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Anxiety Sensitivity Factor Structure Among Brazilian Patients with Anxiety Disorders

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Abstract Anxiety sensitivity (i.e., fear of arousal-related bodily sensations, including sensations that arise from normal physiological processes, due to the personal belief that these sensations will produce harmful consequences) is an important psychological construct involved in the etiology and maintenance of different anxiety disorders. The present study evaluated the psychometric proprieties and the factor structure of the 18-item Anxiety Sensitivity Index-3 (ASI-3) among 585 Brazilian patients with primary anxiety disorder diagnosis. Results indicated good internal consistency and item-total correlation coefficients. Exploratory factor analyses suggested a hierarchical structure composed of a single higher-order factor and three lower-order factors related to physical, cognitive and social concern. ASI-3 score comparisons across the different anxiety disorder groups indicated that panic disorder patients produced significantly higher overall ASI-3 scores as well as on the physical and social subscales.

Keywords Anxiety sensitivity · Factor analysis · Hierarchical structure · Anxiety disorder

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Anxiety Sensitivity Factor Structure Among Brazilian Patients with Anxiety Disorders

Anxiety sensitivity (AS) is the fear of arousal-related bodily sensations, including sensations that arise from normal physiological processes, due to the personal belief that these sensations will produce harmful consequences (Reis and McNally 1985). AS seems to be a trait-like cognitive characteristic that amplifies the intensity of specific anxiety symptoms and thus builds up the perception of anxiety reactions. Individual differences in AS might play a central role on the etiology and maintenance of anxiety disorders. For example, a person with high AS might perceive specific anxiety related symptoms as a sign of eminent physical, cognitive or social threats, which in turn increases the experienced level of anxiety (see Taylor, 1999, for a review).

The Anxiety Sensitivity Index (ASI) is the most popular instrument to measure AS (Reiss et al. 1986). The ASI consists of a 5-point Likert-type scale ranging from 0 (*agree very little*) to 4 (*agree very much*). It has 16 items that measure fears of somatic reactions (e.g., It scares me when my heart beats rapidly), fear of cognitive loss of control (e.g., When I cannot keep my mind on a task, I worry that I might be going crazy), and fear of publicly observable anxiety reactions (e.g., It is important for me not to appear nervous). All items are stated positively and responses to all 16 items are summed to produce a final

score that indicates the amount of AS. The higher the score, the more intense the AS level.

The ASI has received considerable psychometric support (e.g., Peterson and Plehn 1999). For instance, the ASI total scale demonstrated high internal consistency across both clinical (Tayloret al. 1991) and non-clinical samples (Peterson and Heilbronner 1987). There is also evidence showing that ASI levels seem to be very stable over time. Test-retest studies indicated that ASI scores are highly stable over a period of three years (Maller and Reiss 1992).

Despite its wide and well-established psychometric properties, there has been considerable controversy in the literature about whether the ASI should be conceptualized as a unidimensional or multidimensional AS assessment (Taylor 1999). Some research indicates that the ASI reflects a unitary dimension (Reiss et al. 1986; Taylor et al. 1991, 1992) However, more extensive examination of the ASI has led to an emerging consensus that ASI might have as many as four factors: two of them related to the fear of somatic sensations whereas the other two being associated with the fear of cognitive dyscontrol and fear of publicly observable anxiety reactions (Blais et al. 2001; Cox et al. 1996; Wardle et al. 1990). It also appears that these four factors might be organized hierarchically into a one single higher-order factor (Zinbarg et al. 1997).

A possible reason for factor structure inconsistencies in the ASI might be related to its insufficient number of items. In fact, most of its 16 items assess fear of somatic reactions whereas there are very few items associated with cognitive and social domains. Moreover, it also appears that 5 of the 16 items of the ASI might present some sort of conceptual psychometric problems (Blais et al. 2001). Based on these grounds, Taylor and Cox (1998) developed a 36-item revised form of the ASI (ASI-R). This new instrument has the same instructions and response format of the original ASI and included 10 of its 16 items.

