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TRANSLATION AND VALIDATION OF DIABETES MANAGEMENT SELF-EFFICACY QUESTIONNAIRE (DMSES) INTO URDU LANGUAGE

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ABSTRACT

Introduction: Self-management of diabetes is strongly influenced by self-efficacy. So it is important to assess the self efficacy of diabetic patients in order to improve self management education. There are various questionnaires available for assessment of self-efficacy of diabetic patients, the most widely used being the Diabetes Management Self-Efficacy Questionnaire (DMSES). The aim of the present study was to translate, culturally adapt, and validate the Urdu version DMSES (U-DMSES) in order for it to be used Pakistani diabetic Population.

Methods*:* Standard procedure of back translation was followed to translate the questionnaire into Urdu. Expert panel assessed the Content validity by calculating content validity index (CVI) of the overall questionnaire. A convenient sample was recruited to complete the questionnaire. Psychometric testing of the produced instrument included construct validity (factor analysis) and internal consistency test (Cronbach's alpha) by using SPSS.

Results: Two hundred and seventy four diabetes type 2 patients (DMT2) participated in study. aged 36–86 years. Few changes were made in accordance with the suggestions of panel but no Question was excluded from questionnaire. The average questionnaire based CVI was .85 and

the Cronbach's alpha for the internal consistency was 0.93. Factor analysis presented four factors.

Conclusion: This study showed that DMSES is successfully translated in Urdu, culturally adopted. U-DMSES is a valid and reliable questionnaire and can be used easily and quickly to measure self-efficacy among Pakistani DM patients

Keywords: Diabetes; Diabetes Management Self-Efficacy Questionnaire; Urdu; Self-efficacy; translation

INTRODUCTION

Diabetes Mellitus (DM) is amongst the most threatening global public health issues of twenty-first century. The most frequent forms of DM are type 1, type 2 and Gestational Diabetes so far. But this study will focus on DMT2 because this type is responsible for global epidemic of DM [1].Due to lack of interest of health policy makers, DM remained a low priority as compared to communicable diseases. Due to which prevalence of DM is emerged as global burden. According to International Diabetes Federation (IDF), there were over 415 million people suffering from Diabetes Mellitus Type 2 (DMT2) in 2015. According to their estimation, by 2040 this number could increase up to 642 million [2]. Similarly there are lots of studies which confirm the increase in prevalence over time [1]. In Pakistan, The prevalence of diabetes among adults is 6.9% and 86,364 adults died due to diabetes [3]. Not only the prevalence but DMT2 is also responsible for increasing cost burden and decreasing the quality of life of patients. However, self-efficacy and Self-management can effectively decrease this burden and can increase the quality of life of patients [4].

Self-management is strongly influenced by self-efficacy. Self-efficacy is a psychosocial faith of one's competency to perform a positive activities or tasks[5]. Self-efficacy is based on social cognitive theory. This theory shows that the interaction between behavioral, individual's and environmental factors effecting human performance to cope with health issues and chronic diseases. Bandura demonstrated strong association between self-efficacy and good self-management of diabetes regimens, regular glucose testing, diet plan, and exercise; it can also predict level of Diabetes control [5].

In case of chronic diseases, such as DMT2, Self-management and self-efficacy can play a vital role in management. It is expected

that patient can control 97% of disease with good self-management skills and self-efficacy [6].Thus it is very essential to know the level of self-management and self-efficacy of a Diabetic patient to control the glycemic control. For this purpose several Questionnaires have been developed to assess self-efficacy. Among these Diabetes Management Self-Efficacy Questionnaire (DMSES) was developed by Jaap van der Bijl*et al* found to be best and accurate in terms of assessing the self-efficacy and managing the diabetes of one's by the patient himself [7].

Very few studies have been conducted to assess self-efficacy among DMT2 Patients in Pakistan. One of the reasons for this problem is the availability of validated Urdu version of questionnaire to analyze the self-efficacy among the diabetic patients in research and clinical use [8]. Without proper psychometric evaluation of questionnaire, the outcomes of studies would not be reliable.

The present study aims to translate English version of DMSES into Urdu language, validate translated instrument and check its psychometric properties.

RESEARCH METHODOLOGY

Study Design

This research is designed as questionnaire based cross-sectional study. This would be conducted in Quetta city of Pakistan.

