



Research paper

Should health anxiety be carved at the joint? A look at the health anxiety construct using factor mixture modeling in a non-clinical sample

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ARTICLE INFO

Article history:

Received 5 April 2011

Received in revised form 4 November 2011

Accepted 20 November 2011

Keywords:

Health anxiety

Hypochondriasis

Illness Attitude Scales

Factor mixture modeling

ABSTRACT

Cognitive-behavioral models conceptualize health anxiety as a construct that varies in degree along a continuum rather than existing as nonpathological versus pathological classes or taxons. Only two studies have empirically evaluated the latent structure of health anxiety, both using taxometric statistical methods and both supporting its conceptualization as continuous (Ferguson, 2009; Longley et al., 2010). We sought to further evaluate the latent structure of health anxiety using factor mixture modeling (FMM), which involved a combination of exploratory factor analysis (EFA) and mixture modeling that allowed comparison of models comprising one or more latent classes. Health anxiety symptom data were obtained from the Illness Attitude Scales (IAS) administered to 1768 university undergraduate students. Indicators of health anxiety, derived from EFA of IAS item data, included disease worry, disease conviction, health-related safety behaviors, fear of death, somatic focus, interference due to symptoms, and treatment seeking. FMM of these indicators suggested that health anxiety consists of two classes: (a) an “anxious” class comprising 81.4% of the sample and characterized primarily by somatic focus and interference due to symptoms, and (b) a “nonanxious” class comprising 18.6% of the sample with low scores on all indicators. Contrary to current conceptualizations and taxometric findings, the FMM results indicate the latent structure of health anxiety to be taxonic rather than continuous. Implications for the measurement and conceptualization of health anxiety are discussed and future research directions are highlighted.

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1. Introduction

Health anxiety often arises when bodily sensations or changes are believed to be indicative of serious disease. The magnitude of health anxiety can vary over time for a given individual, and levels can vary across people; consequently, contemporary cognitive-behavioral models conceptualize it along a continuum ranging from minimal to severe (Abramowitz, Schwartz, & Whiteside, 2002; Salkovskis & Warwick, 1986; Taylor & Asmundson, 2004). Mild to moderate degrees of health anxiety can be adaptive, motivating one to seek clinical care in cases in which clinical care is warranted (Asmundson, Abramowitz, Richter, & Whedon, 2010); however, both minimal and severe health anxiety can be maladaptive. Minimal health anxiety is associated with ignoring or minimizing the

potential importance of bodily sensations and changes that may be indicative of disease, not seeking medical attention, and sometimes leading to disease progression or death (Taylor & Asmundson, 2004). Conversely, high levels of health anxiety are characterized by preoccupation and worry that often lead to undue personal suffering, impaired social and occupational functioning, as well as over utilization of general and specialty health care services (Asmundson & Taylor, 2007).

Health anxiety is characterized by several core cognitive, somatic, and behavioral features that typically manifest following periods during which one is stressed, seriously ill, or has suffered the loss of a family member (Barsky & Klerman, 1983) or after exposure to disease-related popular media (Taylor & Asmundson, 2004). The core cognitive feature is disease conviction; that is, the belief that bodily sensations and changes are due to disease processes rather than benign bodily perturbations, symptoms of minor ailments, or autonomic nervous system arousal. Other dysfunctional beliefs (e.g., the doctor has missed something critical) may accompany disease conviction and, together with disease-related preoccupation and worry, motivate maladaptive coping behaviors.

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Reassurance seeking and recurrent checking behaviors, while providing transient relief to distress (Haenen, de Jong, Schmidt, Steven, & Visser, 2000), perpetuate dysfunctional beliefs and are detrimental in the long term (Warwick & Salkovskis, 1990). People with high levels of health anxiety are often diagnosed with hypochondriasis, a DSM-IV somatoform disorder characterized by presentations of core features of health anxiety (Asmundson et al., 2010).

Whether health anxiety is a construct that varies between people in degree along a continuum, as opposed to existing as nonpathological versus pathological classes or taxons, has important implications for theorists, researchers, and clinicians (Ruscio, Haslam, & Ruscio, 2006). Only two studies have empirically evaluated the latent structure of the health anxiety construct (Ferguson, 2009; Longley et al., 2010). Ferguson (2009) used three procedures belonging to the applied mathematical approach of taxometrics (i.e., MAXimum ElGenvalue [MAXEIG; Meehl & Yonce, 1994], mean above minus below cut [MAMBAC; Meehl & Yonce, 1994], and latent mode [L-Mode; Waller & Meehl, 1998]) to examine this issue in a sample of 501 healthy individuals who completed the Whiteley Index (WI; Pilowsky, 1967). Results suggested that health anxiety is a dimensional construct. Longley et al. (2010) applied a similar selection of taxometric analyses to four symptom indicators derived from exploratory factor analysis (EFA) of several health anxiety measures (i.e., Illness Attitude Scales [IAS; Kellner, 1986; Kellner, Abbott, Winslow, & Pathak, 1987]; Multidimensional Inventory of Hypochondriacal Traits [MIHT; Longley, Watson, & Noyes, 2005]; WI), completed by a sample of 1083 undergraduate students. As with Ferguson (2009), results suggested a dimensional construct.

