Validity-Reliability Study of the Turkish version of the Self-Efficacy for Managing Chronic Disease 6-item Scale in Migraine Patients

İlknur ÖZKAN[1], Nermin OLGUN [2]

[1](Akdeniz University Faculty of Kumluca Health Sciences, Nursing Department, Turkey, Asst. Prof.)
[2](Hasan Kalyoncu University School of Health Sciences Nursing Department, Turkey, Prof. Dr.)
Corresponding Author: İlknur ÖZKAN

Abstract
 Aim: The purpose of the study is to conduct the validity-reliability study the Turkish version of Self-Efficacy for Managing Chronic Disease 6-Item Scale (SEMCD) in migraine patients.
Method: The sample of the methodological and descriptive study consisted of 343 migraine patients in the neurology outpatient clinic of a university hospital. Language validity of SEMCD scale was conducted with back translation and expert panel methods. Reliability analysis was performed with test-retest correlation, item-total score correlation and internal consistency analysis. Explanatory factor analysis was applied for construct validity. In order to support the construct validity, the Migraine Disability Assessment Test (MIDAS) and Scale of Self-Disease Management Strategies in Migraine Patients (SSDMSMP)" were used.
Results: It was found that the scale was composed of one factor with loads ranging from 0.86 to 0.93. The item-total score correlation coefficients of the scale were found to be between 0.67 and 0.74. The Cronbach's alpha reliability coefficient was found as 0.95 for the overall scale. Test-retest correlations were found to be significant. Moreover, significant correlations were obtained between MIDAS and SSDMSMP.
Conclusion: The Turkish version of SEMCD is a valid and reliable tool to be used to evaluate the self-efficacies ofmigraine patients.
Keywords: Migraine, psychological adaptation, psychometric, self-efficacy, chronic disease management

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I.   Introduction

Self-efficacy is defined as a person's personal belief in the fulfillment of a specific behavior. The concept of self-efficacy was introduced by the psychologist Albert Bandura in 1977 for the first time (1). Self-efficacy, one of the basic concepts thought to be effective on behavior, is one of the basic components of social learning theory. According to Bandura, behaviors are influenced by the people's beliefs on their capacities and competences in any area, rather than their actual ability levels they have in that area. The stronger the competency expectations people have, the more active they are and the more effort they spend (2).

There are disagreements as to whether self-efficacy belief is a state or trait. Accordingly, self-efficacy belief is examined as task-specific or general self-efficacy. In the task-specific self-efficacy measure, academic self-efficacy is analyzed as situation specific like interpersonal relationships self-efficacy, and disease-specific self-efficacy, in other words, self-efficacy related to targeted behavior (2, 3). According to the self-efficacy theory, patients' confidences in fulfilling health behaviors affect the health outcomes (3, 4). It has been seen in the studies on individuals with chronic illness that as self-efficacy increases, the quality of life and disease management behaviors increase, but pain intensity, anxiety and depressive symptoms decrease (5,6 7,8,9,10,11).

Self-efficacy plays a key role in adaptation to disease in the management of migraine which is a chronic disease. Self-efficacy specific to headache demonstrates the confidence in fulfilling the activities conducted to prevent headache episodes or manage headache-related inadequacy. Individual differences perceived about the interventions to be applied in the prevention and management of headache are related to individual adaptation to headache problems (11, 12, 13, 14, 15, 16). Therefore, it is very important to evaluate the self-efficacy of the migraine patients about the self-disease management behaviors. Healthcare professionals can make the interventions that increase the self-efficacies on coping skills with the disease by determining the patients with low self-efficacy in migraine management.

The Self-Efficacy for Managing Chronic Disease 6-Item Scale (SEMCD) is a scale that is less burdensome for the patients and can be used effectively in clinical practices and researches. This brief scale was developed by the Stanford Patient Education Resource Center. The SEMCD scale covers the fields of symptom control, role function, emotional function, and communication with doctors which are common in all chronic

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diseases (17). The adaptation study of this scale into various languages has been conducted and it has been found to be a valid and reliable tool (18, 19, 20, 21).Turkish adaptation of SEMCD scale has not been conducted so far. The aim of this study is to conduct the validity-reliability study of the Turkish version of SEMCD in migraine patients.

