# Translation and cultural adaptation of the COVID-19 Anxiety Scale in Brazil

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## Abstract

**Objective**
This study aimed to translate and culturally adapt the COVID-19 Anxiety Scale for the Brazilian context.

**Method**
Cross-sectional and methodological study that encompassed the following stages: initial translation, synthesis of translations, back-translation, expert committee review, and pre-testing.

**Results**
The COVID-19 Anxiety Scale was initially translated into Portuguese by two translators. A consensus version was established and then back-translated into English by a different translator. Eight experts reviewed these versions, resulting in modifications to two of the seven scale items. This led to the creation of the pre-final version of the COVID-19 Anxiety Scale. Finally, the pre-testing of this version was conducted with 47 individuals, who found the scale to be clear and understandable.

**Conclusion**
In conclusion, the COVID-19 Anxiety Scale was adequately translated and culturally adapted for the Brazilian context, and further research is intended to verify evidence of the scale's validity.

**Keywords**: Anxiety; Coronavirus; Mental health; Validation studies.

In December 2019, an outbreak of pneumonia caused by a newly identified β-coronavirus occurred in Wuhan, Hubei province, China (Guo et al., 2020). In early March 2020, with high global spread and the rapid increase in the number of deaths from the disease, the World Health Organization declared the pandemic of the disease caused by Coronavirus Disease 2019 (COVID-19) (World Health Organization, 2020a).

On December 19, 2022, there were 649,038,437 confirmed cases worldwide, including 6,645,812 deaths. On the same date, Brazil had 35,751,411 confirmed cases and 691,449 deaths (World Health Organization, 2020b). Given such high transmissibility, dramatic increase in the number of cases, and clinical severity, it is impossible to disregard its psychological effects (Silva, Santos, et al., 2020).

Some studies report that in the short period during which the pandemic spread, there was an increase in the prevalence of Common Mental Disorders, especially aggression, stress, depression, anxiety, and panic episodes, not only among healthcare professionals but in the general population as well (Cruz et al., 2020; Vindegaard & Benros, 2020).

Campos et al. (2020) conducted a study with 12,196 Brazilian adults to assess the mental health of the Brazilian population during the pandemic of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and its relationship with demographic and health characteristics. They found a high prevalence of depression (61.3%), anxiety (44.2%), stress (50.8%), and psychological impact (54.9%) due to the isolation experienced during the pandemic. The authors also reported that females with lower economic and educational levels were more predisposed to developing psychological symptoms.

Alzueta et al. (2021) examined the effects of the COVID-19 pandemic on the mental health of adults in the general population across five global regions. The study included 6,882 participants across 59 countries, ranging in age from 18 to 94 years, with a higher prevalence of women (78.8%). Regarding the results, most of the sample presented low or mild symptoms of depression and anxiety during the pandemic, while a significant proportion of respondents reported moderate to severe symptoms of depression (25.4%) and anxiety (19.5%). The study also revealed, among demographic factors, that younger individuals who were without a partner and resided in high-income countries were more predisposed to higher levels of depression and anxiety during the pandemic.

In this context, the identification of symptoms of depression, anxiety, and stress in response to the COVID-19 pandemic in the general population is confirmed (Wang et al., 2020). Barros et al. (2021) emphasize the importance of screening for common mental disorders, such as anxiety, in at-risk populations.

Recent publications worldwide have introduced anxiety measurement scales related to COVID-19, with evidence of reliability and validity and high applicability for the current context (Bernardo et al., 2020; Caycho-Rodríguez et al., 2022; Chandu et al., 2020; Lee, 2020; Petzold et al., 2020; Riad et al., 2020; Silva, Sampaio Brito, et al., 2020).

