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COVID-19, Social Isolation, and Psychological Distress in a Brazilian Sample

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Objective: To determine whether social isolation during the coronavirus disease (COVID-19) pandemic in Brazil led to higher signs of psychological distress, and which intra (loneliness, coping mechanisms, feelings of entrapment) and interpsychic (media consumption) variables mediated this effect. ***Method:*** Two phases of web-based surveys were applied to Brazilian participants between May 25, 2020 and August 19, 2020. Phase 1 involved the application of psychological scales as well as information on isolation habits and media consumption. ***Results:*** Social isolation during the COVID-19 pandemic significantly increased psychological distress at clinically relevant rates, with loneliness being an important predictor of this effect. We also found that escape–avoidance and distancing coping strategies mediated this effect. Psychological distress was also related to high consumption of COVID-19-related information in social networks, print or online newspapers, and podcasts, but that relying on positive reappraisal coping strategies *increased* this effect instead of decreasing it. ***Conclusions:*** Our results suggest the need for policies that diminish the impact of social isolation on mental health; the need to assess and teach alternative coping strategies in clinical settings; and the need to address the impact of internet-based sources.

Public Significance Statement
The global infection outbreak by the new SARS-CoV-2 prompted community containment schedules; however, social isolation is apredictor of psychological distress across many contexts. Here, we provide evidence that social isolation-induced loneliness is an important factor of poorer mental health outcomes, and negative coping strategies mediate this effect. We also show that media consumption was also a predictor of poorer mental health outcomes in a Brazilian sample. Taken together, these results can help policymakers and mental health professionals to construct policies and interventions for individuals suffering from loneliness-related distress during the COVID-19 pandemic.

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Public health actions related to coronavirus disease (COVID-19) aim to decrease the probability of encounter between infected and susceptible individuals, decreasing the rate of transmission (Bourouiba, 2020; Wilder-Smith & Freedman, 2020). As a rule, countries that promptly adopted community containment schemes (i.e., as soon as community transmission status of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) coronavirus was found) have had relative success in reducing mortality and infection rate to date (Anderson et al., 2020).

The objective of community confinement is to reduce contact of unidentified infected individuals with noninfected members of the community (Wilder-Smith & Freedman, 2020). While confinement is particularly useful in contexts where community transmission is substantial, it also involves ethico-political difficulties (van den Berge, 2020) and possible impacts on mental health (Holmes et al., 2020). In effect, several meta-analyses (e.g., Bareeqa et al., 2021; Bueno-Notivol et al., 2021; Liu et al., 2021; Prati & Mancini, 2021; Şimşir et al., 2021; Wu et al., 2021) now suggest an impact of the pandemic on mental health across the world. Liu et al. (2021) meta-analysis included studies from the early phase of the pandemic (January 2020–July 2020), and found increased prevalences of insomnia, anxiety, depression, and posttraumatic stress disorder. This effect was higher in confirmed and suspected patients than other cohorts.

There is potentially a myriad of factors that are associated with psychological distress during the COVID-19 pandemic (Holmes et al., 2020). Since social isolation is an important mediator of psychological distress, it is likely that community containment schemes are responsible for these effects. Prati and Mancini's (2021) meta-analysis found that lockdowns had small effects on mental health symptoms—especially anxiety and depression—but studies were highly heterogeneous, making it difficult to assess the roles of social support, loneliness, and general distress. Nonetheless, in the SARS outbreak that occurred in Hong Kong in 2003–2004, most respondents report symptoms of psychological distress, including symptoms of posttraumatic stress and/or acute stress, even in the absence of social isolation (Lau et al., 2005), suggesting that other factors can also contribute, such as the existential risk of the disease ("fear of dying" or "fear of losing a loved one"). Şimşir et al. (2021) meta-analysis found a significant correlation between fear of COVID-19 and anxiety, traumatic stress, distress, depression, and insomnia.