II. Method

2.1. Design, Sample, and Place of the Study

The study was designed as methodological and descriptive. The population of the study consisted of outpatients diagnosed with migraine according to the criteria of the International Headache Society (IHS) in Neurology Outpatient Clinic of a University hospital between June 2011 and June 2012. The sample of this study consisted of 343 migraine patients who were diagnosed with migraine according to IHS criteria at least 6 months ago, had MIDAS score >5, did not use protective treatment, were older than 18 years, were willing to participate in the study, had no other chronic disease, and can read and write in Turkish based on item number of the scale.

2.2. Adaptation Stages of Measuring Tools

The language validity of The Self-Efficacy for Managing Chronic Disease 6-Item Scale (SEMCD) was conducted in the first stage of the study; whereas, the validity and reliability study was conducted in the second step.

1st Stage; Language Validity

Language and translation studies of the scale were performed by following the below steps as mentioned in the literature: 1.The scale was translated from English into Turkish by two independent people who knew both languages fluently. 2. Two translations were combined and turned to a single tool by two people who have a good command of English by reaching to an agreement. 3. The combined translation was translated back from Turkish to English by a translator who can speak and write both languages very well. 4. The scale which was translated back into English was compared with the original English scale (24). The Turkish version was discussed and finalized. The obtained Turkish form was presented to the expert panel for the content validity. Content validity index (CVI) value of the scale was calculated as 1. The suggestions of the experts were evaluated and the scale was applied to a group of 30 people. Since each item was found to be comprehensible in the preliminary application, no change was made in the scale.

2nd Stage; Psychometric Validation of the Scale

In the development of the scale, reliability was tested by using test-retest analysis, correlation-based item analysis and internal consistency analysis with Cronbach's alpha; whereas, the validity was tested by explanatory factor analysis methods.

2.3. Data Collection

The information form prepared by the researcher, SEMCD scale adapted into Turkish, MIDAS test, Scale of Self-Disease Management Strategies in Migraine Patients (SSDMSMP) developed by the researcher were applied to the patients who met the inclusion criteria of the study.

The Patient Information Form consisted of 30 questions including socio-demographic and disease-related data of the patients. Questions regarding socio-demographic characteristics like age, gender, education, marital status, the status of having children, social security, occupation, and financial situation were asked. Questions were asked about the disease like the duration of the illness, pain frequency, onset, characters, duration, and severity, the presence of aura, the symptoms accompanying the pain, the localization of the pain, the post-pain condition, the treatment received, the factors triggering the pain, and the non-pharmacological methods used to cope with the pain. SEMCD scale was developed by the Stanford Patient Education Resource Center. This brief scale can be used effortlessly and effectively in the clinical practices and researches for the patients. The scale consists of items that are common in many chronic diseases, including common symptom control, role function, emotional function, and communication with the physician. In the scoring, each item is marked with a number. If two consecutive numbers are encircled, the smaller number is coded. If two non-consecutive numbers are marked for a question, the question is not coded. The total score of the scale is the mean of these six items. If more than two questions are not marked, the scale is not calculated. High score indicates high self-efficacy (17). MIDAS test was developed by Stewart et al., Turkish validity and reliability study of the test was conducted by Ertas et al., in 2004. MIDAS is a scale involving 7 questions to assess the severity of headache and headache-related losses. The MIDAS test is designed to measure the losses caused by migraine in 3 major activity areas such as work/school, housework and family/social activities. The questions are answered by considering the last three months. MIDAS is a clinically widely used scale to evaluate the effects of migraine on patients (23).

SSDMSMP is a scale consisting of 17 items developed by the researcher for the purpose of evaluating the strategies used by the patient to manage and prevent the migraine related headache. The Cronbach's alpha value of the scale is 0.95 and consists of four subscales as palliative strategies, strategies to be avoided, systematic cognitive and behavioral strategies, and muscle tension reduction strategies. While calculating the scores of the factors of the scale, factor scores are obtained by summing the values of the items in the factors and then dividing the result to the number of items (arithmetic mean). The increase in the overall score average of the scale indicates that the use of self-disease management strategy is increasing.