Study Instrument

The instrument to be translated and validated is Diabetes Management Self-Efficacy Questionnaire (DMSES) developed by Jaap van der Bijl*et al*. This instrument contains 20 Questions each having 11 point questionnaire from 0-10. This instrument consists of several activities that patient needs to perform to manage patient's diabetes.

Population

This study would be conducted among DMT2 patients attending different diabetic clinics of Quetta City.

Sampling Procedure

Sampling would be done through convenient sampling method.

Sample Size

For obtaining sufficient sample size these aspects are considered.

a) There should be 51 more cases than the number of variables to support Chi-square testing in Bartlett's test of sphericity.

b) Sample should be large enough to be divided in 2 subsamples for cross validation approach. That would be 200 in number.

c) With 30% Dropout the sample size should be 260 in overall.

Inclusion Criteria

All Patients visiting Diabetic clinic who are diagnosed with DMT2 are included in this study. Except for

a) Patients having age below 18.

b) Patients having DMT1.

c) Patients having any mental disorder.

d) Patients who cannot read or understand Urdu.

e) Patients who did not sign the consent.

Translation Method

The English language version of DMSES will be translated into Urdu by using forward and backward translation technique [9]. Content validity is performed by panel of experts by giving scores and calculating CVI both Question wise and questionnaire wise.

Statistical Analyses

The validation and reliability was done by using SPSS.

RESULTS

1.1. Description of sample

Three hundred patients with DMT2 were requested to take part in this study. Out Of these 300 patients, 26 did not complete the study for the following reasons.

- Twelve withdrew from study without giving any specific reason
- Seven patients did not meet the inclusion criteria
- Two participants did not complete the questionnaire
- Four patients didn't sign the consent form

Therefore, two hundred and seventy four respondent's data was analyzed. The mean age was 48.7 (SD=17.5) years with a diagnosis of DMT2 on average for 8.6 (SD=8.2) years. The youngest DMT2 patient was 31, the oldest was 65. The respondents consisted of 58% females. Forty seven percent had primary school education only, 44% were unemployed or retired. The average number of years they were suffering from DMT2 was 8.6 (SD=8.2) years. The characteristics of participants are summarized in Table 1.

Table 1: Characteristics of participants **(n=274)**

Characteristics		Number	%	Mini-mum	Maxi-mum	Mean(SD)
Age		274	100	31	65	48.7 (17.5)
Diagnosis duration (years)		274	100	.1	17	8.6 (8.2)
Gender:	Male	127	46.3			
	Female	147	53.7			
Education:	No education	37	13.5			
	Primary	36	13.1			
	Matriculation	82	29.9			
	Intermediate	111	40.5			
	Graduates	08	2.9			
Marital status:	Single	07	2.5			
	Married	258	94.1			
	Divorced/ Widowed	09	3.2			
Employment status:	None or retired	54	19.7			
	Presently employed	69	25.1			
	Home makers	151	55.1			
Diabetic complications:	No	171	62.4			
	Yes	103	37.5			
History of other diseases:	No	121	44.1			
	Yes	153	55.8			
Management of diabetes:						
Insulin injection:	No	247	90.1			
	Yes	27	9.9			
Diet control	No	143	52.1			
	Yes	131	47.8			
Exercise control	No	214	78.1			
	Yes	60	21.8			

Result of The Urdu Translated Version Of The Dmses (U-DMSES)

Translation and development of the U-DMSES

To maintain semantic equivalence and clarity of the Urdu translation, methods and principles of translation proposed in methodology chapter were followed. Due to inherent differences in the structures of English and Urdu languages, few changes were made in the DMSES during the translation process to adopt the questionnaire. The translated Urdu version of DMSES was adopted after four revisions from translators during the process of forward and backward translation. The changes were identified by panel of expert's discussion on the back-translation. Results of the adaptation of the U-DMSES included: In Question no 1, 2 and 3 "Blood glucose" was

change with word "Blood Sugar". In Question no 18, "Diabetes" word was changed with "Sugar" because diabetes is less known by diabetes and its Urdu word (Ziabitees) and commonly known as "sugar". In same Question Doctor was left as it is because most of patients do not understand the Urdu translation of Doctor that is "Mualij". Question no 13 and 14 very seemed very similar to panel but panel accepted it provisionally.

Validation and reliability analyses of the U-DMSES

After the translation stage, the second stage tested the validation and reliability of the U-DMSES. The validation of questionnaire was been performed by examining the content of questionnaire, construct and criterion validity. While the reliability of questionnaire was confirmed by assessing internal consistency.

