

## "CORONAPHOBIA" IN PARAGUAY: SPANISH VALIDATION OF THE COVID-19 PHOBIA SCALE

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### SUMMARY

**Background:** The COVID-19 is a highly transmissible disease caused by a new zoonotic coronavirus called SARS-CoV-2 that has led to several health, social, and economic issues worldwide. Anxiety and stress are predominant symptoms in the population during the quarantine; also, levels of fear or phobia have been reported.

**Subjects and methods:** This study validate the Spanish version of the COVID-19 Phobia Scale (C19P-S). Participants were recruited using an Internet-based survey. The survey was open from July 20 to July 31, 2021 and 1079 subjects were included.

**Results:** Kaiser-Meyer-Olkin test was adequate ( $KMO=0.956$ ) and sphericity tested significantly ( $p<0.0001$ ). The model of adjustment was good as shown by fit indices ( $S-B \chi^2=351.67$ ,  $df=164$ ,  $p>0.05$ ;  $RMSEA=0.033$ ;  $SRMSR=0.042$ ;  $CFI=0.995$ ,  $NFI=0.990$ ).

**Conclusions:** This confirms that the model of the Spanish version of the C19P-S may reproduce the same four-factors model from the original version of the scale and all items of these factors reported standardized loadings higher than 0.40 ( $p<0.001$ ).

**Key words:** COVID-19 - COVID-19 Phobia Scale – validity – reliability - factor analysis

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### INTRODUCTION

The COVID-19 is a highly transmissible disease caused by a new zoonotic coronavirus called SARS-CoV-2 that has led to several health, social, and economic issues worldwide (Chu et al. 2020, Khan et al. 2020, Kontangelos et al. 2020, Newby et al. 2020). The lack of specific treatment so far has led most governments to employ isolation measures (Liu & Liu 2020; Nussbaumer-Streit et al. 2020) and focus efforts on the development of preventive vaccines (Dror et al. 2020). Isolation measures have been associated with an increase in mental health problems, both new onset and worsening symptoms of pre-existing disorders (Ammar et al. 2020, Daly et al. 2021, Fanaj & Mustafa 2021, Marano et al. 2021).

Health emergencies may be associated to an increase of depression, post-traumatic stress, substance use disorders and a wide range of other mental and behavioral disorders, as well as domestic violence and child maltreatment (Galea et al. 2020). Anxiety and stress are predominant symptoms in the population during the quarantine; also, levels of fear or phobia have been reported (He et al. 2021, Torales et al. 2020). Anxiety during the pandemic may be also associated with a number of somatic symptoms such as gastrointestinal

sequelae and fatigue (Shevlin et al. 2020). However, the impact of contextual factors on the development of anxiety symptoms in these patients should not be overlooked (Bäuerle et al. 2020, Skoda et al. 2021).

Based on the Diagnostic and Statistical Manual of Mental Disorders - Fifth edition (DSM-5) specific phobia criteria (American Psychiatric Association 2013), the COVID-19 Phobia Scale (C19P-S) has been developed and validated as a self-report instrument to measure the levels of COVID-19 phobia among a wide range of age groups. Its 20 items and four factors (psychological, psycho-somatic, economic, and social) have shown to report good psychometric properties, as well as a good factorial structure (Arpaci et al. 2020; Aparci et al. 2021). It is considered a useful tool in the mental assessment during the COVID-19 pandemic. The aim of this research was to test and validate the Spanish version of this scale.

### SUBJECTS AND METHODS

#### Subjects

Participants were recruited using an Internet-based survey advertised on social media and on the official media channels of the School of Medical Sciences of

the National University of Asunción, Paraguay. Evidence suggests that responses to the online surveys may provide similar findings to those reported through "in person" samples (Gosling et al. 2004). This Internet-based approach has been particularly useful, especially in times of social distancing.

The sample size was calculated using the Epidat epidemiological package. Assuming an expected anxiety frequency of 14.25% (Torales et al. 2016), a confidence level of 95%, and a precision of 2.1%, the minimum sample was established in 1065 participants (Muñoz Navarro 2014).

Subjects included were individuals  $\geq 18$  years old and whose scores in the Generalized Anxiety Disorder-7 (GAD-7) questionnaire were  $>0$ . The survey was open from July 20 to July 31, 2021 and 1311 subjects responded voluntarily. Finally, 1079 subjects, scoring  $>0$  at GAD-7, were included. All participants received complete information about the aim of the study, privacy and data-processing, and they did not receive any compensation for completing the survey.

