Psychological impact of COVID-19 pandemic in Brazil: Adaptation and validation of mental impact and distress screening instrument and the sociodemographic profile of impact

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Abstract

The Mental Impact and Distress Scale: COVID-19 (MIDc) was constructed and validated by one of the first pandemic-impact research teams in February 2020 and aims to assess psychosocial impacts of the COVID-19 pandemic. The purpose of the present research was to determine the psychometric properties of the MIDc’s Brazilian form and outline a sociodemographic profile of the pandemic’s psychosocial impact in a Brazilian sample. Altogether, 1004 Brazilians living in different regions of Brazil completed an online survey. The adapted Brazilian version presented significant validity and reliability as assessed by exploratory and confirmatory factor analysis, Cronbach alpha and Spearman-Brown coefficients, and associations with related psychological measures. Even though the Brazilian version differs from a previous (Macau) version, it contains both anticipation (i.e., the mental engagement processes of manag-
ing the unknowns) and modulation (i.e., the mental processes of insulation being activated to maintain a sense of normalcy) factors. Findings indicate greater vulnerability to modulation among younger and female participants. Black participants and those with lower family income were more prone to be economically impacted. Participants living in isolation were more vulnerable to anticipation. Thus, the COVID-19 pandemic was found to differentially affect gender, ethnic, and social groups in Brazil.

INTRODUCTION

At the end of August 2020, when this study’s data collection was carried out, the COVID-19 pandemic had already exceeded 25 million cases and accounted for more than 850,000 deaths worldwide. Brazil ranked second in the list of deaths and case numbers (more than 120,000 and 3.8 million, respectively), surpassed only by the United States of America (Johns Hopkins, 2020). Since March 2020, containment measures had been adopted in Brazil to decrease the transmission of the virus. Even though the Brazilian president did not assign a range of mandatory measures suggested by the World Health Organization (WHO), each Brazilian federal state independently adopted different sorts of actions. After approximately 6 months since the beginning of the pandemic in Brazil, some states followed reopening protocols, even with infection and death rates still high. These measures were taken with little consensus across the Brazilian federal units.

Regardless of the high rates of infection and death, the extension of isolation measures may have contributed to different psychological consequences, the magnitude of which is yet to be determined (Brooks et al., 2020). The 2002 SARS outbreak in China already had grave consequences, such as intense emotional distress and psychiatric morbidity, particularly in health care workers (Sim & Chua, 2004). It is believed that the COVID-pandemic might bring challenges that are even more severe. Such findings were reported by Wang et al. (2020) and Bao et al. (2020), who studied the psychological consequences of the COVID-19 pandemic since the first months of the situation in China, which was the first nation to report cases of the infection.

In Brazil, researchers also found psychological consequences associated with the pandemic. An online survey carried out from April to May 2020 found that over 40% of its 45,161 participants reported frequent depressed humor, anxiety, and sleep issues after the beginning of the COVID-19 pandemic. Groups more impacted were females, young adults, and participants with a history of depression (Barros et al., 2020). In another Brazilian study, participants whose income had decreased during the pandemic had a 42% greater chance of developing minor mental disorders (Duarte et al., 2020).

Although the social and psychological effects of Brazil’s economic changes are yet to be revealed, official data indicated that, in September 2020, 43.6% of households received emergency aid from the government. Furthermore, 19.7 million employed Brazilians had a lower-than-average income level (Brazilian Institute of Geography and Statistics [IBGE], 2020). As Brazilian Black people are more likely to have lower income (IBGE, 2019; Silva & Lima, 2016), the impact of the pandemic on the Black population could be more profound. Brazil was the last country in the West to abolish slavery, which lasted over 300 years and is still reflected in the country’s society
and economy. Also, Silva and Lima (2016) suggested that racial differences still exist in Brazil and have had a direct impact on the social life and health of Black people.

**Psychological needs to expect**

The mental health consequences of the pandemic will probably last longer than the physical health issues (Kousoulis et al., 2020). This means that there might be an increase not only in psychiatric disorders, such as depression, but also in subclinical symptoms, such as anxiety, loneliness, and insomnia (Brooks et al., 2020). These anticipated consequences raise challenges at both local and global levels. Therefore, collective efforts should be made with contributions from health services and research teams worldwide.

To promote mental health support both during and after the pandemic, it may be helpful to use instruments capable of tracing transdiagnostic symptoms on a large scale. Even though instruments such as the Depression, Anxiety, and Stress Scale (DASS-21; e.g., Ref. Alkhamees et al., 2020; Ozamiz-Etxebarria et al., 2020), the Patient Health Questionnaire (PHQ; e.g., Ref. Ettman et al., 2020), and the Hospital Anxiety and Depression Scale (HADS; Özdin & Bayrak Özdin, 2020) have been widely used to assess people's psychological symptoms during the pandemic, they are not pandemic-specific. Other instruments have been created to address this demand, such as the COVID-19 Anxiety Syndrome Scale (C-19ASS; Nikčević & Spada, 2020), the Corona Disease Anxiety Scale (CDAS; Alipour et al., 2020), and the Coronavirus Anxiety Scale (CAS; Lee et al., 2020), but they only assess anxiety.

The Mental Impact and Distress Scale: COVID-19 (MIDc), with its subscales of Psychological Response (MIDc-PR) and Situational Impact (MIDc-SI), was created in February 2020 by Macau-based researchers seeking to investigate the psychological challenges commonly observed during the COVID-19 pandemic (Chang et al., 2021). The MIDc is conceptually informed by the significant clinical responses to prolonged stressors, as well as the coping circumplex model (CCM; Stanisławski, 2019), which describes the specific relationships of coping responses. The CCM expands existing theories and defines eight distinct psychological coping styles based on the relative stable qualities of stress response in terms of the bipolar nature (+) for the problem-coping (P) and emotional-coping (E) dimensions. Five out of eight CCM coping styles are most relevant to MIDc's scope of pandemic distress, they include hedonic disengagement (P-E+), problem avoidance (P-), helplessness (P-E-), negative emotional coping (E-), and preoccupation with the problem (P+E-).

