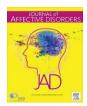


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Research paper

Psychometric properties of the Youth Anxiety Measure for DSM-5, Part I (YAM-5-I) in a community sample of Spanish-speaking adolescents



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ABSTRACT

Background: Anxiety disorders are among the most common mental disorders in adolescence. There is a need for brief screening tools to identify adolescents at risk for anxiety disorders. The Youth Anxiety Measure for DSM-5 has been recently developed to assess youths' anxiety symptoms in terms of the current classification system. The goal of this study is to provide a first test of its psychometric properties in a community sample of adolescents in Spain.

Methods: The sample consisted of 505 13- to 17-year-old adolescents who completed Part I of the YAM-5 (YAM-5-I), which measures symptoms of the major anxiety disorders.

Results: Data indicated that the YAM-5-I displays appropriate internal consistency reliability. In addition, support was also found for the construct validity of the measure: most items loaded on a factor that represented the hypothesized anxiety syndromes, although it should also be noted that some items exhibited issues and therefore had to be discarded.

Limitations: Cross-cultural and trans-national studies are needed to determine psychometric properties of scale across languages and cultures.

Conclusions: Our findings suggest that the YAM-5-I has satisfactory psychometric properties, which indicates that it can be used as a screening tool in Spanish-speaking adolescents from the general population.

1. Introduction

Anxiety disorders are among the most prevalent mental health problems. Although current anxiety scales have proven to be reliable and valid indices of anxiety symptomatology in youths, they are not up to date with the latest edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013). However, DSM-5 has made two main changes with regard to the anxiety disorders section: (1) selective mutism is now included as anxiety appears to be a key symptom of this problem (Muris and Ollendick, 2015), while (2) obsessive-compulsive disorder and traumatic stress disorders have been removed from the section as they are no longer considered as pure anxiety syndromes.

In an attempt to construct a screening scale for assessing anxiety symptoms in children and adolescents in terms of the contemporary classification system, Muris et al. (2016) recently developed the Youth Anxiety Measure for DSM-5 (YAM-5), with good psychometric properties. The YAM-5 consists of two parts: Part I is measuring symptoms of the major anxiety disorders (i.e., separation anxiety disorder, generalized anxiety disorder, panic disorder, social anxiety disorder, and

selective mutism), whereas Part II is dedicated to assess symptoms of phobias (i.e., various types of specific phobias and agoraphobia).

The present study aimed to investigate the reliability and validity of Part I of the newly developed YAM-5 in Spanish adolescents. More specifically, we examined (a) age and gender differences; (b) factor structure of the recently designed scale; (c) measurement invariance in gender and age; (d) reliability of scale; and (e) concurrent validity of scale with social anxiety measures.

2. Method

2.1. Participants

The sample consisted of 505 participants aged between 13 and 17 years old (M =14.94, SD =1.25), of which 238 (47%) were boys. Participants were recruited from 1 private and 4 public high schools in a medium-size state in the south of Spain. Schools were selected by a clustered random sampling method from the school lists of the Department of Education to ensure that the socioeconomic status and ethnic composition of the sample were representative of the

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Table 1
Mean scores (standard deviations) for various YAM-5-I scales by gender and age.

	N	Total score M (SD)	Separation anxiety disorder $M(SD)$	Selective mutism <i>M</i> (<i>SD</i>)	Social anxiety disorder $M(SD)$	Panic disorder <i>M</i> (<i>SD</i>)	Generalized anxiety disorder $M(SD)$
Total sample	505	17.23 (10.54)	2.41 (2.47)	1.91 (1.86)	4.44 (3.40)	1.92 (2.63)	6.55 (3.75)
Gender							
Boys	238	14.24 (10.16)	1.98 (2.28)	1.78 (1.81)	3.69 (3.31)	1.36 (2.10)	5.43 (3.61)
Girls	267	19.90 (10.16)	2.78 (2.58)	2.03 (1.90)	5.12 (3.35)	2.42 (2.94)	7.54 (3.59)
Age							
13	82	18.11 (10.57)	2.59 (2.54)	2.00 (1.79)	5.00 (3.62)	1.70 (2.36)	6.83 (3.99)
14	106	17.32 (9.47)	2.69 (2.60)	1.91 (1.80)	4.63 (3.21)	1.63 (1.99)	6.46 (3.47)
15	135	16.90 (11.33)	2.37 (2.55)	1.75 (1.86)	4.48 (3.72)	1.93 (2.78)	6.38 (3.69)
16	123	16.67 (9.14)	2.02 (2.02)	1.94 (1.79)	3.98 (2.88)	2.03 (2.68)	6.71 (3.64)
17	59	17.76 (13.10)	2.54 (2.77)	2.15 (2.22)	4.20 (3.62)	2.49 (3.44)	6.37 (4.30)

