

Short Versions of the Penn State Worry Questionnaire: Psychometric Performance in a Sample of People Seeking Help

Versiones breves del cuestionario Penn State Worry Questionnaire: Rendimiento psicométrico en una muestra de personas que buscan ayuda

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Abstract

Worry is a cognitive transdiagnostic variable that is relevant for psychopathology research. The Penn State Worry Questionnaire (PSWQ) was developed to measure it. We aimed to examine the psychometric properties of three short versions of the PSWQ (11, 8, and 7 items) in a sample of Mexicans seeking help. A sample of 1391 individuals (82.2% women) seeking online psychological help completed the 11-item PSWQ, as well as measures of depression and anxiety. Single and multi-group confirmatory factor analyses were conducted. Good fit was achieved in the three versions only after adding correlated residuals to the models. Internal consistency reliability was excellent for the PSWQ-11 ($\omega = .93$) and the PSWQ-A ($\omega = .90$); it was acceptable for the PSWQ-5 ($\omega = .81$). Furthermore, evidence of approximate invariance between sexes and age groups was found. Finally, the three versions were similarly associated with depression and anxiety.

Keywords: *worry, anxiety, psychopathology, validation studies, factor analysis, Mexico*

Resumen

La preocupación es una variable cognitiva transdiagnóstica relevante para la investigación en psicopatología. El Penn State Worry Questionnaire (PSWQ) fue desarrollado para medirla. Nuestro objetivo fue examinar las propiedades psicométricas de tres versiones cortas del PSWQ (11, 8 y 7 ítems) en una muestra de personas de origen mexicano que buscaban ayuda. Una muestra de 1391 individuos (82.2% mujeres) que buscaban ayuda psicológica en línea completaron el PSWQ-11, así como medidas de depresión y ansiedad. Se realizaron análisis factoriales confirmatorios de grupo único y multigrupo. Se alcanzó un buen ajuste en las tres versiones solo después de añadir residuos correlacionados a los modelos. La fiabilidad de la consistencia interna para el PSWQ-11 ($\omega = .93$) y el PSWQ-A fue excelente ($\omega = .90$), mientras que para el PSWQ-5 fue aceptable ($\omega = .81$). Asimismo, se encontraron evidencias de invarianza aproximada entre sexos y grupos de edad. Por último, las tres versiones se asociaron de forma similar con la depresión y la ansiedad.

Palabras clave: *preocupación, ansiedad, psicopatología, estudios de validación, análisis factorial, México*

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Introduction

Worry is a cognitive phenomenon that involves focusing on adverse consequences related to future events, characterized by catastrophic anticipations, and correlated with various mental health disorders (Borkovec et al., 1998). Indeed, worry can have a negative impact on individuals and it is strongly associated with anxiety, depression, and other diagnoses (Wu et al., 2013); in this context, it can be considered a transdiagnostic feature (Ehring & Behar, 2020). Therefore, studies show the necessity to use questionnaires or reliable instruments to measure this variable, mainly because of the relevance of interventions supported by measurements and monitoring of therapeutic progress (Puccinelli et al., 2023; Wuthrich et al., 2014).

The Penn State Worry Questionnaire (Meyer et al., 1990), known as PSWQ, measures worry intensity. Originally, it was developed based on a single general dimension of the trait worry, which has been considered in its application. However, this unidimensionality has been questioned in some studies, identifying two factors: the first factor relates to the general tendency to worry which comprises 11 positively worded items and the second factor relates to the absence of worry, which includes 5 negatively worded items. This last factor, however, seems to be a methodological artifact and lacks a substantial interpretation (Brown, 2003). Due to the above, the elimination of the five negatively worded items has been suggested, resulting in the 11-item PSWQ-11 (Nuevo Benítez et al., 2002; Sandín et al., 2009). Likewise, there are antecedents on other abbreviated versions of the PSWQ, which seek to shorten the administration time in clinical practice without compromising reliability and efficiency (Carbonell-Bàrtoli & Tume-Zapata, 2022), such as the 8-item PSWQ-A (Hopko et al., 2003) and

the 5-item Brief PSWQ (Topper et al., 2014).