Forms were applied to the patients, who met the inclusion criteria, by the researcher. A second interview was conducted with 30 patients in the same sample group for the test-retest application with 15-day interval.

2.4. Data Analysis

When evaluating the results obtained in the study, SPSS (Statistical Package for Social Sciences) for windows 17.0 program was used for statistical analyses and Lisrel 8.51 program was used for explanatory factor analyses.

Socio-demographic and disease-related characteristics of the migraine patients were given in number and percentage. In order to determine if or not the sample size was sufficient for factor analysis, the Kaiser-Meyer-Olkin (KMO) test and the Bartlett's Sphericity test were applied before factor analysis.

In order to assess the construct validity of the scale, exploratory factor analysis which is mainly used for combining the related items in a specific cluster and varimax' axis rotation principal components analysis were used.

In order to determine the reliability of the adapted scale, the item total score correlation coefficients of 6 items were calculated. Cronbach's Alpha values were calculated by performing the internal consistency analysis of the items in the scale. In order to evaluate the time invariance property of the scale, test-retest was applied to 30 participants who were reached fifteen days after the first application. The "Pearson Product-Moment Correlation Coefficient" was calculated for the test-retest method.

2.5. Ethical Consideration of the Study

The compliance of this study with the ethical principles was evaluated by non-invasive ethics committee of Marmara University Faculty of Medicine and the ethical approval was obtained (MAR-YÇ-2009-0152/08.05.2009). Written consents of the patients were obtained after the necessary explanations made by the researcher during the application. Stanford Patient Education Resource Center has allowed SEMCD scale to be used without their permission.

III.   Results

Results of the study were examined under the titles of socio-demographic characteristics, test-retest analysis, correlation-based item analysis, factor analysis, internal consistency analysis, and descriptive results of the study.

3.1. Socio-demographic Characteristics

The mean age of the migraine patients participating in the study was 33.6 ± 11.2 years and 66.2% of them (n: 227) were married, 43.1% (n:148) had higher education level, 53.4% (n:183) were married, 89.2% (n:306) had social security, 28.9% (n: 99) were housewives, 84.5% had moderate level income.

When the clinical features of migraine were examined; it was determined that 42.6% (n:146) of them had a disease duration of 1-5 years, headaches of 48.4% (n:166) lasted for 4-12 hours, 66.5% (n:228) had severe pain, headaches of 38.8% (n: 133) varied 1-3 days a week, 59.5% (n:204) had slow pain onset, 60.6% (n:208) had throbbing pain, and 61.5% (n:211) had pains as attacks.

3.2. Test-retest analysis:

In the Pearson product-moment correlation analysis showing the conformance between the test-retest mean scores of the adapted scale, a statistically significant, positive, and strong correlation was found between two measurements (r=0.95; p=0.00). The difference between the scores obtained with two measurement results repeated 15 days apart in the draft scale was examined by using dependent samples t-Test analysis. The difference between the two applications was found to be statistically insignificant (t=-1.73; p=0.16).

3.3. Correlation-based item analysis:

According to the result of correlation-based item analysis of the SEMCD scale, the item-total score correlation coefficients of 6 items ranged from 0.67 to 0.74 (Table 1).

3.4. Factor Analysis

The explanatory factor analysis method was applied to reveal the construct validity of the scale. As a result of the Barlett's test (p=0.000<0.05), a correlation between the variables included in the factor analysis was determined. As a result of the test (KMO=0.909>0.60) the sample size was found to be sufficient for the factor analysis. By selecting varimax method in the factor analysis, the structure of the correlation between the factors was kept the same. As a result of the factor analysis, the variables were collected under a factor with total variance of 83.17% (Table 1).

3.5. Analysis of SEMCD Scale

In order to calculate the reliability of SEMCD scale, "Cronbach's Alpha" which is the internal consistency coefficient was calculated. The overall reliability of the scale was found very high as alpha=0.958 (Table 1).