The content validity of the U-DMSES

The panel of content experts analyzed the content validity of U-DMSES (see Table 4.2). Content validity was judges by asking the members of panel to rate each Question as a valid measure of the construction using a five-point Likert questionnaire based on following criteria:

- The applicability of content
- Clarity of phrasing.

Moreover, the panel was asked to comment on each Question relative to the precision, clarity, style, and cultural relevance of the Urdu translated Questions.

Question Based CVI

According to CVI results Question no 15 was least applicable having average applicability score of .70 and Question no 2 had .72. Question no 8 and 10 had average applicability CVI of .74. Question based CVI for the clarity of Question 5 was .76. The average score of Question based CVI of Question no 5 and 15 was .77. Question no 15 was confusing but panel accepted this.

Questionnaire based CVI

Overall average CVI score for the applicability and clarity was .84 and .85, respectively. The average CVI score for U-DMSES was .85.

Pilot Testing: The modified version of the U-DMSES by the panel was pilot tested with 10 patients. All participants easily understood and showed their willingness to fill the questionnaire in 10-15 minutes.

The construct validity of the U-DMSES

For the purpose to analyze the construct validity of Questionnaire principal-component factor analysis was performed with a varimax rotation using SPSS V20. In order to obtain correct number of factors the following criteria was followed:

(1) Eigen values greater than 1.0

(2) Scree Plot

(3) The percentage of total variance explained by each factor

(4) Factor loading cutoff of .4

Sample Tests

Two sample related tests to be significant before doing Factor analyses.

(1) **The Bartlett's chi-square test of sphericity**: It is used to test if samples have homogeneity of variances. The Bartlett's chi-square test of sphericity was found to be significant ($p<.00$).

(2) **KMO Measure of Sampling Adequacy (MSA):** The Kaiser-Meyer-Olkin (KMO) was found to be acceptable at .90.

The results of these two tests confirmed that a factor analysis could be performed on this dataset.

The principal-component factor analysis (PCA) for U-DMSES

PCA revealed Six (6) factors with an Eigen value > 1, mentioned in table 4.5. Acording to scree plot, a four factors were identified (Eigen value values: 9.33, 2.35, 1.61 and 1.29) was considered. These factors accounted for 48.75, 10.51, 8.32 and 5.69 percentile of variance respectively. Over all these factors accounted for 74.27 cumulative percentile (Table 2).

Results of the PCA using Varimax rotation

Following distribution of Questions which loaded above .40 were observed among factors.

Factor I contained 9 Questions (4, 5, 9, 10, 13, 14, 15, 16 and 17) related to nutrition.

Factor II contained 4 Questions (1, 2, 3, and 7) related to blood sugar and feet check.

Factor III contained 4 Questions (6, 8, 11 and 12) related to physical exercise and weight.

Factor IV contained 3 Questions (18, 19 and 20) related to medical treatment.

Over all factorial analyses showed that U-DMSES was consistent and the results reflected the four factors (Table 3).

Reliability Analyses of U-DMSES

Internal Consistency of U-DMSES

A Cronbach's alpha value was calculated by using SPSS. The overall cronbach's alpha value was .86. As the results of factor analysis showed, four sub questionnaires were formed. The Cronbach's alpha was .91 for nutrition related Questions, .78 for physical exercise and weight related Questions, .83 for medical treatment related Questions and .84 for blood sugar and feet check related Questions. "Alpha if Question deleted" procedure showed the mean-Question correlation was .39 (min. = .12, max= .90) for U-DMSES. This analysis demonstrated a multi-dimensional questionnaire (Table 4).

Table 2: The result of the principal-component factor analysis for U-DMSES

Factor number	Eigenvalue[a]	Percentiles of variance[b]	Cumulative percentiles[b]
1	9.33	48.75	48.75
2	2.35	10.51	59.26
3	1.61	8.32	67.58
4	1.29	5.69	74.27