Developed as one of the first of its kind by a group of frontline clinicians (Chang et al., 2021) as a brief but comprehensive screening measurement amid the unfolding of COVID-19, an open perspective was kept when defining the scale structure of the MIDc at this evolving stage of the pandemic. Nevertheless, MIDc-PR can be understood by simplifying the measures to two major factors of psychological reactions: anticipation and modulation. Anticipation is defined as the mental engagement with the perceived threat, deploying one's active coping strategy to manage the unknowns and expectations. Modulation refers to the mental insulation of avoiding the impact of the perceived threat, involving the consolidation of available resources in order to maintain a sense of familiar security (Chang et al., 2022). The MIDc-SI subscale measures situational impact across eight common, but somewhat different, life domains (such as work/study, leisure activities, and food access). In China, the MIDc-SI had a single-factor structure.

Considering the expansion of the pandemic worldwide and the potential impact on mental health, it is essential to develop a scale tailored to the Brazilian population that can track subclinical symptoms to guide future interventions. Additionally, it is crucial to comprehend how
different groups in the population have been impacted so that future interventions can be sensitive to their particular needs. Therefore, this research has two primary purposes: (1) to assess the psychometric properties of the Brazilian versions of both MIDc-PR and MIDc-SI; and (2) to outline a sociodemographic profile of psychosocial impacts triggered by the COVID-19 pandemic in a sample of Brazilians.

METHOD

Participants

Participants (N = 1271) answered an online survey. Invalid or incomplete surveys were excluded (n = 267) and data from 1004 participants aged between 18 and 79 years old (M = 31.7, SD = 12.57) were analyzed. As seen in Table 1, most participants were women, White, held a university degree, were active workers or students, and had a per capita income of between one and three family members at minimum wage. In addition, participants reported leaving home only due to essential tasks, and the average time of COVID-19 related isolation was 20 weeks.

In international surveys, when an ethnic classification is an object of interest, it is generally captured according to the local categories used by the country’s official statistical organization. This occurs because there is no international classification for races and ethnicities. In different countries, concepts such as ethnicity, tribe, nation, people, and race reflect local content as the bases for delimiting the boundaries between social groups, which are produced by the history of each society (Osório, 2003). In Brazil, the main method of racial identification for the official census is by self-reports of the groups to which people belong. More specifically, people are asked about their skin color according to the following five options: Preto, Pardo, Branco, Indígena, and Asiático, which is directly translated to English as Black, Brown, White, Indigenous, and Asian. Pardo ("Brown") is a unique concept in Brazil, meaning the mix of White and Black. In Brazil, there was a lot of biological and cultural miscegenation of different ethnicities. As a result, a person who, for instance, is genetically identifiable as African descent does not necessarily have black skin. Rather than descentance, it is the phenotypic feature (skin color) that creates hierarchies and prejudices in Brazilian society (Osório, 2003) and, consequently, this is the feature assessed by the Brazilian census.

Measures

MIDc-PR, Brazilian version

MIDc-PR is a 24-item measure developed by Chang et al. (2021) that assesses mental impact and distress related to the COVID-19 pandemic on a scale ranging from 1 (not at all) to 5 (extremely). Higher values indicate greater distress. We adapted the MIDc-PR to the Brazilian context following the guidelines of Borsa et al. (2012). Items were first translated from English to Brazilian Portuguese by two independent translators. Our team examined both translations and provided a first Brazilian Portuguese version. Changes in the sequential order of the items were implemented to improve the overall cultural and linguistic comprehension. That is, items were divided into two groups with two slightly different instructions. The Portuguese version was back-translated to
### Table 1  Sociodemographic characteristics of the sample

| Gender       | n   | %   | Education            | N   | %   |
|--------------|-----|-----|----------------------|-----|-----|
| Women        | 704 | 70.1| University degree    | 559 | 55.7%
| Men          | 297 | 29.6| High school          | 396 | 39.4%
| Other        | 3   | .3  | High school incomplete | 49  | 4.9% |

| Age          | M   | SD  | Occupation           | N   | %   |
|--------------|-----|-----|----------------------|-----|-----|
| Women        | 31.7| 12.57| Active workers       | 556 | 55.4% |
| Men          | 29.6| 11.36| Students             | 451 | 44.9% |
| Both         | 31.1| 12.24| Unemployed           | 110 | 11.0% |
|              |     |      | Retired              | 51  | 5.1% |

| Family income per capita | n   | %   | Isolation            | N   | %   |
|--------------------------|-----|-----|----------------------|-----|-----|
| Up to 1 minimum salary   | 334 | 33.4%| Never leave home     | 259 | 25.8% |
| From 1 to 3 minimum salaries | 350 | 34.9%| Leave home only for essential | 507 | 50.5% |
| 3 or more minimum salaries | 265 | 26.4%| Leave home for non-essential | 219 | 21.8% |
| No answer                | 55  | 5.5%| Not isolated         | 19  | 1.9% |

| Racea | n   | %   | Time of Isolation (weeks) | M   | SD  |
|-------|-----|-----|---------------------------|-----|-----|
| White | 598 | 59.6% | Never leave home       | 20.3| 2.56|
| Brown | 283 | 28.2% | Leave home only for essential | 20.1| 3.69|
| Black | 92  | 9.2%  | Leave home for non-essential | 19.4| 4.08|
| Asian | 10  | 1.0%  | Considering all         | 20.0| 3.54|
| Indigenous | 3  | .3%  |                           |     |     |
| Other/No answer | 18 | 1.8%  |                           |     |     |

*a In Brazil, racial classification in the official census asked people their ethnicity according to the following options: Black, Brown (mixed of White and Black), White, Indigenous or Asian.