## Measures

### Demographics

Participants were asked to provide information on their sex (male, female, I prefer not to tell), age, marital status (single, married, widow, divorced), and social status (alone, with partner/family, with friends).

### Socioeconomic data

Participants were asked to provide information on their own educational level (no formal education, primary education, secondary education, tertiary/university education) and on their average monthly income (less, equal or more than the minimum wage).

### Health status regarding COVID-19

Participants answered if they had been diagnosed with COVID-19, or had been in contact with persons with a diagnosis of COVID-19, as well as if they had lost a family member or a close friend due to COVID-19 (yes, no).

### Mental health status

Participants reported whether they had previously been diagnosed with a mental disorder (anxiety, depression, psychotic disorders, bipolar disorder, personality disorders, obsessive-compulsive disorder, others) or not.

### The COVID-19 Phobia Scale (C19P-S)

Originally developed in Turkish (Arpaci et al. 2020) and then validated into English (Arpaci et al. 2021) Korean (Bilgiç et al. 2021) and Persian (Samimi Ardestani et al. 2021), the C19P-S is a self-administered scale aimed to measure the levels of COVID-19-related phobia. It is based on the DSM-5 specific phobia criteria (American Psychiatric Association 2013) and it includes four factors: Psychological, Psycho-somatic, Economic,

and Social. Its 20 items are rated on a 5-point Likert scale from 1 (completely disagree) to 5 (completely agree). In the English version, the subscales show adequate internal consistency ( $0.715 < \alpha < 0.798$ ), and Cronbach's alpha for the overall scale is 0.93 (Arpaci et al. 2021).

### The Fear of COVID-19 Scale (FCV-19S)

The FCV-19S (Ahorsu et al. 2020) is a seven-item scale assessing the fear of COVID-19. The seven items are rated on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree) with scores ranging from 7 to 35. Higher scores on the scale show higher levels of fear of COVID-19. In this research, the Spanish validation of the FCV-19S was used, which showed a valid internal consistency ( $\alpha=0.86$ ) in a previous study conducted in Paraguayan population (Barrios et al. 2021).

### Generalized Anxiety Disorder-7 (GAD-7) questionnaire

The GAD-7 questionnaire is a one-dimensional self-administered scale designed to assess the presence of the symptoms of Generalized Anxiety Disorder (GAD). The GAD-7 represents an anxiety measure based on seven items which are scored from zero to three. The whole scale score can range from 0 to 21 and cut-off scores for mild, moderate and severe anxiety symptoms are 5, 10 and 15, respectively. A score of 10 or higher on the GAD-7 represents a reasonable cut point for identifying cases of GAD (Spitzer et al. 2006). In this research, we used the Spanish validation of the GAD-7, which shows good psychometric properties and excellent internal consistency ( $\alpha=0.936$ ) (García-Campayo et al. 2010).

## Translation process and validation

The translation of the C19P-S from English to Spanish was performed following the procedures suggested for cross-cultural adaptation of self-report measures, using the back-translation method (Beaton et al. 2000). First, the original English version was translated into Spanish; second, a bilingual expert back-translated the Spanish version into English; third, a native English speaker compared, sentence by sentence, the back translation with the original English version, in order to verify if they were equivalent in meaning. Finally, minor changes were made after the comparison and the Spanish version was administered to 20 individuals, as a pilot test, in order to verify if the questionnaire was comprehensible. After the pilot test, the final Spanish version was approved (the final questionnaire is available by request).

## Statistical analysis

The Kaiser-Meyer-Olkin (KMO) test for sample adequacy and the Bartlett's Test of Sphericity were used to assess the pertinence of performing a factor analysis (SPSS software - version 23). Confirmatory factor

analysis (CFA) was performed using Jeffrey's Amazing Statistics Program (Love et al. 2019). Diagonally weighted least squares (DWLS) estimation procedure was used for CFA, taking into consideration the sample size. Model fit was tested through chi-square ( $\chi^2$ ), the comparative fit index (CFI), the normed fit index (NFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMSR). These indices detect if the fit model is good (RMSEA and SRMSR < 0.05 and CFI and TLI > 0.95) or acceptable (RMSEA and SRMSR between 0.05 and 0.08, and CFI and TLI between 0.90 and 0.95) (Schermele-Engel et al. 2003).

