



The Chinese version of hospital anxiety and depression scale: Psychometric properties in Chinese cancer patients and their family caregivers

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ABSTRACT

Purpose: The Hospital Anxiety and Depression Scale (HADS) acts as one of the most frequently used self-reported measures in cancer practice. The evidence for construct validity of HADS, however, remains inconclusive. The objective of this study is to evaluate the psychometric properties of the Chinese version HADS (C-HADS) in terms of construct validity, internal consistency reliability, and concurrent validity in dyads of Chinese cancer patients and their family caregivers.

Methods: This was a cross-sectional study, conducted in multiple centers: one hospital in each of the seven different administrative regions in China from October 2014 to May 2015. A total of 641 dyads, consisting of cancer patients and family caregivers, completed a survey assessing their demographic and background information, anxiety and depression using C-HADS, and quality of life (QOL) using Chinese version SF-12. Data analysis methods included descriptive statistics, confirmatory factor analysis (CFA), and Pearson correlations.

Results: Both the two-factor and one-factor models offered the best and adequate fit to the data in cancer patients and family caregivers respectively. The comparison of the two-factor and single-factor models supports the basic assumption of two-factor construct of C-HADS. The overall and two subscales of C-HADS in both cancer patients and family caregivers had good internal consistency and acceptable concurrent validity.

Conclusions: The Chinese version of the HADS may be a reliable and valid screening tool, as indicated by its original two-factor structure. The finding supports the basic assumption of two-factor construct of HADS.

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1. Introduction

As the leading cause of morbidity and mortality worldwide, cancers reached up to 14.1 million new cases, with 8.2 million cancer-related deaths in 2012. Of these, 21% (3 million) of new cancer cases, and 27% (2.2 million) of cancer deaths occurred in China (WHO, 2015). It is unfortunate that in developing countries,

where most new cancer cases are frequently diagnosed at an advanced stage, treatment options are both limited and expensive (López-Gómez et al., 2013). With the increase in cancer cases, there is a need for a similar number of family caregivers, who are expected to provide care or support to cancer patients. Both cancer patients and their family caregivers need to cope together and adjust to the challenge of the profound emotional and social adversity imposed by a cancer diagnosis and its treatment (Kayser et al., 2007).

Accumulating evidence has shown that psychological distress represents a significant adversity in cancer populations (Saboonchi

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et al., 2013; Satin et al., 2009; Carlson et al., 2004) and their family caregivers (Li and Loke, 2013; Haley, 2003). Anxiety and depression – the most common presenting symptoms of psychological distress (Rodgers et al., 2005) – are reported to be prevalent in approximately one-third, or as many as 45% of cancer patients (Rodgers et al., 2005; Schreier and Williams, 2004; Grassi et al., 1996) and their family caregivers (Janda et al., 2007; Fridriksdóttir et al., 2011). It has been reported that the psychological distress of family caregivers could be as high or even higher, than that of cancer patients themselves (Hagedoorn et al., 2008; Northouse et al., 2000). Anxiety and depression also exert a significant impact on quality of life (QOL) in both cancer patients (Grassi et al., 1996; Li et al., 2014; Saevarsdóttir et al., 2010), and their family caregivers (Fridriksdóttir et al., 2011; Kim et al., 2008; Northouse et al., 2000). Evidence from a meta-analysis concluded that depression, in particular, constitutes a predictor of mortality in cancer patients (Satin et al., 2009). Studies have also shown there is a mutual impact between dyads of cancer patients and family caregivers in terms of QOL and psychological distress (Kim et al., 2008; Northouse et al., 2000).

Evidence also indicates that cancer affects caregiver-patient dyads as a unit, rather than as isolated individuals (Hagedoorn et al., 2008), leading to the primary focus of cancer care research to shift from the individual experiences of cancer patients or family caregivers, to the dyadic level of caregiver-patient dyads (Fletcher et al., 2012). For a better understanding of the related experiences of caregiver-patient dyads from the dyadic level, the participants in the present study included both cancer patients and their family caregivers.

The growing recognition of the common prevalence of anxiety and depression, and the significant impact on the lives of cancer patients and their family caregivers, highlights the need for valid assessment and screening methods for anxiety and depression in cancer practice (Saboonchi et al., 2013). Self-report questionnaires appear to be specifically appropriate, and a practical tool in this context (Mitchell, 2010). The Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983) stands out as one of the most frequently used self-reported measures, which is considered an effective screening measure for both anxiety and depression, and has been widely used across a variety of cancer populations and family caregivers (Saboonchi et al., 2013; Smith et al., 2002; Moorey et al., 1991; Muszbek et al., 2006; Gough and Hudson, 2009; Mitchell et al., 2010).