Research has consistently shown that shorter versions of the PSWQ perform better than the original 16-item version (Padros-Blazquez et al., 2018; Valencia & Paredes-Angeles, 2021). For example, the PSWQ-11 has demonstrated adequate factorial fit and evidence of gender invariance (Ruiz et al., 2018). Likewise, the PSWQ-A has exhibited a much better fit than the original PSWQ-16, along with evidence of measurement invariance between racial groups in the United States (Cares et al., 2022; DeLapp et al., 2016). One possible exception is a study conducted with Chinese adolescents, where it was necessary to include two pairs of residual correlations (items 4–5 and 7–8 as numbered in the PSWQ-11) for the PSWQ-A to achieve a good fit (Xie et al., 2023). However, after adding these modifications, the PSWQ-A showed evidence of invariance by sex and age within this adolescent sample (Xie et al., 2023). Regarding the PSWQ-5, there have been few studies conducted in the literature. In a study conducted with Peruvian university students, a good model fit was found for this version, but no data were reported regarding measurement invariance (Valencia & Paredes-Angeles, 2021). In a previous Mexican study, the PSWQ-11 and PSWQ-A performed adequately in the adult population (Padros-Blazquez et al., 2018). However, this research had two main limitations: (a) all study samples were non-clinical, and (b) measurement invariance was not examined.

Therefore, the present study aimed to examine the psychometric properties of the PSWQ-11, PSWQ-A, and PSWQ-5 in a Mexican sample of individuals seeking psychological care online. Specifically, we examined the factor structure, reliability, invariance by sex and age, and validity evidence based on relations to other variables (depression and anxiety, akin to the examination conducted by Becerra Herrera et al., 2023).

Method

Design

The present study follows an instrumental design since its objective is to examine the psychometric properties of a test (Ato et al., 2013).

Participants

The sample consisted of 1391 individuals (82.2% women) aged 18 to 76 ($M = 31.67$, $SD = 9.92$). Most participants were single (52.9%), followed by those married or cohabiting (34.0%). The great majority (69.0%) reported having a university education. Regarding their place of residence, all except 49 individuals lived in Mexico; the states with the highest representation were the State of Mexico (33.8%) and Mexico City (30.8%). Of the participants, 15.5% indicated that they were undergoing psychological or psychiatric treatment, while 10.6% reported being under psychiatric pharmacological treatment. Regarding their occupation, 27.0% were students, 26.2% were employed, 14.5% were professionals, 9.8% were unemployed, 9.1% were homemakers, 8.3% were self-employed, 4.5% were employed in another job, and 0.6% were retired. The only inclusion criterion was to be 18 years old or older and to have completed the PSWQ-11. For the present study, no exclusion criteria were considered.

Measures

Penn State Worry Questionnaire (PSWQ-11). The Penn State Worry Questionnaire (Meyer et al., 1990), known as PSWQ-11 in the version applied in this study, is an instrument for measuring trait worry. It consists of 11 Likert-type items (1 = *not at all*, 5 = *very much*) and is recommend-

ed to measure the intensity of worry, as well as to help in the diagnosis of generalized anxiety disorder (González et al., 2007; Nuevo Benítez et al., 2002). For this study, a translated version with psychometric properties analyzed with Mexican samples was used; both the PSWQ-11 and the PSWQ-A showed good reliability ($\alpha = .88$ and $\alpha = .85$, respectively; Padros-Blazquez et al., 2018). The detailed psychometric properties of this measure in our data are presented in the Results section.

Beck Depression Inventory-II (BDI-II). The Beck Depression Inventory (Second Version) is an instrument seeking to assess the severity of depressive symptoms during the last two weeks (Beck et al., 2006). It comprises 21 items (e.g., *Loss of interest*) and a response scale from 0 to 3, resulting in total scores ranging from 0 to 63. The present study employed the Mexican adaptation of the BDI-II by González et al. (2015), who found high internal consistency in students ($\alpha = .92$) and a community sample ($\alpha = .87$). Finally, the instrument presented a Fernandez-Huerta index of 80, evidencing that the Mexican adaptation is very readable/accessible. In the present study, the reliability of this instrument was optimal ($\alpha = .91$).

Beck Anxiety Inventory (BAI). The Beck Anxiety Inventory (BAI) represents an empirically validated psychometric assessment instrument designed to quantify the severity of anxious symptomatology in adolescent and adult populations (Robles et al., 2001). This self-report inventory comprises 21 items covering a wide range of anxiety-related symptoms, including both physical and cognitive manifestations. Each BAI item is assessed using a four-point Likert scale ranging from 0 (indicating the absence of the symptom) to 3 (indicating the severe presence of symptoms). Participants are instructed to rate each item based on their experience during the week prior to the

time of the assessment. Subsequently, the item scores are summed to obtain a total score ranging from 0 to 63. In the present study, the reliability of the scores was good ($\alpha = .92$).