*b The sum of percentage is above 100 because participants may simultaneously belong to more than one occupational category.
English, and the back-translated version was evaluated by the scale’s author. Following the scale author’s suggestions, the content of one item was changed.

Ten interviews with Brazilian men and women from different age groups and educational backgrounds\(^1\) were carried out to assess participants’ perceptions regarding the content of the items and instructions. Following the participants’ suggestions, the content of one item was slightly changed, and the scale’s author approved that change. The scale’s psychometric properties are reported in the results section.

**MIDc-SI, Brazilian version**

The MIDc-SI is an eight-item measure that assesses situational impact by means of a 5-point scale ranging from 1 (not at all) to 5 (extremely), with five meaning greater distress. We adapted the MIDc-SI to the Brazilian context following the same guidelines described by Borsa et al. (2012). No changes were suggested by the scale’s author after the evaluation of back-translation. The content of two items was changed during the semantic verification process. The scale’s psychometric properties are reported in the results section.

**Depression, anxiety, and stress scale (DASS-21), Brazilian version**

DASS-21 assesses 21 symptoms of depression, anxiety, and stress during the last 2 weeks using scale of 1 (did not apply to me at all) to 4 (applied to me very much, or most of the time). It was created by Lovibond and Lovibond (1995) and adapted to the Brazilian context by Vignola and Tucci (2014). We tested its original factor structure in our sample and found acceptable fit indices, \(\chi^2 = 529.47, \text{df} = 186, p < .001, \text{RMSEA} = .070 [.063, .077], \text{CFI} = .971, \text{TLI} = .967, \text{WRMR} = 1.105\). The reliability of the full scale and depression subscale were excellent (\(\alpha = .95\) and \(\alpha = .91\), respectively), and the reliabilities of the anxiety and stress subscales were good (\(\alpha = .87\) and \(\alpha = .90\), respectively).

**World Health Organization–Five Well-Being Index (WHO-5), Brazilian version**

The WHO-5 is a five-item measure that assesses subjective psychological well-being during the last 2 weeks on a scale of 1 (never) to 6 (all the time). It was created by Johansen (1998) and adapted to the Brazilian context by Souza and Hidalgo (2012). We tested its original factor structure in our sample and found good fit indices, \(\chi^2 = 11.617, \text{df} = 5, p < .001, \text{RMSEA} = .054 [.011, .096], \text{CFI} = .999, \text{TLI} = .997, \text{WRMR} = .319\). The reliability of the full scale was good (\(\alpha = .89\)).

**Procedure**

Participants answered an anonymous online survey on the LimeSurvey platform during August 2020. The survey was launched on social media by over 20 data collectors from different places

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\(^1\) Participants were aged between 18 and 63 years (\(M=31.2, SD=16.83\)); seven participants were female and three were male; four participants were White, four were Brown, and two were Black; also, five participants held a college degree and five did not.
Validation of MIDc among Brazilian sample around Brazil. All participants responded to the MIDc and a sociodemographic questionnaire. Participants were then randomly divided into groups that completed different sets of measures. Altogether, 382 participants responded to the DASS-21, 451 responded to the WHO-5; and 134 participants responded to both measures. Ethics approval was obtained from an Ethics Commission, and all participants provided informed consent before answering the survey.

Data analyses

We assessed the psychometric properties of scores from the MIDc-PR and MIDc-SI, using exploratory and confirmatory factor analyses (EFAs and CFAs, respectively). EFAs were carried out with the software FACTOR. We used the polychoric correlation matrix and minimum rank factor analysis (Ten Berge & Kiers, 1991) estimation method. For the retention of factors, we compared the extracted eigenvalues with a parallel analysis (Timmerman & Lorenzo-Seva, 2011), and the retained factors were rotated by the direct oblimin method. The adequacy of the correlation matrix was assessed by Kaiser-Meyer-Olkin and Bartlett’s tests.

For the CFAs, we used the software MPlus 8 and the estimator weighted least squares with means and variance (WLSMV). The fit indices and reference values were as follows: comparative fit index ($CFI \geq .95$), Tucker-Lewis index ($TLI \geq .95$), and root mean square error approximation ($RMSEA < .06$), and weighted root mean residual ($WRMR < .9$) (Schreiber et al., 2006). The reliabilities of the full scale and factor scores were assessed by Cronbach’s alpha and Spearman-Brown coefficients.

We identified the associations of MIDc-PR and MIDc-SI subscale factor scores with the DASS-21 and WHO-5 factor scores and sociodemographic variables (Table 1) using the software Statistical Package for the Social Sciences Statistics 22. The scales’ factor scores were extracted via the maximum a posteriori method. We calculated the correlations between continuous variables by Pearson or Spearman coefficients, depending on whether the variables had normal distributions or not.

We carried out multivariate analyses of variance (MANOVAs), considering the sociodemographic variables as independent variables (IV) and the MIDc-PR and MIDc-SI subscale scores as the dependent variables (DV). The third and fourth categories of the isolation variable were united because the fourth had only 19 participants. The ethnicity categories of Asian and Indigenous, and the gender category “other” were excluded due to the low number of participants. Whenever one or more DVs showed non-significant results ($p \geq .05$) or decreased power ($1-\beta \leq .80$), we carried out a new MANOVA keeping only the significant and powerful DVs. And if only one DV was significant and powerful, we carried out analyses of variance (ANOVA). Also, a Bonferroni post-hoc test was used whenever a categorical variable with more than two levels was used as an IV. Levene’s test of equality of variance and Box’s test of equality of covariance matrices verified the homoscedasticity across subgroups. Partial $\eta^2$ was used as the effect size indicator, which is usually interpreted as low ($.01 \leq \eta^2_{par} < .06$), medium ($0.06 \leq \eta^2_{par} < .14$), or high ($\eta^2_{par} \geq .14$) (Cohen, 1988).

