


RESEARCH ARTICLES

Psychometric Properties of the GAD-7, GAD-2, and GAD-Mini in Peruvian College Students

Propiedades psicométricas del GAD-7, GAD-2 y GAD-Mini en universitarios peruanos

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Received: 11/09/2021

Revised: 11/18/2021

Accepted: 01/25/2022

Online: 04/22/2022

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Cited as:

Franco-Jimenez, R. & Nuñez-Magallanes, A. (2022). Psychometric Properties of the GAD-7, GAD-2, and GAD-Mini in Peruvian College Students. *Propósitos y Representaciones*, 10(1), e1437. <https://doi.org/10.20511/pyr2022.v10n1.1437>

Summary

The psychometric properties of the General Anxiety Disorder-7 (GAD-7) and its ultra-short versions, the GAD-2 and the GAD-Mini, were evaluated in a sample of 407 students from two Peruvian universities (259 females and 148 males). First, a structural analysis was performed using the CFA, showing a good fit with respect to the instrument's unifactorial model $\chi^2(14) = 31.717$, CFI = .995, TLI = .992, RMSEA = .056, SRMR = .026. In addition, a measurement invariance analysis was performed, finding a stable unifactorial structure considering sex. Furthermore, evidence of convergent validity was analyzed in the GAD-7 and its ultra-short versions, presenting moderate correlations with instruments such as the PHQ-2 and the AAQ-II. The internal consistency of the instruments was evaluated using the omega coefficient and obtained high values of .89, .80, and .79 in the GAD-7, GAD-2, and GAD-Mini respectively. Therefore, it is concluded that the GAD-7 is a unifactorial instrument, invariant according to sex, with adequate internal consistency and convergent validity as well as its ultra-short versions in the sample studied.

Keywords: General Anxiety Disorder-7; anxiety; factor analysis; university students.

Resumen

Se evaluó las propiedades psicométricas del General Anxiety Disorder-7 (GAD-7) y la de sus versiones ultracortas el GAD-2 y el GAD-Mini en una muestra conformada por 407 estudiantes de dos universidades peruanas (259 mujeres y 148 varones). Inicialmente se realizó el análisis estructural mediante el AFC mostrándose un buen ajuste respecto al modelo unifactorial del instrumento $\chi^2(14) = 31.717$, CFI = .995, TLI = .992, RMSEA = .056, SRMR = .026. Adicionalmente se efectuó un análisis de invarianza de la medición encontrándose una estructura unifactorial estable considerando el sexo. Además, se analizaron evidencias de validez convergente en el GAD-7 y sus versiones ultracortas presentando correlaciones moderadas con instrumentos como el PHQ-2 y el AAQ-II. La consistencia interna de los instrumentos fue evaluada mediante el coeficiente omega y obtuvieron valores altos de .89, .80 y .79 en el GAD-7, GAD-2 y GAD-Mini respectivamente. Por ello, se concluye que el GAD-7 es un instrumento unifactorial, invariante de acuerdo con el sexo, presenta adecuada consistencia interna y validez convergente al igual que sus versiones ultracortas en la muestra estudiada.

Palabras clave: General Anxiety Disorder-7; ansiedad; análisis factorial; estudiantes universitarios.

Introduction

Anxiety is a normal response of a person to the anticipation of a threat (Sierra et al., 2003) and can cause symptoms such as tremors, difficulty breathing, headaches, decreased concentration, among others (Hofmann & Hinton, 2014). Although it is a common emotion, it may be considered pathological when it occurs intensely, frequently, persistently (Vila, 1984) or accompanied by excessive worry (Newman et al., 2013), in which case it could be associated with an anxiety disorder.

Anxiety disorders are the most usual form of mental disorders (Penninx et al., 2021) and present a high prevalence both in the general population (Somers et al., 2006) and in students at universities (Auerbach et al., 2016) where it is often associated with the use of tobacco (Boehm et al., 2016; Peltzer & Pengpid, 2017), alcohol, drugs (Conway et al., 2006; Webb et al., 1996) and poor academic performance (Vitasari et al., 2010; Yasin & Dzulkifli, 2011). Likewise, the prevalence of anxiety in young university students is higher than in the general population (LeViness et al., 2017). Among the factors that generate anxiety in university students are

academic pressure when taking exams, homework, lack of free time, worries about parental expectations, as well as moving to a new place (Kumaraswamy, 2013).

It is worth mentioning that young people who develop an anxiety disorder present an increased risk of having other mental disorders later in life (Ströhle et al., 2018). However, an early diagnosis can prevent them in the patient's life, so it is important to identify who is at greater risk of developing these problems (Dixon & Kurpius, 2008), being necessary for this purpose appropriate instruments.

In order to assess generalized anxiety disorder, the GAD-7 was developed (Spitzer et al., 2006), a brief, unidimensional instrument that has demonstrated adequate internal consistency in different studies (Ahn et al., 2019; Camargo et al., 2021; García-Campayo et al., 2009; Jordan et al., 2017; Konkan et al., 2013; Mills et al., 2014; Moreno et al., 2016; M. A. Ruiz et al., 2011; Seo & Park, 2015; Soto-Balbuena et al., 2021; Zhong et al., 2015) and presents adequate convergent validity assessed by correlation with other instruments such as BAI (Ahn et al., 2019), HADS (García-Campayo et al., 2009) or the HAM (M. A. Ruiz et al., 2011). Moreover, it has shown invariance with respect to sex (Moreno et al., 2016) even considering different gender orientations (Borgogna et al., 2021).

