

# Reliability and Validity of the Turkish Version of the Dialysis Symptom Index in Chronic Hemodialysis Patients

## *Kronik Hemodiyaliz Hastalarında Diyaliz Semptom İndeksinin Türkçe Versiyonunun Güvenirlik ve Geçerliği*

### ABSTRACT

**OBJECTIVE:** This study was planned for the purpose of adapting and determining the reliability and validity of the Turkish version of the “Dialysis Symptom Index (DSI)” for Turkish hemodialysis patients.

**MATERIAL and METHODS:** This study was conducted in two dialysis units. A total of 120 hemodialysis patients participated in the research. Written permission to conduct the research was obtained from the institutions and the patients. Research data were collected using a questionnaire and the DSI. It assesses symptoms and their severity and is widely used in patients in the end stage of the disease. The kappa values were calculated for test-retest and the Cronbach alpha coefficients were also calculated in the reliability study. Language validity and content validity were tested in the validity study.

**RESULTS:** The patients’ mean age was 54.53 (13.80). The kappa values ranged between 0.10 to 0.9 on the DSI. Cronbach’s alpha coefficient of the DSI was determined to be 0.83.

**CONCLUSION:** As a result of this study carried out in accordance with methodological research principles, the Turkish version of the DSI has been understood to be a reliable and valid measurement index in Turkish populations.

**KEY WORDS:** Hemodialysis, Symptom, Dialysis symptom index

### ÖZ

**AMAÇ:** Bu çalışma kronik hemodiyaliz hastalarında Türkçe Diyaliz Semptom İndeksinin (DSİ) uyarlanması ve güvenirlilik ve geçerliliğinin belirlenmesi amacıyla planlandı.

**GEREÇ ve YÖNTEMLER:** Bu çalışma 2 diyaliz merkezinde yürütüldü. Araştırmaya toplam 120 hemodiyaliz hastası katıldı. Araştırmanın yürütülebilmesi için kurumlardan ve hastalardan yazılı izin alındı. Araştırma verileri soru formu ve DSİ kullanılarak toplandı. DSİ son dönem böbrek hastalığı olan bireylerde yaygın olarak kullanılır ve semptomları ve semptomların şiddetini değerlendirir. Güvenirlilik çalışmasında test –retest için kappa değerleri, ve ayrıca Cronbach alfa katsayısı hesaplandı. Geçerlik çalışmasında dil geçerliği ve kapsam geçerliği test edildi.

**BULGULAR:** Hastaların yaş ortalaması 54,53 (13,80)’di. DSİ kappa değerleri 0,10 ile 0,93 değerindeydi. DSİ Cronbach alfa katsayısı 0,83 olarak belirlendi.

**SONUÇ:** Metodolojik araştırma prensiplerine uygun olarak yapılan bu araştırmanın sonucunda, DSİ’nin Türkçe versiyonunun Türk toplumu için güvenilir ve geçerli bir indeks olduğu anlaşıldı.

**ANAHTAR SÖZCÜKLER:** Hemodiyaliz, Semptom, Diyaliz semptom indeksi

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## INTRODUCTION

Hemodialysis patients can suffer from a number of physical and emotional symptoms due to the comorbid illness, treatment-related side effects, lifestyle alteration, and the psychosocial impact of living with end-stage renal disease (1,2,3,4). Loss of energy, exhaustion, anorexia, pain, nausea, pruritus, shortness of breath, muscle cramps, sexual inadequacy and sleep disturbances are often reported by patients (1,2). These symptoms affected negatively the quality of life of patients (1,2,5). A comprehensive evaluation of these symptoms of patients with chronic renal disease provides information about the impact of the disease and the treatment. A multidimensional measurement of the symptoms also provides information that can be used to improve patient care, through education and counseling in order to sustain the physical and psychological well-being of patients (6). Therefore, these symptoms should be measured by using reliable tools before, during and after the treatment process.

The Dialysis Symptom Index (DSI), developed by Weisbord et al. (2004), is a self-reported index that assesses symptoms and their severity and is widely used in end-stage renal disease patients (Table I). As the original scale is in English, validation of the Turkish version was necessary (Table II).