Silva, Sampaio Brito, et al. (2020) developed and validated the COVID-19 Anxiety Scale in Brazil, based on the DSM-5 definition (Severity Measure for Specific Phobia–Adult Scale). Broche-Pérez et al. (2020) adapted the Cuban version of the Coronavirus Anxiety Scale, which was originally developed and validated in English by Lee (2020). Caycho-Rodríguez et al. (2022) carried out the cross-cultural validation of the Coronavirus Anxiety Scale (Lee, 2020) in 12 Latin American countries. During their study, they identified other measures in addition to the scale under validation, namely: the COVID-19 Anxiety Syndrome Scale (C-19ASS), developed in the USA by Nikčević and Spada (2020); the COVID-19 Anxiety Questionnaire (C-19-A), developed in Germany by Petzold et al. (2020); the COVID-19 Anxiety Scale (CAS), developed in Brazil by Silva, Sampaio Brito, et al. (2020); and an additional scale developed in India by Chandu et al. (2020).

Given the above, the importance of ensuring the availability of assessment tools for anxiety-related aspects in the context of COVID-19 for use in Brazil becomes evident. This is especially crucial to enable healthcare professionals to conduct rapid screening and provide necessary assistance.

It is important for multidisciplinary teams to have access to a range of culturally validated and reliable scales, enabling early screening of COVID-19-related mental disorders, including specialized anxiety assessment instruments.

In this context, the present study aimed to translate and culturally adapt the COVID-19 Anxiety Scale (CAS), developed in India by Chandu et al. (2020). The scale contains seven items and covers two domains. After analyzing psychometric properties, the authors found that CAS demonstrated satisfactory face and content validity, internal consistency, and structural validity.

The CAS developed by Chandu et al. (2020) addresses "fear of social interaction" and "illness anxiety" and has the advantage of being a brief and quickly administrable instrument, distinguishing it from the COVID-19 Anxiety Scale constructed by Silva, Sampaio Brito, et al. (2020), which includes symptoms related to Generalized Anxiety Disorder.

It is worth noting that CAS has not yet been adapted and validated for use in other countries. The availability of this measure can assist healthcare professionals in recognizing the psychological impacts caused by COVID-19 and in developing psychological interventions to aid individuals with pandemic-induced dysfunctional anxiety. Hence the importance and choice of this instrument. Given the above, the objective of the present research was to translate and culturally adapt CAS for the Brazilian context.

## Method

This is a cross-sectional and methodological study (Polit et al., 2004) that followed the steps proposed by Beaton et al. (2020) to translate and adapt CAS for use in Brazil. The project received approval from the Research Ethics Committee of the Universidade Federal de São Carlos under protocol No. 4.536.845.
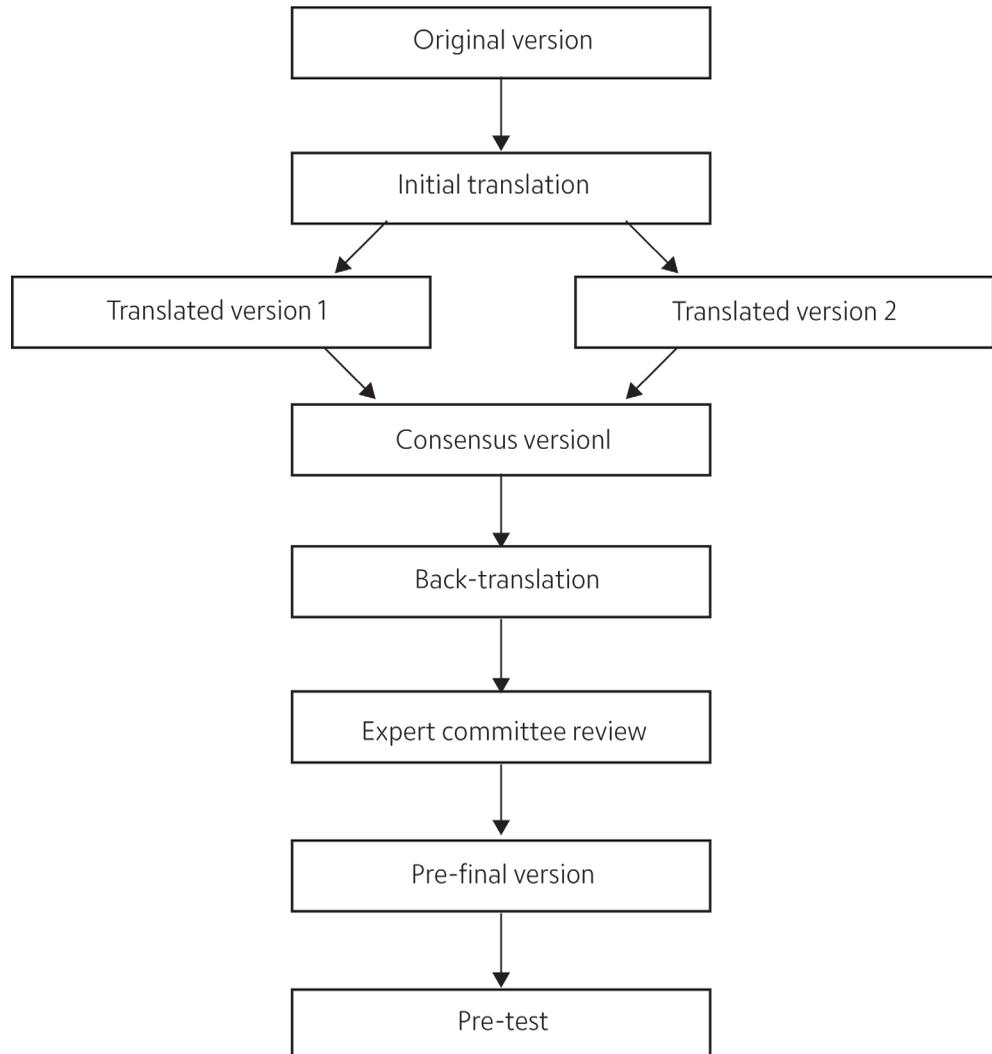
Figure 1 illustrates the five steps followed during the research.