The instrument has also presented adequate psychometric properties when assessing anxiety in people with migraine (Seo & Park, 2015), cancer (Esser et al., 2018) and chest pain (Lin et al., 2021), as well as in non-clinical population (Donker et al., 2011; Hinz et al., 2017; Mills et al., 2014; Moreno et al., 2016) and university students (Bártolo et al., 2017) even in the current context of COVID-19 (Saravia-Bartra et al., 2020).

Also, in order to reduce the administration time of the GAD-7, ultra-short versions of two items have emerged. One of them is the GAD-2, which employs only items 1 and 2 of the GAD-7 for the measurement of anxiety, and demonstrates adequate psychometric properties (Ahn et al., 2019; Kroenke et al., 2007; Seo & Park, 2015). Byrd-Bredbenner et al. (2020) propose items 2 and 3, which make up the GAD-Mini, as a more parsimonious set with better psychometric characteristics. Both ultra-short versions could be suitable alternatives to the original instrument in case of time constraints. It should be noted that short instruments are usually desirable in the clinical context due to the short time that health professionals usually have when attending to their patients (Kroenke et al., 2003, 2007). In addition, if an instrument is long and has a considerable number of items, the professional may not use it routinely as it increases their workload (Slade et al., 1999).

Considering the impact of the current pandemic on anxiety in university students both worldwide (Cao et al., 2020; Sartorão Filho et al., 2020) and in Peru (Saravia-Bartra et al., 2020), it is necessary to have valid instruments for the diagnosis of problems associated with anxiety, thus contributing to early detection in university students. Moreover, in order to make a rapid diagnosis of anxiety, short instruments are needed, so the aim of this study is to evaluate the internal consistency of the GAD-7, the GAD-2 and the GAD-Mini, as well as the factor structure, the invariance according to sex and to provide evidence of convergent validity.

Method

Design

The study is of instrumental design since it seeks to analyze the psychometric properties of a self-report measurement instrument (Ato et al., 2013).

Participants

The sample consisted of 407 Peruvian students from a private university and a public university in Peru, who responded virtually to the instruments. Of the total number of participants, 259 were female (63.6%) and 148 male (36.4%), with ages ranging from 16 to 44 years ($M = 21.50$; $SD = 3.90$). Accidental sampling was used since the research was made up of available subjects (Kerlinger & Lee, 2002).

Instruments

Acceptance and Action Questionnaire-II (AAQ-II)

The AAQ-II is a unifactorial instrument that assesses experiential avoidance and psychological inflexibility and has seven items with seven response options each with scores ranging from 1 (never true) to 7 (always true). The items refer to the difficulty in experiencing unpleasant emotions and thoughts (e.g., 'I am afraid of my feelings'). The Spanish adaptation made by Ruiz et al. (2013) was used, in which the instrument presented high internal consistency assessed by coefficient alpha ($\alpha = .88$) and showed evidence of convergent validity assessed by correlation with the BDI II and the SCL-90-R.

Patient Health Questionnaire-2 (PHQ-2)

The PHQ-2 was used to measure depression. It is an instrument derived from the PHQ-9 that has only 2 items and a Likert-type rating scale with four response options ranging from 0 (no day) to 3 (almost every day), with scores ranging from 0 to 6. The two items of the instrument refer to the frequency with which the respondent has felt in the last two weeks little interest or pleasure in doing things, as well as the frequency with which the respondent has felt down, depressed or hopeless. It has demonstrated an adequate alpha coefficient ($\alpha = .80$) in a sample of Peruvian university students (Caycho-Rodríguez et al., 2020).

Generalized Anxiety Disorder-7 (GAD-7)

Anxiety was assessed using the GAD-7, which is an instrument composed of seven items and that employs a Likert-type rating scale with four alternatives that are rated from 0 (not at all) to 3 (almost every day). The total score ranges from 0 to 21, with higher scores suggesting a higher level of anxiety symptoms. This instrument evaluates seven anxiety symptoms determined by the DSM-IV and related to the frequency or level of complaints in the last two weeks. In this study we used the Spanish adaptation for the Colombian population by Camargo et al. (2021), which reported adequate internal consistency in his original study ($\alpha = .92$). Language modifications were made to make the instrument more understandable for the sample of Peruvian university students.

General Anxiety Disorder 2 (GAD-2)

The GAD-2 is an instrument derived from the GAD-7 that assesses two of the core symptoms of anxiety according to the DSM-IV, which are linked to emotional and cognitive expression. It is composed of item 1 of the GAD-7 "Feeling nervous, anxious or on edge" and item 2 "Not being able to stop worrying or control worries". It has presented an adequate alpha coefficient ($\alpha = .74$) in a sample of Peruvian university students (Merino-Soto et al., 2017)

General Anxiety Disorder Mini (GAD-Mini)

The GAD-Mini is an instrument derived from the GAD-7 proposed by Byrd-Bredbenner et al. (2020) that focuses on assessing excessive or difficult-to-control worry, this being the main characteristic of anxiety. It is composed of GAD-7 item 2 "Not being able to stop worrying or control worries" and item 3 "Excessive worrying about different things or situations", and has shown to have a high correlation with the GAD-7 ($r \geq .90$) and adequate internal consistency (Byrd-Bredbenner et al., 2020).