general population in Spain.

2.2. Measures

Part I of the YAM-5 (Muris et al., 2016) consists of 28 items, including items related to separation anxiety disorder (SA, 6 items), selective mutism (SM; 4 items), social anxiety disorder (SAD; 6 items), panic disorder (PD; 6 items) and generalized anxiety disorder (GAD; 6 items). Items are rated on a four-point Likert scale. Total and subscale scores can be obtained by summing across relevant items, with higher scores reflecting higher levels of anxiety symptoms. A back-translation procedure was followed. The original author of the scale supervised the translation process before given permission to administer the test.

The *Brief version of the Social Phobia and Anxiety Inventory* (SPAI-B; Garcia-Lopez et al., 2008a) contains 16 items measuring cognitive, behavioral and somatic symptoms of social anxiety while also tapping performance and interactional socially-anxious situations. Items are rated on a 5-point Likert scale.

The Social Anxiety Scale for Adolescents (SAS-A; La Greca and Lopez, 1998) consists of 22 items presented on a 5-point Likert scale. The SAS-A contains three subscales: Fear of Negative Evaluation (FNE; 8 items), Social Avoidance and Distress specific to new situations or unfamiliar peers (SAD-N; 6 items), and Social Avoidance and Distress that is experienced more generally in the company of peers (SAD-G; 4 items).

Studies conducted in various cultures have reported excellent psychometric properties in adolescents either for SAS-A or SPAI-B (for a review, please see Garcia-Lopez et al., 2015).

2.3. Procedure

Active informed consent was obtained from the adolescents and their parents before the study was conducted. More than half (67%) of those invited actually decided to participate. Completion of the scales took place in a classroom at school and lasted on average 33 min (range: 19–41 min). Ten research assistants administered the questionnaires after receiving a 2-h training. The study was approved by the Management Committee in each high school and the University Research Ethics Board. Data were collected within the context of a larger research project focused on youth's social anxiety.

2.4. Statistical analysis

Age and gender differences in YAM-5-I total and subscale scores were investigated by means of Analysis of Variance (ANOVA). Cronbach's alpha, greatest lower bound (glb), and the omega total coefficient were used to examine the internal consistency of the YAM-5-I. Glb and omega total coefficients were calculated using the psych package (Revelle, 2015) in R statistical software (R Core Team, 2016).

Exploratory and confirmatory analyses were conducted by the R statistical software. A parallel analysis procedure determined the number of factors in the exploratory factor analysis (EFA), by means of the psych R package. We employed lavaan R package (Rosseel, 2012) for the confirmatory factor analysis (CFA). After determining which CFA model best represented the data of the total sample, a multiple-group analysis was performed.

Concurrent validity was examined by calculating Pearson product-moment correlation coefficients. Correlation coefficients between 0.10 and 0.29 are indicative for a weak association, between 0.30 and 0.49 for a moderate association, and 0.50 or higher for a strong association (Cohen, 1988).

3. Results

3.1. Gender and age differences

Table 1 displays the mean scores (and standard deviations) for the YAM-5-I total score and subscales. ANOVA showed that boys and girls differed significantly with regard to the YAM-5-I Total score, F(1, 495) =39.70, p < 0.001, η_p^2 =0.07. This gender difference also showed itself in the SA, F(1, 495) =14.01, p < 0.001, η_p^2 =0.03, SAD, F(1, 495) =24.11, p < 0.001, η_p^2 =0.05, PD, F(1, 495) =22.00, p < 0.001, η_p^2 =0.04, and GAD subscales F(1, 495) =43.63, p < 0.001, η_p^2 =0.08. No significant main effects of age or interaction effects of gender and age were found for any of the YAM-5-I (sub)scales.