Procedure

Data collection was part of a larger project, which consisted of a clinical trial that tested two online psychotherapy interventions (de la Rosa-Gómez et al., 2023). Dissemination was carried out in social networks and institutional channels, inviting individuals interested in applying for a free online psychotherapeutic intervention, which required them to answer a series of questionnaires as an initial screening. For the present study, only data from this initial screening (baseline) were used. These data were collected via a SurveyMonkey form, and the instruments were administered in randomized order to control for participant fatigue.

Ethical Considerations

At the beginning of the SurveyMonkey form, participants were provided with information regarding confidentiality, data handling, potential risks, and benefits. Individuals were required to provide consent to participate in the study. Throughout the project, the complete baseline data were exclusively managed by two research assistants, who created anonymized versions of the databases for use by other team members. The intervention project was approved by the Ethics Committee of the Facultad de Estudios Superiores Iztacala of the Universidad Nacional Autónoma de México (CE/FESI/082020/1363).

Data Analysis

First, the descriptive statistics of mean, standard deviation, skewness, and kurtosis were examined for each item and instrument (PSWQ-11, PSWQ-A and PSWQ-5). Skewness and kurtosis values within the range $[-1, +1]$ were considered as evidence that the item follows an approximately normal distribution (Ferrando et al., 2022). In addition, the response percentages for each option were analyzed to identify potential floor or ceiling effects. The corrected item-test correlations for each dimension were also examined to determine whether any should be eliminated for having a value of less than .30; values greater than .30 were considered acceptable.

Subsequently, a confirmatory factor analysis (CFA) based on Pearson correlations was performed. The method used was a robust variant of maximum likelihood (MLR) considered appropriate when the items have five or more response options (Rhemtulla et al., 2012). Model fit was assessed with the following approximate indices (the good fit criterion is mentioned in parentheses): CFI ($> .95$), TLI ($> .95$), RMSEA ($< .06$), and SRMR ($< .08$). Reliability was estimated from the results of the factor analysis through the omega coefficient. In a complementary manner, Cronbach's alpha coefficient was also calculated.

Next, measurement invariance was examined regarding sex (male vs. female) and age (< 30 vs. ≥ 30). Models of increasing invariance were tested sequentially: factor loadings (metric invariance), intercepts (scalar invariance) and residuals (strict invariance). To assess whether invariance was met, we examined the change in CFI (Δ CFI). Compared with the previous model, if the CFI of the new model decreased by more than .01, invariance was considered not to be met at that level (Cheung & Rensvold, 2002). Specifically, the robust CFI proposed by Brosseau-Liard and

Savalei (2014) was used for such comparisons.

Finally, Pearson correlation coefficients were estimated as evidence of associative validity. All analyses were performed in the *R* 4.3.0 program, using the following packages: lavaan 0.6-16, semPlot 1.1.6 and psych 2.3.3.

Results

Preliminary Item Analysis

When analyzing the questionnaire items across the PSWQ-11, PSWQ-A, and PSWQ-5 versions, most of the skewness and kurtosis values were within the range $[-1, +1]$ and no evidence of a floor or ceiling effect was observed. Furthermore, all item-test correlations were examined, and all of them were greater than .30 (Table 1).

Confirmatory Factor Analysis and Internal Consistency Reliability

To empirically test the proposed dimensionality, a CFA was performed for each PSWQ questionnaire (Table 2). The one-factor model of the PSWQ-11 presented a good fit only regarding SRMR. Consequently, the modification indices were examined, which suggested allowing for covariation between the errors of items 1 and 2. However, the fit was still suboptimal even after allowing this pair of correlated errors. Subsequently, we proceeded to test a model that incorporated the correlations between the errors of items 1–2 and items 7–8, and this model achieved an acceptable fit across most of the indices (Table 2). Similarly, the PSWQ-A version required the same pair of correlated errors to achieve a good fit (Table 2). Finally, the PSWQ-5 achieved an acceptable fit only after including the correlation between the residuals of items 7 and 8

(Table 2). The standardized factor loadings of the final models are shown in Figure 1.