While not the sole source of distress during a pandemic, social isolation has been shown to negatively affect psychological well-being outside of lockdown as well. Social isolation produces various psychophysiological, cardiovascular, immune, and endocrine effects; a meta-analysis of these effects has suggested that the perception of social support is strongly correlated with lower levels of autonomic activity (e.g., lower resting blood pressure), better indicators of immunovigilance (e.g., higher levels of natural killer cell lysis), and lower levels of neurovegetative axis hormones (e.g., lower levels of urinary catecholamines; Uchino et al., 1996). The perception of social support is opposed to the feeling of loneliness, a psychological construct that describes the negative emotional response to the perception of isolation. Loneliness produces transient or chronic effects (Hawkley & Cacioppo, 2003). Short-term effects involve negative feelings, but usually motivate individuals to seek social connections (Weiss, 1973). The chronic effects, however, are associated with depression and suicide, higher rates of alcoholism, and low quality of sleep, all of which are important risk factors for mental disorder (Cacioppo & Hawkley, 2003).

Thus, understanding the relationship between the perception of loneliness and the impacts of community containment on mental health is a research priority in the area (Holmes et al., 2020). Some suggestions of this impact already exist; using the Personal Social Capital Scale 16 (PSCI-16) questionnaire, which evaluates the perception of the degree of connection with groups of relatives, neighbors, friends, colleagues, and work, and more distant people (Wang et al., 2014), Xiao et al. (2020) showed that individuals who self-isolated due to the COVID-19 outbreak in China

presented with sleeping difficulties, anxiety, and signs of acute stress, and that these effects were mediated by "social capital," a set of current or potential resources that include social confidence, sense of belonging, and participation (Portes, 1998). This construct is inversely associated with the degree of perceived loneliness (Bian & Leung, 2015), suggesting that the perception of loneliness can mediate the effects of social isolation in a pandemic situation on mental health.

Studies on loneliness suggest that its impact is indirect, reflecting differences in the ways individuals cope with the stress of daily life (Cacioppo et al., 2000). Applying the University of California Los Angeles (UCLA) Loneliness Scale (Russell et al., 1978), Cacioppo et al. (2000) demonstrated that individuals with low levels of perceived loneliness were more likely to present active coping strategies (e.g., problem solving strategies) and to seek emotional and instrumental support from others, while individuals with high levels of perceived loneliness were more likely to present passive coping strategies, including behavioral disengagement or avoidance of stressors.

Despite these findings, loneliness in a pandemic context is qualitatively different from loneliness in other contexts because it is—if community containment is successful—inescapable. Thus, an important psychological construct that can mediate the effects of community containment on mental health is entrapment. Entrapment is defined as a desire to escape from an unbearable situation associated with the perception that all escape routes are blocked (Gilbert & Allan, 1998). Thus, the concept of entrapment is based on theoretical models that suggest that blocking defensive behavior in the context of uncontrollability or inescapability (Maier et al., 2006) induces subjective states of suffering and depression (Gilbert & Allan, 1998). Entrapment was pointed as a potential moderating factor for the effects of social containment in the COVID-19 outbreak (Holmes et al., 2020).

Although the relationship between loneliness, social support, and psychological distress is relatively well established, little is known about how loneliness is subjectively experienced in the context of forced social isolation. Loneliness can be one of the possible consequences of a reduction in the quantity and quality of social interactions (i.e., small social network), but this is not necessarily the case (Cloutier-Fisher et al., 2011; Victor et al., 2009; Wenger et al., 1996). For example, in a situation of forced social isolation (such as community restraint), some individuals may refer to isolation as a catalyst for creativity, or individuals may choose to nurture significant ties with a few people, increasing the quality of those ties despite the decrease in quantity. Karnick (2005) suggests that the current literature on loneliness and its correlates is still unable to adequately address the lived experience of isolation; therefore, to comprehend the subjective experience of social isolation in the context of the COVID-19 pandemic in a broad way, complementary methods of in-depth qualitative research will also be needed.