3.2. Item analysis and exploratory factor analysis

Twenty-nine (5.43%) out of 534 cases revealed atypical and inconsistent responses to items, that is, infrequent or unusually inconsistent responses to similar item pairs, suggestive of random responses, and therefore, were removed. Kaiser-Meyer-Olkin measure of sampling adequacy (KMO =0.89) and Barlett sphericity test (χ^2 =4673; p<. 001) indicated the idoneity of data to consider the EFA. The number of factors was determined by parallel analysis and scree plot evidence, and a promax oblique rotation was employed.

Items with a primary factor loading lower than 0.30 or a cross-loading with less than a 0.15 difference between their primary and secondary factors were eliminated (Worthington and Whittaker, 2006). As a result, following items were eliminated: 3, 4, 6, 7, 11, 12, 13, 17, 18, 19 and 22. All remaining items showed itemtotal correlations above 0.30 and interitem correlation coefficients were lower than 0.70. Parallel analysis revealed 6 factors, which explained 56% of total variance, with correlations above .50. Eigenvalues were as follow: 5.12, 1.73, 1.59, 1.35, 1.21 and 1.00.

First factor tapped GAD (items 5, 9, 14, and 27) and explained 14% of the variability. Factor 2 explained 12% of the variance and was composed by items 8, 21 and 26 (PD subscale). Factor 3 explained 11%

 Table 2

 Structure matrix (correlations) of the exploratory factor analysis.

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
YAM5_1	0.22	0.33	0.18	0.24	0.13	0.59
YAM5_2	0.14	0.16	0.12	0.19	0.54	0.08
YAM5_5	0.79	0.47	0.34	0.28	0.26	0.23
YAM5_8	0.40	0.31	0.83	0.20	0.23	0.22
YAM5_9	0.71	0.53	0.43	0.32	0.29	0.23
YAM5_10	0.23	0.30	0.21	0.80	0.30	0.28
YAM5_14	0.84	0.46	0.36	0.20	0.25	0.26
YAM5_15	0.26	0.30	0.19	0.85	0.24	0.27
YAM5_16	0.43	0.80	0.26	0.28	0.21	0.34
YAM5_20	0.18	0.14	0.17	0.19	0.66	0.12
YAM5_21	0.38	0.28	0.80	0.18	0.20	0.19
YAM5_23	0.53	0.68	0.23	0.24	0.24	0.34
YAM5_24	0.21	0.29	0.17	0.21	0.17	0.69
YAM5_25	0.24	0.29	0.22	0.17	0.51	0.26
YAM5_26	0.35	0.22	0.76	0.21	0.26	0.21
YAM5_27	0.76	0.48	0.45	0.25	0.26	0.24
YAM5_28	0.46	0.77	0.27	0.28	0.27	0.40

of variance and comprised items 16, 23 and 28 (SAD subscale). Factor 5 explained 6% of variance and contained items 2, 20 and 25, consistently with SM. Finally, Factor 4 (items 10 and 15) and Factor 6 (items 1 and 24) explained 8% and 5% of variance, respectively, which both measured symptoms of separation anxiety (Table 2).

3.3. Confirmatory factor analysis

We employed robust maximum likelihood estimators (MLM) for the model parameters (see Fig. 1). All items in CFA loaded 0.30 or greater, ranging between 0.30 (item 24) and 0.80 (items 10 and 15). According to the results, the six factor model fit the data very well: $\chi 2/df$ ratio =1.53, RMSEA = 0.03, SRMR =0.03, CFI =0.98, and NNFI=0.98.

3.3.1. Testing measurement invariance

3.3.1.1. Testing measurement invariance in gender. Data revealed the adequacy of the model fit to data (configural invariance), with CFI =0.97 and RMSEA =0.04. Further, the Δ CFI between this model and the baseline one was <0.001, below the cut-point 0.01 proposed by Cheung and Rensvold (2002), so factor loadings were considered equivalent across gender (weak invariance). Finally, items were forced to be equal across gender groups (strong invariance). The Δ CFI with respect to the previous model was 0.005, so intercepts may also be considered equivalent across gender.