Lastly, we carried out structural equation modeling using all significant and powerful associations between the MIDc-PR and MIDc-SI scores and sociodemographic variables. We used the software MPlus 8, the estimator WLSMV, and used the same fit indices as for the CFA. The model was adjusted until only significant correlations were achieved.
### TABLE 2  Eigenvalues, variance, and parallel analysis

|        | EFA (MRFA) | Parallel Analysis (% Variance) |         |         |         |
|---|---|---|---|---|---|
|     | Eigenvalue | Variance | Cumulative variance | Real Data | Mean of Random | 95 percentile of Random |
| 1   | 9.209      | .485     | .485                  | 52.340<sup>a</sup> | 10.636 | 12.092 |
| 2   | 2.088      | .110     | .595                  | 11.484<sup>a</sup> | 9.941  | 11.342 |
| 3   | .849       | .045     | .640                  | 4.695      | 9.307  | 10.440 |
| 4   | .754       | .040     | .685                  | 4.213      | 8.704  | 9.682  |
| 5   | .677       | .036     | .721                  | 3.753      | 8.103  | 8.856  |
| 6   | .651       | .034     | .755                  | 3.528      | 7.508  | 8.242  |
| 7   | .570       | .030     | .785                  | 3.151      | 6.926  | 7.534  |
| 8   | .504       | .027     | .812                  | 2.805      | 6.365  | 7.008  |
| 9   | .484       | .025     | .837                  | 2.460      | 5.781  | 6.428  |
| 10  | .455       | .024     | .861                  | 2.318      | 5.211  | 5.882  |
| 11  | .424       | .022     | .883                  | 2.120      | 4.656  | 5.413  |
| 12  | .390       | .021     | .904                  | 1.876      | 4.103  | 4.908  |
| 13  | .382       | .020     | .924                  | 1.467      | 3.556  | 4.404  |
| 14  | .341       | .018     | .942                  | 1.346      | 2.982  | 3.858  |
| 15  | .325       | .017     | .960                  | 1.132      | 2.418  | 3.192  |
| 16  | .270       | .014     | .974                  | .681       | 1.842  | 2.589  |
| 17  | .225       | .012     | .986                  | .531       | 1.271  | 1.935  |
| 18  | .222       | .012     | .998                  | .101       | .690   | 1.296  |
| 19  | .180       | .009     |                       |           |        |        |

<sup>a</sup>Advised dimensions according to parallel analysis.

### Results

**Psychometric properties: MIDc-PR**

We first tested the original MIDc-PR from the Mental Impact and Distress: COVID, Traditional Chinese version (MIDc-tCHI) factor-structure in our sample using a CFA. As we found non-fitting indices, $\chi^2 = 2273.327$, $df = 222$, $p < .001$, $RMSEA = .096 [ .092, .100]$, $CFI = .927$, $TLI = .917$, $WRMR = 2.199$, we proposed a new factor-structure grounded on our data. We randomly split the sample into two halves and carried out EFAs on the first half ($n = 502$). After eliminating items that either had double loadings or a factor loading less than .30, we extracted two factors explaining 59.5% of the variance (see Tables 2 and 3). A Kaiser-Meyer-Olkin test ($KMO = .95$) and Bartlett’s test, $\chi^2 = 11465.0$, $df = 171$, $p < .001$, indicated very good adequacy of the correlation matrix. The reliability of the full scale was excellent ($\alpha = .92$), and the reliabilities of the subscales were excellent ($\alpha = .92$) and good ($\alpha = .85$). Correlation between the factor scores was moderate ($r = .57$).

We tested the extracted factor-structure in a CFA with the second half of the sample ($n = 502$), and found good fit indices, $\chi^2 = 411.300$, $df = 151$, $p < .001$, $RMSEA = .059 [ .052, .065]$, $CFI = .978$, $TLI = .975$, $WRMR = 1.076$, except for the WRMR. As WRMR is affected by increased sample size (DiStefano et al., 2017), we tested a new CFA with a sample of 200 randomly selected participants,
### TABLE 3 Rotated factor loadings

| Item | Content (Back-translated items from Brazilian Portuguese to English)                                                                                                                                                                                                 | Mod.  | Ant.  |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|
| 1    | Compared to my life before the COVID-19 pandemic…                                                                                                                                                                                                                  | .667  | .099  |
| 2    | … I get easily irritated and angry.                                                                                                                                                                                                                            | .629  | .059  |
| 3    | … I feel sad and unhappy.                                                                                                                                                                                                                                       | .814  | .046  |
| 4    | … I have difficulties concentrating.                                                                                                                                                                                                                           | .873  | -.088 |
| 5    | … I have problems restraining some of my excessive behaviors, such as eating, using social media, drinking, gaming, smoking, online shopping, and so on.                                                                 | .674  | .013  |
| 7    | … I feel unmotivated.                                                                                                                                                                                                                                          | .934  | -.112 |
| 8    | … I feel exhausted.                                                                                                                                                                                                                                            | .837  | -.040 |
| 9    | … I cannot relax.                                                                                                                                                                                                                                              | .779  | .077  |
| 10   | … I feel lonely.                                                                                                                                                                                                                                                | .676  | .058  |
| 11   | … I feel stuck.                                                                                                                                                                                                                                                 | .513  | .200  |
| 12   | … it is hard for me to make decisions.                                                                                                                                                                                                                          | .716  | .135  |
| 13   | I think about the current situation even when I do not want to.                                                                                                                                                                                               | .059  | .775  |
| 14   | I am taken by thoughts about how to keep me out of danger.                                                                                                                                                                                                   | -.119 | .882  |
| 16   | Images of the current situation suddenly pop into my mind.                                                                                                                                                                                                   | .114  | .763  |
| 17   | People I know are worried about my exaggerated reaction due to the current situation.                                                                                                                                                                            | -.031 | .722  |
| 19   | Remembering the current situation leads me to have physical reactions, such as sweating, difficulty breathing, nausea, pounding heart, and so on.                                                                                                           | .196  | .580  |
| 22   | I worry that bad things may happen to me or to people I like.                                                                                                                                                                                                  | .088  | .668  |
| 23   | I cannot stop following news and information about the current situation.                                                                                                                                                                                       | -.014 | .596  |
| 24   | I feel that people have been expecting a lot from me.                                                                                                                                                                                                       | .536  | .104  |