Step 1 – Initial translation: CAS was submitted for initial translation from English (original version) to Brazilian Portuguese, which was performed by two independent and qualified translators, fluent in both languages, and experienced in translating scientific texts in the field of health.

Step 2 – Synthesis of translations: both the translators and the researchers synthesized the results of the translations to identify possible divergences and items that were more closely aligned and had the best meaning in the Portuguese language.

Step 3 – Back-translation: a third translator, who was unaware of the study's purpose and was a native English speaker, translated the consensus version of CAS, rendering the scale from Brazilian Portuguese back into the English language (original language).

Step 4 – Expert committee review: composed of eight experts with backgrounds in different areas (Gerontology, Nursing, Physiotherapy, Psychology, and Literature). These experts were invited via email and were informed about the scale's objectives and the number of proposed items. Upon acceptance, the Informed Consent Form and the online questionnaire for scale evaluation were sent. The experts reviewed the translation syntheses and analyzed four types of equivalence: (1) semantic equivalence, (2) idiomatic equivalence, (3) experimental equivalence, and (4) conceptual equivalence. In addition, the Content Validity Index (CVI) was analyzed along with suggestions made by the experts. After this analysis, some words were modified for better understanding and adaptation of the scale to the Brazilian context.

**Figure 1**
*Translation and cultural adaptation stages of the COVID-19 Anxiety Scale*

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              │     Original version     │
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              ┌─────────────────────────┐
              │    Initial translation   │
              └─────────────────────────┘
                    ╱           ╲
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    ┌──────────────────────┐  ┌──────────────────────┐
    │  Translated version 1│  │  Translated version 2│
    └──────────────────────┘  └──────────────────────┘
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              ┌─────────────────────────┐
              │    Consensus versionl    │
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              │     Back-translation     │
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              │  Expert committee review │
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              │     Pre-final version    │
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              │        Pre-test          │
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Step 5 – Pre-test: The scale was submitted to a sample of 47 individuals to assess clarity, comprehensibility, and item relevance. Participants were invited through social media and email. Volunteers who met the eligibility criteria (age 18 or older, possessing a minimum level of education for reading, and internet access) were invited to participate in the study. Those who agreed to participate were provided with a link to the data collection form. The first item displayed to the participants was the Informed Consent Form for online data collection. If the individual selected the option "I have read and agree to participate in the study", the data collection instruments were then made available. Specifically, a questionnaire for collecting sociodemographic and health characteristics (name, age, phone number, date of birth, gender, ethnicity, marital status, education level, family income, occupation, religion and if practitioner of that religion's practices, number of people in the same household, number of comorbidities and medications in use, and use of alcohol and tobacco); the pre-final version of CAS; and some questions regarding the clarity, comprehensibility, and relevance of the CAS items. In case the individual did not agree to participate in the study, they could simply close the browser window.