The original Taylor and Cox (1998) report revealed a hierarchical structure, consisting of four lower-order factors related to 1) fear of respiratory symptoms, 2) fear of publicly observable anxiety reactions, 3) fear of cardiovascular symptoms, and 4) fear of cognitive dyscontrol. Subsequent factor analysis studies have confirmed that ASI-R's latent structure is composed of a cognitive and a social factor. However, the two somatic factors were not consistent with the findings of Taylor and Cox's (1998) original study. For example, Deacon, Abramowitz, Woods, and Tolin (2003) found that the two somatic factors were associated with beliefs about the harmful consequences of somatic sensations and fear of somatic sensations without explicit consequences. Conversely, Deacon and Abramowitz, (2006) suggested that one of the somatic factors might be related to fear of physical catastrophe whereas the other factor would be associated with fear of physical disease.

Administration of the ASI-R to a large and culturally diverse sample represented in six Western countries revealed an unstable factorial structure (Zvolensky et al. 2003). This is an important finding due to the increasing interest in cross-cultural studies in anxiety instruments (Friedman 1997). Among the several reasons for this growing interest is the evaluation of structural dimensions of psychometric instruments across different cultures. Accordingly, existing scales when employed in different cultures might be interpreted differently (Irvine and Carroll 1980). Moreover, although it is assumed that anxiety disorders are universal across all cultures (Guarnaccia 1997), symptom perception and expression might be strongly influenced by cultural variability (Kirmayer et al. 1995). Therefore, an important issue in AS factor structure investigation is the assessment of this construct across different cultures.

Evaluation of the ASI factor structure in non-English speakers produced a different number of factors, ranging from a single dimension in the ASI Spanish version (Sandin et al. 1996) to a multidimensional structure composed by four factors in a Japanese population (Maruta et al. 2007). The Cambodian translation of the ASI with a 9-item addendum supplement revealed a four-factor solution: two somatic-type factors and two others related to social and control concerns (Hinton et al. 2006). Investigations of ASI-R factor structure in non-English speaking populations have also led to conflicting results. The French translation of the ASI-R yielded a two-factor solution related to the fear of physical sensations and social-cognitive worries (Bouvard et al. 2006). In a different study, Lim, Yu, and Kim (2007) reported that the Korean version of the ASI-R led to a similar four-factor solution originally identified by Taylor and Cox (1998).

In order to deal with AS dimension instability, an 18-item AS instrument was recently developed to measure the three most common factors observed in previous AS research: physical, cognitive and social concerns (Taylor et al. 2007). This instrument, termed ASI-3, incorporated six items from the ASI-R that best represented each of these three factors. Taylor et al. (2007) reported that the ASI-3 has a more stable factor structure than the ASI-R, and has improved psychometric properties compared to the original ASI. In this study, the ASI-3 factor structure was replicated in samples from North America, Canada, France, Spain, the Netherlands, and Mexico.

At the present time, only one study evaluated the psychometric properties of the ASI-3 (Taylor et al. 2007). Moreover, the ASI-3 has not been translated into Portuguese. Therefore, one of the purposes of the present work was to further investigate the psychometric properties of this instrument among Brazilian patients with anxiety disorders. Since it has been reported that ASI-R has a hierarchical factor structure, the present study also evaluated whether the

present version of the ASI-3 might also reveal a unifactorial structure at a higher-order level as well as lower-order factors related to physical, cognitive, and social concerns. Comparisons of ASI-3 scores across the different groups of anxiety disorder patients were examined. Finally, the relationship between ASI-3 scores and general anxiety, as assessed by the Beck Anxiety Inventory, was also investigated.

Method

Participants

The study participants included 585 treatment-seeking patients with a primary anxiety disorder diagnosis. Table 1 presents age and gender distribution information from each of the four anxiety disorders that composed the present sample. Patient overall age mean was 33.0 (SD=11.1), ranging from 18 to 72 years of age. The sample included 171 men (29.2%) with a mean age of 32.9 (SD=11.8) and 414 women (70.8%) with a mean age of 33.1 (SD=10.8). Over half of the sample (56.1%) was composed of generalized anxiety disorder (GAD) patients, whereas only approximately five percent included patients suffering from social phobia (SP) and obsessive-compulsive disorder (OCD). Anxiety disorder patients diagnosed with panic disorder (PD), with or without agoraphobia, represented over one-third of the sample (33.3%). Women were predominant throughout the four anxiety disorder by a ratio of close to a 3:1. One-way analysis of variance indicated that the four groups of anxiety disorder patients did not differ in same mean age (F [3, 581]=0.42; p=.74). Many patients (46.2%) with primary anxiety disorder diagnosis were also diagnosed with a second anxiety disorder, or an additional DSM-IV-TR diagnosis such as depression and somatization disorder. Approximately half of the sample (49.6%) was on some type of psychotropic medication.