Abbreviations: Ant., anticipation; Mod., modulation.
and found good WRMR indices, $\chi^2 = 266.294$, $df = 151$, $p < .001$, $RMSEA = .062 [.049, .074]$, $CFI = .975$, $TLI = .972$, $WRMR = .876$. Figure 1 shows the factor loadings of the items. The reliability of the full scale was excellent ($\alpha = .93$), and the reliabilities of the subscales were excellent ($\alpha = .93$) and good ($\alpha = .85$). A Spearman-Brown coefficient that was run using the entire sample supported good to excellent reliabilities for the full scale (.93) and factor scores (.92 and .85). The extracted factors had seven and 12 items that correspond to “anticipation” and “modulation,” respectively. Higher scores in each subscale indicate greater maladaptation.

**Psychometric properties: MIDc-SI**

We tested the single-factor structure and found bad fit indices, $\chi^2 = 274.733$, $df = 20$, $p < .001$, $RMSEA = .113 [.101, .125]$, $CFI = .879$, $TLI = .830$, $WRMR = 1.770$). Therefore, we carried out a CFA testing a two-factor structure for measuring social and economic impacts. The social impact was assessed through participants’ answers regarding the pandemic’s impact on their work/study, family relations, social support, and leisure activities. As for the economic impact, participants’ answers regarding the impact on their work/study, financial condition, and access to food were assessed. The impact on work/study pertained to both factors because work/academic life may relate to both social and economic life domains. Sex life and physical health were not analyzed because they do not refer to any of the domains analyzed, that is, social and economic impact.
Following the recommendation regarding CFA modification indices, we correlated the residual variance of family relations and social support. The CFA found good fit indices, $\chi^2 = 26.142$, $df = 6$, $p < .001$, $RMSEA = .058 \ [.036, .081]$, $CFI = .986$, $TLI = .966$, $WRMR = .600$. Figure 1 shows the factor loadings of the items. The reliabilities of the full scale and social impact subscale were questionable ($\alpha = .68$ and $\alpha = .63$), and the reliability of the economic impact subscale was poor ($\alpha = .59$). The low reliability may relate to the number of subscale items, as Cronbach alpha tends to be lower when the number of items is low (Damásio, 2012). It may also relate to the fact that one of the items loaded on both factors. The correlations between the scores on the MIDc-PR and MIDc-SI subscales were low to moderate (Table 4).

**Relations to psychological features**

The scores on the MIDc-PR and MIDc-SI subscales correlated positively to the DASS-21 scores and negatively to the WHO-5 scores (Table 4). Correlations to modulation were stronger when compared to correlations to anticipation, which were stronger than the correlations to social and economic impact.

**Relations to sociodemographic features**

The MIDc-PR and MIDc-SI subscale scores were related to age, gender, race, family income per capita, and isolation. Although we found significant correlations to occupation and education degree, they became insignificant when age or family income was controlled. Age was negatively correlated with modulation ($r = -.297$) and economic impact ($r = -.127$). Women had higher anticipation, modulation, and social impact scores (Table 5), and Black respondents were more economically impacted (Table 6). Participants with lower family income per capita had higher antic-
### TABLE 5  Comparing means across gender

| MANOVA | Box’s test | Levene’s test |
|--------|------------|---------------|
| $\Lambda$ | $df$ | $p$ | $\eta^2_{par}$ | $1-\beta$ | $F$ | $df$ | $p$ |
| .976 | 3 | .000 | .024 | .991 | 6.084 | 1.010 | 6 | .417 | F1 | 1.180 | 1 | .278 |
| | | | | | | | | | | F2 | .713 | 1 | .399 |
| | | | | | | | | | Soc. imp. | .425 | 1 | .514 |

Descriptive statistics–$M(SD)$

| | Women | Men |
|---|---|---|
| Modulation | 1.41 (.697) | 1.18 (.725) |
| Anticipation | 1.14 (.596) | 1.00 (.578) |
| Social impact | 1.12 (.417) | 1.02 (.438) |

Tests of between-subjects effects

| | $F$ | $df$ | $p$ | $\eta^2_{par}$ | $1-\beta$ |
|---|---|---|---|---|---|
| F | 22.237 | 1 | .000 | .022 | .997 |
| | 11.180 | 1 | .001 | .011 | .916 |
| | 12.344 | 1 | .000 | .012 | .939 |

Note. $N = 1001$.

Abbreviations: MANOVA, multivariate analysis of variance; DV, dependent variable; Soc. Imp., social impact.

### TABLE 6  Comparing means across race

| ANOVA | Levene’s test |
|---|---|
| Descriptive statistics–$M(SD)$ | Ec. imp. |
| | $F$ | $df$ | $p$ |
| White | .75 (.515) | .80 (.545) | .99 (.499) |
| Brown | 8.306 | 2 | .000 | .017 | .963 |
| Black | | | |

Post-Hoc (Bonferroni)

| | White $\times$ Brown | | White $\times$ Black | | Brown $\times$ Black |
|---|---|---|---|---|---|
| | $M$ Diff. | SE | $p$ | $M$ Diff. | SE | $p$ | $M$ Diff. | SE | $p$ |
| Ec. imp. | -.048 | .0377 | .625 | -.237 | .0585 | .000 | -.190 | .0627 | .008 |

Note. $N = 973$.

Abbreviations: ANOVA, analysis of variance; DV, dependent variable; Ec. Imp., economic impact; $M$ Diff., mean difference.

ipation, modulation, and social and economic impacts scores (Table 7). Participants who never leave home had higher modulation scores compared to participants who leave home for essential and non-essential tasks. They also had higher social impact scores compared to participants who leave home for non-essential tasks. Lastly, participants who leave home for non-essential tasks had lower anticipation scores compared to participants who never leave home or leave home only for essential tasks (Table 8).

