±0.57 (1-3.8), the score for the Factor 2 subdimension was 2.87±0.54 (1-4), the score for the Factor 3 subdimension was 2.97±0.57 (1.2-4), the score for the Factor 4 subdimension was 2.13±0.74 (1-4), the score for the Factor 5 subdimension was 2.72±0.71 (1-4), and the total score for the Diabetes Self-Management scale was 2.34±0.47 (1-31- 3.78) (Table 3).

Exploratory factor analysis (EFA): The Exploratory Factor Analysis determined that the sufficiency measurement value for the KMO sampling was 0.910 and Bartlett's Test of Sphericity was meaningful when the Varimax rotation was implemented (chi square=4246,706; $p<0.001$). These four factors explain 62.86% of the variance of our scale. Table 4 shows the factor weights regarding the factor

analysis. The deletion of the item showed that the removal of any item from the factor would not increase reliability when reviewing the Cronbach Alpha values for the scale. The four-item factor structure was preserved in this framework (Figure 2).

Reliability Analysis: Reviewing the internal consistency of the Diabetes Self-Management scale produced a reliability value of $\alpha = 0.950$. Based on this, it shows that our scale has a high degree of reliability.

Table 1: Individual and Diabetes characteristics of the diabetes people

Characteristic						
		n	**%**	**Min-Max**	**Median**	**Mean±SD**
Age (year)				31-83	55	55.98±9,08
BMI (kg/m^2)				16.2-52.7	31.6	32.16±6.03
Gender	**Female**	107	61.1			
	Male	68	38.9			
Marital Status	**Married**	156	89.1			
	Single	3	1.7			
	Widow/Widower	16	9.1			
	Divorced	1	0.6			
Education	**Literate**	34	19.4			
	Primary/Secondary	129	73.7			
	school	9	5.1			
	High school	3	1.7			
	University					
Occupation	**non-working**	95	54.3			
	Salaried employee	36	20.6			
	Retired	37	21.1			
	Other	7	4.0			
Economic status	**Worse**	11	6.3			
	Moderate	161	92			
	Good	3	1.7			
People with whom he/she lives	**Alone**	8	4.6			
	Partner(wife/husband)	40	22.9			
	Partner and children	111	63.4			
	Children	15	8.6			
	Other	1	0.6			
Length of diabetes (year)				1-32	9	9.84±6.76
Family history	**Yes**	140	80.0			
	No	20	11.4			
	Don't know	15	8.6			
Hospitalization in the past year for diabetes or complications	**Yes**	11	6.3			
	No	164	93.7			
Complications (n=11)	**CVS**	5	45.5			
	Retinopathy	1	9.1			
	Nephropathy	1	9.1			
	Neuropathy	1	9.1			
	Ketoacidosis	1	9.1			
	Other	2	18.2			
Regular check up	**Yes**	42	24.0			
	No	133	76.0			
Diabetes therapy	**OAD**	20	11.4			
	Insulin	23	13.1			

	Insulin + OAD	132	75.4			
Treatment compliance				0-10	3	2.70±1.89
Regular drug use	**Yes**	118	67.4			
	No	57	32.6			

Table 2: Fit Index of Confirmatory Factor Analysis

Fit Measurement	**Good Fit**	**Acceptable Fit**	**Results**	**Fit**
RMSEA	0<RMSEA<0.05	0.05≤ RMSEA ≤0.10	0.086	Acceptable
NFI	0.95≤ NFI ≤1	0.90≤ NFI ≤0.95	0.92	Acceptable
NNFI	0.97≤ NNF ≤1	0.95≤ NNFI ≤0.97	0.95	Acceptable
CFI	0.97≤ CFI ≤1	0.95≤ CFI ≤0.97	0.95	Acceptable
IFI	0.97≤ IFI ≤1	0.95≤ IFI ≤0.97	0.95	Acceptable
SRMR	0≤ SRMR ≤0.05	0.05≤ SRMR ≤0.10	0.097	Acceptable
RFI	0.90≤ RFI ≤1	0.85≤ RFI ≤ 0.90	0.92	Good
κ^2 **/df**	$0 \leq \kappa^2/df \leq 2$	$2 \leq \kappa^2/df \leq 3$	2.29	Acceptable