Table 1 Anxiety disorder patient distribution by age and gender

Diagnosis	Age	Female	Male	Total
Generalized Anxiety Disorder	33.0 (11.5)	234 (71.3%)	94 (28.7%)	328 (56.1%)
Social Phobia	33.9 (8.1)	15 (62.5%)	9 (37.5%)	24 (4.1%)
Obssesive-Compulsive Disorder	31.2 (11.5)	26 (68.4%)	12 (31.6%)	38 (6.5%)
Panic Disorder	33.2 (10.7)	139 (71.3%)	56 (28.7%)	195 (33.3%)
Total	**33.0 (11.1)**	**414 (70.8%)**	**171 (29.2%)**	**585 (100%)**

For age, mean and standard deviation, in parenthesis, are presented
For gender, raw frequency and its percentage, in parenthesis, are presented

Measures

Developing the Portuguese version of the ASI-3 The ASI-3 was not available at the time that the study was initiated. Consequently, the ASI-R was translated into Portuguese, and administered to the anxiety disorder patients. However, all analyses were performed on the 18 ASI-R items that Taylor et al. (2007) employed to create the new ASI-3. It is important to acknowledge the possible presence of item measurement biases because ASI-3 items were not administered independently but selected from the ASI-R item pool.

Two translators converted the original version of the ASI-R to Portuguese. Linguistic equivalence of this ASI-R version was assessed by its translation back to English by other translators who had not seen the original version of the ASI-R. This back translation was then compared to the English original ASI-R by one of the authors. This analysis, which took into consideration linguistic and semantic equivalence between translations, resulted in several corrections and eventually led to the first Portuguese version of the ASI-R. Face validity of this first version was evaluated by two bilingual psychologists who reached a final consensus after revising each of the 36 translated items. This second version of the ASI-R was then tested in a sample of 120 psychology students. This pilot study indicated that all subjects were able to perfectly understand the scale, so that no more adjustments to the translation were required.

Beck Anxiety Inventory (BAI) The BAI is a 21-item Likert scale self-report inventory. It was developed by Beck, Epstein, Brown and Steer (1988) to measure common features of anxiety. Respondents are asked to report how much they have been bothered by several symptoms in the previous week on a four-point scale ranging from ‘not at all’ (0) to ‘severely’ (3). Possible score ranges from 0 to 63 with higher scores indicating higher level of anxiety. Excellent psychometric properties of the BAI Portuguese version have been reported among the Brazilian population (Cunha 2001).

Procedure

Anxiety disorder diagnoses were made by an experienced psychiatrist based on the DSM-IV-TR after an unstructured clinical interview. ASI-R and BAI instruments were administered as part of a comprehensive clinical evaluation. Written informed consent to participate in the study was obtained from all patients. The study was approved by the Ethical Review Board Committee from Pontifícia Universidade Católica from Rio de Janeiro. All the patients completed the questionnaires employed in the present study.

Results

Descriptive and Reliability Analysis

The mean of the total ASI-3 score was 30.9 (SD=15.7), ranging from 1 to 67. Student t-test revealed no significant ASI-3 difference between men (M=31.0; SD=18.8) and women (M=30.8; SD=15.3), (t[582]=0.17; p>.80). Cronbach's alpha of internal consistency indicated a value of. 91 for the entire sample, .92 for the men and .91 for the women subsets of data. These results are well above .7, which indicates an acceptable Cronbach's alpha (Nunnally and Bernstein 1994), and indicates a high internal consistency for the scale.