The reasons for choosing the DSI included the following: (1) There are no reliable tools for assessing hemodialysis symptoms in Turkey, (2) It is a widely used measurement of symptoms in dialysis patients, and (3) The scoring system is practical.

The aim of this study was to adapt culturally and assess the psychometric properties, including internal reliability, stability (test-retest) reliability, and construct validity of the DSI in a Turkish sample.

## METHODS

### Setting

The study was conducted in two dialysis units in Izmir, Turkey.

### Sample

A potential sample of 135 hemodialysis patients who visited 2 dialysis units between September to December 2006 met the following inclusion criteria: They were (1) at least 18 years of age, (2) able to speak Turkish (3) receiving hemodialysis treatment, (4) willing to participate in the study. All participants signed a written consent form prior to participation. If the patients were illiterate, the researcher read the questionnaire items to patients and recorded their responses in order to minimize the burden on patients and decrease the likelihood of missing data.

### Instruments

The Dialysis Symptom Index (DSI) was developed by Weisbord et al. (2004), for assessing physical and emotional symptoms and their severity. The DSI contains 30 items, each of

which targets a specific physical or emotional symptom. Patients enrolled in the study were asked to describe the presence (yes/no) of each symptom at any time during the previous 7 days. The severity of each reported symptom was assessed by asking patients to rate the degree to which the symptom was bothersome by using a 5-point Likert scale (1= "not at all bothersome" to 5= "very much bothersome"). Two scores were generated from the DSI. First, an overall symptom burden score was formulated by totaling the number of symptoms reported as present. Second, a total symptom severity score was generated by summing the severity scores for each reported symptom, with a score of 0 for symptoms that were not reported as present. Using this scoring system, the minimum possible total severity score was 0 if none of the 30 symptoms was present and the maximum potential score was 150 if all of the 30 symptoms were reported and rated as "very much bothersome" (severity score of 5) (6).

### Translation procedures

The study was initiated after the permission was obtained from Steven D. Weisbord to adapt the DSI to Turkish. After obtaining a written consent from the authors' of the DSI, the English language version of the DSI was first translated into the Turkish language separately by three bilingual medical and nursing professionals. Another expert reviewed the Turkish translations together for inconsistencies with the original English form and minor revisions were suggested in some areas and Turkish version of the DSI was prepared. Afterwards, it was translated back from Turkish to English by two English language experts (bilingual and employed in the Department of English Language Education at Ege University). The back translated and original forms of the DSI were compared and found to be highly similar in meaning.

### Ethical considerations

Written permission to use the DSI was obtained before the commencement of the study. Subsequently, permission to undertake the study was obtained from the Nursing School Ethics Committee and written permission was obtained from the hemodialysis units. Patients who met the inclusion criteria were informed by the investigators on the purpose of the study and invited to participate as volunteers. All were given information about opportunities to withdraw from the study at any stage without detriment to their treatment and care.

### Data analysis

The data were entered and analyzed with SPSS (SPSS, version 11.0 for Windows). Descriptive statistics (frequencies, means, standard deviations [SD] ) were used to describe the demographics characteristics of the respondents.

### Content validity

Content validity refers to the extent to which the instrument measures the phenomena for which it is designed. The validity