3.3.1.2. Testing measurement invariance in age. Similarly, analyses were conducted to determine whether the 6-factor structure of YAM-5-I was invariant across two age groups: middle adolescents (13–15 year-old) and late adolescents (16–17 year-old). CFI =0.97 and RMSEA =0.043 reflected an adequate fit of the baseline model. Weak invariance hypothesis was accepted, since Δ CFI =0.002 < 0.01. Finally, strong invariance was also admissible, as Δ CFI =0.002 < 0.01.

3.4. Internal consistency

Internal consistency (Cronbach's alpha) of the total score was found to be 0.84, the glb was 0.92, and the omega total coefficient was 0.85 (CI 95%; 0.82–0.87). The values for the subscales were as follows:

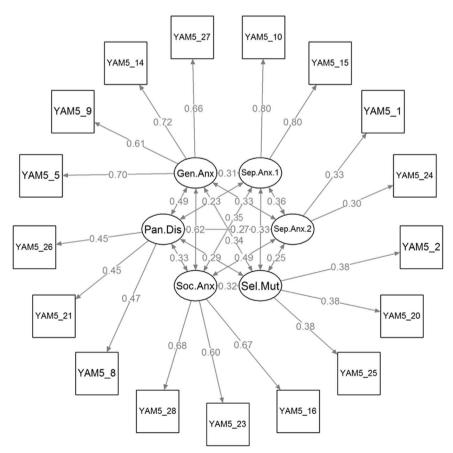


Fig. 1. CFA model. Factor loadings and correlations between factors. Gen. Anx: Generalized anxiety disorder subscale; Pan. Dis: Panic disorder subscale; Soc. Anx: Social Anxiety Disorder subscale; Sel. Mut: Selective Mutism subscale; Sep. Anx.1 and Sep. Anx.2: Separation Anxiety subscale.

alpha was found to be 0.85, glb =0.88 and omega =0.86 (CI 95%; 83-0.88) for GAD; alpha was found to be 0.84, glb =0.84 and omega =0.83 (CI 95%; 0.78-0.88) for PD; alpha was found to be 0.79, glb =0.79 and omega =0.79 (CI 95%; 76-0.83) for the SAD; alpha was found to be 0.58, glb =0.59 and omega =0.58 (CI 95%; 0.48-0.67) for SM; and alpha =0.81, glb =0.81 and omega =0.81 (CI 95%; 0.77-0.85), and alpha =0.58, glb =0.58 and omega =0.58, (CI 95%; 0.44-0.67) for SA1 and 2 subscales, respectively.

3.5. Construct validity: correlations with social anxiety scales

The correlations between the YAM-5-I-SAD subscale and the SPAI-B, the FNE, SAD-N and SAD-G subscales of the SAS-A and SAS-A Total score were strong (r = 0.66, 0.65, 0.54, 0.53 and 0.67, respectively). Similarly, the correlations between the YAM-5-I Total score and the SPAI-B, the FNE, SAD-N and SAD-G subscales of the SAS-A and SAS-A Total score were strong (r = 0.69, 0.66, 0.56, 0.57 and 0.70, respectively). Strong correlations were also found between the GAD subscale and the SPAI-B (0.51), FNE (0.54) and SAS-A Total score (0.55). Moderate correlations were found between the SM subscale and the SPAI-B, the SAD-G subscales of the SAS-A and SAS-A Total score (r =0.35, 0.40 and 0.33, respectively). Similarly, moderate correlations were found between the PD subscale and the SPAI-B, the FNE, and SAD-G subscales of the SAS-A and SAS-A Total score (r = 0.43, 0.37, 0.36, and 0.39 respectively) and weak correlation for SAD-N (r = 0.29). Still within the moderate range of correlations was observed for SA, subscale 2, and the SPAI-B, SAD-N and SAD-G subscales of the SAS-A and SAS-A Total score (r = 0.36, 0.31, 0.32,and 0.35 respectively) and weak correlation for FNE (r =0.29). Finally, weak correlations were also found between the SA, subscale 1 and the SPAI-B (0.27), FNE (0.27), SAD-N (0.17), SAD-G (0.19) and SAS-A Total score (0.25).