The mean for individual items was 1.72 and ranged from 1.23 for item 4 ("When my stomach is upset, I worry that I might be seriously ill") to 2.41 for item 3 ("It scares me when my heart beats rapidly"). The mean of corrected item-total correlation coefficients was high (r=.58), ranging from r=.37 for item 1 ("It is important for me not to appear nervous") to r=.72 for item 14 ("When my thoughts seem to speed up, I worry that I might be going crazy"). All were above the r=.3 cut-off criteria suggested by Nunnally and Bernstein (1994), and indicated that all the 18 ASI-3 items produced good correlations with the scale total score.

Exploratory Factor Analysis

Before performing an exploratory factor analysis with all 18 items of the ASI-3 scale, the Kaiser-Meyer-Olkin (KMO) measure was calculated to evaluate sampling adequacy in order to carry out a factor analysis. It has been suggested that KMO values should be equal to or above.60 in order to perform and interpret satisfactorily a factor analysis solution (Tabachnick and Fidell 2001). The KMO analysis revealed a value of.91, indicating that the correlation matrix was suitable for factor analysis.

It has been pointed out that principal axis factoring (common factor analysis) is a preferable method for factor extraction when employed in an exploratory manner (Field 2005). Since the present study was the first attempt to replicate the ASI-3 latent structure reported by Taylor et al. (2007), factors were extracted through the principal axis factoring. Factor rotation was performed through the oblique method (Promax, K=4) due to likelihood of considerable conceptual correlation among the factors. Velicer's minimum average partial (Velicer 1976) and parallel analysis (Hayton et al. 2004) were employed to determine the number of factors. Both of these procedures, performed through a SPSS syntax developed by O`Conner (2000), led to a three-factor solution which accounted for 59.89% of the variance. Table 2 depicts the pattern of rotated factor loadings for this three-factor solution, as well as the respective communalities.

Table 2 Principal axis factoring analysis factor loading and communalities (h2) of the 18 ASI-3 scale items following Promax rotation

Item No	Item	ASI-R Factor			
		I	II	III	h2
7.	When my chest feels tight, I get scared that I won't be able to breathe properly. (Quando sinto um aperto no peito, fico apavorado (a) em não conseguir respirar direito.)	**.86**	.03	−.03	.67
12.	When I notice my heart skipping a beat, I worry that there is seriously wrong with me. (Quando sinto alterações nas batidas do meu coração, fico achando que existe algo de muito sério comigo.)	**.82**	.01	−.04	.67
8.	When I feel pain in my chesm, I worry that I'm going to have a heart attack. (Quando sinto dor no peito, fico preocupado (a) que vou ter um infarto.)	**.82**	−.07	.00	.57
3.	It scares mre when my heart beats rapidly. (Fico assustado (a) qando o meu coracão bate muito rápido.)	**.66**	.00	.03	.47
15.	When my throat feels tight, I worry that I could choke to death. (Quando minha garganta fecha, tenho medo de morrer engasgado (a).)	**.55**	.12	−.03	.39
4.	When my stomach is upset, I worry that I might be seriously ill. (Quando o meu estomago está embrulhado, fico preocupado (a) que estou com uma doenca séria.)	**.53**	.03	.12	.44
14.	When my thoughts seem to speed up, I worry that I might be going crazy.	−.01	**.84**	.03	.67

Table 2 (continued)