CAS was developed by Chandu et al. (2020) and assesses COVID-19-related anxiety. It is a free-to-use instrument composed of seven items, rated on a 4-point variation semantic scale, measuring fear of social interaction and illness-related anxiety. CAS scores range from 7 to 28 points, with scores < 13 considered low anxiety and > 21 considered high anxiety. Therefore, higher scores indicate higher levels of COVID-19-related anxiety.

The authors of the CAS granted permission for the translation and cultural adaptation of the instrument to the Brazilian context.

In the pre-test, in addition to completing the items of the pre-final Brazilian version of CAS, participants were asked about the clarity, comprehensibility, and relevance of the scale items, and were then asked to provide suggestions.

Regarding the statistical analyses, initially, the data were entered into a spreadsheet using Microsoft Excel for Windows 7 and then transferred to the IBM®SPSS® software (version 22.0) for descriptive analysis, including the creation of frequency tables, measures of central tendency (mean, median, minimum, and maximum), and measures of dispersion (standard deviation).

The CVI was also analyzed, indicating the degree of equivalence between CAS versions using a Likert-type scale with four response options: 1 = not equivalent; 2 = slightly equivalent; 3 = equivalent; and 4 = very equivalent. For the CVI analysis, the criterion proposed by Lynn (1986) was applied, suggesting that with six or more experts, the expected value is CVI ≥ 0.78.

Cronbach's alpha coefficient was also calculated to assess the internal consistency of the final Brazilian version of the CAS. Values ≥ 0.70 were considered satisfactory (Terwee et al., 2007).

## Results

Following the steps recommended by Beaton et al. (2000), CAS was first translated, the translations were then synthesized and, afterwards, they were back-translated (Table 1).

A committee composed of eight experts (two gerontologists, two nurses, two psychologists, one physiotherapist, and one linguist) analyzed the CAS versions. Among the eight experts, two held post-doctoral degrees, two had doctoral degrees, two were doctoral students, one was a master's student, and one had a specialization in translation. Furthermore, two of the experts were university professors. It is worth noting that the members of the expert committee had previous experience with the process of translating and validating scales, including participation in multicenter projects.

The CVI was calculated for each item of the scale analyzed by the experts. Of the seven items that composed the CAS, five presented CVI = 1, indicating equivalence, and thus were kept in the pre-final version of the instrument. The other two items were reanalyzed and modified by the researchers based on the experts' suggestions, as shown in Table 2.

In item 1, the word "receio" was replaced with "medo", and "adquirir a COVID-19" was replaced with "ser contaminado pela COVID-19". Therefore, item (1) "Você tem receio de adquirir a COVID-19 quando sai em público?" was replaced with "Você tem medo de ser contaminado pela COVID-19 quando sai em público?".

In item 7, the order of the words was reversed, changing "O quanto você fica preocupado(a) quando uma pessoa tosse ou espirra devido ao medo de ser contaminado pela COVID-19?" to "O quanto você fica preocupado(a) de ser contaminado pela COVID-19 quando uma pessoa tosse ou espirra?" (Table 2). Thus, the pre-final version of the CAS was established.

**Table 1**

*Original instrument's items and synthesis of translations of the COVID-19 Anxiety Scale*