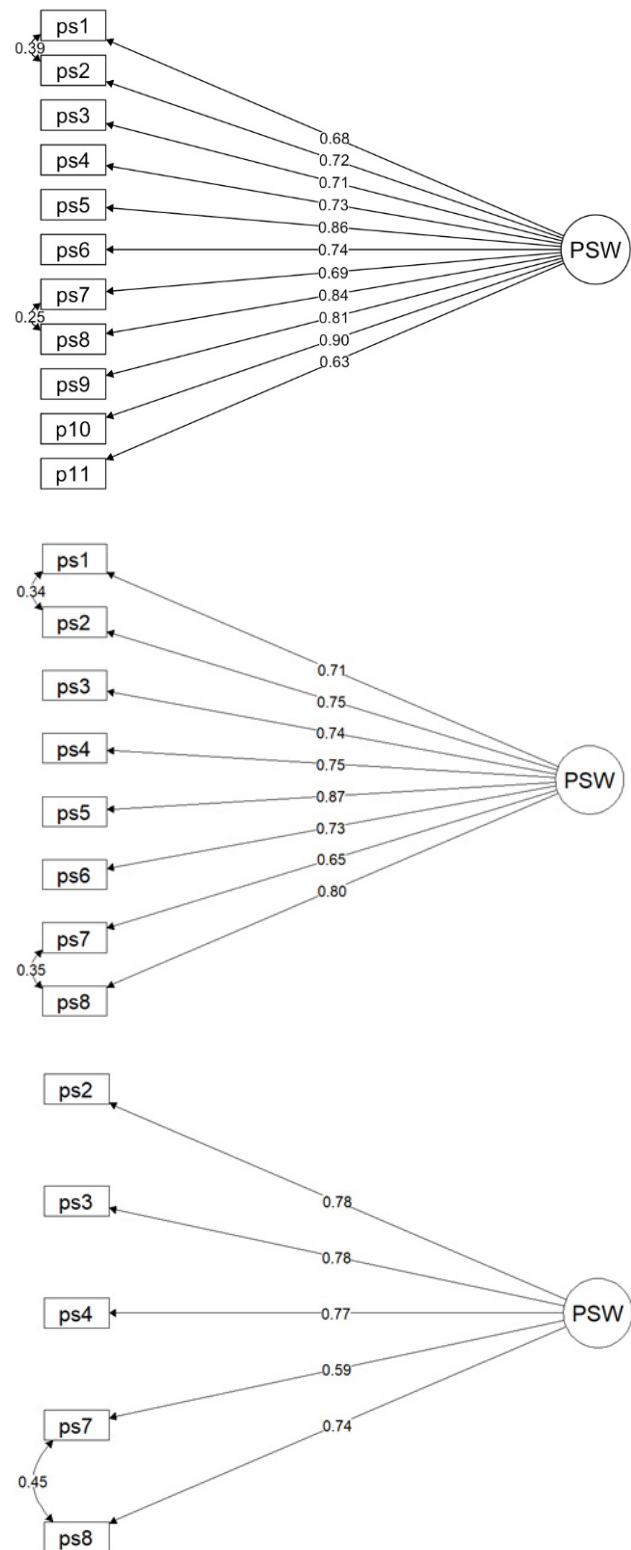


Figure 1
Standardized Coefficients of the Confirmatory Factor Analyses of PSWQ (Short Versions).

Table 1

Descriptive statistics and item-total correlations of the Penn State Worry Questionnaire's items.

Item	<i>M</i>	<i>DE</i>	<i>g</i> ₁	<i>g</i> ₂	% of responses per option					<i>r</i> _{it}		
					1	2	3	4	5	PSWQ -11	PSWQ -A	PSWQ -5
1. Sus preocupaciones le agobian [Your worries overwhelm you].	4.01	0.94	-0.83	0.24	1	7	17	41	34	.68	.69	
2. Hay muchas circunstancias que hacen que se preocupe [Many situations make you worry.].	3.88	0.97	-0.63	-0.28	1	10	19	41	29	.72	.73	.69
3. Sabe que no debería preocuparse por las cosas, pero no puede evitarlo [You know you should not worry about things, but you just cannot help it.].	3.98	1.00	-0.82	-0.03	1	9	17	37	36	.69	.70	.67
4. Cuando está bajo tensión tiende a preocuparse mucho [When you are under pressure, you worry a lot].	4.13	0.95	-1.10	0.82	2	6	13	37	43	.71	.71	.68
5. Siempre está preocupándose por algo [You are always worrying about something].	3.77	1.10	-0.60	-0.49	3	12	21	33	31	.82	.81	
6. Tan pronto como termina una tarea, en seguida empieza a preocuparse por alguna otra cosa que debe hacer [As soon as you finish one task, you start to worry about everything else you have to do].	3.68	1.22	-0.62	-0.61	6	12	21	29	32	.72	.69	
7. Ha estado preocupado toda su vida [You have been a worrier all your life].	3.39	1.25	-0.28	-1.01	8	20	22	27	23	.67	.65	.62
8. Se da cuenta de que siempre está preocupándose por las cosas [You notice that you have been worrying about things.].	3.72	1.16	-0.59	-0.68	4	15	18	33	31	.81	.79	.76
9. Una vez que comienza a preocuparse por algo, ya no puede parar [Once you start worrying, you cannot stop].	3.67	1.16	-0.57	-0.58	5	13	21	32	29	.77		
10. Está todo el tiempo preocupándose por algo [You worry all the time].	3.60	1.19	-0.52	-0.73	5	16	19	33	27	.85		
11. Se preocupa por un proyecto hasta que está acabado [You worry about projects until they are all done].	3.72	1.18	-0.61	-0.60	5	13	20	30	32	.61		

