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Health anxiety: Comparison of the latent structure in medical and non-medical samples

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ABSTRACT

The Short Health Anxiety Inventory (SHAI; Salkovskis, Rimes, Warwick, & Clark, 2002) is a self-report measure designed to assess health anxiety in both medical and non-medical samples. The invariance of the factor structure across these samples has not been examined in the 14-item version of the SHAI. In the current study, the SHAI was completed by a community sample with no serious medical conditions (n = 232) and a medical sample with multiple sclerosis (n = 245). Factor analysis implied the same two-factor solution for both samples, with the two factors labelled: (1) Thought Intrusion, and (2) Fear of Illness. Item loadings were invariant across the medical and non-medical samples, but the two factors were more strongly correlated in the non-medical sample. Implications of the findings as well as directions for future research are discussed.

1. Introduction

Health anxiety refers to excessive or inappropriate fear that one has a serious illness based on the misinterpretation of bodily sensations or changes (Abramowitz & Braddock, 2008). As confirmed in recent taxometric analyses (Ferguson, 2009; Longley et al., 2010), health anxiety exists on a continuum with mild concern about health at one end and severe anxiety at the other. Some level of concern about health is present within most individuals and is generally viewed as adaptive if it provides motivation to engage in appropriate actions (e.g., take prescribed medications) or seek needed medical attention (Abramowitz & Braddock, 2008). Adaptive concerns about health are usually short-lived as either they are replaced by more urgent thoughts or dispelled through medical consultation. On the other hand, severe health anxiety persists despite medical reassurance (e.g., no medical condition is identified) and creates clinical levels of distress or functional impairment (Taylor & Asmundson, 2004).

Salkovskis, Rimes, Warwick, and Clark (2002) developed the Health Anxiety Inventory (HAI) and a shortened version of this scale — the Short Health Anxiety Inventory (SHAI) — as a measure sensitive to both mild and more severe forms of health anxiety. In addition, the SHAI was designed to be suitable for use in both psychological and medical contexts. The SHAI contains 14 items assessing health anxiety independently of physical health as well as a 4-item subscale that measures the perceived negative consequences of becoming ill. Several studies have demonstrated that the SHAI has good reliability and validity in both clinical and non-clinical samples (Abramowitz, Deacon, & Valentiner, 2007; Abramowitz, Oltunji, & Deacon, 2007; Salkovskis et al., 2002; Wheaton, Berman, Franklin, & Abramowitz, 2010).

Previous factor analyses suggest that the SHAI has two factors: one that assesses the perceived likelihood of illness and one that assesses the perceived severity of becoming ill (Abramowitz, Deacon, et al., 2007; Abramowitz, Oltunji, et al., 2007; Salkovskis et al., 2002; Wheaton et al., 2010). However, all of these analyses included the 14 items that assess health anxiety as well as 4-item negative consequences subscale which asks individuals to imagine what it would be like if they had a serious illness. This particular subscale does not assess health anxiety directly and is also not appropriate for use when the SHAI is administered to medical populations who already have a serious medical illness. To date, no factor analyses have been conducted exclusively on the 14 items designed to address health anxiety directly. This omission is especially surprising given that the 14-item SHAI alone is often used in both physically healthy clinical samples (Barsky & Ahern, 2004; Lovas & Barsky, 2010), non-clinical samples (Karademas, Christopoulou, Dimostheni, & Pavlu, 2008; Witthöft, Rist, & Bailer, 2008), and medical samples (e.g., multiple sclerosis (MS), Kehler & Hadjistavropoulos, 2009; chronic pain, Tang, Wright, & Salkovskis, 2007; patients receiving hematopoietic stem cell transplantations, Demarinis, Barsky, Antin, & Chang, 2009).

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Table 1
Principal axis factoring of the SHAI: factor loadings and communalities $(h)^2$.

Item	Factor		
	TI	FI	h^2
1. Time spent worrying about health	**0.65**	0.00	0.43
2. Noticing aches and pains	**0.52**	−0.06	0.25
3. Awareness of bodily sensations/changes	**0.58**	−0.13	0.28
4. Ability to resist thoughts of illness	**0.76**	−0.02	0.56
5. Fear of having a serious illness	−0.09	**0.71**	0.44
6. Images of self being ill	**0.51**	0.08	0.30
7. Ability to take mind off health thoughts	**0.75**	−0.00	0.56
8. Relieved if doctor says nothing's wrong	0.41	**0.41**	0.34
9. Hear about illness and think I have it	0.01	**0.53**	0.28
10. Wonder what body sensations/changes mean	**0.63**	−0.5	0.36
11. Feeling at risk for developing serious illness	0.13	**0.55**	0.39
12. Think I have a serious illness	−0.9	**0.84**	0.64
13. Ability to think about other things if I notice unexplained bodily sensation	**0.57**	0.16	0.45
14. Family/friends say I worry about my health	0.34	0.21	0.13

Note: factor loadings ≥.40 are in boldface type. TI, Thought Intrusion factor; FI, Fear of Illness factor.