**Table I:** Dialysis Symptom Index (DSI).

During the past week: Did you experience this symptom?		If "yes" How much did it bother you?				
		Not at All	A Little Bit	Some-what	Quite a Bit	Very Much
1. Constipation	No Yes→	1	2	3	4	5
2. Nausea	No Yes→	1	2	3	4	5
3. Vomiting	No Yes→	1	2	3	4	5
4. Diarrhea	No Yes→	1	2	3	4	5
5. Decreased appetite	No Yes→	1	2	3	4	5
6. Muscle cramps	No Yes→	1	2	3	4	5
7. Swelling in legs	No Yes→	1	2	3	4	5
8. Shortness of breath	No Yes→	1	2	3	4	5
9. Lightheadedness or dizziness	No Yes→	1	2	3	4	5
10. Restless legs or difficulty keeping legs still	No Yes→	1	2	3	4	5
11. Numbness or tingling in feet	No Yes→	1	2	3	4	5
12. Feeling tired or lack of energy	No Yes→	1	2	3	4	5
13. Cough	No Yes→	1	2	3	4	5
14. Dry mouth	No Yes→	1	2	3	4	5
15. Bone or joint pain	No Yes→	1	2	3	4	5
16. Chest pain	No Yes→	1	2	3	4	5
17. Headache	No Yes→	1	2	3	4	5
18. Muscle soreness	No Yes→	1	2	3	4	5
19. Difficulty concentrating	No Yes→	1	2	3	4	5
20. Dry skin	No Yes→	1	2	3	4	5
21. Itching	No Yes <sup>2</sup>	1	2	3	4	5
22. Worrying	No Yes→	1	2	3	4	5
23. Feeling nervous	No Yes→	1	2	3	4	5
24. Trouble falling asleep	No Yes→	1	2	3	4	5
25. Trouble staying asleep	No Yes→	1	2	3	4	5
26. Feeling irritable	No Yes→	1	2	3	4	5
27. Feeling sad	No Yes→	1	2	3	4	5
28. Feeling anxious	No Yes→	1	2	3	4	5
29. Decreased interest in sex	No Yes→	1	2	3	4	5
30. Difficulty becoming sexually aroused	No Yes→	1	2	3	4	5

Are there any other symptoms not mentioned on this questionnaire that you have experienced during the past week?.....

Weisbord SD, Fried LF, Arnold RM, Rotondi AJ, Fine MJ, Levenson DJ, Switzer GE: Development of a symptom assessment instrument for chronic hemodialysis patients:the Dialysis Symptom Index. *J Pain Symptom Manage.* 2004; 27(3): 226-240.

**Table II:** Turkish version of the DSI.

Geçen hafta boyunca Aşağıdaki semptomu yaşadınız mı?		“Evet” ise: Siz ne kadar etkiledi?				
		Hiç	Biraz	Bazen	Çok Az	Çok Fazla
1. Kabızlık	Hayır Evet→	1	2	3	4	5
2. Bulantı	Hayır Evet→	1	2	3	4	5
3. Kusma	Hayır Evet→	1	2	3	4	5
4. İshal	Hayır Evet→	1	2	3	4	5
5. İştahta azalma	Hayır Evet→	1	2	3	4	5
6. Kas krampları	Hayır Evet→	1	2	3	4	5
7. Bacaklarda şişlik	Hayır Evet→	1	2	3	4	5
8. Nefes darlığı	Hayır Evet→	1	2	3	4	5
9. Sersemlik/baş dönmesi	Hayır Evet→	1	2	3	4	5
10. Bacakları hareketsiz tutmada zorlanma	Hayır Evet→	1	2	3	4	5
11. Ayaklarda uyuşukluk veya karıncalanma	Hayır Evet→	1	2	3	4	5
12. Yorgun hissetme veya enerjide azalma	Hayır Evet→	1	2	3	4	5
13. Öksürme	Hayır Evet→	1	2	3	4	5
14. Ağız kuruluğu	Hayır Evet→	1	2	3	4	5
15. Kemik veya eklem ağrısı	Hayır Evet→	1	2	3	4	5
16. Göğüs Ağrısı	Hayır Evet→	1	2	3	4	5
17. Baş ağrısı	Hayır Evet→	1	2	3	4	5
18. Kas ağrısı	Hayır Evet→	1	2	3	4	5
19. Konsantrasyon olma zorluk	Hayır Evet→	1	2	3	4	5
20. Deride kuruluk	Hayır Evet→	1	2	3	4	5
21. Kaşıntı	Hayır Evet→	1	2	3	4	5
22. Endişelenme	Hayır Evet→	1	2	3	4	5
23. Sinirli hissetme	Hayır Evet→	1	2	3	4	5
24. Uykuya dalmada zorlanma	Hayır Evet→	1	2	3	4	5
25. Uykuyu sürdürmede zorlanma	Hayır Evet→	1	2	3	4	5
26. Rahatsız hissetme	Hayır Evet→	1	2	3	4	5
27. Üzgün hissetme	Hayır Evet→	1	2	3	4	5
28. Kaygılı hissetme	Hayır Evet→	1	2	3	4	5
29. Sekse ilgide azalma	Hayır Evet→	1	2	3	4	5
30. Cinsel yönden uyarılmada zorluk	Hayır Evet→	1	2	3	4	5

Bu anket formunda sizin geçen hafta yaşadığınız başka semptom belirtilmemiş ise lütfen belirtiniz.....

of the construct is demonstrated by a thorough examination of all the concepts included in the instrument's definition, limitations and dimensions (7,8,9,10,11).

