
Validation of a Turkish Version of the Burn-Specific Health Scale

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The abbreviated Burn-Specific Health Scale (BSHS) is an instrument that measures physical, mental, social, and general health in burn survivors. This scale is composed of 80 items. The aim of this study was to determine the reliability and validity of a Turkish version of the BSHS (the BSHS-Turkish). The BSHS-abbreviated was translated and adapted for Turkish persons according to standard procedures. After a telephone interview with all eligible patients, the BSHS-Turkish was mailed to 103 burn patients. Fifty-three patients (51.46%) filled out both questionnaires; the second one was completed within 15 days of the first one. The mean time that it took to complete the questionnaire was 31.06 ± 15.2 minutes (range, 3–60 minutes). The test–retest, internal reliability, and construct validity of the BSHS-Turkish were satisfactory according to intraclass correlation coefficient, Cronbach’s alpha, and the Mann Whitney *U* test. The BSHS-Turkish is a reliable and valid instrument for determining the health status of Turkish patients with burns. (*J Burn Care Res* 2009;30:288–291)

Burn injuries affect not only the skin but all aspects of human life, leaving survivors with numerous physical and psychosocial handicaps. Increased survival rates in patients with burns have led to an increase in attention to rehabilitation, and therefore, to measuring health status.^{1,2}

The Burn-Specific Health Scale (BSHS) was developed in the 1980s as a self-reporting questionnaire to measure the quality of life in burn patients.³ Later, it was shortened to an abbreviated version, the BSHS-A.⁴ It remains the only disease-specific questionnaire that measures health status in burn patients.¹ The questionnaire includes physical and psychosocial domains. It has been determined reliable and valid in several languages other than English.^{2,5} It also has been shown to be useful in clinical studies.^{1,6–13}

The BSHS is not only used for patients, but also used for the parents of children with burn injuries to assess the parents’ psychosocial status. Significantly increased levels of anxiety and depression have been found in the parents of children with burn injuries.¹⁴

This study aimed to investigate whether a Turkish version of the BSHS-A would be a reliable and valid tool for measuring the health statuses of Turkish persons with burns.

METHODS

Patients

From July 2000 to July 2006, 543 patients were hospitalized and treated at the Baskent University, Adana Research and Training Center Burn Unit for burn injuries. Of 543 patients, 219 (40.33%) were between 15 and 65 years of age at time of injury and 163 of the 219 were survivors of burn injuries. The other 56 of the 219 patients died, either during hospitalization or afterwards. Because of changes in address or telephone numbers, or both, 60 survivors could not be contacted. A telephone interview was done with 103 patients or patients’ relatives. During this telephone interview, respondents were informed about how to answer the questionnaires. The answers were obtained by mail.

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Questionnaire

The BSHS-A is composed of 80 items divided into four major domains: physical (mobility and self-care, hand function, and role activities), mental (body image and affective), social (friends, family, and sexual activity), and general health. Translation process was performed according to report of the International Society for Pharmacoeconomics and Outcome Research task force for translation and cultural adaptation and TCA (translation and cultural adaptation) group.¹⁵

The test was translated into Turkish by four physicians (forward translation). At the first meeting, the physicians agreed on a common version (reconciliation). This version was examined by a group of six health care workers to assess the conceptual equivalence between the two versions. A blind back-translation was done by a professional English lecturer (back translation). At a second meeting, the four physicians and the lecturer compared the original version with the back-translated version (harmonization). This version was examined by a group of six health care workers to assess conceptual equivalence (cognitive debriefing). Minor modifications were made to items numbered 12, 13, 15, and 18 (proofreading). A final BSHS-T version was reached (final report).

Procedure

Two standardized questionnaires and a letter of informed consent were sent by mail to 103 burn patients. A short explanatory letter was also sent. Respondents were asked to fill out the two questionnaires within 2-week intervals of each other and to record the time it took to complete each questionnaire.

Reliability. Test-retest reliability was evaluated by 53 patients. Each patient twice completed an identical questionnaire at an interval of 15 days, and the results were compared between the two interviews. The internal reliability was evaluated for the total sample in each of the four health domains and their subdomains.

Validity. The variables used to determine disease severity also were used to assess validity. These variables were total body surface area, presence of full-thickness burn, presence of face and head burns, presence of hand burns, presence of genital burns, number of operations, and length of hospitalization.

Statistical Analyses

Internal consistency was determined by calculating Cronbach's alpha for each domain, subdomain, and in the total scale score. Test-retest reliability was de-

termined by estimating the intraclass correlation coefficient in each domain, subdomain, and for total scale score. Construct validity was determined using the Mann-Whitney *U* test. Data were considered statistically significant at a value for *P* of less than .05. The study protocol was approved by the Ethics Committee of Baskent University.