All previous factor analyses of the SHAI have been conducted only on samples of reportedly physically healthy adults. Salkovskis et al. (2002) administered the 18-item SHAI to healthy controls as well as individuals attending a general practice clinic, a gastroenterology clinic, and a MRI scan. However, these researchers did not indicate which samples were used in their factor analysis. Despite widespread use of the SHAI in medical samples and its purported suitability for such samples, the factor structure of the SHAI has not been examined among individuals who are already physically ill. In addition, the invariance of the factor structure across medical and non-medical (i.e., healthy) samples has not been confirmed.

The present study therefore had two purposes. The primary purpose was to examine the factor structure of the 14-item SHAI in a medical sample using exploratory factor analysis (EFA). The secondary purpose was to use the results from the EFA to compare the factor solutions for the medical sample and a non-medical sample (i.e., factor loadings) through confirmatory factor analysis (CFA).

2. Method

2.1. Participants and procedure

Data were obtained from two previous studies of 245 adults with MS (medical sample, Kehler & Hadjistavropoulos, 2009) and 232 adults with no serious medical conditions (non-medical sample; Hadjistavropoulos et al.). In both studies, participants completed an online survey that consisted of demographic questions followed by the SHAI and other measures. Results pertaining only to the SHAI are reported in the current study. Participants were recruited through advertisements in community health clinics, physicians' offices, newspapers, and community websites. Ethical approval for the study was obtained from the University of Regina Research Ethics Board. Average age of participants in the medical sample was 41.7 years (SD = 10.1); 96% identified themselves as Caucasian. For the non-medical sample, the average age of participants was 32.4 years (SD = 12.1); 92% identified themselves as Caucasian. The majority of each sample was female (82% and 78%, respectively).

All participants completed the 14-item version of the SHAI. Each item of the SHAI consists of a group of four statements rated by frequency of occurrence (e.g., *I do not*, *I occasionally*, *I spend much of my time*, *I spend most of my time*) over the past 6 months. In the medical sample, the phrase *other than MS* was added to items 5, 9, 11, and 12 to ensure that participants' responses were not limited by having this medical condition (e.g., "As a rule, I am not afraid that I have a serious illness [other than MS]").

3. Results

3.1. Preliminary analyses

An independent samples t-test indicated that the total SHAI score for the medical sample (M = 13.98; SD = 5.95) was higher than the total SHAI score for the non-medical sample (M = 9.19, SD = 4.86), $t(475) = 9.61$, $p < .001$.

3.2. Exploratory factor analysis

The EFA was conducted on data from the medical sample. Preliminary analyses supported the suitability of the data for factor analysis, as the Kaiser–Meyer–Olkin value was .86, and correlations between items were sufficiently large according to Bartlett's Test of Sphericity, $\chi^2(91) = 1032.79$, $p < .001$. Factor analysis of the correlation matrix was conducted using principal axis factoring with promax (oblique) rotation, as it was anticipated that the factors would be correlated. The number of factors to retain was determined by the eigenvalues greater than one rule, which produced a two-factor solution that explained 38.6% of the variance after rotation. The first extracted factor accounted for 29.99% of the variance while the second accounted for 8.58% of the variance. Substantial loadings were set at .40 or greater. Table 1 presents the factor loadings and communalities for the two-factor solution. Item 14 did not load on either factor and there were no items with cross-loadings. Based on a reading of the items, the first factor was labelled Thought Intrusion and the second factor was labelled Fear of Illness.

3.3. Confirmatory factor analysis

Using results from the EFA, CFA was conducted on the medical data and the non-medical data to obtain fit indices and for comparison purposes. The CFA was done using maximum likelihood estimation of the variance–covariance matrix through AMOS 6.0. Model fit was assessed using the root mean square error of approximation (RMSEA), goodness of fit index (GFI), and the comparative fit index (CFI). A well-fitting model is suggested by GFI and CFI values greater than .90 (liberal criteria) or .95 (more strict criteria) and an RMSEA value <.08 (liberal criteria) or .05 (more strict criteria). The fit of the two-factor model from the medical data was evaluated separately in the non-medical and medical samples. Acceptable fit was found for the non-medical sample: $\chi^2(64) = 117.24$, RMSEA = .060 (CI = .043–.077), GFI = .931, CFI = .930, and the medical sample: $\chi^2(64) = 150.82$, RMSEA = .075 (CI = .059–.090), GFI = .914, CFI = .908. Therefore, both samples showed acceptable fit to the two-factor model derived from the medical data.