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Research Article

Validity and Reliability of the Turkish Version of the Thirst Distress Scale in Patients on Hemodialysis

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SUMMARY

Purpose: Thirst has been reported as an important source of distress for patients on hemodialysis. However, there is no instrument available that assesses thirst distress of Turkish patients on hemodialysis. Therefore, the aim of this study was to examine the psychometric properties of the Turkish version of the Thirst Distress Scale (TDS-T) for patients on hemodialysis.

Methods: This study was conducted methodologically. A convenience sample of 142 Turkish patients on hemodialysis participated in this study. Data were collected by using a questionnaire, the TDS-T and a visual analogue scale for thirst intensity. The analysis of data included descriptive statistics, the one-sample Kolmogorov-Smirnov test, Kruskal-Wallis test, Mann-Whitney *U* test, correlation coefficients and psychometric tests.

Results: The TDS-T demonstrated acceptable internal consistency (Cronbach's alpha coefficient = .81), good test-retest reliability (intraclass correlation coefficient = .88), and correlations with interdialytic weight gain values and thirst intensity scores (measured by visual analogue scale) indicating concurrent and convergent validity, respectively. Construct validity was supported by known-group comparisons. The results revealed a one-component structure of the instrument.

Conclusions: The psychometric properties of the TDS-T were consistent with those reported in the original study. The TDS-T was found to be a valid and reliable tool for evaluating thirst distress in patients on hemodialysis.

Introduction

The incidence and prevalence of end-stage renal disease is increasing worldwide and in Turkey (Turkish Society of Nephrology, 2012; Zhang & Rothenbacher, 2008). In Turkey, approximately 60,000 people have end-stage renal disease, according to the 2011 report from the Registry of Nephrology, Dialysis and Transplantation. Hemodialysis (HD) is the most commonly used renal replacement therapy method in this patient population with a rate of 82.3%. Cardiovascular diseases are the leading cause of death (54.4%) among patients on HD (Turkish Society of Nephrology, 2012).

The success of HD treatment is closely linked to the treatment adherence of patients. However, adherence to fluid restrictions is very difficult for patients on HD (Kara, Caglar, & Kilic, 2007). Results indicate that excessive thirst leads to excessive intake of water (Mistiaen, 2001; Welch, 2002). Understanding patients' thirst sensation may help determine the best ways for prevention and management of this symptom. On the other hand, a valid and reliable instrument is needed to correctly assess thirst. In Turkey, there is no valid and reliable instrument to evaluate thirst distress in patients on HD. In this study, we examined the psychometric properties of the Thirst Distress Scale (TDS) in Turkish patients on HD.

Theoretical framework

The Symptom Management Theory (SMT) provided the theoretical framework for this study (Humphreys et al., 2008). The faculty and students at the University of California, San Francisco, School of Nursing developed the original Symptom Management Model (Larson et al., 1994). This model was subsequently revised by Dodd et al. (2001). The SMT is the further revised version of the Symptom Management Model. This theory includes three dimensions: symptom experience, symptom management strategies, and symptom status outcomes. Each dimension is interrelated to the others (Humphreys et al., 2008). A symptom is defined as "a

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subjective experience reflecting changes in the biopsychosocial functioning, sensations, or cognition of an individual" (Dodd et al., 2001, p. 669). The concept of symptom experience consists of an individual's perception of symptoms, evaluation of the meaning of symptoms and response to symptoms. Symptoms have four dimensions: the timing (duration & frequency), intensity (strength), level of distress perceived, and quality (Lenz, Pugh, Milligan, Gift, & Suppe, 1997; Rhodes & Watson, 1987). According to the SMT, personal, environmental, and health-related or illness-related variables can affect the symptom experience of individuals (Humphreys et al., 2008).

In this study, we focused on the symptom experience dimension of the SMT and evaluated thirst distress. Symptom distress is defined as "the degree or amount of physical or mental upset, anguish or suffering experienced from a specific symptom" (Rhodes & Watson, 1987, p. 243). In other words, symptom distress refers to the extent to which a person is bothered by a symptom (Lenz et al., 1997). Decreasing symptom distress is important because of its effect on adherence to treatment recommendations and quality of life (Dodd et al., 2001; Humphreys et al., 2008).

Thirst and HD

Thirst is defined as a sensation of dryness in the mouth and throat associated with a desire for liquids (Greenleaf, 1992). There is limited information in the literature about thirst in patients on HD. Several factors influence thirst including fluid restriction, reduced salivary secretion, biochemical and biological changes, hormonal abnormalities, and medication use, but how this symptom occurs is not known accurately yet (Bots et al., 2004, 2005; Sung et al., 2005, 2006; Zwiech & Bruzda-Zwiech, 2013). Thirst is one of the most powerful stimulus to drinking liquids and often leads to higher interdialytic weight gain (IWG) in patients (Bots et al., 2004). Excessive IWG also increases the risk of cardiovascular morbidity and mortality and reduces quality of life. Therefore, thirst is one important source of distress for patients and their families (Bots et al., 2005; Welch, 2002).