Reliability was measured with McDonald's Omega coefficient ( $\omega$ ), Cronbach's alpha ( $\alpha$ ), and composite reliability (CR). Convergent validity was measured via the correlations of the C19P-S with the FCV-19S and GAD-7 using Pearson correlations in SPSS. These correlations are defined as strong ( $r \geq 0.50$ ), moderate ( $r$  values between 0.30 and 0.49), and weak ( $r$  values between 0.10 and 0.29) (Cohen 2013). Lastly, multivariate analysis of variance (MANOVA) and post hoc Tukey's HSD (honestly significant difference) test were conducted to assess differences between patients' characteristics (demographics, socioeconomics, health status related to COVID-19, mental health status) on the C19P-S scores.

### Ethical considerations

The study was approved by the Department of Psychiatry of the National University of Asunción, School of Medical Sciences (Paraguay). Data were treated with confidentiality, equality, and justice, respecting the Helsinki principles. Participants who required feedback from the survey were invited to write down their email address and received information or specific helpful suggestions.

## RESULTS

Kaiser-Meyer-Olkin (KMO) test was adequate (KMO=0.956) and sphericity tested significantly ( $p < 0.0001$ ). The sociodemographic characteristics of the sample are outlined in Table 1.

Of the participants, 2.5% have tested positive for COVID-19, 99.5% knew someone who had been tested positive for COVID-19, and 50.7% have lost a family member or close friend due to COVID-19. 10.8% ( $n=116$ ) have been previously diagnosed with a mental disorder. Of these, 47.41% reported anxiety, 37.93% depression, and 6.03% personality disorders. Other diagnoses were bipolar disorder, obsessive compulsive disorder and post-traumatic stress disorder. According to the GAD-7, 28.1% of participants had current mild anxiety, 30.3% moderate anxiety, and 41.6% severe anxiety. The mean GAD-7 score was  $9.7 \pm 5.7$ , the mean C19P-S score was  $55.29 \pm 15.8$ , while the mean FCV-19S score was  $19.13 \pm 6.6$ .

## Factorial analysis

The original four-dimensional mode was assessed with confirmatory factorial analysis. The model adjustment was good, according to all fit indices (S-B  $\chi^2=351.67$ ,  $df=164$ ,  $p > 0.05$ ; RMSEA=0.033; SRMSR=0.042; CFI=0.995, NFI=0.990, TLI=0.994). This confirms that the model of the Spanish version of the C19P-S may reproduce the same four-factors model of the original version and all items had standardized factor loadings higher than 0.40 ( $p < 0.001$ ) (Table 2).

**Table 1.** Sociodemographic characteristics of the sample (N=1079)

Characteristic	n	%
Sex		
Man	223	20.7
Woman	849	78.7
Age		
18-20 years	38	3.52
21-30 years	414	38.37
31-40 years	337	31.23
>40 years	290	26.88
Education		
Primary Education	4	0.4
Secondary Education	82	7.6
University Education	993	92
Socioeconomic status		
High	698	64.7
Medium	203	18.8
Low	178	16.5
Civil status		
Married	368	34.1
Divorced	66	6.1
Single	635	58.9
Widowed	10	0.9
Social status		
Friends	16	1.5
Family/partner	996	92.3
Alone	67	6.2

## Internal consistency and convergent validity

The total C19P-S ( $\alpha=0.94$ ) Cronbach's alpha showed a valid internal consistency ( $\alpha=0.938$ ) as well as its subscales including psychological ( $\alpha=0.87$ ), psycho-somatic ( $\alpha=0.86$ ), economic ( $\alpha=0.82$ ), and social ( $\alpha=0.84$ ). Also, Omega coefficients were 0.94, 0.87, 0.86, 0.83, and 0.84, respectively. The C19P-S subscales including psychological (CR=0.953), psycho-somatic (CR=0.926), economic (CR=0.831), and social (CR=0.948) factors had good CR (CR > 0.70). Inter-correlations among the C19P-S subscales were statistically significant and strong ( $p < 0.01$ ) (Table 3). The GAD-7 had a Cronbach's alpha of 0.92 and an Omega of 0.92, while the FCV-19 had a Cronbach's alpha of 0.90 and an Omega of 0.89.