| Original instrument's items in English | 1st Translation | 2nd Translation |
|---|---|---|
| Please rate your perceptions on the following questions. Select the circle that closely reflects your perception. | *Por favor avalie suas percepções das seguintes perguntas. Marque o círculo que reflete fielmente sua percepção.* | *Por favor, avalie suas percepções nas seguintes questões. Selecione o círculo que mais fielmente reflete suas percepções.* |
| 1. How afraid are you of acquiring COVID-19 when going into the public?<br>Extremely afraid - Not at all afraid | *1. Quanto receia ser contaminado pela COVID-19 ao se deslocar em público?*<br>*Extremamente receoso – Nada receoso* | *1. Quão temeroso(a) você fica de adquirir o COVID-19 quando sai em público?*<br>*Muito temeroso - Nem um pouco* |
| 2. How frequently are you feeling worried that you have acquired Covid-19?<br>Always - Never | *2. Com que frequência você está preocupado achando que foi contaminado pela COVID-19?*<br>*Sempre - Nunca* | *2. Quão frequentemente você se sente preocupado de ter adquirido o COVID-19?*<br>*Sempre - Nunca* |
| 3. How Frequently is your sleep getting affected because of thoughts relating to COVID-19?<br>Always - Never | *3. Com que frequência seu sono está sendo influenciado por pensamentos relacionados à COVID-19?*<br>*Sempre - Nunca* | *3. Quão frequentemente seu sono é afetado por conta de pensamentos relacionados ao COVID-19?*<br>*Sempre - Nunca* |
| 4. How frequently are you avoiding conversations on COVID-19 related information out of fear/anxiety?<br>Always - Never | *4. Com que frequência está evitando conversas sobre informações relacionadas à COVID-19 devido ao medo/à ansiedade?*<br>*Sempre - Nunca* | *4. Quão frequentemente você evita conversas sobre informação relacionada ao COVID-19 por medo ou ansiedade?*<br>*Sempre - Nunca* |
| 5. How worried are you of acquiring COVID-19 when an unknown person is cominh closer to you?<br>Extremely worried - Not at all anxious | *5. Quanto está preocupado com a contaminação pela COVID-19 quando um desconhecido se aproxime de você?*<br>*Extremamente preocupado - Nada preocupado* | *5. Quão preocupado(a) você fica de adquirir o COVID-19 quando pessoas desconhecidas chegam perto de você?*<br>*Extremamente preocupado(a) - Nem um pouco preocupado(a)* |
| 6. How anxious are you getting When knowing information on COVID-19?<br>Extremely anxious - Not at all anxious | *6. Quanto fique ansioso ao receber informações sobre a COVID-19?*<br>*Extremamente ansioso - Nada ansioso* | *6. Quão ansioso você fica ao saber sobre informação relacionada ao COVID-19?*<br>*Extremamente ansioso(a) - Nem um pouco ansioso(a)* |
| 7. How concerned are you When people cough or sneeze because of the fear that you may acquire COVID-19?<br>Extremely concerned - Not at all concerned | *7. Quanto está preocupado quando uma pessoa tosse ou espirra devido ao medo de ser contaminado pela COVID-19?*<br>*Extremamente preocupado - Nada preocupado* | *7. Quão preocupado(a) você fica quando pessoas tossem ou espirram por medo de que possa adquirir o COVID-19?*<br>*Extremamente preocupado(a) - Nem um pouco preocupado(a)* |

**Table 2**

*Consensual and pre-final version of the COVID-19 Anxiety Scale*

| Consensual version | Pre-final Version | CVI |
|---|---|---|
| Please rate your perceptions of the following questions. Mark the circle that accurately reflects your perception. | Please rate the following questions and mark an X on the answer that best reflects your perception. | 0.87 |
| 1. Are you worried about acquiring COVID-19 when you go out in public?<br>Extremely worried - Not worried at all | 1. Are you afraid of being infected with COVID-19 when you go out in public?<br>Very afraid - Not afraid at all | 0.87 |
| 2. How often do you feel worried about having acquired COVID-19?<br>Always - Never | 2. How often do you feel worried about being infected with COVID-19?<br>Always - Never | 1 |
| 3. How often is your sleep affected by thoughts related to COVID-19?<br>Always - Never | 3. How often is your sleep affected by thoughts related to COVID-19?<br>Always - Never | 1 |
| 4. How often are you avoiding conversations about COVID-19-related information due to fear or anxiety?<br>Always - Never | 4. How often do you avoid conversations about COVID-19-related information due to fear or anxiety?<br>Always - Never | 1 |
| 5. How concerned are you about acquiring COVID-19 when strangers get close to you?<br>Extremely concerned - Not concerned at all | 5. How concerned are you about being infected with COVID-19 when strangers get close to you?<br>Extremely concerned - Not concerned at all | 1 |
| 6. How anxious do you get when you learn about COVID-19-related information?<br>Extremely anxious - Not anxious at all | 6. How anxious do you get when you receive COVID-19-related information?<br>Extremely anxious - Not anxious at all | 1 |
| 7. How worried are you when a person coughs or sneezes for fear of being infected with COVID-19?<br>Extremely worried - Not worried at all | 7. How worried are you about being infected with COVID-19 when a person coughs or sneezes?<br>Extremely worried - Not worried at all | 0.87 |

Note: CVI: Contente Validity Index.