Notes. x^2 : chi square

Table 3: Descriptive Statistic for DSMI-35

	Question Number	**Min-Max (Median)**	**Mean ± SD**	**Cronbach's Alpha**
Factor 1	10	1.1-3.8 (1.8)	1.89±0.54	0.903
Factor 2	9	1.33-4.0 (2.4)	2.39±0.55	0.894
Factor 3	9	1-4 (3)	2.87±0.54	0.940
Factor 4	4	1-4 (2)	2.13±0.74	0.885
Factor 5	3	1-4 (2.7)	2.72±0.71	0.715
Total	35	1.34-3.77 (2.3)	2.37±0.47	0.956

Notes. SD: standart deviation

Table 4: DSMI_35 with Standardized Loadings on Subscales

	Factor Loadings			
	1	2	3	4
13. I monitor my progress toward my desired goals by keeping track of blood glucose levels and A1c.	**0.790**			
7. I have successfully merged diabetes into my daily life.	**0.749**			
12. I compare the differences between my current blood sugar levels and my target blood glucose levels.	**0.737**			
29. I manage my food choices to help control my blood glucose.	**0.713**			
9. I pay attention to situations in my daily life that might cause my blood glucose levels to change.	**0.696**			
1. I consider the effect on my blood sugars when choosing foods and portions to eat.	**0.656**			
33. I see my diabetes provider every 1-3 months.	**0.636**			
18. I can adjust my diabetes routine to fit new situations (such as being away from home. changing my schedule. and celebration).	**0.629**			
32. I keep my weight within the range set up by health care provider and me.	**0.622**			
2. I can participate in the social activities and still manage my diabetes.	**0.614**			
8. I pay attention to signals my body gives me related to my blood glucose level.	**0.594**			
6. My daily life style is more healthy than before because of having diabetes	**0.572**			
31. I exercise enough to help control my blood glucose and my weight.	**0.558**			
3. I know how to manage food portions and choices when I eat out.	**0.551**			
23. I am comfortable telling my health care provider about changes I would like to make in my treatment plan		**0.909**		
22. I am comfortable telling my health care provider how much flexibility I want in my treatment plan.		**0.908**		
25. I am comfortable discussing the results of out-of-range blood glucose tests with my health care providers.		**0.848**		
20. I am comfortable asking my health care provider questions about my treatment plan.		**0.817**		
24. I tell others (e.g.. my friends. my family) about the situations in which I need their help for controlling my diabetes.		**0.799**		
27. I am comfortable asking my health care provider about resources that could help me manage my diabetes.		**0.774**		
21. I work with my health care providers to identify the possible causes when my diabetes control is poor.		**0.744**		
26. I ask others (e.g., my friends, my family) to help me with my high blood glucose reaction if needed.		**0,646**		
5. I am comfortable asking other people with diabetes for tips about managing diabetes.		**0.622**		
30. I take my diabetes medications at the times prescribed.			**0.745**	
35. I take the amount diabetes medication that has been prescribed for me.			**0.742**	
16. I decide what action to take based on the results of my previous actions.			**0.654**	
34. If I get a low blood glucose reaction I know how to treat it.			**0.601**	
14. I take action based on body signals such as thirst, losing my temper, and feeling anxious.			**0.464**	
15. When I feel as though my blood glucose is too low, I check my blood glucose levels as soon as possible.				**0.815**
17. When I feel unwell but I am not sure if the cause is either high or low blood glucose, I check my blood glucose as soon as possible.				**0.799**
19. When I feel as though my blood glucose is too high, I check my blood glucose levels as soon as possible.				**0.770**
28. I check my blood glucose to help me make self-care decisions (e.g., medications, diet, exercise).				**0.613**

Table 5: Internal Consistency Reliability

	Our research	Tol et al. Iranian	Doa-Tron et al. Vietnamese
Factor 1	0,903	0,88	0.87
Factor 2	0,894	0.88	0.91
Factor 3	0.940	0.79	0.89
Factor 4	0.885	0.92	0.95
Factor 5	0.715	0.87	0.81
Total	0.956	0.91	0.92