Another important interpersonal factor in the negative impact of disease outbreaks is information consumption (Holmes et al., 2020). Individuals seek reliable information from traditional media or social media about pandemics, looking for brief, timely guidelines, and criticism about what to do. Information consumption can therefore be adaptive and positive for mental health; however, media reports of infectious diseases often use messages that raise risk perception, potentially amplifying public anxiety (e.g., Sell et al., 2017). In particular, social networks can be an important source of dissemination of misinformation (Wang et al., 2019), amplifying uncertainty and perceptions of risk (Ng et al., 2018). An example of this impact, in relation to COVID-19, was observed from a computerized sentiment analysis, applied to posts on the Chinese social network Weibo, before and after the declaration that the new coronavirus was an International Public Health Emergency (Li et al., 2020). This analysis suggested that the statement, which impacted the Weibo network in several ways, produced an increase in negative emotions (e.g., anxiety, depression, and indignation) and sensitivity to social risks (Li et al., 2020).

Repeated exposure to information on infectious diseases can exacerbate psychic suffering and stress, amplify feelings of concern, and negatively impact psychological functioning (e.g., Thompson et al., 2017). The anxiety and uncertainty produced by excessive and repeated consumption of conflicting information can lead to an increase in media consumption (in an attempt to reduce uncertainty), generating a "vicious circle" that can be difficult to break (Thompson et al., 2017, 2019). Thus, a better understanding of how repeated consumption of media relative to

COVID-19 can amplify psychological distress and negatively impact mental health in various groups can help optimize patterns of information that promote well-being (Holmes et al., 2020).

While meta-analyses already identified that the COVID-19 pandemic—and its associated lockdown and community confinement strategies—negatively impacted mental health worldwide, the identification of causal mechanisms associated with the effects on mental health, including loneliness, sense of entrapment, coping strategies, and repeated consumption of information derived from the media, is fundamental to the creation of complementary mental health policies that reduce the impact of social isolation while maintaining the effectiveness of community confinement (Holmes et al., 2020). Thus, understanding the intra and interpsychic mechanisms that provide appropriate or inappropriate responses from a mental health perspective can positively impact the creation of policies and interventions that mitigate the negative effects of community confinement.

Method

Open Science Practices

Study hypothesis, methods, and statistical analysis were preregistered on Open Science Framework (https://osf.io/g6j8n). Public access to the preregistration was opened on June 20, 2020. Results and analysis scripts were also posted in the same platform (https://osf.io/fv7ax/). After conclusion of the study, some analysis were made which were not proposed in the preregistration; these are flagged as exploratory.

Participants

For Phase 1, high-coverage population list-based samples (Couper, 2000) were obtained by distributing the online form (see Data Analysis section, below) through directed email messages to research groups, directed messages using instant messaging (IM) apps (WhatsApp and Telegram), social media posts (on Facebook pages, Instagram profiles, and Twitter and Mastodon accounts related to neuroscience and/or mental health), and press releases sent to local newspapers. Biases in terms of political views of participants and/or traffic in these pages (which could lead to preexisting beliefs around economics, social infrastructure, religion, and other sociopolitical characteristics that could influence views on social isolation and public health measures) were mainly unknown, but care was taken not to direct messages to groups explicitly associated with either left-wing or right-wing politics. Due to probable low reliability of self-reported medical history, we chose not to solicit information on previous history of mental health problems, and therefore participants were not excluded based on that. This is further discussed in the Limitations section, below.

For Phase 2, an authorization was produced in the debriefing session of the survey form of Phase 1, and responders who agreed to participate in further stages of the research were contacted by email. For the first phase (quantitative survey) of the research, 440 respondents answered an online survey on sociodemographical characteristics, social isolation practices, and media consumption habits, and responded to scales on loneliness, symptoms, disease anxiety, coping strategies, and entrapment (see Data Analysis section , below). Sample characteristics can be found on Table 1.