Item No	Item	ASI-R Factor			
		I	II	III	h2
	(Quando os meus pensamentos parecem se acelelar, tenho medo de estar ficando louco (a).)				
16.	When I have trouble thinking clearly, I worry that there is something wrong with me. (Quando não consigo pensar com clareza, fico achando que estou com algum problema.)	−.04	**.83**	−.04	.6
18.	When my mind goes blank, I worry there is something terrily wrong with me. (Quando a minha cabeça "dá um branco",tenho medo de estar com algum problema muito sério.)	.01	**.81**	−.02	.61
10.	When I feel "spacy" or spaced out, I worry that I may be mentally ill.(Quando me sinto aéreo (a) ou "fora" do ar", fico preocupado (a) em estar com alguma doença mental.)	.01	**.67**	.11	.58
5.	It scares me when I am able to keep my mind on a task. (Fico assustado (a)quando não consigo me concentrar no que estou fazendo.)	.06	**.64**	.03	.52
2.	When I cannot keep my mind on task, I worry that I might be going crazy. (Quando não consigo me consentrar tenho medo de estar ficando louco (a).)	.21	**.61**	−.03	.55
9.	I worry that other people will notice my anxiety.(Tenho medo que as outras pessoas percebam minha ansiedade.)	−.12	.10	**.77**	.56
13	When I begin to sweat in a social situation, I fear people will think negatively of me. (Quando começo a suar em situações sociais, fico preocupado que as pessoas pensem mal de mim.)	.05	.01	**.75**	.55
6.	When I feel like I'm not getting enough air, I get scared that I might suffocate. (Quando meu corpo começa a tremer na presença de outras pessoas, tenho medo do que elas vão pensar de mim.)	.18	−.15	**.69**	.48
11.	It scares me when I blush in front of people.(Fico assustado (a) quando fico vermelho (a) na frente de outras pessoas.)	.00	−.07	**.59**	.34
17.	I think it would be horrible for me to faint in public. (Acredito que seria horrível se eu desmaiasse em público.)	−.01	.24	**.47**	.43
1.	It is important for me not to appear nervous. (Para mim,é importante não demonstar nervosismo.)	−.08	.15	**.41**	.27
Eigenvalue		7.34	2.10	1.37	
Variance		40.75	11.54	7.60	
Cronbanch's alpha		.86	.89	.81	

Factor loadings greater than 0.4 are represented in bold

The magnitude of the communalities indicated that these three factors accounted for a substantial proportion of variance in all items. Examining the simple structure, no hyperplane items were found (i.e., items that did not have

salient loadings on any factor). As a whole, the three-factor solution of the ASI-3 presented a well-defined structure. All 18 items had salient loadings in a single factor exclusively.

The first factor was responsible for 40.75% of the variance with an eigenvalue of 7.34. This factor was composed of all six physical concern items. Factor loadings were high and yielded good internal consistency (alpha= .86). The second factor explained 11.54% of the variance with an eigenvalue of 2.10. This factor incorporated all six items related to cognitive concern with very high factor loadings (all above.60). Cronbach's alpha for this factor was .89, indicating a very high level of internal consistency. Finally, the third factor explained 7.60% of the variance with an eigenvalue of 1.37. This included all six items associated with social concern with good factor loadings and high level of internal consistency (alpha=.81).

Hierarchical Factor Analysis

It has been suggested that ASI-R has a hierarchical factor structure. Therefore, it is possible that ASI-3 might also have this factorial structure. In order to test this possibility, a second-order factor analysis was conducted on the three oblique factors in the same manner as previously described. This analysis lead to a one factor solution with eigenvalue equal to 2.05, which accounted for 68.30% of the variance, and two other factors with eigenvalues smaller than one (0.59 and 0.36, respectively). This result indicated that in fact ASR-3 has a hierarchical factor structure, in which the three lower-order factors loaded on a single higher-order factor.

Based on the second-order factor analysis, the Schmid-Leiman orthogonalization procedure (Schmid and Leiman 1957) was employed to investigate item loading in the higher- and lower-order factors. This procedure was computed using a SPSS syntax procedure developed by Wolff and Preising (2005). Table 3 shows that the higher-order structure had an excellent simple structure. The higher-order factor accounted for 57.7% of the variance and yielded salient loading on all the items. The three lower-order factors explained relatively less of the variance and the item loadings across these factors were similar to the pattern observed in Table 2, suggesting the same factor labels.

It is important to note that lower-order factor loadings derived after the Schmid-Leiman procedure were lower than those observed in the simple factor structure original loadings presented in Table 2. This is due to the Schmid-Leiman procedure allowing the higher-order factor to account for as much of the correlation among the items as possible while the lower-order factors are reduced to residual factors uncorrelated with each other and with the higher-order factor. Therefore, factor loadings equal to or greater than.25 are generally considered satisfactory (Wolff and Preising 2005).