Figure 2: Distribution of Diabetes Self-Management Scale Scores

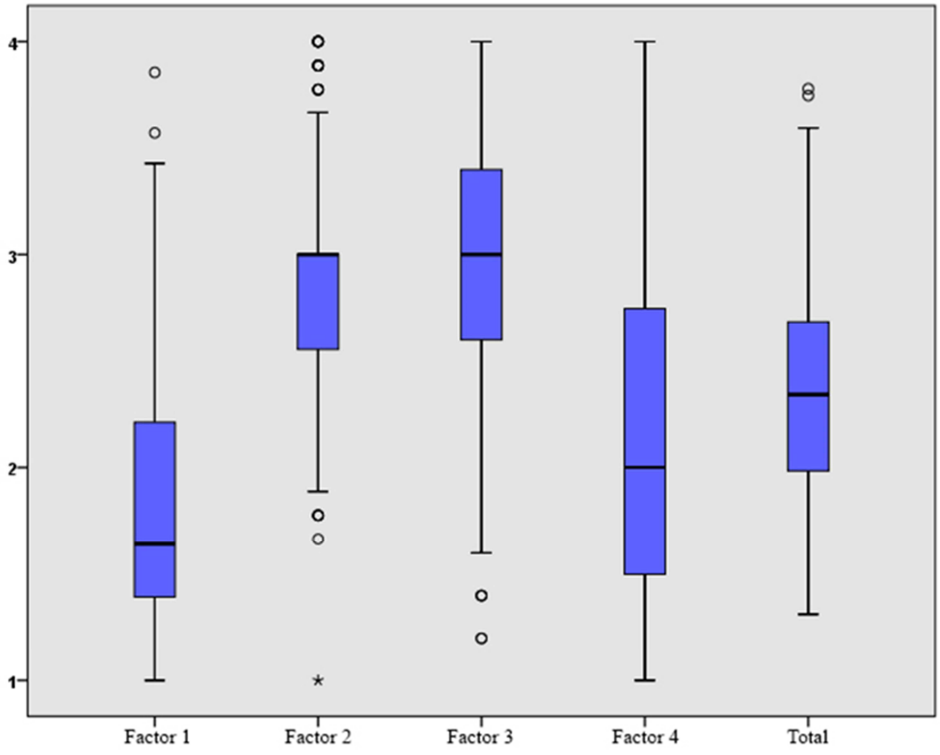
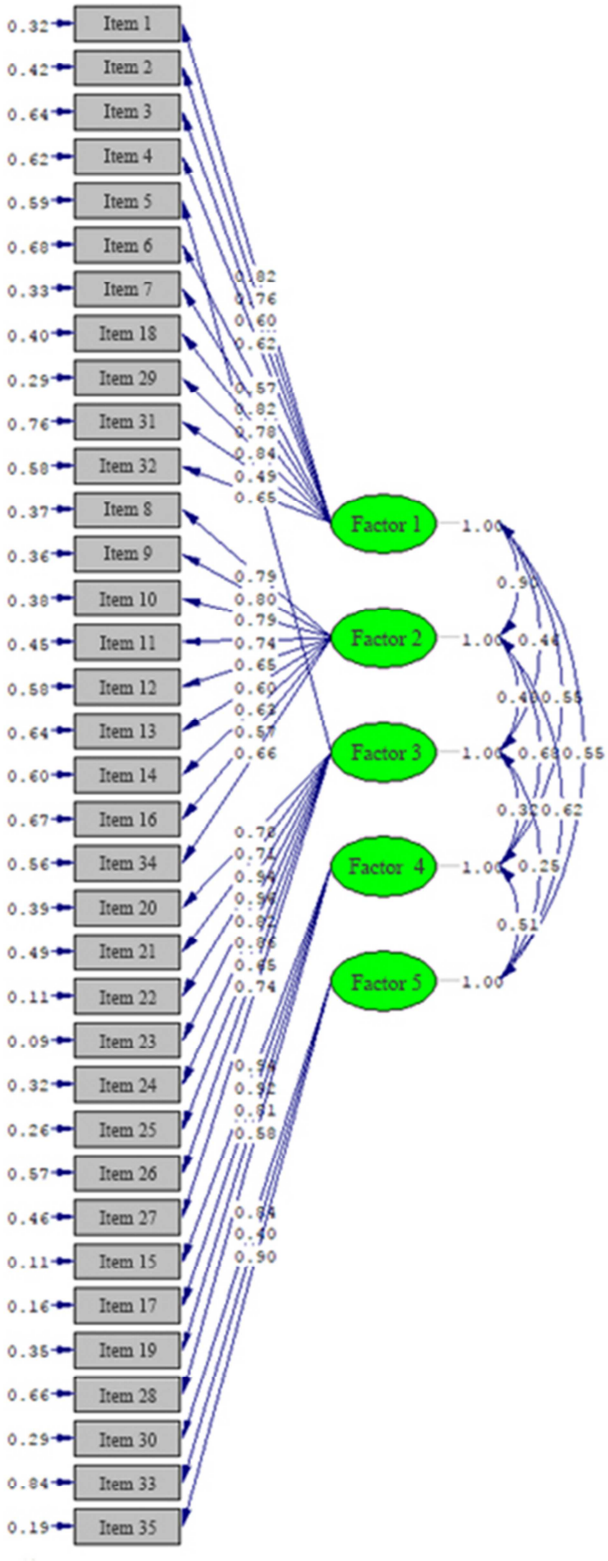