Previous studies report that 39–95% of patients on HD experience thirst, depending on the methods used to determine the presence of symptom (Bots et al., 2004; Curtin, Bultman, Thomas-Hawkins, Walters, & Schatell, 2002; Dominic, Ramachandran, Somiah, Mani, & Dominic, 1996; Virga et al., 1998). Current literature suggests that thirst may be assessed separately or together with other symptoms of renal failure. A self-reporting method is thought to be the most appropriate, because thirst is a subjective feeling (Zwiech & Bruzda-Zwiech, 2013). Several instruments with dichotomous (yes/no) or continuous item response format are available for the measurement of thirst in patients on HD. Unfortunately, few of these have published details regarding the instruments' psychometric properties (Bots et al., 2004; Welch, 2002). To better assess thirst in patients, Bots et al. (2004) developed the 7-item Dialysis Thirst Inventory with a 5-point Likert scale, ranging from *never* (1) to *very often* (5) experiencing thirst. However, the development process of the Dialysis Thirst Inventory was not explained. Other than its the internal consistency (Cronbach's alpha coefficient = .87) and construct validity (one-factor model), the psychometric properties of the scale were not reported in their study (Bots et al., 2004).

Welch (2002) wanted to develop an instrument that would completely measure thirst in patients on HD. The Symptom Management Model (Larson et al., 1994) was used as the theoretical construct in the process of the instrument development. The dimensions of thirst were determined according to this model: duration, frequency, distress, and intensity. However, because the use of the visual analogue scale (VAS) for assessment of thirst intensity is recommended (Sung et al., 2005; Yang, Yates, Chin, & Kao, 2010), the instrument did not include thirst intensity. Firstly, conceptual definitions for the three dimensions of thirst were provided as follows: (a) thirst distress: "The degree to which a person is bothered by thirst or its associated discomfort"; (b) thirst duration: "The length of time that thirst is experienced by the person per episode"; and (c) thirst frequency: "How often during a day thirst is experienced by the person" (Welch, 2002, p. 338). Original items were developed for each of the three dimensions based on interviews with 10 patients on HD, a literature review and the conceptual definitions of dimensions. Content validity of the instrument was established through a panel of nine experts and revisions were made accordingly. Then, the validity and reliability of the scale was investigated in a sample of 247 American patients on HD with a mean age of 59 years (SD = 14.8, range: 20–91) by Welch (2002). All items in the duration (3 items) and frequency subscales (16 items) and 6 of the 12 items in the distress subscale were deleted from the scale after item analysis because of low average inter-item correlations. The resulting 6-item scale was called as the TDS. The researcher reported satisfactory internal consistency (Cronbach's alpha coefficients = .78) and support for construct validity. A principal component analysis revealed a single-component structure, explaining 48.0% of the variance in the original study. All component loadings were greater than .40 (range: .59–.81). Thus, the TDS is the only tool that has been tested statistically in terms of validity and reliability for measuring thirst distress; however, the known-group validity and test-retest reliability of the scale have not been investigated (Welch, 2002). Although the TDS was used as a data collection instrument in the studies conducted in Canada and Italy (Jacob & Locking-Cusolito, 2004; Porcu, Fanton, & Zampieron, 2007), to our knowledge, its psychometric properties were not tested.

Currently, there is no instrument available that evaluates thirst distress of Turkish patients on HD. Therefore, the purpose of this study was to examine the validity and reliability of the Turkish version of the Thirst Distress Scale (TDS-T) in this patient group. The results of this study will provide better understanding of thirst distress of Turkish patients on HD and will contribute to the planning and implementation of appropriate intervention strategies for the prevention and control of thirst distress.

Methods

Study design

This study used a methodological design.

Setting and sample

One hundred sixty-six patients from two HD centers in a large city in central Turkey were included in this study. The inclusion criteria for the patients were as follows: (a) aged 18 years and older; (b) on maintenance HD three times every week for 4 hours per session; and (c) able to communicate in Turkish. Medical records were reviewed for past medical history and comorbidities before the study began. In line with previous studies (Bots et al., 2005; Porcu et al., 2007; Sung et al., 2006), patients who had clinically diagnosed psychiatric, cognitive or comorbid terminal illness and those who were clinically unstable were excluded from the study. All participants fulfilling the inclusion criteria and willing to participate were enrolled for the study. A convenience sample of 142 patients participated in the study (participation rate at 85.5%), which exceeded the recommended criterion of at least 5–10 participants per item of an instrument for determining the factor structure (Tinsley & Tinsley, 1987).