Procedure

The instruments were administered virtually through Google Forms. The participants were students from a public university in the city of Ica and from a private university in the city of Lima, recruited through social networks. Informed consent was virtually obtained, indicating the voluntary and anonymous nature of the study. In addition, it was stated that the data would be used for strictly academic purposes. Responding to the online survey took approximately 10 to 15 minutes.

Data Analysis

The psychometric analysis was performed through the statistical software R version 4.1.2 (R Core Team, 2021) using the Lavaan package (Rosseel et al., 2018).

The degree of association between items was analyzed using polychoric correlations, which take into consideration the ordinal nature of the items. Estimates employing this type of correlations in factor analysis tend to provide more accurate results (Pendergast et al., 2017).

In addition, confirmatory factor analysis (CFA) was used, which is a multivariate statistical technique that determines the fit between a proposed factor structure and the data collected. The weighted least squares mean and variance adjusted (WLSMV) estimation method was used. The fit indices chosen for the interpretation of the factor model were the Root Mean Square Error of Approximation (RMSEA) index, the Standardized Root Mean Squared Residual (SRMR), comparative fit index (CFI), Tucker-Lewis index (TLI), in addition to Chi-square (χ^2). Values of $RMSEA \leq .06$, $CFI/TLI \geq .90$ and $SRMR \leq .10$ were considered adequate (Hu & Bentler, 1999; Mehmetoglu & Jakobsen, 2016).

The factor loadings of the items were analyzed. In addition, measurement invariance according to sex was tested based on Byrne's (2008) approaches. The configurational, metric (factor loadings), strong (factor loadings and intercepts) and strict (factor loadings, intercepts and residuals) invariance was performed (Barrera-Barrera et al., 2015) considering adequate values of the $\Delta CFI \leq .01$ and the $\Delta RMSEA \leq .015$ (Cheung & Rensvold, 2002).

Evidence of convergent validity was analyzed by Pearson correlation using the PHQ-2 and the AAQ-II. In addition, in order to evaluate the equivalence between the GAD-7 and its ultra-short versions, a corrected Pearson correlation was used to avoid spurious variance obtained due to items in common (Levy, 1967). Finally, the reliability of the scores was estimated through the omega coefficient (McDonald, 1999). It is worth mentioning that this coefficient is shown as an alternative to the discussed limitations of the alpha coefficient such as tau-equivalence (Cho, 2016; Sijtsma, 2009).

Results

The polychoric correlations of the GAD-7 items are shown in Table 1, all being greater than .40.

In addition, the results of the CFA of the GAD-7 show adequate fit indices in the original unifactorial model, $\chi^2(14) = 31.717$, $CFI = .995$, $TLI = .992$, $RMSEA = .056$, $SRMR = .026$. Figure 1 shows the factor loadings in this model with values between .70 and .81, where the item with the lowest factor loading is explained by 49% of the factor.

Table 1.
Matrix of polychoric correlations of the GAD-7 items.

	I1	I2	I3	I4	I5	I6	I7
I1	-						
I2	.71	-					
I3	.60	.70	-				
I4	.59	.66	.66	-			
I5	.65	.69	.68	.71	-		
I6	.47	.54	.53	.51	.57	-	
I7	.57	.58	.51	.51	.63	.50	-

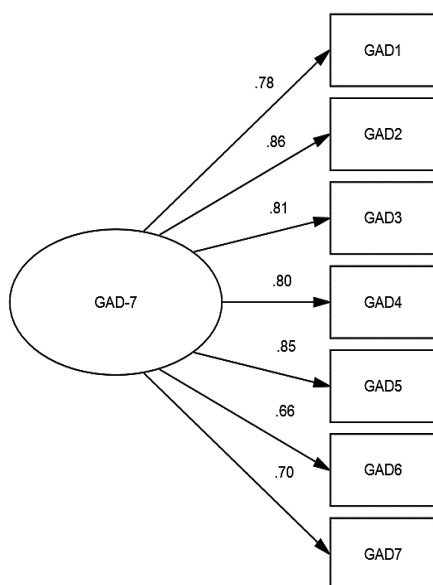


Figure 1.
Factor structure of the GAD-7 in Peruvian university students.

Table 2 shows the measures of invariance in relation to sex. The configurational invariance was evaluated, obtaining satisfactory fit values and showing that in both men and women the construct is represented by a single latent variable. Next, the invariance of the factor loadings (metric invariance), of the intercept of the items (strong invariance) and of the residuals (strict invariance) were tested, with adequate fit indices in all cases. ($\Delta CFI \leq .010$).

Table 2.
Invariance of the GAD-7 measurement in relation to sex.