To test content validity, which included item clarity, the translated version was submitted to a panel of 10 experts (4 nursing instructors at a university nursing school, 4 clinical nurses and 2 doctors who were working in the dialysis centers and were informed about the index. They were asked to rate each item of the Turkish version of the DSI based on confirming the conceptual meaning, clarity and medical terminology as 1 (not relevant), 2 (somewhat relevant), 3 (relevant) or 4 (very relevant). Lastly, the Turkish version of the DSI was created by pre-testing it with 20 hemodialysis patients.

#### Internal consistency

The reliability of the Turkish version of the DSI was based on internal consistency and test-retest stability. Internal consistency was assessed by the Cronbach's alpha coefficient, which is a measure of the reliability of each construct. Cronbach's alpha coefficient need to be as close to 1.00 as possible, which indicates the reliability through the measurement of consistency. When Cronbach's alpha coefficient is 1.00, it indicates perfect reliability and 0.00 indicates no reliability. A reliability of 0.80 is considered the lowest acceptable coefficient for a well-developed measurement tool (7,8,9,10,11).

Stability was assessed with kappa values by using a repeated measure design with a one-week interval. A kappa value of < 0.20 is considered slight,  $\leq 0.40$  is fair,  $\leq 0.60$  is moderate and  $\leq 0.80$  is almost perfect (12). Test-retest reliability was assessed by calculating the kappa in a sample of 120 adults. The retest procedure was conducted 1 week after the first test of the Turkish version of the DSI. Although test-retest kappa values as low as  $\kappa = 0.20$  have been reported as evidence for reliability, 0.60 is a more realistic measure.

## RESULTS

### General characteristics of the sample

The sample was composed of a total of 135 patients who were interviewed in the dialysis center. Fifteen patients did not complete the questionnaire forms accurately. The patient questionnaire forms for a total of 120 patients (response rate: 88%) were evaluated in this study. The demographic data of the patients are summarized in Table III. The mean age of the patients was 54 years. Of the patients, 55.8% were male, 74.2% were married, 94.2% were unemployed and 66.7% had completed primary school. Fifty percent (n=60) of the participants had an income equal to their expenses. Sixty-two percent (n=74) of the patients had no other chronic disease, except for renal failure. The mean duration of illness and dialysis in the patients were  $75.57 \pm 61.18$  and  $48.14 (41.17)$  months at the time of the study. The mean frequency of dialysis in patients was  $2.99 \pm 0.91$  day/week.

**Table III:** General characteristics of the sample.

	n	%
<b>Gender</b>		
Male	67	55.8
Female	53	44.2
<b>Marital status</b>		
Married	89	74.2
Divorced	17	14.2
Single	14	11.7
<b>Educational status</b>		
Primary school	80	66.7
Illiterate	17	14.2
High school	14	11.7
Secondary school	8	6.7
Other	1	0.8
<b>Perceived income level</b>		
Income equal to expenses	60	50.0
Income less than expenses	55	45.8
Income higher than expenses	5	4.2
<b>Work status</b>		
Unemployed	113	94.2
Employed	5	4.2
Employed part-time	2	1.7
<b>Chronic disorder</b>		
No	74	61.7
Yes	46	38.3
	<b><math>\bar{X}</math> (Sd)</b>	
<b>Age / years</b>	54.53 (13.80)	
<b>Duration of illness / months</b>	75.57 (61.18)	
<b>Duration of hemodialysis / months</b>	48.14 (41.17)	
<b>Frequency of hemodialysis day / week</b>	2.99 (0.91)	

### Content validity

The content validity index (CVI) was used to determine item validity. A CVI was computed using the proportion of experts who were in agreement about item relevance. Ten experts rated each item of the Turkish version of the DSI based on relevance, clarity and simplicity as 1 (not relevant), 2 (somewhat relevant), 3 (relevant), or 4 (very relevant). The average CVI of 0.82 in the final version indicated adequate content validity ( $> 0.80$ ) (8,13).