All associations had low magnitude, except for the relation between family income and economic impact, which was moderate. Although Levene’s test indicated a violation of homoscedasticity across subgroups with different family incomes, we still may consider these results because $p$ values of the tests of between-subjects effects were lower than .01 (Pallant, 2013).

As for the structural equation modeling, after eliminating non-significant correlations, we found very good fit indices, $\chi^2 = 1,202.781, df = 386, p < .001, RMSEA = .048 [.045, .051], CFI = .962, TLI = .958$. We considered ethnicity a dichotomous variable that distinguished Black people from other ethnic backgrounds\(^2\). As seen in Figure 2, some of the significant relationships found in the previously performed MANOVA and ANOVA were not identified in the results of the structural

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\(^2\) This decision was made because of previous results found in our sample; differences across ethnic groups were found only between Black people and other ethnic categories. No differences between Brown and White were found; and very
### TABLE 7  Comparing means across family income per capita groups

| MANOVA | Box's test | Levene's test |
|--------|------------|---------------|
| Λ | df | p | $\eta^2_{par}$ | $1-\beta$ | M | F | df | p | DVs | F | df | p |
| .875 | 8 | .000 | .065 | 1.000 | 26.158 | 1.300 | 20 | .166 | Mod. | 1.246 | 2 | .288 |
| | | | | | Ant. | 1.047 | 2 | .352 |
| | | | | | Soc. imp. | 1.060 | 2 | .347 |
| | | | | | Ec. imp. | 7.569 | 2 | .001 |

#### Descriptive statistics–M(SD)

| < 1 sal. | 1-3 sal. | > 3 sal. | Tests of between-subjects effects |
|----------|----------|----------|----------------------------------|
| Modulation | 1.51 (.735) | 1.33 (.696) | 1.18 (.681) | 16.344 | 2 | .000 | .033 | 1.000 |
| Anticipation | 1.19 (.587) | 1.08 (.573) | 1.04 (.619) | 5.830 | 2 | .003 | .012 | .872 |
| Soc. imp. | 1.16 (.411) | 1.10 (.419) | 1.05 (.438) | 4.982 | 2 | .007 | .010 | .813 |
| Ec. imp. | 1.01 (.538) | .75 (.487) | .57 (.445) | 61.842 | 2 | .000 | .116 | 1.000 |

#### Post-Hoc (Bonferroni)

| <1 × 1–3 sal. | <1 × > 3 sal. | 1–3 × > 3 sal. |
|----------------|----------------|----------------|
| M Diff. | SE | p | M Diff. | Std. Er | P | M Diff. | SE | p |
| Modulation | .183 | .0540 | .002 | .329 | .0581 | .000 | .146 | .0575 | .034 |
| Anticipation | .115 | .0452 | .033 | .156 | .0486 | .004 | .041 | .0482 | 1.000 |
| Soc. imp. | .060 | .0323 | .190 | .109 | .0347 | .005 | .049 | .0343 | .473 |
| Ec. imp. | .260 | .0378 | .000 | .446 | .0407 | .000 | .186 | .0403 | .000 |

**Note.** N = 949.

Abbreviations: MANOVA, multivariate analysis of variance; DV, dependent variable; Mod., modulation; Ant., anticipation; Soc. Imp., social impact; Ec. Imp., economic impact; M Diff., mean difference.

### TABLE 8  Comparing means across isolation patterns

| MANOVA | Box's test | Levene's test |
|--------|------------|---------------|
| Λ | df | p | $\eta^2_{par}$ | $1-\beta$ | M | F | df | p | DVs | F | df | p |
| .969 | 6 | <.001 | .016 | .996 | 7.620 | .632 | 12 | .817 | Mod. | .675 | 2 | .509 |
| | | | | | Ant. | 2.841 | 2 | .059 |
| | | | | | Soc. Imp. | .347 | 2 | .707 |

#### Descriptive statistics–M (SD)

| Never | Essential | Non-essential | Tests of between-subjects effects |
|-------|-----------|---------------|----------------------------------|
| Modulation | 1.48 (.733) | 1.32 (.706) | 1.24 (.696) | 7.429 | 2 | .001 | .015 | .941 |
| Anticipation | 1.19 (.601) | 1.13 (.597) | .94 (.548) | 12.334 | 2 | .000 | .024 | .996 |
| Soc. imp. | 1.15 (.419) | 1.10 (.429) | 1.03 (.422) | 5.263 | 2 | .005 | .010 | .835 |

#### Post-Hoc (Bonferroni)

| Never × Essential | Never × Non-Essential | Essential × Non-Essential |
|-------------------|-----------------------|--------------------------|
| M Diff. | SE | p | M Diff. | SE | P | M Diff. | SE | p |
| Modulation | .155 | .0543 | .013 | .239 | .0638 | .001 | .084 | .0558 | .398 |
| Anticipation | .066 | .0448 | .425 | .250 | .0527 | .000 | .184 | .0461 | .000 |
| Soc. imp. | .059 | .0324 | .211 | .124 | .0381 | .004 | .065 | .0334 | .156 |

**Note.** N = 1004.

Abbreviations: MANOVA, multivariate analysis of variance; DV, dependent variable; Mod., modulation; Ant., anticipation; Soc. Imp., social impact; M Diff., mean difference.
FIGURE 2  Structural equation model. Note. Measurement model is omitted. All standardized coefficients are significant, $p < .05$. Imp., impact

equation modeling. Modulation did not correlate significantly with income or isolation, and the correlation with gender yielded a very low magnitude. Anticipation did not correlate significantly with isolation, gender, or income. Social impact did not correlate significantly with income. And, lastly, economic impact did not correlate significantly with age. Hence, it seems both modulation and anticipation are indirectly impacted by gender, isolation, and income, with gender and isolation being mediated by social impact, and income being mediated by economic impact.