Model	χ^2	gl	$\Delta\chi^2$	Δgl	CFI	ΔCFI	RMSEA	$\Delta RMSEA$
Sex								
Men	16.71	14	-	-	.998	-	.036	-
Women	38.09	14	-	-	.990	-	.082	-
Configurational	47.43	28	-	-	.985	-	.058	-
Metric	50.56	34	3.13	6	.987	.002	.049	.009
Strong	56.96	40	6.40	6	.987	.000	.046	.003
Strict	63.36	47	6.41	7	.988	.000	.041	.004

In addition, Table 3 shows the degree of association between the GAD-7 and its ultra-short versions, finding high correlations between them, all of them greater than .80. Similarly, evidence of convergent validity of these instruments was analyzed by correlating them with the

PHQ-2 and the AAQ-II, which assess depression and experiential avoidance, respectively, and moderate correlations were found.

Conversely, an adequate internal consistency evaluated by the omega coefficient was found in the GAD-7, GAD-2 and GAD-Mini.

Table 3.

Correlations between GAD-7, GAD-2 and GAD-Mini with depression and experiential avoidance.

	1	2	3	4	5	ω
1. GAD-7	-					.89
2. GAD-2	.81*	-				.80
3. GAD-Mini	.83*	.86*	-			.79
4. PHQ-2	.68*	.61*	.62*	-		.80
5. AAQ-7	.62*	.58*	.57*	.50*	-	.92

* $p < .001$

Discussion

The aim of the study was to analyze the factor structure of the GAD-7, its internal consistency and that of its ultra-short versions, the GAD-2 and the GAD-Mini, in a sample of 407 Peruvian university students by means of confirmatory factor analysis and the omega coefficient. In addition, invariance according to sex was determined and evidence of convergent validity was sought through the PHQ-2 and the AAQ-II.

Adequate fit indices were found when using confirmatory factor analysis for the single-factor model, providing empirical evidence for its unifactorial structure. This result is in agreement with what was found by different other studies also in general population (Hinz et al., 2017; Konkan et al., 2013; Löwe et al., 2010). In addition, the GAD-7 showed strict invariance based on sex, which means that the instrument presents the same factor structure in men and women, the factor loadings are equivalent and so are the intercepts. Other studies have also found that the instrument shows invariance in men and women in general population samples (Hinz et al., 2017; Löwe et al., 2010), and even when comparing men and women with different gender identities (Borgogna et al., 2021). In addition, a high internal consistency was found in the GAD-7 and an adequate internal consistency was found in its two ultra-short versions, demonstrating that they are reliable measures for the evaluation of anxiety.

A high correlation was found between the GAD-2 and the GAD-7, which has also been reported by other studies (Delgadillo et al., 2012; Donker et al., 2011; Hinz et al., 2017; Hughes et al., 2018; Kroenke et al., 2007). Similarly, a high correlation was found between the GAD-Mini and the GAD-7, similar to that found by Byrd-Bredbenner et al. (2020). These results suggest that both ultra-short instruments may be suitable alternatives if there are time constraints for the use of the GAD-7.

Considering the characteristics in common between the symptoms of depression and anxiety (Clark et al., 1994), evidence of convergent validity was analyzed through the PHQ-2, finding that it presents a moderate correlation with the GAD-7, which is consistent with the findings of Löwe et al. (2010). Moderate correlations were also found between the PHQ-2 and the ultra-short versions of the GAD-7, demonstrating evidence of convergent validity in such instruments.

Evidence of convergent validity was also found when using AAQ-II, an instrument that assesses experiential avoidance which is a construct that involves rigid attempts to alter the frequency and duration of private events (thoughts, emotions, sensations), which prevents one from leading a fulfilling life (Hayes et al., 2004) and is related to higher levels of anxiety (Berghoff et al., 2017; Stein et al., 2020) as well as generalized anxiety disorder (Roemer et al., 2005). The correlation between the AAQ-II and the GAD-7 was moderate, similar to that found by McCracken et al. (2021). A moderate correlation was also found between the AAQ-II and the ultra-short versions of the GAD-7, offering evidence of convergent validity to these versions of the instrument.

With respect to limitations, it is worth mentioning that this study did not include a clinical sample or a standard measure for the measurement of anxiety, so an analysis of the sensitivity and specificity of the instrument could not be performed. In addition, although the study included students from two universities, one private and one public, the sampling was done by convenience and this reduces the generalization of the results. Moreover, the data were collected through self-reported measures, with the possibility of biased responses in some participants due to social desirability. Finally, it is observed that the GAD 2 and the GAD-Mini are similar instruments since both have in common item 2 "Not being able to stop worrying or control worries" and when analyzing their psychometric properties, no substantial differences were evidenced. For these reasons, further studies would be necessary to determine which of the two instruments is more suitable for the assessment of anxiety disorders.

Despite these limitations, the results provide evidence that the GAD-7 presents a unifactorial structure, is invariant in men and women, and demonstrates adequate internal consistency and evidence of convergent validity as well as its ultra-short versions. Therefore, its use as screening instruments for the diagnosis of clinical anxiety is recommended. Likewise, due to the psychometric properties reported by both the GAD-Mini and the GAD-2, both can be efficient alternatives to the GAD-7 when time constraints exist.