RESULTS

Two questionnaires from each of 53 patients (51.46%) were returned. The final analyses were done with 53 patients and 106 questionnaires. Only 1 patient sent us both questionnaires by e-mail; the rest were returned by postal mail.

The patient's clinical and demographic characteristics are shown in Table 1. The number of patients requiring an operation was 34 (64.15%); the number requiring a skin graft was 28 (52.83%). There were no differences in terms of patient's clinical and demographic characteristics between responders and non-responders.

Feasibility

The mean length of time it took to complete the questionnaire was 31.06 ± 15.28 minutes (range, 3–60 minutes) and 27.29 ± 17.66 minutes (range, 3–75 minutes), respectively, for the first and second questionnaire. We have no information whether or not the respondents received help from a relative(s) to complete the questionnaire.

Reliability

Internal Reliability. As shown in Table 2, the α coefficients obtained in each of the health domains

Table 1. The clinical and demographic features of patients

	n = 53 (mean \pm SD) (range)
Sex (M/F)	43/10 (81.1% vs 18.9%)
Age (at the time of injury)	33.74 \pm 13.19 (15–65)
Total body surface area	19.93 \pm 12.47 (3–70.5)
Full-thickness burn (%)	5 (9.43)
Patients with face and head burns (%)	31 (58.5)
Patients with hand burns (%)	35 (66)
Patients with genital burns (%)	6 (11.3)
Number of operation	1.42 \pm 1.43 (0–5)
Length of hospitalization (d)	23.79 \pm 16.18 (1–75)
Burn type	
Scalding (%)	7 (13.2)
Electric (%)	23 (43.4)
Flame (%)	23 (43.4)

Table 2. Internal reliability for BSHS-T

BSHS-T	Items	Cronbach's Alpha
Total score	80	0.93
Physical health	20	0.95
Mobility and self-care	10	0.89
Hand function	5	0.88
Role activities	5	0.89
Mental health	30	0.90
Body image	7	0.91
Affective	23	0.90
Social health	15	0.87
Family and friends	12	0.88
Sexual activity	3	0.83
General health	15	0.92

varied from 0.83 to 0.95. The overall value of the test was 0.93.

Test-Retest Reliability. Table 3 shows the test-retest reliability for the BSHS-T. The intraclass correlation ranged from 0.81 to 0.96. The total score was 0.93.

Construct Validity. Table 4 shows the construct validity for the BSHS-T.

DISCUSSION

The improved care of acute burns in recent decades has resulted in significantly increased rates of survival in affected persons.¹⁶ This increased rate of survival necessitates a tool for measuring disease-specific outcomes; the BSHS and its variants, which were developed approximately 25 years ago, are appropriate tools for measuring these outcomes. This study showed that the BSHS-T is a feasible, reliable, and valid questionnaire for determining the health status of Turkish patients with burn injuries.

Table 3. Test-retest reliability for the BSHS-T

BSHS-T	Intraclass Correlation Coefficient
Total score	0.93
Physical health	0.96
Mobility and self-care	0.92
Hand function	0.95
Role activities	0.89
Mental health	0.94
Body image	0.90
Affective	0.94
Social health	0.87
Family and friends	0.89
Sexual activity	0.81
General health	0.92

Table 4. Construct validity for BSHS-T

	n	Median	First Quartile	Third Quartile	P
TBSA (%)					.42
≤25	40	92.2	78.5	95.2	
>25	13	82.3	71.3	96.7	
Full-thickness burn					.01
Yes	5	81.1	69.3	91.9	
No	48	95.6	79.9	97.2	
Face-head burns					.02
Yes	31	65.2	59.1	84.5	
No	22	88.4	71.1	92.3	
Hand burns					.02
Yes	35	73.3	68.2	88.1	
No	18	86.9	78.7	96.9	
Genital burns					.04
Yes	6	77.7	69.3	88.4	
No	47	89.5	78.2	95.5	
Number of operations					.03
≤2	43	90.4	79.3	96.2	
>2	10	78.2	71.1	84.3	
Length of hospitalization (d)					.01
≤10	12	93.3	90.1	97.8	
>10	41	85.2	77.2	92.3	

The questionnaire was adapted cross-culturally and was first given to health care workers to determine whether all of the items in the BSHS-T were easy to understand. All of the patients completed the entire BSHS-T. Only one patient reported that the questionnaire was long. Although the mean length of time it took to complete the BSHS-T was longer than the time it took to complete the Norwegian and Spanish versions,^{2,5} completing the BSHS-T took less time when the respondents completed it a second time.

