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The Chinese language version of the abbreviated Burn Specific Health Scale: A validation study

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ARTICLE INFO

Article history:
Accepted 23 October 2013

Keywords:
Abbreviated Burn Specific Health Scale (BSHS-A)
Reliability and validity
Health-related quality of life (HRQoL)
Burn
China

ABSTRACT

Background: The Burn Specific Health Scale (BSHS) is designed to measure burn-specific, health-related quality of life (HRQoL). The aim of the present study was to evaluate the reliability and validity of the Chinese version of the abbreviated BSHS (BSHS-A).

Methods: The English version of the BSHS-A was translated into Chinese using a standardised procedure. The participants were 457 patients classified into three severity groups (mild, moderate and severe). All patients completed the Chinese BSHS-A questionnaire, the Short Form-36 (SF-36) and the EuroQol 5-Dimensions (EQ-5D). To evaluate clinical utility of the BSHS-A, we used Cronbach's alpha (internal consistency), intraclass correlation coefficients (ICCs; test–retest reliability) and construct validity (using the SF-36 and EQ-5D).

Results: Cronbach's alpha for all subscales was >0.80, demonstrating high internal consistency of the BSHS-A (Chinese version). The ICC was >0.70 for each patient group. Strong correlations were observed between the BSHS-A and SF-36 and EQ-5D scales. Neither floor nor ceiling effects were found.

Conclusion: The present study demonstrated that the BSHS-A (Chinese version) has good psychometric properties, showing suitable internal consistency and test–retest reliability. The BSHS-A may, thus, be useful for assessing HRQoL in Chinese burn victims. However, adaptations may be required to reduce its length.

1. Introduction

A burn is one of the most traumatic assaults a human being can experience, and most survivors suffer from a variety of physical and psychosocial handicaps ranging from altered appearance to stigmatisation. In China, there are approximately 10 million burn patients every year, and deaths from fires and burns are the second most common cause of unintentional injury and deaths. Since the 1990s, the clinical management of burns in China has made significant advances and improvements resulting in increased survival rates and more normal life expectancies for burn victims. Further, the overall mortality rate from burns has declined by nearly 30%. These increased survival rates highlight the need to better understand complex rehabilitation issues such as health-related quality of life (HRQoL) as well as the nature of functional, emotional and social readjustment [1].

HRQoL is an important aspect of adaptation after burns and it has recently gained increased awareness as an outcome

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0305-4179/$36.00
http://dx.doi.org/10.1016/j.burns.2013.10.022

measure for interventions in burn patients. The assessment of HRQoL comprises the individual's perception of his or her injury or illness and how this may interfere with the ability to live a fulfilling life [2]. The most commonly used instrument for evaluating burn survivors' quality of life (QOL) is the Burn Specific Health Scale (BSHS) [3] designed specifically for burn patients. Adaptations of the scale include the abbreviated [4], revised [5] and, most recently, brief [6] versions. These self-administered questionnaires have been employed to successfully measure: (1) health status in Finland [7], Sweden [6], Netherlands [8] and Australia [9]; (2) QOL in Spain [10], USA [11] and Canada [12]; and (3) HRQoL in Norway [13] and Brazil [14].

For the present study, we used the abbreviated Burn Specific Health Scale (BSHS-A), an 80-item questionnaire that has proven useful for measuring physical, mental, social and general health in burn survivors. The BSHS has been used consistently and extensively within the area of burn research to study the physical and psychosocial functioning of burn patients [11,16,17]. Although the original psychometric development of the BSHS-A was rigorous, the research team continues to refine the reliability and validity of the scale and to develop normative scoring data [15]. The purpose of the present study was to translate the BSHS-A questionnaire into Chinese and to evaluate the reliability, validity and internal consistency of the Chinese-language version of the BSHS-A.

2. Methods

The English version of the BSHS-A was translated into Chinese according to a standardised procedure [18]. The psychometric properties of the translated version were then investigated in a retrospective study.

2.1. *Translation procedures*

We employed a three-step translation procedure [19]. First, the English version of the BSHS-A was independently translated into Chinese (forward translation) by two native Chinese speakers, one with a technical background and the other with a medical background. During a consensus meeting, a single final version (T-12) was agreed upon [20]. Second, this Chinese version (T-12) was retranslated into English (backward translated) by two bilingual individuals, one with a background in education and the other with a medical background. Both of these translators were blind to the original English version. Third, all four translators participated in a consensus meeting to consolidate the final Chinese version of the BSHS-A questionnaire used in the present study. This final version was presented to a subset of 20 patients who had received extensive burns. These patients were asked whether they understood all items and whether they had any problems with the formulation of the items in the Chinese version of the BSHS-A questionnaire. None of the patients reported problems with any of the scale items.

2.2. *Patients*

To validate the Chinese version of the BSHS-A, we recruited 504 patients who had been admitted to the Burn Unit of the Military General Hospital of Chengdu region over a 4-year period. Of these patients, 34 declined participation and 13 gave invalid responses; the resulting sample consisted of 457 individuals. We found no significant differences (in age, sex or burn size) between these respondents and the 47 non-respondents. The inclusion criteria were (1) $\geq$18 years old, (2) able to speak and understand written Chinese, (3) without documented intellectual disability or dementia, (4) $\geq$5% of total body surface area (TBSA) burned, (5) sustaining a burn between 2004 and 2010 with hospitalisation in the burn unit during rehabilitation, and at the time of the study, the time from burn was between 12 and 15 months and (6) currently being treated in the outpatient clinic. Burn patients were divided into three groups depending on severity (mild, moderate and severe) and based on classifications of the American Burn Association. Mild burns were classified as having a TBSA (superficial, partial thickness and above) $\leq$15%, moderate burns as having a TBSA of 15–25% and severe burns having a TBSA of $\geq$25%.

Patients were identified from the Burn Unit registry, which provides baseline patient and injury characteristics as well as outcome information for all patients admitted. Data obtained from the medical records included TBSA burned, length of hospital stay (LOS), age and gender. Participants were asked to complete the following three questionnaires at home: (1) the Chinese version of the BSHS-A, (2) the EuroQol 5-Dimensions (EQ-5D) and (3) the Short Form-36 (SF-36). (The last was completed between June 2010 and July 2012.) For test–retest studies, the time interval needs to be sufficiently short to support the assumption of patient stability and sufficiently long to prevent recall [19]. For retest, we asked participants to fill in the Chinese version of the BSHS-A at home 2 or 3 weeks after the original test. The study was approved by the Review Board of the Military General Hospital of Chengdu region and it complies with the guidelines set by the Declaration of Helsinki. All participants gave their written informed consent.

2.3. *Questionnaires*

2.3.1. *BSHS-A*

The 80-item BSHS-A is divided into four scales, each measuring a specific domain; three of the scales have subdomains. The four scales of the BSHS-A are: (1) physical (items 1–20), (2) psychological (items 21–50), social (items 51–65) and general (items 65–80). The physical scale is subdivided into mobility/self-care (items1–10), hand function (items 11–15) and role activities (items 16–20).The psychological scale is divided into body image (items 21–27) and affective (items 28–50) subscales. The social scale is subdivided into family/friends (items 51–62) and sexual activity (items 63–65) scales. The general domain (items 66–80) concerns burn-specific impairments such as pain, social sensitivity and health [3,21,22]. All items were rated on a scale ranging from 0 ('*All the time/great difficulty*') to 4 ('*Never/no difficulty*'). In addition to the English version, the Spanish and Norwegian versions of the BSHS-A were translated and their reliability and validity established. Moreover, the instrument was recently translated into Brazilian Portuguese and psychometrically tested [21,14,23,24].