References

- Ahn, J.-K., Kim, Y., & Choi, K.H. (2019). The Psychometric Properties and Clinical Utility of the Korean Version of GAD-7 and GAD-2. *Frontiers in Psychiatry, 10*, 127. <https://doi.org/10.3389/fpsyt.2019.00127>
- Ato, M., López-García, J. J., & Benavente, A. (2013). Un sistema de clasificación de los diseños de investigación en psicología. *Anales de Psicología, 29*(3), 1038–1059. <https://doi.org/10.6018/analesps.29.3.178511>
- Auerbach, R. P., Alonso, J., Axinn, W. G., Cuijpers, P., Ebert, D. D., Green, J. G., Hwang, I., Kessler, R. C., Liu, H., Mortier, P., Nock, M. K., Pinder-Amaker, S., Sampson, N. A., Aguilar-Gaxiola, S., Al-Hamzawi, A., Andrade, L. H., Benjet, C., Caldas-de-Almeida, J. M., Demyttenaere, K., ... Bruffaerts, R. (2016). Mental disorders among college students in the World Health Organization World Mental Health Surveys. *Psychological Medicine, 46*(14), 2955–2970. <https://doi.org/10.1017/S0033291716001665>
- Barrera-Barrera, R., Navarro-García, A., & Peris-Ortiz, M. (2015). El papel de la invarianza factorial en la validación del constructo calidad de servicio electrónico. *Revista Europea de Dirección y Economía de La Empresa, 24*(1), 13–24. <https://doi.org/10.1016/j.redee.2014.07.001>
- Bártolo, A., Monteiro, S., & Pereira, A. (2017). Factor structure and construct validity of the Generalized Anxiety Disorder 7-item (GAD-7) among Portuguese college students. *Cadernos de Saúde Pública, 33*(9), e00212716. <https://doi.org/10.1590/0102-311x00212716>

- Berghoff, C. R., Tull, M. T., DiLillo, D., Messman-Moore, T., & Gratz, K. L. (2017). The role of experiential avoidance in the relation between anxiety disorder diagnoses and future physical health symptoms in a community sample of young adult women. *Journal of Contextual Behavioral Science*, *6*(1), 29–34. <https://doi.org/10.1016/j.jcbs.2016.11.002>
- Boehm, M. A., Lei, Q. M., Lloyd, R. M., & Prichard, J. R. (2016). Depression, anxiety, and tobacco use: Overlapping impediments to sleep in a national sample of college students. *Journal of American College Health*, *64*(7), 565–574. <https://doi.org/10.1080/07448481.2016.1205073>
- Borgogna, N. C., Brenner, R. E., & McDermott, R. C. (2021). Sexuality and gender invariance of the PHQ-9 and GAD-7: Implications for 16 identity groups. *Journal of Affective Disorders*, *278*, 122–130. <https://doi.org/10.1016/j.jad.2020.09.069>
- Byrd-Bredbenner, C., Eck, K., & Quick, V. (2020). Psychometric Properties of the Generalized Anxiety Disorder-7 and Generalized Anxiety Disorder-Mini in United States University Students. *Frontiers in Psychology*, *11*, 2512. <https://doi.org/10.3389/fpsyg.2020.550533>
- Byrne, B. M. (2008). Testing for multigroup equivalence of a measuring instrument: A walk through the process. *Psicothema*, *20*(4), 872–882.
- Camargo, L., Herrera-Pino, J., Shelach, S., Soto-Añari, M., Porto, M. F., Alonso, M., González, M., Contreras, O., Caldichoury, N., Ramos-Henderson, M., Gargiulo, P., & López, N. (2021). Escala de ansiedad generalizada GAD-7 en profesionales médicos colombianos durante pandemia de COVID-19: validez de constructo y confiabilidad. *Revista Colombiana de Psiquiatría*. Publicación anticipada en línea <https://doi.org/10.1016/j.rcp.2021.06.003>
- Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research*, *287*, 112934. <https://doi.org/10.1016/j.psychres.2020.112934>
- Caycho-Rodríguez, T., Barboza-Palomino, M., Ventura-León, J., Carbajal-León, C., Noé-Grijalva, M., Gallegos, M., Reyes-Bossio, M., & Vivanco-Vidal, A. (2020). Traducción al español y validación de una medida breve de ansiedad por la COVID-19 en estudiantes de ciencias de la salud. *Ansiedad y Estrés*, *26*(2–3), 174–180. <https://doi.org/10.1016/j.anyes.2020.08.001>
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, *9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5
- Cho, E. (2016). Making Reliability Reliable. *Organizational Research Methods*, *19*(4), 651–682. <https://doi.org/10.1177/1094428116656239>
- Clark, D. A., Steer, R. A., & Beck, A. T. (1994). Common and specific dimensions of self-reported anxiety and depression: Implications for the cognitive and tripartite models. *Journal of Abnormal Psychology*, *103*(4), 645–654. <https://doi.org/10.1037/0021-843X.103.4.645>
- Conway, K. P., Compton, W., Stinson, F. S., & Grant, B. F. (2006). Lifetime Comorbidity of DSM-IV Mood and Anxiety Disorders and Specific Drug Use Disorders. *The Journal of Clinical Psychiatry*, *67*(02), 247–258. <https://doi.org/10.4088/JCP.v67n0211>
- Delgadoillo, J., Payne, S., Gilbody, S., Godfrey, C., Gore, S., Jessop, D., & Dale, V. (2012). Brief case finding tools for anxiety disorders: Validation of GAD-7 and GAD-2 in addictions treatment. *Drug and Alcohol Dependence*, *125*(1–2), 37–42. <https://doi.org/10.1016/j.drugalcdep.2012.03.011>
- Dixon, S. K., & Kurpius, S. E. R. (2008). Depression and College Stress Among University Undergraduates: Do Mattering and Self-Esteem Make a Difference? *Journal of College Student Development*, *49*(5), 412–424. <https://doi.org/10.1353/csd.0.0024>
- Donker, T., van Straten, A., Marks, I., & Cuijpers, P. (2011). Quick and easy self-rating of Generalized Anxiety Disorder: Validity of the Dutch web-based GAD-7, GAD-2 and GAD-SI. *Psychiatry Research*, *188*(1), 58–64. <https://doi.org/10.1016/j.psychres.2011.01.016>