Subsequently, the Turkish version of DSI was pretested on 20 dialysis patients in order to check the clarity of the items. Cronbach's alpha for internal consistency reliability was 0.79 in this group.

**Table IV:** Cronbach's alpha values of the DSI.

Symptoms	Cronbach's alpha
1. Constipation	0.836
2. Nausea	0.835
3. Vomiting	0.837
4. Diarrhea	0.839
5. Decreased appetite	0.834
6. Muscle cramps	0.831
7. Swelling in legs	0.834
8. Shortness of breath	0.834
9. Lightheadedness or dizziness	0.832
10. Restless legs or difficulty keeping legs still	0.826
11. Numbness or tingling in feet	0.823
12. Feeling tired or lack of energy	0.829
13. Cough	0.836
14. Dry mouth	0.834
15. Bone or joint pain	0.831
16. Chest pain	0.834
17. Headache	0.833
18. Muscle soreness	0.827
19. Difficulty concentrating	0.833
20. Dry skin	0.835
21. Itching	0.836
22. Worrying	0.830
23. Feeling nervous	0.827
24. Trouble falling asleep	0.827
25. Trouble staying asleep	0.830
26. Feeling irritable	0.823
27. Feeling sad	0.829
28. Feeling anxious	0.827
29. Decreased interest in sex	0.841
30. Difficulty becoming sexually aroused	0.841
Cronbach's alpha: 0.83	

### Reliability

#### Internal consistency reliability

Cronbach's alpha was 0.84 for the total DSI. Cronbach's alpha coefficients for the 30 items of the DSI ranged between 0.82 and 0.84 (Table IV).

**Table V:** Test – retest

Symptoms	Kappa
1. Constipation	0.76
2. Nausea	0.23
3. Vomiting	0.74
4. Diarrhea	0.10
5. Decreased appetite	0.72
6. Muscle cramps	0.84
7. Swelling in legs	0.24
8. Shortness of breath	0.73
9. Lightheadedness or dizziness	0.70
10. Restless legs or difficulty keeping legs still	0.40
11. Numbness or tingling in feet	0.89
12. Feeling tired or lack of energy	0.87
13. Cough	0.87
14. Dry mouth	0.35
15. Bone or joint pain	0.85
16. Chest pain	0.83
17. Headache	0.79
18. Muscle soreness	0.85
19. Difficulty concentrating	0.10
20. Dry skin	0.52
21. Itching	0.72
22. Worrying	0.89
23. Feeling nervous	0.88
24. Trouble falling asleep	0.93
25. Trouble staying asleep	0.86
26. Feeling irritable	0.88
27. Feeling sad	0.65
28. Feeling anxious	0.86
29. Decreased interest in sex	0.86
30. Difficulty becoming sexually aroused	0.88

### Test-retest

The test- retest reliability of the index was carried out with 120 patients after one week in order to assess the index's stability over time. The Kappa statistics determined for each symptom appearing in the index for the test-retest was between 0.10 to

0.89. Two values were below 0.20: diarrhea and difficulty concentrating. Twenty-three items demonstrated kappa values of  $\geq 0.60$  (Table V).

## DISCUSSION

Our main purpose was to provide a practical and validated Turkish tool to enhance the assessment of both disease and treatment-related symptoms of hemodialysis patients in clinical settings. We choose the DSI as the target index for translation and validation for the following reasons. Firstly, there is no tool in Turkey for assessing symptoms of hemodialysis patients. Secondly, we think that the DSI is an appropriate index for hemodialysis patients, because it was easy to understand, time-efficient, and easily applicable to everyday life.

The Turkish version of the DSI indicates good content validity, because the CVI was 0.82 ( $>0.80$ ) (8,13). The pre-testing regarding the content of the Turkish version of the DSI indicated that there was no need to modify its translation or content. However, a large sample size will be needed to correct the semantic equivalence.

In the present study, the index's reliability using test-retest procedures was good. Two items had very low kappa values ( $<0.20$ ) (12). These included diarrhea and difficulty concentrating. These results are consistent with those of Weisbord et al. (2004) who reported that diarrhea and difficulty concentrating had very low kappa values. As stated by Weisbord et al. (2004), "diarrhea is a transient symptom, which is the likely explanation for this finding". We could not explain why the "difficulty concentrating" symptom had very low kappa values. We think that there is a need to evaluate the causes of this symptom in dialysis patients. Also, we recommend that the DSI should be replicated in a large population in Turkey.