**Table 2.** Factor loadings for 20 items of the C19P-S based on Confirmatory Factor Analysis (CFA)

Items	Factor loadings
<b>Psychological factor</b>	
Item 1 - The fear of coming down with coronavirus makes me very anxious.	0.852
Item 5 - I am extremely afraid that someone in my family might become infected by the coronavirus.	0.680
Item 9 - News about coronavirus-related deaths causes me great anxiety.	0.919
Item 13 - Uncertainties surrounding coronavirus cause me enormous anxiety.	1.003
Item 17 - The pace that coronavirus has spread causes me great panic.	1.034
Item 20 - I argue passionately (or want to argue) with people I consider to be behaving irresponsibly in the face of coronavirus.	0.743
<b>Psycho-somatic factor</b>	
Item 2 - I experience serious stomachaches out of the fear of coronavirus.	0.722
Item 6 - I experience serious chest pain out of the fear of coronavirus.	0.918
Item 10 - I experience tremors due to the fear of coronavirus.	0.646
Item 14 - I experience sleep problems out of the fear of coronavirus.	0.861
Item 18 - Coronavirus makes me so tense that I find myself unable to do the thing I previously had no problem doing.	1.038
<b>Economic factor</b>	
Item 4 - The possibility of food supply shortage due to the coronavirus pandemic causes me anxiety.	0.776
Item 8 - The possibility of shortages in cleaning supplies due to the coronavirus pandemic causes me anxiety.	0.850
Item 12 - I stock food with the fear of coronavirus.	0.607
Item 16 - After the coronavirus pandemic, I do not feel relaxed unless I constantly check on my supplies at home.	0.726
<b>Social factor</b>	
Item 3 - After the coronavirus pandemic, I feel extremely anxious when I see people coughing.	0.912
Item 7 - After the coronavirus pandemic, I actively avoid people I see sneezing.	0.788
Item 11 - Following the coronavirus pandemic, I have noticed that I spend extensive periods of time cleaning my hands.	0.698
Item 15 - The fear of coming down with coronavirus seriously impedes my social relationships.	0.967
Item 19 - I am unable to curb my anxiety of catching coronavirus from others.	1.031

**Table 3.** Inter-correlations among the C19P-S subscales

Factor	Correlation			
	C19P-S	F1	F2	F3
The total C19P-S				
Psychological factor (F1)	0.993			
Psycho-somatic factor (F2)	0.705	0.757		
Economic factor (F3)	0.656	0.699	0.821	
Social factor (F4)	0.719	0.758	0.780	0.864

Convergent validity of the C19P-S was assessed by evaluating the correlations of the C19P-S with convergent scales (FCV-19S and GAD-7). The correlation between C19P-S and FCV-19S was strong ( $r=0.689$ ,  $p<0.001$ ) as well as the correlation between C19P-S and GAD-7 ( $r=0.59$ ,  $p<0.001$ ).

### The comparison of COVID-19-Related Phobia

The assumptions of MANOVA showed that the data were normally distributed. Results showed that there was statistically significant omnibus difference between men and women,  $\lambda=0.969$ ,  $F[2]=4.261$ ,  $p<0.001$ , partial  $\eta^2=0.016$ . Post hoc analyses showed that women scored higher than men on the psychological CP19P-S factor  $F[2]=10.504$ ,  $p<0.01$ , partial  $\eta^2=0.019$ , psycho-somatic

factor  $F[2]=9.428$ ,  $p<0.01$ , partial  $\eta^2=0.017$ , social factor  $F[2]=4.219$ ,  $p=0.015$ , partial  $\eta^2=0.008$  and economic factor  $F[2]=9.648$ ,  $p=0.018$ , partial  $\eta^2=0.018$ . No associations were found between the other variables and the C19P-S subscales.

Bivariate comparison found that those who were previously diagnosed with a mental illness had a higher mean score on the C19P-S compared to those with no previous diagnosis ( $t[1077] = -2.6$ ,  $p=0.009$ ). Single and widowed participants were also found to show higher scores than married and divorced ones ( $F[1078]=5.61$ ,  $p=0.001$ ).