Table 3 Hierarchical ASI-3 structure with loadings for one higher- and four lower-order factors

ASI-3 Item	High order actor	Lower-Order Factor		
		I	II	III
7	**.54**	**.68**	.01	−.02
12	**.49**	**.64**	.00	−.03
8	**.45**	**.64**	−.03	.00
3	**.43**	**.52**	.00	.02
15	**.43**	**.43**	.01	.09
4	**.44**	**.42**	.01	.09
14	**.77**	−.01	**.37**	.02
16	**.70**	−.03	**.36**	−.03
18	**.72**	.01	**.35**	−.02
10	**.68**	.01	**.35**	−.02
5	**.63**	.05	**.28**	.02
2	**.66**	.17	**.27**	−.02
9	**.52**	−.09	.04	**.58**
13	**.54**	.04	.00	**.56**
6	**.43**	.14	−.07	**.25**
11	**.33**	.00	−.03	**.44**
17	**.52**	−.01	.11	**.35**
1	**.36**	−.06	.07	**.31**
Variance(%)	57.7	21.0	6.9	14.4

Factor loadings greater than 0.25 are represented in bold

ASI-3 Factors and BAI Correlations

The relationship among higher- and lower-order ASI-3 factors and BAI scores are presented in a Pearson's correlation matrix depicted in Table 4. As can be observed, ASI-3 lower-order factors were correlated with each other. Factor II- cognitive concern, and Factor III- social concern produced the highest correlation (r=.60) whereas Factor I- physical concern, and factor II, the lowest (r=.41). The ASI-3 higher-order factor correlated highly with each of the lower-order factors, ranging from.80 (Factor III) to.88 (factor II). Finally, higher-and lower-order ASI-3 factors correlated moderately with BAI scores, ranging from.48 (Factor I) to.65 (higher-order factor).

Comparison of ASI-3 Scores Among Different Diagnostic Groups

Mean ASI-3 overall scores among the four anxiety groups are presented in Fig. 1. A one-way analysis of variance (ANOVA) revealed a statistically significant difference among the four groups (F [3,581]=27.65; $p<.001$). Post-hoc comparisons performed with the Fisher's least significant difference (LSD) test revealed that patients with PD and SP scored significantly higher than OCD and GAD patients ($p<.05$). SP and OCD group differences should be

Table 4 Correlations between AS-3 higher- and three lower-order factor and the Beck Anxiety Inventory

Variable	ASI-3 Lower-Order Factors			ASI-3 Higher-Order Factor	Beck Anxiety Inventory
	I	II	III		
ASI-3 Factor I: Physical Concerns	1.0				
ASI-3 Factor II: Cognitive Concerns	.56	1.00			
ASI-3 Factor III: Social Concerns	.41	.60	1.00		
ASI-3 Higher Order Factor	.81	.88	.80	1.00	
Beck Anxiety Inventory	.48	.61	.52	.65	1.00

All correlation coefficients were statistically significant $p<.01$)

interpreted with caution due to the small numbers of these patients in the sample (24 and 38, respectively).

In addition to the overall score, factor analyses suggested that ASI-3 can be decomposed into three subscales related to physical, cognitive and social concerns. Figure 2 shows the means of these three subscales across the four groups of anxiety patients. Mean physical concern subscale scores are presented in the top of Fig. 2. A one-way ANOVA indicated a significant difference among the four groups (F [3, 581]=496.70; $p<.001$). Subsequent LSD post-hoc comparisons revealed that patients with PD scored significantly higher than all other groups ($p<.001$). The middle of Fig. 2 depicts the mean cognitive concern subscale scores. A one-way ANOVA revealed an overall significant difference among the groups (F [3, 581]=13.56; $p<.001$). Subsequent LSD post-hoc comparisons indicated that SP patients had significantly higher scores than all other groups ($p<.05$). Moreover, GAD patients produced significantly lower scores than all other groups ($p<.05$). Finally, mean social concern subscale scores are represented in the lower portion of Fig. 2. Again, a one-way ANOVA indicated an overall significant difference among the four groups of patients (F [3, 581]=10.14; $p<.001$). Subsequent LSD post-hoc comparisons indicated that GAD patients had significantly lower scores when compared to PD or SP groups ($p<.01$).