- Esser, P., Hartung, T. J., Friedrich, M., Johansen, C., Wittchen, H.-U., Faller, H., Koch, U., Härter, M., Keller, M., Schulz, H., Wegscheider, K., Weis, J., & Mehnert, A. (2018). The Generalized Anxiety Disorder Screener (GAD-7) and the anxiety module of the Hospital and Depression Scale (HADS-A) as screening tools for generalized anxiety disorder among cancer patients. *Psycho-Oncology*, 27(6), 1509–1516. <https://doi.org/10.1002/pon.4681>
- García-Campayo, J., Zamorano, E., Ruíz, M. A., Pardo, A., Freire, O., Pérez-Páramo, M., López-Gómez, V., & Rejas, J. (2009). Cultural Adaptation into Spanish of the Generalized Anxiety Disorder Scale - 7 (GAD-7) Scale. *European Psychiatry*, 24(S1), 1–1. [https://doi.org/10.1016/S0924-9338\(09\)70771-0](https://doi.org/10.1016/S0924-9338(09)70771-0)
- Hayes, S. C., Strosahl, K., Wilson, K. G., Bissett, R. T., Pistorello, J., Toarmino, D., Polusny, M. A., Dykstra, T. A., Batten, S. v., Bergan, J., Stewart, S. H., Zvolensky, M. J., Eifert, G. H., Bond, F. W., Forsyth, J. P., Karekla, M., & McCurry, S. M. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The Psychological Record*, 54(4), 553–578. <https://doi.org/10.1007/BF03395492>
- Hinz, A., Klein, A. M., Brähler, E., Glaesmer, H., Luck, T., Riedel-Heller, S. G., Wirkner, K., & Hilbert, A. (2017). Psychometric evaluation of the Generalized Anxiety Disorder Screener GAD-7, based on a large German general population sample. *Journal of Affective Disorders*, 210, 338–344. <https://doi.org/10.1016/j.jad.2016.12.012>
- Hofmann, S. G., & Hinton, D. E. (2014). Cross-Cultural Aspects of Anxiety Disorders. *Current Psychiatry Reports*, 16(6), 450. <https://doi.org/10.1007/s11920-014-0450-3>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Hughes, A. J., Dunn, K. M., Chaffee, T., Bhattarai, J. (Jackie), & Beier, M. (2018). Diagnostic and Clinical Utility of the GAD-2 for Screening Anxiety Symptoms in Individuals with Multiple Sclerosis. *Archives of Physical Medicine and Rehabilitation*, 99(10), 2045–2049. <https://doi.org/10.1016/j.apmr.2018.05.029>
- Jordan, P., Shedden-Mora, M. C., & Löwe, B. (2017). Psychometric analysis of the Generalized Anxiety Disorder scale (GAD-7) in primary care using modern item response theory. *PLOS ONE*, 12(8), 1–14. <https://doi.org/10.1371/journal.pone.0182162>
- Kerlinger, F. N., & Lee, H. B. (2002). *Investigación del Comportamiento: Métodos de Investigación en Ciencias Sociales*. McGraw-Hill Interamericana.
- Konkan, R., Şenormanci, Ö., Güçlü, O., Aydin, E., & Z. Sungur, M. (2013). Yaygın Anksiyete Bozukluğu-7 (YAB-7) Testi Türkçe Uyarlaması, Geçerlik ve Güvenirliği. *Nöro Psikiyatri Arşivi*, 50(1), 53–58. <https://doi.org/10.4274/npa.y6308>
- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2003). The Patient Health Questionnaire-2. *Medical Care*, 41(11), 1284–1292. <https://doi.org/10.1097/01.MLR.0000093487.78664.3C>
- Kroenke, K., Spitzer, R. L., Williams, J. B. W., Monahan, P. O., & Löwe, B. (2007). Anxiety Disorders in Primary Care: Prevalence, Impairment, Comorbidity, and Detection. *Annals of Internal Medicine*, 146(5), 317–325. <https://doi.org/10.7326/0003-4819-146-5-200703060-00004>
- Kumaraswamy, N. (2013). International Review of Social Sciences and Humanities Academic Stress, Anxiety and Depression among College Students-A Brief Review. *International Review of Social Sciences and Humanities*, 5(1), 135–143. <https://tinyurl.com/5e8a5n6m>
- LeViness, P., Bershad, C., Gorman, K., Braun, L., & Murray, T. (2017, julio 1). *The Association for University and College Counseling Center Directors*. AUCCCD. <https://www.auccd.org/assets/documents/Survey/2018%20auccd%20survey-public-revised.pdf>
- Levy, P. (1967). The correction for spurious correlation in the evaluation of short-form tests. *Journal of Clinical Psychology*, 23(1), 84–86. [https://doi.org/10.1002/1097-4679\(196701\)23:1<84::AID-JCLP2270230123>3.0.CO;2-2](https://doi.org/10.1002/1097-4679(196701)23:1<84::AID-JCLP2270230123>3.0.CO;2-2)