4. Discussion

Findings suggest the data show the stability of anxiety symptomatology across gender and age, as effect sizes were small (except for GAD), which is consistent with other studies in Spanish children (Garcia-Lopez et al., 2008b; Orgiles et al., 2012).

The factor structure appeared to be similar to the original one with two differences. First, Spanish YAM-5-I consisted of lesser number of items (17 instead of 28). It must be noted that most of deleted items exhibited methodological problems in its development (Muris et al., 2016). Second, data revealed two different factors tapping separation anxiety subscale items. This is different than proposed factor structure by authors of scale, but consistent with current considerations as to whether separation anxiety disorder is multidimensional. Recent separation anxiety scales such as Children's Separation Anxiety Scale (CSAS; Mendez et al., 2008) or the Separation Anxiety Assessment Scale (SAAS; Eisen and Schaefer, 2007) includes different subscales measuring different features of this disorder. For instance, Fear of being alone subscale items of SAAS seem to be consistent with factor 6 in our study, whereas factor 4 items may be related to fear of abandonment subscale of SAAS. In addition, Mendez et al. (2014) found that behavioral (i.e., avoidance) separation symptomatology seem to be more related to social anxiety but heterogeneity of correlations (weak and moderate) between oppositional subscale of CSAS and social anxiety subscales may suggest something may be missing in the puzzle. In our study, moderate correlation was found only in Factor 6 (consistent with fear of being alone) and with exclusively social anxiety measures tapping behavioral and distress social anxiety symptomatology, namely, SAD subscales of SAS-A, as well as, SPAI-B, which assesses behavioral symptoms rather than cognitive aspects of social anxiety (Garcia-Lopez et al., 2015). This finding may highlight not only multidimensionality of separation anxiety disorder but also unique pattern of correlation between a particular dimension of separation anxiety disorder (factor 6) and

social anxiety symptomatology. Further studies are warranted.

For the separate subscales, most Cronbach's alpha values were between 0.79 and 0.85, consistent with original study (Muris et al., 2016). The only exception in our study was the SM subscale, although it must be noted that this subscale also displayed the lowest internal consistency either on clinical and nonclinical samples by Muris et al. (2016).

Good measurement invariance was found for YAM-5-I across gender and age samples, consistent with data for other anxiety scales (i.e., SCARED) in Spanish population (Hale et al., 2013). Thus, our findings demonstrated that the factor loadings and factor variances and covariances were equivalent across gender and age groups of Spanish adolescents. Therefore, it may be recommend administering the Spanish YAM-5-I for any gender and ages 13–17.

As expected, YAM5-I social anxiety disorder subscale correlated highly with the SPAI-B and the SAS-A/Total score, the SAS-A cognitive subscale, and to a lesser extent, avoidance and distress symptomatology. This finding may suggest that the YAM5-I social anxiety disorder subscale is more related to overall social anxiety, particularly assessing cognitive symptomatology. This finding is consistent with research suggesting cognitions may be particularly pertinent in the context of social anxiety disorder in childhood (Alkozei et al., 2014). In addition, strong correlations were also found for generalized anxiety disorder subscale and social anxiety measures, which is consistent with clinical (Garcia-Lopez et al., 2016) and epidemiological studies pointing out high comorbidities between GAD and SAD in adolescents (for a review, please see Knappe et al., 2015).

4.1. Limitations

Two limitations are that the present study focused on social anxiety measures and the attrition rate. Future research should include additional anxiety scales to correlate with other YAM-5-I subscales, apart from social anxiety subscale. Future studies should examine whether the psychometric properties of the YAM-5-I can generalize to younger populations. Similarly, cross-cultural and trans-national studies are needed to determine psychometric properties of scale across languages and cultures and it is expected that these findings may be generalizable to non-Spanish-speaking adolescents. Finally, further studies should examine if YAM-5-I can be utilized not only as a screening instrument for Spanish adolescents in the general population but to clearly differentiate between anxious and healthy adolescents.

Conflict of interest

The author(s) have declared that they have no competing or potential conflicts of interest. The first author confirms that he had full access to all the data in the study, and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study funding: The author(s) declare we have no financial support for this paper.

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