3.6. Descriptive Results of the Scale

SEMCD scale overall mean scores of the migraine patients participating in the study was determined as 4.532 ±1.704 (min-max: 1.500 - 9.330). In order to support the construct validity, SEMCD scale mean scores were evaluated according to socio-demographic characteristics, migraine characteristics, and patients' MIDAS grades. The correlation between the SEMCD scale overall mean score and gender, age, disease duration of the migraine patients participating in the study was not statistically significant (p>0.05). When the mean scores of SEMCD scale were compared with the educational level, pain duration, pain severity and MIDAS grades, the difference was found to be statistically significant. As the educational level increased, mean scores of SEMCD scale increased (F=16.443; p<0.001). It was seen that as the pain duration, pain severity and MIDAS grade increased, mean scores of SEMCD scale decreased (F=3.40 p<0.05; F=16.252, p<0.001; F=81.358; p<0.001) (Table 2). A negative significant correlation was found between SEMCD and MIDAS total number of pain days (r=-0.370; p<0.001). The correlation between the SEMCD and SSDMSMP scale was assessed. Strong positive correlations were determined between two scales (Table 3).

IV. Discussion

The study was conducted to adapt the "Self-Efficacy for Managing Chronic Disease 6-Item Scale" (SEMCD) into Turkish and evaluate its psychometric properties. The SEMCD scale adapted to Turkish showed an acceptable validity and high reliability.

As a result of the explanatory factor analysis applied in order to reveal the construct validity of SEMCD scale, items were observed to be collected under a factor. In the English, German, Spanish, and Persian versions of the SEMCD scale, the scale items were also collected under one factor (17, 18, 20, 21). Only in the study by Hu et al., the items were collected under two factors in the Chinese version of SES6 (19). The fact that the sample group consisted only of patients with hypertension was shown to be the possible cause. Only migraine patients were studied in the Turkish version of SEMCD scale; but the scale items were collected under a single factor as in the original form.

In order to test the reliability of the SEMCD scale, item total score correlation, Cronbach's alpha, and test-retest testing methods were used. Although there is no consistency in the literature regarding the item-total score correlation coefficient, the lowest level is generally accepted as 0.20. It is reported that the items with a correlation coefficient between 0.30 and 0.40 are "good" and those with a value above 0.40 are "very good" (24). In this study, when the "item-total score correlation" of 6 items was examined, correlation coefficients of the items were determined to be between 0.67 and 0.75. Another method recommended in the evaluation of reliability in Likert type scales is the Cronbach's Alpha reliability coefficient (25). The Cronbach's Alpha coefficient of the SEMCD scale adapted to Turkish was 0.95. The Cronbach's Alpha value of the adapted scale is similar to the results of other studies. In the Pearson Product-Moment Correlation analysis showing the coherence between the test-retest mean scores of the adapted scale, a statistically significant, positive, and strong correlation was determined between the two measurements (r=0.95; p=0.00). The difference between the scores obtained with the results of two measurements repeated with 15-day intervals on the adapted scale was examined by using dependent samples t-Test analysis. The difference between two applications was not statistically significant (t=-1.73; p=0.16). The fact that the consistency between the test-retest mean scores of SEMCD scale was positive and strong and there was no significant difference between the mean scores obtained from two measurements showed that the responses of the participants did not change and were similar.

Scale scores were assessed according to their socio-demographic characteristics and MIDAS grades in order to support the construct validity. In the study, as the educational levels of migraine patients increased, mean scores of SEMCD scale increased. In the literature, there is no information regarding the correlation between educational level and self-efficacy in migraine patients. It was seen in the studies in hemodialysis patients that as the educational level increased, the self-efficacy levels of the patients increased (26,27).

As the pain duration and pain severity increased, the mean scores taken from SEMCD scale decreased. These negative experiences of patients may have affected their self-efficacy perception negatively. It was observed that self-efficacy mean scores decreased as MIDAS grade increased. A negative significant correlation was found between the mean scores from SEMCD scale and MIDAS total number of pain days. It was determined in the study conducted by French et al. (2000) with migraine patients that migraine- induced limits decreased as the self-efficacy increased.