Note. *N* = 1731. *g*₁ = skewness; *g*₂ = kurtosis (zero-centered); *r*_{it} = corrected item-total correlation.

Table 2

Fit indices of the confirmatory factor analyses for PSWQ-11, PSWQ-A, and PSWQ-5.

Model	Correlated residuals	χ^2	<i>gI</i>	<i>p</i>	CFI	TLI	RMSEA	SRMR	α	ω
PSWQ-11	—	572.29	44	<.001	.93	.91	.09	.04	.94	.94
	1 & 2	413.36	43	<.001	.95	.94	.08	.04	.94	.93
	1 & 2, 7 & 8	357.05	42	<.001	.96	.95	.07	.04	.94	.93
PSWQ-A	—	355.25	20	<.001	.93	.90	.11	.04	.91	.91
	7 & 8	235.91	19	<.001	.95	.93	.09	.04	.91	.90
	1 & 2, 7 & 8	139.33	18	<.001	.97	.96	.07	.03	.91	.90
PSWQ-5	—	179.57	5	<.001	.92	.84	.16	.04	.86	.86
	7 & 8	11.22	4	.024	1	.99	.04	.01	.86	.81

Note. $N = 1731$. The estimation method used was robust maximum likelihood (MLR).

Table 2 also illustrates the internal consistency reliability estimates for each version. In the final models, the coefficients of the PSWQ-11 ($\omega = .93$) and the PSWQ-A ($\omega = .90$) were very similar. On the other hand, the reliability of the PSWQ-5 was relatively lower ($\omega = .81$), although still acceptable.

Measurement Invariance

Table 3 shows the results of the invariance analysis. Notably, strict invariance was met in all the brief versions concerning sex. On the other hand, regarding age, strict invariance was met in the PSWQ-11 and PSWQ-A, but only scalar invariance in the case of the PSWQ-5.

Associative Evidence of Validity

A subset of individuals also reacted to measures of depressive ($n = 1323$) and anxious ($n = 1327$) symptomatology. As shown in Table 4, correlations were very similar across the three versions. Indeed, correlations of the PSWQ-11 and PSWQ-A with both measures were virtually identical.

Discussion

In the present study, the psychometric properties of three brief versions of the PSWQ (PSWQ-11, PSWQ-A, and PSWQ-5) were examined in a sample of people seeking psychotherapeutic help. The scale was found to function almost unidimensionally, but it was necessary to consider the correlation between residuals. Likewise, reliability in all three versions was adequate and evidence of invariance about sex and age was found. Finally, the three versions offered similar correlations with measures of anxiety and depression.

Previous studies have also found that the PSWQ, in its different brief versions, functions adequately as a unidimensional measure and, in addition, shows good reliability (Cares et al., 2022; Padros-Blazquez et al., 2018; Ruiz et al., 2018; Sandín et al., 2009; Valencia & Paredes-Angeles, 2021). On the other hand, in the present study, the final models of the three versions included correlated errors, which is considered an undesirable psychometric characteristic (Dominguez-Lara, 2019). However, it is important to identify and monitor this inter-item dependence, otherwise, the internal consistency reliability estimates will be

Table 3
Measurement invariance of the brief versions of the PSWQ by sex and age.