In the pre-test, this pre-final version was evaluated by 47 individuals, mostly female (63.8%), mixed-race (48.9%), Catholic (42.4%), and practicioners of some form of religion (55.35%). The mean age and level of education were 33.53 (± 13.05) and 10.76 (± 5.15) years, respectively (Table 3). Participants in this stage found the scale to be clear and comprehensible, as there were no suggestions for modifications to the instrument's items, thus establishing the final adapted Brazilian version of CAS.

Also in the scale's pre-test, the 47 participants filled out the instrument to assess their level of COVID-19-related anxiety, obtaining a mean score of 16.06 (± 4.43); overall scores ranged from 8.0 to 25.0 points. Among the pre-test respondents, 51.1% (*n* = 24) exhibited coronavirus-related anxiety. In addition, the internal consistency of the final version of CAS was satisfactory, with a Cronbach's alpha value of 0.798.

**Table 3**
*Population's sociodemographic characteristics and health condition*

| Category | n | % |
| --- | --- | --- |
| Sex | | |
| Female | 30 | 63.6 |
| Male | 17 | 36.2 |
| Race | | |
| White | 16 | 34.0 |
| Black | 7 | 14.9 |
| Mixed race | 23 | 48.9 |
| Other | 1 | 2.1 |
| Marital status | | |
| Single | 26 | 55.3 |
| Married | 14 | 29.0 |
| Common-law marriage | 5 | 10.6 |
| Divorced | 2 | 4.3 |
| Religion | | |
| Catholic | 20 | 42.4 |
| Evangelical | 4 | 8.4 |
| Other | 23 | 49.2 |
| Practitioner of religion | | |
| Yes | 26 | 55.3 |
| No | 21 | 44.7 |

## Discussion

This study performed the translation and cultural adaptation of the CAS for use in Brazil, following the methodological recommendations and steps proposed by Beaton et al. (2000). The process of translating and adapting an instrument to another language involves a complex methodology. Sometimes, a simple translation may not be feasible due to cultural and language differences. Language, cultural context, and lifestyle need to be considered (Alexandre & Coluci, 2011). Experts become indispensable during the process of translating and adapting instruments, and the committee should ensure that the final version is entirely understandable to assess its cultural equivalence (Alexandre & Coluci, 2011).

In this research, experts carefully analyzed all CAS items; two were flagged as requiring adjustments. It is well-established that expert committee review is essential for the analysis of

translations, and they have the role of making critical decisions and modifying words that are common in culture and linguistics, which have peculiarities, given that countries have different socioeconomic characteristics and ethnicities, as is the case of Brazil (Santos et al., 2015).

The adapted Brazilian version of CAS is equivalent to the original English scale developed in India by Chandu et al. (2020), and all the CVIs were ≥ 0.87, indicating satisfactory content validity. Furthermore, all 47 pre-test participants found all scale items to be clear and comprehensible, without suggesting modifications.

The pre-test participants were predominantly women (63.8%), of mixed-race (48.9%), single (55.3%), Catholic (42.4%), and practitioners of some form of religion (55.3%). The respondents' mean age was 33.53 years (± 13.05), and the mean level of education was 10.76 years (± 5.15), ranging from 2 to 17 years or more in the education item. Similar characteristics were found in the profile of participants in the study conducted by Bernardo et al. (2020). Their study aimed to develop the CPAS-11 in the Philippines, based on a systematic search for existing anxiety scales. A total of 925 people participated in the study, with a predominance of women (71.14%) and a mean age of 35.26 years. Most were single (58.27%) and employed (60.86%). The authors indicated that the CPAS-11 demonstrated good internal consistency and validity, making it an efficient and reliable tool for research and clinical practice.