- Lin, Q., Bonkano, O., Wu, K., Liu, Q., Ali Ibrahim, T., & Liu, L. (2021). The Value of Chinese Version GAD-7 and PHQ-9 to Screen Anxiety and Depression in Chinese Outpatients with Atypical Chest Pain. *Therapeutics and Clinical Risk Management*, *17*, 423–431. <https://doi.org/10.2147/TCRM.S305623>
- Löwe, B., Wahl, I., Rose, M., Spitzer, C., Glaesmer, H., Wingenfeld, K., Schneider, A., & Brähler, E. (2010). A 4-item measure of depression and anxiety: Validation and standardization of the Patient Health Questionnaire-4 (PHQ-4) in the general population. *Journal of Affective Disorders*, *122*(1–2), 86–95. <https://doi.org/10.1016/j.jad.2009.06.019>
- McCracken, L. M., Badinlou, F., Buhrman, M., & Brocki, K. C. (2021). The role of psychological flexibility in the context of COVID-19: Associations with depression, anxiety, and insomnia. *Journal of Contextual Behavioral Science*, *19*, 28–35. <https://doi.org/10.1016/j.jcbs.2020.11.003>
- McDonald, R. P. (1999). *Test theory: A unified treatment*. Lawrence Erlbaum.
- Mehmetoglu, M., & Jakobsen, T. G. (2016). *Applied Statistics Using Stata: A Guide for the Social Sciences* (SAGE, Ed.; íntegra).
- Merino-Soto, C., Dominguez-Lara, S., & Fernández-Arata, M. (2017). Validación inicial de una Escala Breve de Satisfacción con los Estudios en estudiantes universitarios de Lima. *Educación Médica*, *18*(1), 74–77. <https://doi.org/10.1016/j.edumed.2016.06.016>
- Mills, S. D., Fox, R. S., Malcarne, V. L., Roesch, S. C., Champagne, B. R., & Sadler, G. R. (2014). The psychometric properties of the Generalized Anxiety Disorder-7 Scale in Hispanic Americans with English or Spanish language preference. *Cultural Diversity and Ethnic Minority Psychology*, *20*(3), 463–468. <https://doi.org/10.1037/a0036523>
- Moreno, A. L., DeSousa, D. A., Souza, A. M. F. L. P., Manfro, G. G., Salum, G. A., Koller, S. H., Osório, F. L., & Crippa, J. A. S. (2016). Factor Structure, Reliability, and Item Parameters of the Brazilian-Portuguese Version of the GAD-7 Questionnaire. *Temas Em Psicologia*, *24*(1), 367–376. <https://doi.org/10.9788/TP2016.1-25>
- Newman, M. G., Llera, S. J., Erickson, T. M., Przeworski, A., & Castonguay, L. G. (2013). Worry and Generalized Anxiety Disorder: A Review and Theoretical Synthesis of Evidence on Nature, Etiology, Mechanisms, and Treatment. *Annual Review of Clinical Psychology*, *9*(1), 275–297. <https://doi.org/10.1146/annurev-clinpsy-050212-185544>
- Peltzer, K., & Pengpid, S. (2017). Association between tobacco use, depression, and anxiety: A cross-national study among university students from 30 low- and middle-income countries. *Journal of Psychology in Africa*, *27*(6), 483–487. <https://doi.org/10.1080/14330237.2017.1347772>
- Pendergast, L. L., von der Embse, N., Kilgus, S. P., & Eklund, K. R. (2017). Measurement equivalence: A non-technical primer on categorical multi-group confirmatory factor analysis in school psychology. *Journal of School Psychology*, *60*, 65–82. <https://doi.org/10.1016/j.jsp.2016.11.002>
- Penninx, B. W., Pine, D. S., Holmes, E. A., & Reif, A. (2021). Anxiety disorders. *The Lancet*, *397*(10277), 914–927. [https://doi.org/10.1016/S0140-6736\(21\)00359-7](https://doi.org/10.1016/S0140-6736(21)00359-7)
- R Core Team (2021). *R: A Language and environment for statistical computing*. R Foundation for Statistical Computing. <https://www.R-project.org/>
- Roemer, L., Salters, K., Raffa, S. D., & Orsillo, S. M. (2005). Fear and Avoidance of Internal Experiences in GAD: Preliminary Tests of a Conceptual Model. *Cognitive Therapy and Research*, *29*(1), 71–88. <https://doi.org/10.1007/s10608-005-1650-2>
- Rosseel, Y. (2012). lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Software*, *48*(2), 1–36. <https://doi.org/10.18637/jss.v048.i02>
- Ruiz, F. J., Langer Herrera, Á. I., Luciano, C., Cangas, A. J., & Beltrán, I. (2013). Measuring experiential avoidance and psychological inflexibility: The Spanish version of the Acceptance and Action Questionnaire - II. *Psicothema*, *25*(1), 123–129. <https://doi.org/10.7334/psicothema2011.239>
- Ruiz, M. A., Zamorano, E., García-Campayo, J., Pardo, A., Freire, O., & Rejas, J. (2011). Validity of the GAD-7 scale as an outcome measure of disability in patients with generalized