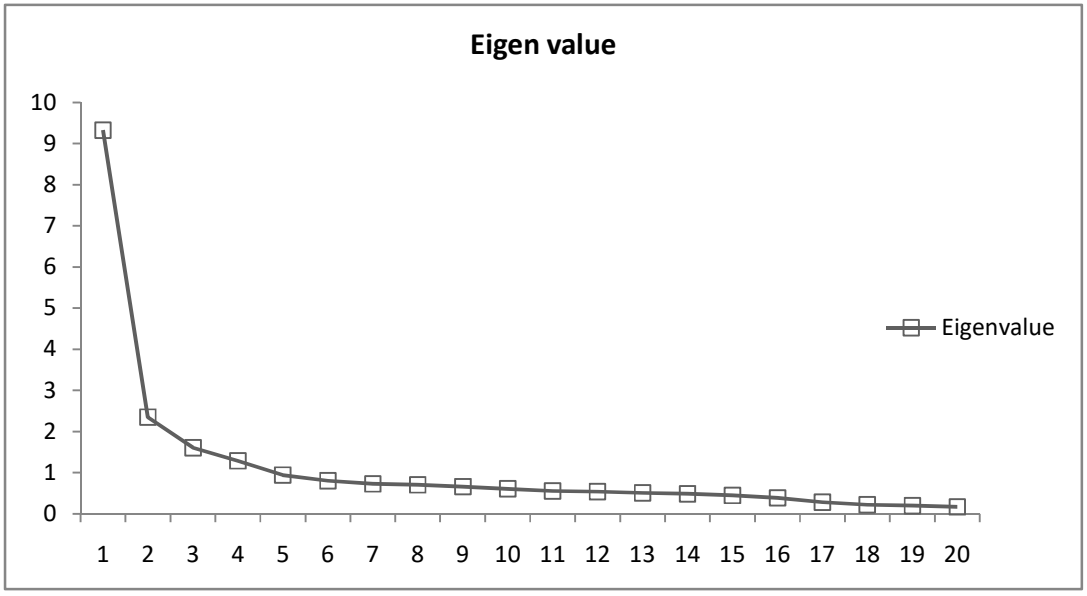

Figure 1: Scree Plot

Table 3 Rotated factor matrix of the U- DMSES. Principal-component method with Varimax

Question No	Factor I	Factor II	Factor III	Factor IV
Factor I				
U-DMSES 17	.87			
U-DMSES 4	.86			
U-DMSES 9	.81			
U-DMSES 10	.77			
U-DMSES 5	.68			
U-DMSES 14	.53			
U-DMSES 13	.53			
U-DMSES 16	.47			
U-DMSES 15	.42			
Factor II				
U-DMSES 7		.85		
U-DMSES 1		.81		
U-DMSES 3		.52		
U-DMSES 2		.48		
Factor III				
U-DMSES 11			.78	
U-DMSES 6			.75	
U-DMSES 12			.66	
U-DMSES 8			.48	
Factor IV				
U-DMSES 18				.87
U-DMSES 20				.85
U-DMSES 19				.74
Variance Explained (%)				68.32

Table 4: Cronbach's α value of U-DMSES

Factors	Number of Questions	Cronbach's α
Over all U-DMSES	**20**	**.93**
Nutrition Factor	**9**	**.91**
Physical exercise and weight Factor	**4**	**.78**
Medical treatment Factor	**3**	**.83**
Blood sugar and feet check Factor	**4**	**.84**

DISCUSSION

This present study was aimed to translate, culturally adapt and perform the psychometric properties of translated U-DMSES among Diabetic population of Pakistan. Results demonstrated that the Questions were homogenous to the questionnaire. The psychometric properties of the U-DMSES showed that this translated tool can work as a significant predictor of diabetes self management.

The sample size determination criteria were satisfied in methodology section. The sample size in the present study was greater than that of the Australian (n = 88) and Turkish (n = 125) Chinese (n=230) and Greek (n=116) validation studies and smaller than that of the Iranian (n = 332), Malaysian (n=388) and Korean (n=440) validation studies [10-16].

The content validity of U-DMSES proved to be secured. Questionnaire based CVI was equal to Greek version of DMSES but was less then Turkish where S-CVI was .86 [10]. Just like Greece validation panel of experts in this study lacked self efficacy expert because there is no specialty in Pakistan.

Four factors were identified in current study using PCA. These factors were similar to other validation studies except Turkish and Iranian version where 3 and 6 factors were identified respectively [10, 17].

Internal consistency of the U-DMSES was high with a value of 0.93 was similar to Greek version of DMSES and Chinese version of DMSES. Internal consistency of subscales ranged from 0.78 to 0.91. These findings of subquestionnaires are similar to results for the Iranian (0.92), English (0.91), and Chinese versions (0.93), and higher than the Dutch (0.81) and Turkish versions (0.88) [10-13, 15-19].