The findings of Ferguson (2009) and Longley et al. (2010) are consistent with contemporary cognitive-behavioral models, suggesting that health anxiety varies along a continuum. Conceptualizing health anxiety as dimensional diverges from the categorical approach used in numerous studies of health anxiety (e.g., Hadjistavropoulos, Craig, & Hadjistavropoulos, 1998; Hitchcock & Mathews, 1992; Owens, Asmundson, Hadjistavropoulos, & Owens, 2004) and espoused by the DSM-IV (American Psychiatric Association [APA], 2000). Accordingly, additional empirical scrutiny of the latent structure of health anxiety using alternative statistical methods is warranted. Taxometric statistical methods are useful for understanding the latent structure of psychological phenomena, but have disadvantages relative to the alternate method of factor mixture modeling (FMM). First, because taxometric statistical methods were principally designed to estimate whether a model consisting of two latent classes (i.e., a taxonic model) has a better goodness-of-fit than a model consisting of a single latent class (i.e., a dimensional model), they are generally less informative with regard to whether a two-class model has a better or worse fit to the data than models consisting of three or more classes (e.g., a model of health anxiety comprising classes characterized by health anxiety that is either pathologically low, adaptive, or pathologically elevated). Second, taxometric statistical methods assume that indicators are uncorrelated within classes, whereas empirical investigations (using FFM) have shown that a better fitting model can be obtained when indicators are allowed to correlate within classes (e.g., Bernstein et al., 2010). Thus, compared to taxometric statistical methods, FFM has advantages for investigating the latent structure of health anxiety.

The present study was conducted to further evaluate the latent structure of health anxiety using FMM, which entailed a combination of EFA and mixture modeling that allowed the comparison of models comprising one or more latent classes. The IAS – a trait measure of the construct (Hadjistavropoulos, Asmundson, & Kowalyk, 2004; Stewart & Watt, 2000) considered by some to be the gold-standard (Sirri, Grandi, & Fava, 2008) – was used to measure health anxiety in a large sample of university students who completed the

measure as part of participating in several other studies. Despite some debate (cf. Otto, Demopolous, McLean, Pollack, & Fava, 1998; Otto, Pollack, Sachs, & Rosenbaum, 1992; Stewart & Watt, 2000; Taylor, 1992, 1995), there is evidence indicating that the construct assessed by the IAS and measures of arousal-reactive constructs (e.g., anxiety sensitivity) are distinct (Sirri et al., 2008; Watt & Stewart, 2000). The base rate of clinical forms of health anxiety is not known; however, epidemiological studies suggest community past 12-month prevalence rates of between 0.4% (Bleichhardt & Hiller, 2007; Looper & Kirmayer, 2001) and 4.5% (Faravelli et al., 1997) and a lifetime prevalence rate of approximately 1–5% (APA, 2000). Since one of the two prior taxometric studies of health anxiety (Ferguson, 2009) utilized a sample that may have been too small to detect a health anxiety taxon class had it existed, the empirical basis for concluding that health anxiety is either continuous or taxonic remains insufficient. Accordingly, the current study can be considered exploratory in nature.

2. Method

2.1. Participants

The study included data from 1768 adult participants ($n = 503$ men, ages 18–41; $M = 20.6$; $SD = 3.4$; $n = 1261$ women, ages 18–52; $M = 20.4$; $SD = 3.8$). The participant data were all from samples of undergraduate students who had participated in one of several previously published studies as described below. Ethnicity data were not available for all samples; however, in the sample for which ethnicity was assessed ($n = 315$), participants identified as Caucasian/White (90%), First Nations (4%), Asian (3%), other (2.4%), or did not identify ethnicity (1.6%).

2.2. Measure

The IAS (Kellner, 1986; Kellner et al., 1987) is a 27-item, self-report inventory designed to assess fears, beliefs, and attitudes associated with hypochondriasis and health anxiety. The scale contains two additional items to assess types of treatment and illness experiences, but these are not used in subscale scoring. Sirri et al. (2008) conducted a recent search of articles published between 1980 and 2006 using the IAS and, on that basis, provide a comprehensive critique of its psychometric properties; in short, they report that the IAS has excellent discriminant validity (e.g., between patients with hypochondriasis, patients with other psychiatric conditions, and health controls), excellent concurrent validity (e.g., with the WI and other measures of health anxiety), good to very good test–retest reliability (e.g., subscale r s between .44 and 1.00 on retest evaluations conducted at 1 week to 6 months), and is sensitive to changes with treatment. Although originally designed to assess nine different indicators of health anxiety – worry about illness, concerns about pain, health habits, hypochondriacal beliefs, fear of death, disease phobia, bodily preoccupation, effects of symptoms, and treatment experience – recent factor analytic work in nonclinical and clinical samples (Cox, Borger, Asmundson, & Taylor, 2000; Ferguson & Daniel, 1995; Hadjistavropoulos & Asmundson, 1998; Hadjistavropoulos, Frombach, & Asmundson, 1999; Stewart & Watt, 2000; also see Sirri et al., 2008) has indicated that the IAS is composed of fewer than nine dimensions, although a definitive factor structure has yet to be identified. Accordingly, we conducted a further EFA of the IAS as part of the present study.

2.3. Procedure and sample considerations

The sample data were assembled from three pre-existing data sets, each derived as part of larger university research ethics board-approved studies. Sample 1 comprised 315 (77 men, ages 18–33;

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