To our knowledge, our study is the first study to investigate the validity and reliability of the DSI in hemodialysis patients in Turkey. From our study, the DSI is validated and reliable in hemodialysis patients and the DSI is an index that could be used in determining the effect of disease and treatment-related symptoms on the quality of life of hemodialysis patients in Turkey.

### Relevance to clinical practice

Valid measurement instruments are needed to assess symptoms in Turkish hemodialysis patients, both in research and practice. The DSI is simple to administer and dialysis nurses and other health professionals will be able better identify patients at risk of developing treatment and illness-related symptoms affecting their quality of life by using this equipment in routine clinical practices.

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## REFERENCES

1. Weisbord SD, Carmody SS, Bruns FJ, Rotondi AJ, Cohen LM, Zeidel ML, Arnold RM: Symptom burden, quality of life, advance care planning and the potential value of palliative care in severely ill haemodialysis patients. *Nephrol Dial Transplant* 2003; 18 (7): 1345-1352
2. Weisbord SD, Fried LF, Arnold RM, Fine MJ, Levenson DJ, Peterson RA, Switzer GE: Prevalence, severity, and importance of physical and emotional symptoms in chronic hemodialysis patients. *J Am Soc Nephrol* 2005; 16 (8): 2487-2494
3. Weisbord SD, Fried LF, Unruh ML, Kimmel PL, Switzer GE, Fine MJ, Arnold RM: Associations of race with depression and symptoms in patients on maintenance haemodialysis. *Nephrol Dial Transplant* 2007; 22 (1): 203-208
4. Weisbord SD, Bossola M, Fried LF, Giungi S, Tazza L, Palevsky PM, Arnold RM, Luciani G, Kimmel PL: Cultural comparison of symptoms in patients on maintenance hemodialysis. *Hemodial Int* 2008; 12 (4): 434-440
5. Yong DS, Kwok AO, Wong DM, Suen MH, Chen WT, Tse DM: Symptom burden and quality of life in end-stage renal disease: A study of 179 patients on dialysis and palliative care. *Palliat Med* 2009; 23 (2): 111-119
6. Weisbord SD, Fried LF, Arnold RM, Rotondi AJ, Fine MJ, Levenson DJ, Switzer GE: Development of a symptom assessment instrument for chronic hemodialysis patients: The Dialysis Symptom Index. *J Pain Symptom Manage* 2004; 27 (3): 226-240
7. Gözüm S, Aksayan S: Kültürlerarası ölçek uyarlaması için rehber II: Psikometrik özellikler ve kültürlerarası karşılaştırma (A guide for transcultural adaptation of the scale II. Psychometric characteristics and crosscultural comparison). *Hemşirelikte Araştırma ve Geliştirme Dergisi* 2003; 5 (1): 3-14
8. Erefe İ: Veri toplama araçlarının niteliği (Quality of scales). In: Erefe İ (ed.), *Hemşirelikte araştırma ilke, süreç ve yöntemleri* (Principles and methods of nursing research). İstanbul: Odak Ofset, 2002; 169-187
9. Tezbaşaran A: Likert tipi ölçek geliştirme kılavuzu (Likert type instrument development guidelines) (2nd ed). Ankara: Türk Psikologlar Derneği Yayınları, 1997; 45-51

10. Özgüven İE: Psikolojik testler (Psychological tests) (2nd ed). Ankara: Psikoloji Danışma Rehberlik ve Eğitim Merkezi (PDREM), 1998; 83-107
11. Karasar N: Bilimsel araştırma yöntemi (Scientific research management) (7th ed). Ankara: Sim Matbaası, 1995; 147-153
12. Özdamar K: Paket programlar ile istatistiksel veri analizi (Statistical data analysis with package programmes), (2nd ed) Eskişehir: Kaan Kitabevi, 1999
13. Polit DF, Beck CT: Nursing research: Principles and methods, (7th ed). Philadelphia, Pa: Lippincott Williams & Wilkins, 2004