Figure 1 : Confirmatory Factor Analysis Model



Discussion

The present research found suitable results for reliability and validity for the Turkish version of the DSMI-35. The results of the translations and analysis performed regarding the provision of linguistic equivalence demonstrated that the DSMI-35 could be easily implemented in Turkish society. Experts evaluated the items found in the Turkish version of the scale, and the mean KGI coefficients showed that the scope validity was quite good.

The adaptation of the good fit and acceptable fit by the fit measurements of the scale and the adaptation of acceptable fit by the correction chi-share value in the confirmatory factor analysis demonstrate that our data has acceptable fit and that our model is statistically meaningful and valid. Lin, Anderson, Chang, Hagerty, & Loveland-Cherry (2008) reached a similar conclusion in their study in the confirmatory factor analysis.

We can say that the KMO value in the exploratory factor analysis in our study was quite a good value and that conducting the analysis on the relevant data group was suitable. Bartlett's Test of Sphericity was used to test the hypothesis of whether the correlation matrix was a similar matrix, and this hypothesis was rejected at the level of $p<0.001$. This demonstrates to us the suitability of the data for the factor analysis by revealing the existence of the relationship between the items (Akgul&Cevik, 2003; Hair, Anderson, Tatham & Black, 1998). Tol et al. (2012) found the KMO sampling sufficiency measurement in their study to be 0.81 and reported that Bartlett's Test of Sphericity was statistically meaningful ($x^2= 1126.08$, df = 545, $p <0.001$).

The height of the variance rates acquired from the analysis results are high correlate to the strength of the factor structure of the scale. It was seen that the items in the scale were gathered under five factors in the exploratory factor analysis. Questions 4, 10, and 11 received burdens close to one another in more than two factors as a result of the analysis. While the burden of "I regard my diabetes management as a way to stay healthy overall" for item 4 should have been high in factor 1 (self-integration), it emerged in burdens similar to factor 3 (interaction with health professionals and significant others) and factor 4 (self-monitoring of blood glucose). While the burden of "I can recognize which signs and symptoms tell me the most about my blood glucose level" for item 10 should be high in factor 2 (self-regulation), it emerged in similar burdens in factor 1, factor 4 (self-monitoring of blood glucose), and factor 5 (adherence to recommended regimen). While the burden of "I can usually figure out the reasons for changes in my blood glucose levels" burden for item 11 should have been high in factor 2, it emerged as high in factor 4 and factor 5. Excluding these questions from the study, the questions were collected under the four factors when administering the factor analysis again. Item 30 "I take my diabetes medications at the times prescribed" and item 35 "I take the amount diabetes medication that has been prescribed for me" in factor 5 settled in factor 3, and item 33 "I see my diabetes provider every 1-3 months" settled in factor 1.

Table 5 shows the inter-factor and total Cronbach alpha coefficients of the scale. The Cronbach alpha coefficient was 0.95 in our study, and it can be said that the Turkish version is reliable to measure the concept of diabetes self-management in adult individuals with type 2 diabetes. The inter-factor value for the internal consistency of the scale varied between 0.77-0.90 in the original study conducted in Taiwan (Lin, Anderson, Chang, Hagerty, & Loveland-Cherry, 2008), and the total value was 0.94. The total values of 0.91 in Iran (Tol et al., 2012; Tahmasebi, 2012) and 0.92 in Vietnam (Doa-Tron et al., 2016) exhibit similarities with our study.

Limitations: The instrument was validated in adults with T2DM in an outpatient clinic in Istanbul city in Turkey only. Therefore, the findings of the current study may be limited to this population, but not for other different populations.

Implications for Practice: Healthcare professionals can gain more detailed knowledge in patients' diabetes management using this scale and can plan training regarding how support can be provided.

Conclusion: Self-management behaviours help diabetic patients better deal with the responsibilities of daily diabetes care. This scale could help determine suitable treatment programs by evaluating the effectiveness of self-management behaviours in patients with Type 2 Diabetes. Scales regarding diabetes management

in Turkey measure only the medication, nutrition, and physical exercise statuses of patients and do not evaluate patients psychosocially. Adapting this scale, which deals psychosocially with patients with Type 2 diabetes managing the disease, into Turkish was an important step for patients.

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