- anxiety disorders in primary care. *Journal of Affective Disorders*, 128(3), 277–286. <https://doi.org/10.1016/j.jad.2010.07.010>
- Saravia-Bartra, M. M., Cazorla-Saravia, P., & Cedillo-Ramirez, L. (2020). Anxiety level of first-year medical students from a private university in Peru in times of Covid-19. *Revista de La Facultad de Medicina Humana*, 20(4), 568–573. <https://doi.org/10.25176/RFMH.v20i4.3198>
- Sartorão Filho, C. I., Conte de Las Villas Rodrigues, W., Beauchamp de Castro, R., Aparecida Marçal, Arlete Pavelqueires, S., Takano, L., de Oliveira, W. L., & Sartorão Neto, C. I. (2020). *Impact Of Covid-19 Pandemic On Mental Health Of Medical Students: A Cross-Sectional Study Using GAD-7 And PHQ-9 Questionnaires*. MedRxiv. <https://www.medrxiv.org/content/10.1101/2020.06.24.20138925v1>
- Seo, J.-G., & Park, S.-P. (2015). Validation of the Generalized Anxiety Disorder-7 (GAD-7) and GAD-2 in patients with migraine. *The Journal of Headache and Pain*, 16(1), 1–7. <https://doi.org/10.1186/s10194-015-0583-8>
- Sierra, J. C., Ortega, V., & Zubeidat, I. (2003). Ansiedad, angustia y estrés: tres conceptos a diferenciar. *Revista Mal Estar e Subjetividade*, 3(1), 10–59.
- Sijtsma, K. (2009). On the Use, the Misuse, and the Very Limited Usefulness of Cronbach's Alpha. *Psychometrika*, 74(1), 107–120. <https://doi.org/10.1007/s11336-008-9101-0>
- Slade, M., Thornicroft, G., & Glover, G. (1999). The feasibility of routine outcome measures in mental health. *Social Psychiatry and Psychiatric Epidemiology*, 34(5), 243–249. <https://doi.org/10.1007/s001270050139>
- Somers, J. M., Goldner, E. M., Waraich, P., & Hsu, L. (2006). Prevalence and Incidence Studies of Anxiety Disorders: A Systematic Review of the Literature. *The Canadian Journal of Psychiatry*, 51(2), 100–113. <https://doi.org/10.1177/070674370605100206>
- Soto-Balbuena, C., de La Fe Rodríguez-Muñoz, M., & Le, H. N. (2021). Validation of the generalized anxiety disorder screener (GAD-7) in Spanish pregnant women. *Psicothema*, 33(1), 164–170. <https://doi.org/10.7334/psicothema2020.167>
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A Brief Measure for Assessing Generalized Anxiety Disorder. *Archives of Internal Medicine*, 166(10), 1092–1097. <https://doi.org/10.1001/archinte.166.10.1092>
- Stein, A. T., Medina, J. L., Rosenfield, D., Otto, M. W., & Smits, J. A. J. (2020). Examining experiential avoidance as a mediator of the relation between anxiety sensitivity and depressive symptoms. *Cognitive Behaviour Therapy*, 49(1), 41–54. <https://doi.org/10.1080/16506073.2018.1546768>
- Ströhle, A., Gensichen, J., & Domschke, K. (2018). The Diagnosis and Treatment of Anxiety Disorders. *Deutsches Ärzteblatt International*, 155(37), 611–620. <https://doi.org/10.3238/arztebl.2018.0611>
- Vila, J. (1984). Técnicas de reducción de ansiedad. En J. Mayor & F. J. Labrador (Eds.), *Manual de Modificación de conducta* (pp. 229–264). Alhambra.
- Vitasari, P., Wahab, M. N. A., Othman, A., Herawan, T., & Sinnadurai, S. K. (2010). The Relationship between Study Anxiety and Academic Performance among Engineering Students. *Procedia - Social and Behavioral Sciences*, 8, 490–497. <https://doi.org/10.1016/j.sbspro.2010.12.067>
- Webb, E., Ashton, C., Kelly, P., & Kamali, F. (1996). Alcohol and drug use in UK university students. *The Lancet*, 348(9032), 922–925. [https://doi.org/10.1016/S0140-6736\(96\)03410-1](https://doi.org/10.1016/S0140-6736(96)03410-1)
- Yasin, A. S., & Dzulkipli, M. A. (2011). Differences in depression, anxiety and stress between low-and high-achieving students. *Journal of Sustainability Science and Management*, 6(1), 169–178.
- Zhong, Q.-Y., Gelaye, B., Zaslavsky, A. M., Fann, J. R., Rondon, M. B., Sánchez, S. E., & Williams, M. A. (2015). Diagnostic Validity of the Generalized Anxiety Disorder - 7 (GAD-7) among Pregnant Women. *PLOS ONE*, 10(4), 1–17. <https://doi.org/10.1371/journal.pone.0125096>