DISCUSSION

This research assessed the psychometric properties of the Brazilian versions of both the MIDc-PR and MIDc-SI. Although the MIDc Traditional Chinese (Macau) factor structure was not completely replicated in our sample, there are notable similarities with the overall conceptual structure. Similar to the two-factor model reported in the original Macau study, our study found that, statistically, our best-fit model is based on a similar conceptualization of the “anticipation” (i.e., the mental engagement processes of managing the unknown processes of preservation when faced with prolonged or uncertain conditions related to COVID pandemic) and “modulation” (i.e., the mental processes of insulation being activated to maintain a sense of normalcy when the level of COVID threat is immediate or heightened) factors. Like the MIDc Macau study, this two-factor structure in our study had excellent reliability and validity, enhanced by their associations with DASS-21 and WHO-5 scores. Indeed, given that COVID-19 hit Brazil at a significantly more severe level than Macau, in terms of infection rate and death toll, the robustness of the MIDc as a screening scale was validated by the findings in our study. There were similar distress expressions, such as issues with concentration, loneliness, excessive escapism behaviors, and anger.

few participants were Asian or Indigenous, which, thus, did not allow us to compare these groups with the other ethnic categories.
This points to the applicability of the two-factor structure on a cross-cultural level. At the same time, consideration of the cultural variances and pandemic severity differences in terms of distress expression is noteworthy here. For example, on the anticipation factor, the Brazilian sample expressed additional cognitive distress (intrusive thoughts and concerns for danger) while the Macau sample had behavioral expressions (avoiding the topic and routine interruptions). The positive findings for the Brazilian Portuguese form of the MIDc (MIDc-bPOR) subscale adaption and validation confirm it as a useful instrument to consider for both preventative policies and interventions. This study is best understood as an initial step to systematically quantify the distress and impact of an on-going pandemic specific to Brazilian people. As for the MIDc-SI, our Brazilian version has two factors that assess social and economic impacts.

This research outlined a sociodemographic profile of the psychosocial impact triggered by the COVID-19 pandemic in a sample of 1004 Brazilians. Our findings indicate greater vulnerability among participants who are young, female, Black, and had lower income. Greater vulnerability to modulation among young people was also found in previous studies in several countries (Bao et al., 2020; Justo-Alonso et al., 2020; Wang et al., 2020), including Brazil (Duarte et al., 2020). A study in Spain during the early stages of the pandemic found that participants aged between 18 and 33 years old had higher scores on depression and anxiety (Justo-Alonso et al., 2020). One of the reasons for such findings may be that young people had a lack of daily routine during quarantine because most of their activities were discontinued. They also spent more time with their family and less time with peers, which could lead to increased stress and conflict. Interestingly, even though elderly people have a higher risk of being contaminated or even death, our results revealed that they were less psychologically impacted than younger people.

Similar results were found in studies carried out in Spain and China regarding the higher scores on anticipation and modulation among women (Justo-Alonso et al., 2020; Wang et al., 2020). A study based in Southern Brazil found that women were 2.73 times more likely to develop a minor mental health disorder (Duarte et al., 2020). It is well documented in the literature that women are more vulnerable to genetic, hormonal, and physiological factors related to depression (Kuehner, 2016). Nevertheless, abuse and discrimination against women also make them more vulnerable to domestic violence and depression (García-Moreno et al., 2014). For instance, according to the Brazilian Public Security Yearbook (2020), domestic-violence calls for help increased by 3.8% since the beginning of the pandemic, while femicide increased by 1.9%. This study contributes to the literature by indicating that women’s vulnerability to modulation might be mediated by social impact.

Our findings indicate that Black people and lower-income participants were more economically impacted, which is in line with previous studies. An online survey carried out with Black, Indigenous, and Latinx young adults in the United States found that perceived victimization experiences were associated with employment problems, health risks, depression, and anxiety among participants (Fisher et al., 2020). In Brazil, Goes et al. (2020) emphasized that even adopting preventive measures is conditioned by racial bias because Black people represent the majority of informal workers who were still active during the pandemic.

The COVID-19 pandemic has created new pathways to disparities by intensifying societal inequities. Skin color and socioeconomic class are historically related features in Brazilian society, which implies racial inequalities in current times (Silva & Lima, 2016). As a consequence, different social indicators demonstrate higher levels of economic and social vulnerability in this group. In 2018, 64.0% of unemployed people were Black, a percentage higher than their distribution in the general population (55.8%). Also, White family income per capita was almost double that of Black people (IBGE, 2019).
As for the pattern of isolation, isolated participants were more impacted on both modulation and anticipation. This study provided evidence that this might be due to the mediation effect of social impact. In addition to the usual impairments of isolation and mental health, studies have shown that quarantine and confinement measures further impact the risk of future dementia and psychological distress. For elderly people with cognitive issues and in cognitive decline, the consequences could be even worse (Di Santo et al., 2020). Also, the association between isolated non-followers and their lower anticipation might relate to an unrealistic optimism in which one perceives oneself as less likely than others to suffer from disasters (Fernandes, 2020). A study carried out in the United States indicated that the relation between perceived vulnerability to COVID-19 and traumatic stress symptoms were mediated by COVID-19-related worries and moderated by greater social isolation (Boyratz et al., 2020). Even though anticipation can increase the risk of psychological distress, our study suggests that, in contrast, low levels of anticipation relate to greater exposure to risk due to the non-fulfillment of living in isolation.