Groups	Version	Model	χ^2	<i>df</i>	CFI	$\Delta\chi^2$	Δdf	<i>p</i>	ΔCFI
Females vs. Males	PSWQ-11	Configural	390.02	84	.96				
		Metric	409.73	94	.96	9.97	10	.443	0
		Scalar	444.49	104	.96	32.40	10	<.001	-.002
		Strict	479.48	115	.96	36.54	11	<.001	-.003
	PSWQ-A	Configural	157.14	36	.98				
		Metric	168.23	43	.98	5.17	7	.639	0
		Scalar	198.38	50	.97	30.73	7	<.001	-.003
		Strict	229.75	58	.97	31.43	8	<.001	-.005
	PSWQ-5	Configural	16.47	8	1.00				
		Metric	22.92	12	1.00	5.72	4	.221	0
		Scalar	25.33	16	1.00	1.88	4	.758	.001
		Strict	45.32	21	.99	18.22	5	.003	-.006
Age < 30 vs. Age \geq 30	PSWQ-11	Configural	398.59	84	.96				
		Metric	422.63	94	.96	17.3	10	.069	-.001
		Scalar	450.33	104	.96	23.47	10	.009	-.001
		Strict	523.05	115	.95	69.38	11	<.001	-.008
	PSWQ-A	Configural	159.33	36	.98				
		Metric	173.49	43	.98	10.09	7	.183	0
		Scalar	191.15	50	.98	15.55	7	.030	-.001
		Strict	236.85	58	.97	43.61	8	<.001	-.008
	PSWQ-5	Configural	21.41	8	1.00				
		Metric	26.10	12	1.00	3.57	4	.467	0
		Scalar	32.86	16	.99	6.51	4	.164	-.001
		Strict	72.66	21	.98	36.52	5	<.001	-.013

Note. The CFI values correspond to the robust coefficient proposed by Brosseau-Liard and Savalei (2014).

Table 4

Correlations between the three brief versions of the PSWQ and two measures of symptomatology.

Brief version	Depression (BDI-II)	Anxiety (BAI)
PSWQ-11	.54 [.50, .58]***	.49 [.45, .53]***
PSWQ-A	.54 [.50, .58]***	.48 [.44, .52]***
PSWQ-5	.53 [.49, .56]***	.46 [.42, .50]***

Note. Sample sizes were 1323 for depression and 1327 for anxiety.

*** $p < .001$.

biased (Viladrich et al., 2017). It should be noted that, in a previous study, covariation was also observed between the residuals of items 7 (*You have been a worrier all your life*) and 8 (*You notice that you have been worrying about things*) (Xie et al., 2023). This result seems to be explained by the fact that both statements refer to a temporal aspect of worry (i.e., chronicity). Future studies should examine whether this result replicates in similar samples to the one used in this study, and if it is confirmed, consider potential modifications to the instrument for this population.

Given the existence of three short versions that function similarly, the question arises as to which of them is preferable. The answer to this question, however, depends on each research project. When dealing with a substantial number of measures, and worry is a secondary variable in the study, researchers may opt for the shortest possible version that maintains good psychometric properties (Schetsche et al., 2022). Indeed, there has even been a proposal for a single-item version of the PSWQ (Schroder et al., 2019). On the other hand, if the number of items is not an issue or worry is the principal outcome variable, a version with more items will almost always be preferable (Petersen et al., 2023). When examining the three short versions in this study, it is important to consider that the 11- and 8-item versions demonstrated similar performance, while the 5-item version exhibited slightly lower per-

formance in terms of internal consistency and the attenuation of its correlation with other variables. This result coincides with the findings of another study that also compared these three versions (Valencia & Paredes-Angeles, 2021).

Limitations

The present study has several limitations. First, although the objective was to examine three brief versions, these were not administered independently. In fact, only the PSWQ-11 was administered in the study, and the analyses of the PSWQ-A and PSWQ-5 were conducted by selecting the corresponding items in the database. Second, the PSWQ-16, which could be an interesting point of comparison, was not considered. Third, it is worth noting that the majority of participants (69%) had higher education, which is probably not representative of the Mexican population requiring psychological help. Fourth, all the data in this study were cross-sectional, so it was not possible to assess properties such as longitudinal invariance or test-retest reliability. Despite these limitations, this study reveals several strengths, including using a large sample of people seeking professional help (as opposed to other studies that were limited to university samples; Valencia & Paredes-Angeles, 2021).

Conclusion

The current findings demonstrated that the three short versions of the PSWQ (11-item, 8-item, and 5-item) function adequately within a sample of individuals seeking psychological help. This performance is similar in males and females and between adults younger and older than 30. Future studies should examine whether the presence of error correlations replicates in other populations. Researchers are encouraged to use the brief version of the PSWQ that best suits the needs of their projects.

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