CONCLUSION

This study showed that DMSES is successfully translated in Urdu, culturally adopted. U-DMSES is a valid and reliable questionnaire and can be used easily and quickly to measure self-efficacy among Pakistani DM patients. Moreover, U-DMSES will give the opportunity to health professionals of Pakistan to compare the effectiveness of their Diabetes education

regarding self-efficacy and further improve their diabetes education techniques.

REFERENCES

[1] Zimmet, P.Z., et al., *Diabetes: a 21st century challenge.* The lancet Diabetes & endocrinology, 2014. **2**(1): p. 56-64.

[2] Zimmet, P., et al., *Diabetes mellitus statistics on prevalence and mortality: facts and fallacies.* Nature Reviews Endocrinology, 2016. **12**(10): p. 616-622.

[3] International Diabetes Federation. *Diabetes in Pakistan* 2015 [cited 2016; Available from: http://www.idf.org/membership/mena/pakistan.

[4] Lorig, K., et al., *Benefits of diabetes self-management for health plan members: a 6-month translation study.* Journal of Medical Internet Research, 2016. **18**(6).

[5] Bandura, A., *Self-efficacy*1994: Wiley Online Library.

[6] Mohebi, S., et al., *Review the key role of self-efficacy in diabetes care.* Journal of education and health promotion, 2013. **2**(1): p. 36.

[7] Bijl, J.v.d., A.v. Poelgeest-Eeltink, and L. Shortridge-Baggett, *The psychometric properties of the diabetes management self-efficacy questionnaire for patients with type 2 diabetes mellitus.* Journal of advanced nursing, 1999. **30**(2): p. 352-359.

[8] Ansari, R.M., H. Hosseinzadeh, and N. Zwar, *Systematic review of Type 2 diabetes self-management: focusing on the middle-aged population of rural area of Pakistan.* 2016.

[9] Cha, E.S., K.H. Kim, and J.A. Erlen, *Translation of questionnaires in cross-cultural research: issues and techniques.* Journal of advanced nursing, 2007. **58**(4): p. 386-395.

[10] Kara, M., et al., *Cross-cultural adaptation of the diabetes management self-efficacy questionnaire for patients with type 2 diabetes mellitus: Questionnaire development.* International journal of nursing studies, 2006. **43**(5): p. 611-621.

[11] McDowell, J., et al., *Validation of the Australian/English version of the diabetes management self-efficacy questionnaire.* International journal of nursing practice, 2005. **11**(4): p. 177-184.

[12] Fappa, E., et al., *Validation of the Greek Version of the Diabetes Management Self-Efficacy*

Questionnaire (GR-DMSES). Advances in therapy, 2016. **33**(1): p. 82-95.

[13] Wu, S.-F.V., et al., *Development and validation of the Chinese version of the Diabetes Management Self-efficacy Questionnaire.* International journal of nursing studies, 2008. **45**(4): p. 534-542.

[14] Sharoni, S.K.A. and S.F.V. Wu, *Self-efficacy and self-care behavior of Malaysian patients with type 2 diabetes: a cross sectional survey.* Nursing & health sciences, 2012. **14**(1): p. 38-45.

[15] Noroozi, A. and R. Tahmasebi, *The diabetes management self-efficacy questionnaire: translation and psychometric evaluation of the Iranian version.* Nursing Practice Today, 2015. **1**(1): p. 9-16.

[16] Choi, E.J., et al., *Psychometric properties of a Korean version of the summary of diabetes self-care activities measure.* International journal of nursing studies, 2011. **48**(3): p. 333-337.

[17] Coffman, M.J., *Translation of a Diabetes Self-Efficacy Instrument: Assuring Content and Semantic Equivalence.* Journal of Theory Construction & Testing, 2008. **12**(2).

[18] Lee, E.-H., et al., *Psychometric properties of the diabetes management self-efficacy questionnaire in Korean patients with type 2 diabetes.* International journal of endocrinology, 2015. **2015**.

[19] Sturt, J., H. Hearnshaw, and M. Wakelin, *Validity and reliability of the DMSES UK: a measure of self-efficacy for type 2 diabetes self-management.* Primary Health Care Research & Development, 2010. **11**(04): p. 374-381.