### Social issues and policy implications

Even though the pandemic has deeply impacted the entire Brazilian population, our findings indicate that its effects vary across gender, age, ethnicity, and social class. These differences warrant careful consideration when organizing interventions that aim to mitigate the group-specific impact of the pandemic in Brazil. Although several instruments have been recently used to assess people’s psychological symptoms, pandemic-specific instruments are potentially more effective for tracking symptoms on a large scale. Therefore, the application of instruments such as the MIDc may be a powerful tool for the development of interventions and policies dealing with the pandemic’s psychosocial impacts. The following are possible implications of interest:

First, social and ethnic inequalities are demonstrably significant in this study. Our findings indicate that Black participants and/or participants with lower family income were more impacted economically, which, in turn, was associated with maladapted modulation responses. The pandemic seemed to have deepened the social and ethnic inequality in Brazil. This implied that a significant portion of the population is vulnerable and lacks the ability to comply with the sanitary standards necessary to control the pandemic, such as staying at home, maintaining social distance, washing hands, and eating properly (Costa et al., 2020).

Second, having the financial means to support oneself during the economic downturn makes a difference. For example, the Brazilian Public Social Assistance Policy (Sistema Único de Assistência Social [SUAS]) provided financial assistance, called “emergency aid,” to support vulnerable Brazilians during the pandemic. It was intended to mitigate economic impacts and guarantee a minimum income for Brazilians in need due to severe interruptions of the overall economic activities. However, the aid was planned for the first few months, which were expected to be the most critical of the pandemic. The amount was less than the minimum wage in Brazil, and after 5 months, it was reduced to half of the first amount. For effective changes in this critical situation, economic investigations and responses require prioritizing the survival struggles of the most vulnerable people, followed by implementing corresponding laws and policies that aim to extend a sustainable level of emergency aid for a longer period.

Third, increased psychological needs of the general population are indicated. Planning and training efforts need to be organized to strengthen the delivery network of psychological assistance. Public policies in Brazil already include services in this area, and some projects have been developed during the pandemic, such as the expansion of free psychological care services. Inclu-
sive planning also means crisis training and on-going support for the health care professionals and frontline workers who become exhausted and overwhelmed.

Fourth, to utilize existing systems to provide indicated daily needs for different populations. For instance, the Brazilian public health system (Sistema Único de Saúde [SUS]) has various health services that could meet all demands despite their complexity in different locations. SUS has Primary Health Care, a welcoming service for the population with fewer demands. It is responsible for bonding with the community through multidisciplinary teams for monitoring. During a pandemic, this service can promote preventive actions with the elderly population because even though they are less prone to develop a modulation type of distress response, they are a high-risk group for COVID-19 infection and are more likely to be physically and socially isolated. The work of the care service includes multidisciplinary support teams to teach at-home physical activities, promote virtual socialization with family and friends, and establish food delivery programs.

Fifth, youths and women tend to be more prone to a modulation type of psychological distress. For women, the pandemic increased challenges, such as poorer health and the risk of suffering domestic violence during the quarantine period. The promotion of social support through activities that facilitate a sense of community and increase the feeling of belonging is recommended. We encourage ideas such as the organization of a “help board” among neighbors, or creating virtual groups that promote the exchange of information and support among mothers who are alone in caring for their children. With the expansion of the support network on a neighborhood level, women can be reminded to practice basic self-care exercises and social connection, and practice relaxation and calming activities, such as meditation and Yoga, including at home. It is also relevant to think about actions to combat domestic violence, such as training and allocating staff to effectively provide support and meet demands.

Sixth, strategies that stimulate the sense of belonging and strengthening the bonds between youths are essential. Social media can be used to promote engagement and socialization among young people with simple and individual-level strategies. For example, youths can perform virtual group activities such as watching the same movies, joining online games or even teaching each other healthy physical activities. Another possibility is to provide constructive and continuous tasks. For instance, joining e-challenges of learning a new language or reading a book within the same timeframe. When promoted as goal-directed routines, a sense of normality and competence is reinforced, which can help to reduce the isolation fatigue brought on by the pandemic’s interruption of their lives.

Finally, while interventions at the individual level are important, it is essential to recognize the structural and institutional causes of the problem. Brazil is in the last place in a ranking that analyzed the pandemic’s management across 98 countries (Lowy Institute, 2021). In addition to public policies and emergency aid, one of the most important actions to adequately tackle the pandemic would be a governmental leadership that executes decisions that are consistent with science-based sanitary regulations, clear guidelines, adopting protective measures, and fostering a sense of practical hopefulness under the unifying theme of community bonding and adopting healthy coping practices.

Limitations

The findings revealed interesting social issues, although our sample did not represent the entire Brazilian population. Participants represent a convenience sample and were mostly White, with higher education, and families with per capita income between one and three at minimum wage.
This contrasts with data from the Brazilian census in 2019, according to which most Brazilians are Black or Brown, without higher education, and with family per capita income less than one minimum wage (IBGE, 2020). As data collection was carried out online, access to low-income participants (more frequently Black people and without higher education) was hindered because they have less access to internet use in Brazil. Future studies might include the MIdc-bPOR in the routine of COVID-testing centers in order to obtain a more representative sample of the Brazilian population.

The online and self-response nature of data collection is also an important limitation to be considered. The presence of other people when completing the online survey may have influenced participants’ responses, for example, prompting them to provide more socially desirable responses.

**CONCLUSION**

We investigated the psychometric properties of a COVID-psychosocial impact tracking instrument adapted to the Brazilian context and, based on those findings, outlined a sociodemographic profile of the psychosocial impact triggered by the COVID-19 pandemic in a sample of 1004 Brazilians. The original, Macau-based, factor structure of the instrument was not replicated in our sample and, thus, we provided a new factor structure, which also demonstrated both good validity and reliability.

Our findings corroborate previous research and indicate that pandemics can be more devastating for vulnerable populations. The reality of COVID-19 impacts can be felt to some extent among all people. In Brazil, being in prolonged social isolation differentially affects youths and the elderly. Interruptions of economic activities widened the gap of disparity for marginalized groups in the society. Black women with weak support for child care and uncertain income are particularly at risk. The MIdc-bPOR scale was found to be a validated, short, and easy-to-use scale that can be integrated with frontline services, support programs, and large-scale tracking studies. It is recommended that a wide application of specific instruments like the MIDc be incorporated across agencies and departments to be utilized as a common COVID-19 impact indicator.

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