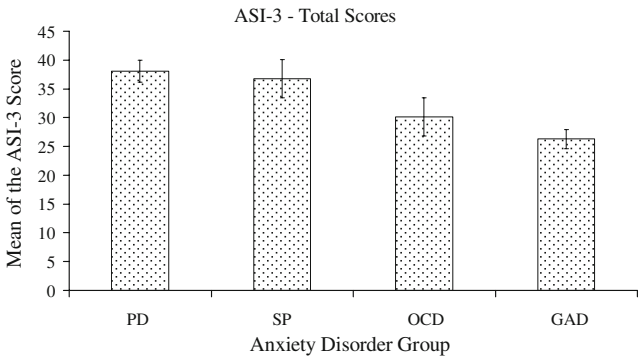

Fig. 1 Overall ASI-3. Mean scores on ASI-3 overall score across different anxiety disorder groups. PD=panic disorder; SP=social phobia; OCD=obsessive-compulsive disorder; GAD=generalized anxiety disorder

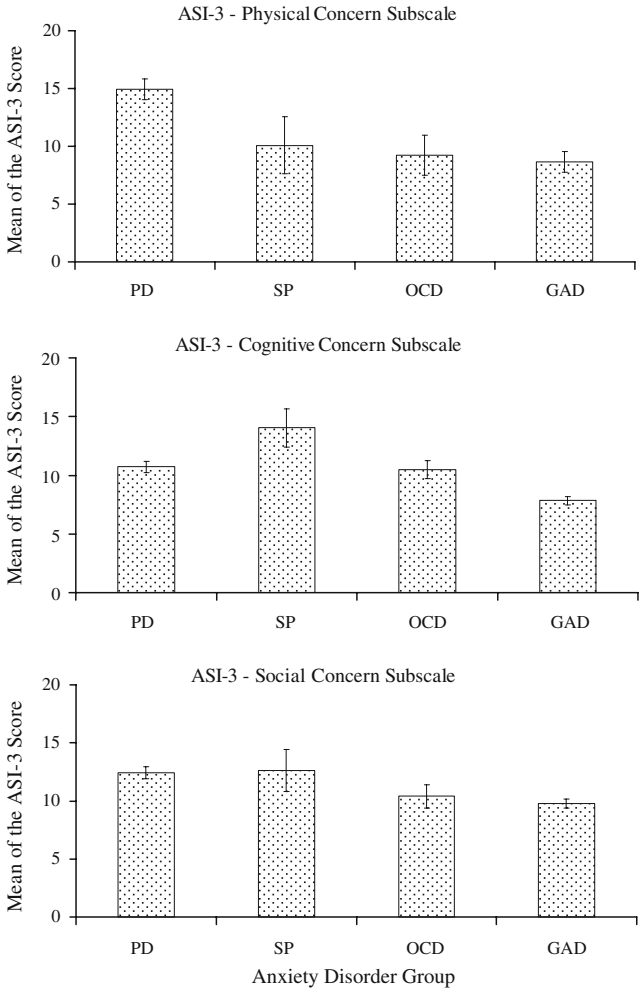

Fig. 2 ASI-3 Subscales. Mean scores on the 3 subscales of the ASI-3. PD=panic disorder; SP=social phobia; OCD=obsessive-compulsive disorder; GAD=generalized anxiety disorder

Discussion

The present study represents the first evaluation of the psychometric properties and the latent structure of the Portuguese translation of the ASI-3. Results were consistent with a previous investigation which also found that the ASI-3 is a reliable measure of AS and its dimensions

(Taylor et al. 2005). Cronbach's alpha was high for the single higher-order factor (alpha=.91) as well as for the three lower-order factors (alpha=.81 −.89). Moreover, item-total correlations coefficients were all within accepted levels, indicating that all ASI-3 items were psychometrically adequate.

Present results were also in agreement with the view that AS consists of a hierarchically structured multiple dimension construct. First-order exploratory factor analysis detected three dimensions related to physical, cognitive and social concern. Item loadings were generally high and restricted to a single factor domain. Second-order exploratory factor analysis indicated that the three lower-order factors loaded onto a single higher-order factor. All items yielded expressive loadings in the higher-order factor. Moreover, the high-order factor accounted for more than half of the variance. These results are consonant with those of the Taylor et al. (2005) original ASI-3 study and extend their findings to a hierarchical structure of this new AS instrument.