In terms of the instrument's psychometric properties, although internal consistency reliability with Cronbach's alpha for HADS anxiety varied from 0.68 to 0.93 (mean 0.83), and for HADS depression from 0.67 to 0.90 (mean 0.82), this suggests the instrument has good reliability and shows a capacity to consistently capture reliable data (Bjelland et al., 2002); however, the evidence for construct validity, which is based on analysis for instrument dimensionality, remains inconclusive. According to a 10-year systematic review of the latent structure of the HADS, the largest degree of heterogeneity of construct validity occurs in studies of cancer populations (Cosco et al., 2012). The heterogeneity of the factorial structure of HADS in cancer populations consists of single-factor (Smith et al., 2006; Razavi et al., 1990), two-factor (Saboonchi et al., 2013; Smith et al., 2002; Moorey et al., 1991; Muszbek et al., 2006), three-factor (Rodgers et al., 2005; Brandberg et al., 1992), and four-factor structure (Lloyd-Williams et al., 2001).

Given that the original English version of HADS has been translated into and validated in many different languages (Herrmann, 1997), including Chinese (Leung et al., 1993; Wang et al., 2009), the measurement properties of the HADS, such as the inconclusiveness of the construct validity, could be affected by cross-lingual and cross-cultural adaptation processes (Guillemin

et al., 1993). Although several studies have been conducted to validate the factorial structure of the Chinese version of HADS (C-HADS), including in a sample of medical students (Leung et al., 1993) and in coronary heart disease (Wang et al., 2009), no studies have been conducted in mainland China, to our knowledge, to validate its psychometric properties in cancer patients and their family caregivers.

Consequently, this study's aim was to evaluate the psychometric properties of the C-HADS from a dyadic perspective. To be specific, to evaluate the psychometric properties of the C-HADS in terms of construct validity, internal consistency reliability, and concurrent validity in dyads of Chinese cancer patients and their family caregivers. This study provides the psychometric properties of the C-HADS when applied to a sample of Chinese cancer patients and their family caregivers.

2. Methods

2.1. Study design and participants

This was a cross-sectional study, conducted in multiple centers: one hospital in each of the seven different administrative regions in China. The seven administrative regions cover different areas of China, and one of the high-ranking hospitals within each of the administrative regions was recruited by convenience sampling. The seven regions were: (i) East China; (ii) Southern China; (iii) North China; (iv) Central China; (v) Northwest China; (vi) Southwest China; and (vii) Northeast China. Participants consisted of 641 cancer patient and their family caregiver dyads, and were recruited by convenience sampling from October 2014 to May 2015.

The study criteria inclusions were as follows: (i) dyads of Chinese adult cancer patients and family caregivers (age >18 years old); (ii) a medical diagnosis of any type of cancer in patients, who had no other diseases, such as dementia, which could lead to unconsciousness; (iii) a primary family caregiver who provides informal care to cancer patients; (iv) both patients and their family caregivers could communicate in Mandarin-Chinese, and consent to take part in the study.

Sample size calculation: the sample size in the HADS evaluation was calculated by $n = (u\alpha\sigma/\delta)^2$ and $n = (u\alpha\sigma/\delta)^2 \approx 4 \times \sigma^2$, given $\alpha = 0.05$ and $\delta = \pm 1$, the error in estimation of population means for HADS -Total, HADS-Anxiety and HADS- Depression. σ^2 was estimated separately by $deff \times \sigma^2_{Total}$, $deff \times \sigma^2_{Anxiety}$ and $deff \times \sigma^2_{Depression}$ (Statistics. health, 2015). From our pilot study in a region, the estimated value of σ^2_{Total} was 9.5, and the value of $\sigma^2_{Anxiety}$ and $\sigma^2_{Depression}$ was 5. The design effect (*deff*) for sampling from different regions was given as 1.5. The sample size for estimating HADS -Total was $4 \times 1.5 \times 9.5^2 = 541$, and for estimating HADS-Anxiety and HADS- Depression it was $4 \times 1.5 \times 5^2 = 150$. One hundred more cases were added to the actual survey in case of no response and missing data; the final sample size was 641. The sample sizes for each subgroup of HADS-Anxiety and HADS-Depression should be no fewer than 150 cases. To simplify, the sample size of the present study is large enough to ensure the statistical power for doing confirmatory factor analysis (CFA).

2.2. Instruments

Three groups of variables were collected: socio-demographic characteristics and clinical data, the Chinese version of HADS (C-HADS) for anxiety and depression (Zigmond and Snaith, 1983), and the Chinese version of Medical Outcomes Study 12-item Short Form (C-SF-12) (version 2) for QOL. The purpose of using the C-SF-12 was to examine the concurrent validity of the C-HADS.

Information on socio-demographic characteristics and clinical

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