Another study that exhibited similar sociodemographic characteristics to the present study was conducted by Padovan-Neto (2021) in Brazil. His study aimed to examine the psychometric properties of a Brazilian adaptation of the Coronavirus Anxiety Scale (CAS-BR), originally developed by Lee (2020). The authors stated that they created an adapted a version of the CAS-BR using a standard translation process. Subsequently, online data collection was carried out with the participation of 505 people; most were female (60.39%), mean age of 32 years, white (76.6%), married (39.4%), followed by singles (38.4%), and with higher education (68.9%). The CAS-BR demonstrated good internal consistency and validity for assessing coronavirus-related anxiety.

This study also observed satisfactory internal consistency (Cronbach's alpha of 0.798) for the adapted Brazilian version of CAS developed by Chandu et al. (2020). This version was answered by 47 participants in the pre-test, which was similar to the result obtained by the instrument's authors during the psychometric analysis stage (Cronbach's alpha of 0.730). It is worth noting that, up to this point, this is apparently the first study that has adapted and/or validated this scale for other cultures.

Other scales assessing COVID-19-related anxiety have also demonstrated satisfactory internal consistency. For instance, in the study conducted by Caycho-Rodríguez et al. (2022), the Coronavirus Anxiety Scale (Lee, 2020) was cross-culturally validated in 12 Latin American countries with 5,196 participants, showing good internal consistency with Cronbach's alpha coefficients ≥ 0.78. Petzold et al. (2020) conducted research with 6,262 participants to develop and validate the COVID-19 Anxiety Questionnaire in Germany, also confirming satisfactory internal consistency (Cronbach's alpha of 0.860).

Silva, Sampaio Brito, et al. (2020) also obtained satisfactory internal consistency (Cronbach's alpha of 0.890) in the psychometric analyses of the COVID-19 Anxiety Scale developed in Brazil. Isik et al. (2022) reported good internal consistency for the Turkish version of the Coronavirus Anxiety Scale, originally developed by Lee (2020), which was applied to 720 individuals and achieved a Cronbach's alpha coefficient of 0.864.

It is important to emphasize that, despite the good internal consistency observed in the pre-test stage, the adapted Brazilian version of CAS will be administered to a larger sample to

analyze various psychometric properties of the scale, including reliability through internal consistency and through test-retest.

Regarding the anxiety levels of the pre-test participants, a mean score of 16.06 (± 4.43) was obtained in the adapted Brazilian version of CAS. The study by Chandu et al. (2020) found a similar mean score on CAS (16.93 ± 3.71) during the pre-test phase. It was found that 51.1% of the pre-test respondents in this study exhibited coronavirus-related anxiety. In the study by Sahu et al. (2021), conducted in India, the prevalence was 20.4%.

Caycho-Rodríguez et al. (2022) cite studies (Pappa et al., 2020; Wu et al., 2020; Xiong et al., 2020) indicating that the global prevalence of COVID-19-associated anxiety ranges from 6.33% to 50.9%. In Latin America, it ranges from 5.61% to 81.90% (Alzueta et al., 2021; Goularte et al., 2021; Krüger-Malpartida et al., 2020; Orellana & Orellana, 2020; Paz et al., 2020).

In this context, the importance of early screening and the development of interventions aimed at reducing people's anxiety levels during the COVID-19 pandemic becomes evident. Having scales with evidence of reliability and validity available for use in different cultures is crucial. Silva, Sampaio Brito, et al. (2020) emphasize the extreme necessity of developing valid and reliable psychological instruments to assess how individuals are reacting to this pandemic situation (Silva, Santos, et al., 2020).

Therefore, it is important to highlight that the present study rigorously followed all the steps outlined in the methodology and achieved the proposed objective. Limitations of the study include convenience sampling and the difficulty in data collection, being that social isolation posed a great challenge in collecting pre-test data online through self-assessment.

## Conclusion

Based on the proposed objectives and obtained results, it can be concluded that the Brazilian version of the COVID-19 Anxiety Scale is translated and adapted for the Brazilian context. For future studies, the researchers are in the process of analyzing the psychometric properties to make the scale available for widespread use in Brazil. This will contribute to equipping healthcare professionals with a tool for screening anxiety associated with COVID-19.

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