Present data also indicated a moderate correlation between the present version of the ASI-3 with general anxiety, as measured by the BAI. This result is in agreement with the Lim et al. (2007) report, which also found an intermediate correlation between ASI-R higher and lower order factors and BAI. Therefore, it is possible that AS and general anxiety, albeit different constructs, might be somewhat related.

A large amount of data indicates that the AS is a main component of PD. For example, ASI scores can predict anxiety symptoms in response to a panic agent such as carbon dioxide (Eke and McNally, 1996; Li and Zinbarg 2007; Schmidt et al. 2007). Also, prospective studies indicate that ASI scores can predict the development of spontaneous panic attacks among undergraduate students (Maller and Reiss 1992; Plehn and Peterson 2002) and young adults under highly stressful military training (Schmidt et al. 1997; Schmidt et al. 1999) with no previous history of panic. Specifically, it appears that the AS-physical concern dimension is strongly associated with PD (Blais et al. 2001; Rector et al. 2007; Rodriguez et al. 2004; Taylor et al. 1996; Zinbarg et al. 1997, 2001). In accordance with this evidence, PD patients produced significantly higher scores on the ASI-3 general scale as well as on the physical and social concern subscales. Particularly, a clear-cut dissociation between PD and other anxiety disorder groups was found in the physical concern dimension of the ASI-3.

It has been reported that the AS-cognitive concern dimension might be associated with GAD (Rector et al. 2007). However, present results indicated that GAD patients had lower scores in the ASI-3 cognitive concern subscale when compared to the three other groups. One possible explanation for this divergent result might be related to the fact that the nature of worry content associated with GAD is somewhat different from the worry domain present in the cognitive dimension of the ASI-3. According to the DSM-IV, worry is generally associated with impairments in academic, social, or personal functioning whereas ASI-3 cognitive concern items are more associated with mental incapacitation, such as "going crazy" and "feeling spacey". An alternative reason for the low GAD scores on the ASI-3 cognitive dimension might be related to cultural differences in the expression of GAD symptoms. For instance, Hoge et al. (2006) found that North American GAD patients demonstrated higher levels of cognitive anxiety symptoms when compared to Nepali patients with GAD.

Patients diagnosed with SP produced the highest scores in the ASI-3 cognitive concern subscale. Moreover, although SP patients scored higher on the ASI-3 social concern subscale when compared to GAD patients, these scores were not significantly higher when compared to PD or OCD patients. These are surprising results, especially because the AS-social, but not cognitive, dimension seems to play a central role in SP (Deacon and Abramowitz 2006; McWilliams et al. 2000; Zinbarg et al. 2001; Zinbarg et al. 1997). Cross-cultural differences might be responsible for the lack of specific association between SP and the ASI-3 social concern subscale as well as for the higher scores that these patients produced on the ASI-3 cognitive concern subscale. An alternative reason for these inconsistent results might be the small number (less than 5%) of these patients in the sample. In any event, additional studies are needed to further clarify the relationship between SP and ASI-3 cognitive and social dimensions.

It is important to acknowledge that the present study had several limitations that can be explored in future research. For example, convergent validity of the ASI-3 could be investigated if the study had another AS instrument. In the same vein, it would be important to use a depression scale, such as the Beck Depression Inventory, so that ASI-3 divergent validity could be evaluated. The use of an unstructured diagnostic interview is also another limitation of the present study. The lack of a more structured interview could lead to misdiagnosis of the examined patients. Since SP and OCD groups had very small numbers of patients, the reported results regarding the relationship between these two anxiety disorders and the ASI-3 latent construct must be carefully interpreted. Moreover, the fact that the sample was comprised primarily of women (70.8%) and GAD patients (56.1%) might have lessened the representativeness of the sample which, in turn, could limit the generalizability of present findings. The presence of a non-clinical sample would be particularly important to evaluate the factor structure of the present version of the ASI-3 in a healthy context. A non-clinical

sample would also provide baseline normative data for comparison with the four anxiety groups. Finally, causality between the AS construct and anxiety disorders cannot be inferred due to the cross-sectional nature of the present study. Therefore, future work employing a longitudinal design is important in order to further evaluate the relationship between anxiety disorders and the underlying dimensions of the AS construct.

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