## DISCUSSION

The aim of the present study was to assess the psychometric properties of the Spanish version of the CP19P-S in a sample from General Paraguayan Population. A confirmatory factor analysis was carried out, taking into account that the original structure based on four dimensions had demonstrated good psychometric properties. All fit indices indicated that the four-dimensional structure correctly explained the construct analyzed and coincided with those reported in the other versions of the scale (Arpaci et al. 2020, Samimi Ardestani et al. 2021).

Our analysis also showed that the factor loadings were high on all items, which means that they are equally valid as the English version. In terms of internal validity, the scale globally has a high Cronbach's alpha value as well as omega and this was also observed through the subscales. Convergence between the scales was high and positive in all comparisons. Convergence with GAD-7 was positive and strong, as well as with the FCV-19S, indicating that the construct was correctly measured.

In our study, the mean GAD-7 score was  $9.7 \pm 5.7$ . This figure is higher than that found in healthy controls from the general population (Ruiz et al. 2011). This difference could be explained by the pandemic context, which may affect mental health outcomes. Regarding the characteristics of the population, 41.6% had a significant level of anxiety based on the GAD-7; however, only 5.1% reported having a confirmed diagnosis of anxiety. This might reflect that some people have been coping with anxiety without support or diagnosis. The level of anxiety found with GAD-7 was similar to those detected in the Paraguayan population during the COVID-19 quarantine (Torales et al. 2020).

In a similar study conducted in Hong Kong, the anxiety of the sample was found to be 14%, with a GAD-7 value higher than 10 as the cut-off point (Choi et al. 2020). A systematic review on patients who overcame COVID-19 infection found that the prevalence of anxiety in this population may reach approximately 47% (Deng et al. 2021).

In the multivariate analysis, a relationship was found between the scores of the C19P-S subscales and sex: women scored higher on the scale, which is in agreement with previous research that has indicated that women suffer more from anxiety disorders, especially in the context of the pandemic (Hossain et al. 2020, Sediri et al. 2020, Sharma et al. 2020).

Women scored higher on all subscales, in contrast to the study by Arpacı et al. (2021), where differences were only found in the psychological and social factors. This discrepancy could be due to the marked overrepresentation of women in our sample, with a ratio of approximately 4 women/1 man. Factors that increase the risk for the development of mental disorders in women during the pandemic include pregnancy, puerperium, experience of abortion or intimate partner violence (Almeida et al. 2020).

Participants who already had a mental disorder reported higher levels of COVID-19 phobia. This has been reported in previous research, which indicated that symptoms of mental disorders may be aggravated during the pandemic (Gloster et al. 2020, Grolli et al. 2021, Heitzman 2020, Meda et al. 2021).

A recent systematic review has shown that patients with pre-existing mental health conditions reported worsening symptoms (Vindegard & Benros 2020). In a study conducted in China, where depressive symptomatology, anxiety, stress and insomnia scales were

compared, higher scores were found, as well as higher levels of suicidal ideation, somatic concerns and impulsivity after the onset of pandemic. Single and widowed people had higher scores compared to married people. This could be explained because social support is a protective factor for any mental disorder and it has also been shown to be a protective factor in the context of the COVID-19 pandemic (Kaparounaki et al. 2020, Saltzman et al. 2020).

In a study conducted among nurses (on experienced anxiety related to COVID-19), it was found that organizational support and social support were associated with lower levels of perceived anxiety (Labrague & Santos 2020). Likewise, the lack of social support experienced by students during the pandemic was shown to have worse psychopathological indicators in the long run, highlighting the importance of social support as a protective factor (Elmer et al. 2020).

Limitations of our research may include that, given the pandemic restrictions, it was not possible to study test-retest reliability. Likewise, a divergence analysis was not performed. Another limitation is that the sample was selected in a non-probabilistic way, through social networks, thus certain sociodemographic characteristics may be biased. This may have an impact on the results of the study but did not affect the main objective of the research.

## CONCLUSIONS

This study confirms that the model of the Spanish version of the C19P-S may reproduce the same four-factors model from the original version of the scale and all items of these factors reported standardized loadings higher than 0.40 ( $p < 0.001$ ). The importance of this study may be the evidence of a useful clinical tool for the Spanish-speaking population in the context of the COVID-19 pandemic. The availability of a validated tool will allow a more specific approach to patients who consult mental health services during the pandemic, as well as a better measurement of post-pandemic consequences.

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**Contribution of individual authors:**

All the authors participated in the drafting, critical revision and final approval of the manuscript.

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