To fill out the BSHS-T repeatedly took less than a mean of 20 minutes. The original BSHS was developed from a 369-item test version into a 114-item final entity. To decrease the time spent filling out the questionnaire, a brief version of the BSHS with 40 items was developed.¹⁷

Internal reliability is tested with an item-correlation test that reflects the homogeneity of the items. To determine the test's reliability, Cronbach's alpha was used. The acceptable value for Cronbach's alpha is 0.7 and above.¹⁸ In this study, the mean Cronbach's alpha was 0.93 (range, 0.83–0.95). This figure is consistent with previous studies.^{2,5}

To determine test-retest reliability, each patient twice completed the BSHS-T. To attain acceptable agreement between the two tests, an intraclass correlation coefficient of more than 0.70 is required.¹⁸ In

this study, we found an intraclass correlation coefficient of 0.93 (range, 0.81–0.95).

To analyze construct validity, we assessed total body surface area, full-thickness burn injury, face and head injury, hand injury, genital injury, number of operations, and length of hospitalization. The results show that patients having a full-thickness injury, or a face and head injury, had significantly lower total scores than did persons with other types of burn injuries. Also, patients who had been hospitalized longer than 10 days or who had undergone more than two operations had lower total scores. However, according to TBSA grouping ($\leq 25\%$ vs $>25\%$), a statistically significant difference was not found. These findings are consistent with those of other studies.^{2,5} Also, we observed that patients with genital burns had significantly lower scores than did persons without genital burns.

In conclusion, the BSHS-T is a reliable and valid questionnaire for determining the health status of Turkish burned persons.

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REFERENCES

1. Moi AL, Wentzel-Larsen T, Salemark L, Hanestad BR. Long-term risk factors for impaired burn-specific health and unemployment in patients with thermal injury. *Burns* 2007;33:37–45.
2. Litré Moi A, Wentzel-Larsen T, Salemark L, Hanestad B. Validation of a Norwegian version of the Burn Specific Health Scale. *Burns* 2003;29:563–70. Erratum: *Burns* 2003;29:872–3.
3. Blades B, Mellis N, Munster AM. A burn specific health scale. *J Trauma* 1982;22:872–5.
4. Munster AM, Horowitz GL, Tudahl LA. The abbreviated Burn-Specific Health Scale. *J Trauma* 1987;27:425–8.
5. Salvador Sanz JF, Sanchez-Payá J, Rodriguez Marín J. Spanish version of the Burn-Specific Health Scale. *J Trauma* 1998;45:581–7.
6. Cromes GF, Holavanahalli R, Kowalske K, Helm P. Predictors of quality of life as measured by the Burn Specific Health Scale in persons with major burn injury. *J Burn Care Rehabil* 2002;23:229–34.
7. Wu A, Edgar DW, Wood FM. The QuickDASH is an appropriate tool for measuring the quality of recovery after upper limb burn injury. *Burns* 2007;33:843–9.
8. Willebrand M, Andersson G, Kildal M, Gerdin B, Ekselius L. Injury-related fear-avoidance, neuroticism and burn-specific health. *Burns* 2006;32:408–15.
9. Kildal M, Willebrand M, Andersson G, et al. Personality characteristics and perceived health problems after burn injury. *J Burn Care Rehabil* 2004;25:228–35.
10. Noble J, Gomez M, Fish JS. Quality of life and return to work following electrical burns. *Burns* 2006;32:159–64.
11. Dyster-Aas J, Kildal M, Willebrand M, Gerdin B, Ekselius L. Work status and burn specific health after work-related burn injury. *Burns* 2004;30:839–42.
12. Kimmo T, Jyrki V, Sirpa AS. Health status after recovery from burn injury. *Burns* 1998;24:293–8.
13. Kildal M, Willebrand M, Andersson G, Gerdin B, Ekselius L. Coping strategies, injury characteristics and long-term outcome after burn injury. *Injury* 2005;36:511–8.
14. Phillips C, Fussell A, Rumsey N. Considerations for psychosocial support following burn injury—a family perspective. *Burns* 2007;33:986–94.
15. Wild D, Grove A, Martin M, et al. Principles of good practice for the translation and cultural adaptation process for patient reported outcomes (PRO) measures: report of the ISPOR task force for translation and cultural adaptation. *Value Health* 2005;8:94–104.
16. Kildal M, Andersson G, Gerdin B. Health status in Swedish burn patients. Assessment utilising three variants of the Burn Specific Health Scale. *Burns* 2002;28:639–45.
17. Kildal M, Andersson G, Fugl-Meyer AR, Lannerstam K, Gerdin B. Development of a brief version of the Burn Specific Health Scale (BSHS-B). *J Trauma* 2001;51:740–6.
18. Fayers PM, Machin D. *Quality of life: assessment, analysis, and interpretation*. Chichester: Wiley; 2000.