In order to support the construct validity, the correlation between the SEMCD scale and SSDMSMP was evaluated. Positive and strong correlations were found between the two scales. In the study by French et al., (12), they evaluated the correlation between the self-efficacy and occupational strategies in headache. Self-efficacy scores were found to be higher for those who used positive psychological engagement strategies to prevent and manage disease than those who did not. In addition, the correlation between the positive psychological engagement strategies used in the prevention and management of headache and the self-efficacy scale in headache management was examined and a positive significant correlation was found. Self-confident individuals used more active engagement strategies in the prevention and management of headache. In the other studies, behavioral migraine management also increased with increasing self-efficacy in migraine patients (12, 13, 14, 15, 16). In the study, the positive correlation between SEMCD scale and SSDMSMP was found to be compatible with the literature.

When the results of this study were evaluated, some limitations should be taken into consideration. Turkish validity and reliability study of SEMCD scale were conducted only in migraine patients. It is also necessary to work in group of other chronic diseases. Because the prevalence of migraine is higher in women, the number of women in the sample was higher than the number of men. This type of sample is not considered appropriate for psychometric studies.

V.   Conclusion

SES6 adapted into Turkish is a relatively short and useful scale showing acceptable validity and high reliability. It can be used practically in migraine training programs to evaluate the self-efficacy of the patients. It can be recommended to repeat the study in different chronic disease groups.

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Table 1. Item Total Correlation Coefficients and Factor Structure Internal Consistency Analysis of SEMCD Scale

Boyut	Madde	Item-Total Correlations	Factor Loading	Explained Variance	Cronbach's Alpha
Self Efficacy	How confdent are you that you can keep the fatigue caused by your disease from interfering with the things you want to do?	0.75	0.935	83.17	0.958
	How confdent are you that you can keep the physical discomfort or pain of you disease from interfering with the things you want to do?	0.74	0.928		
	How confdent are you that you can keep the emotional distress caused by your disease from interfering with the things you want to do?	0.74	0.932		
	How confdent are you that you can keep any other symptoms or health problems you have from interfering with the things you want to do?	0.71	0.904		
	How confdent are you that you can do the different tasks and activities needed to manage your health condition so as to reduce that you need to see a doctor	0.77	0.901		
	How confdent are you that you can do things other than just taking medication to reduce how much your illness affects your everyday life?	0.67	0.869		

Table 2. Distribution of SEMCD Scale in terms of Socio-demographic Characteristics and MIDAS Grade

	Gender	N	Mean	Ss	t	P
Self Efficacy	Male	116	2.339	0.538	1.412	0.159
	Female	227	4.625	1.727		
	Education	**N**	**Mean**	**Ss**	**F**	**P**
	Primary School	93	3.790	1.242	16.443	**0.000***
	Secondary School	102	4.490	1.836		
	University	148	5.027	1.697		
	Duration of disease	**N**	**Mean**	**Ss**	**F**	**P**
	6-12 Month	58	4.773	1.789	0.662	0.576
	1-5 Year	146	4.467	1.733		
	6-10 Year	87	4.416	1.684		
	11 Year and over	52	4.641	1.571		
	Duration of pain	**N**	**Mean**	**Ss**	**F**	**P**
	4-12 hours	166	4.627	1.810	3.401	**0.034***
	12-24 hours	84	4.766	1.742		
	24 hours long	93	4.152	1.404		
	Pain severity	**N**	**Mean**	**Ss**	**F**	**P**
	Mild	61	5.495	1.780	16.252	**0.000****
	Severe	228	4.447	1.677		
	Very severe	54	3.806	1.213		
	MIDAS Grade	**N**	**Mean**	**Ss**	**F**	**P**
	II. Grade	63	6.347	1.543	81.358	**0.000****
	III. Grade	98	4.793	1.515		
	IV. Grade	182	3.764	1.291		

F: One Way Variance Analysis (ANOVA) t: Independent t test   *p< 0.05 ** p<0.001

Table 3. Correlation Analysis of SEMCD Scale with SSDMSMP and MIDAS total number of pain days

		Palliative strategies	Strategies to be avoided	Systematic cognitive and behavioral strategies	Systematic the muscle tension reduction strategies	Overall mean scores of SSDMSMP	MIDAS total number of pain days
SEMCD	r	0.707	0.577	0.610	0.488	0.745	-0.370
	p	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*

r: Pearson Correlation Analysis *p<0.001   SEMCD: Self-Efficacy for Managing Chronic Disease 6-Item, SSDMSMP: Scale of Self-Disease Management Strategies in Migraine Patients