In the preregistered version of this project, sample size needed to achieve 80% power for the first phase was 562 participants (https://osf.io/g6j8n). However, since community containment schemes in Brazil rapidly declined, with average isolation indexes consistently falling below 50% after July 5 (https://mapabrasileirodacovid.inloco.com.br/pt/), we opted to stop collecting data before reaching the final sample size so as to guarantee that most respondents still were in a context of social isolation. A posteriori power was calculated using a R shiny script (Schoemann et al., 2017; https://schoemanna.shinyapps.io/mc_power_med/), using Hypothesis 1, based on the analysis of the principal endpoint (Self-Report Questionnaire-20 [SRQ-20] scores), with the sample size used in the research, and effect sizes based on standardized coefficients of a mediation model with social isolation as predictor, loneliness as mediator, and SRQ-20 scores as dependent variable. Calculated power was 0.73.

For the second phase of the study (qualitative phase), a subsample of participants was drawn from the pool of the first phase. After answering all questions of the first phase, participants could authorize further contact for this stage. Sample characteristics for this phase can be found on Supplemental Table 1. In the preregistered version of this project, sample size projected to reach

Table 1
Sample Characteristics for Phases 1 (Quantitative Survey) and 2 (Qualitative Survey) of the Study

Characteristic			*N* (%)
	Phase 1		
Gender/sexual Identity	Female		322 (73.2%)
	Male		113 (25.7%)
	Prefer not to declare		2 (0.5%)
	Transexual		1 (0.2%)
	Nonbinary AFAB		2 (0.5%)
Age (years)	$M = 28.6$, $SD = 9.94$, min. = 18, max. = 67		
Education level	No formal education		1 (0.2%)
	Completed middle school		1 (0.2%)
	Completed high school		99 (22.5%)
	Completed higher education		218 (49.5%)
	Completed postgrad studies (MBA, specialty, Masters, doctorate)		121 (27.5%)
Residence	Indigenous land		3 (0.7%)
	Rural		17 (3.9%)
	Urban		419 (95.4%)
Household income	No fixed income		10 (2.3%)
	Up to 1*x* minimum wage (up to R$1,045.00)		51 (11.7%)
	From 1*x* to 3*x* minimum wage (R$1,046.00–R $3,135.00)		150 (34.3%)
	From 3*x* to 5*x* minimum wage (R$3,136.00–R $5,225.00)		105 (24.0%)
	From 5*x* to 15*x* minimum wage (R$5,226.00–R $15,675.00)		100 (22.9%)
	More than 15*x* minimum wage (more than R$15,675.00)		21 (4.8%)
Use of mental health service	Participant does not use any service		349 (79.7%)
	Private psychiatric treatment		29 (6.6%)
	Private psychotherapy		68 (15.5%)
	Public psychiatric treatment, outpatient (Centro de Atenção Psicossocial[a])		3 (0.7%)
	Acute inpatient centers		2 (0.5%)
	Residential therapeutic service		2 (0.5%)
	Psychiatric or psychotherapy treatment on primary health settings		2 (0.5%)
	Group settings on public services		1 (0.2%)
City under lockdown or community containment	Yes		386 (87.9%)
	No		53 (12.1%)
Average frequency that respondent leaves the house per week	Less than once per week		224 (51.0%)
	1–2 times per week		121 (27.6%)
	3–4 times per week		43 (9.8%)
	Every day		51 (11.6%)
	If 3–4 times per week or everyday, did you leave the house because you were working?	Yes	78 (83.9%)
		No	15 (16.1%)
	Phase 2		
Gender	Female		45 (81.8%)
	Male		10 (18.2%)
	Prefer not to declare		0
	Transexual		0
	Nonbinary		0
Age	$M = 30.4$, $SD = 8.88$, minimum = 18, maximum = 64		
Education level	No formal education		0
	Completed middle school		0
	Completed high school		6 (10.9%)
	Completed higher education		30 (54.5%)
	Completed postgrad studies (MBA, specialty, Masters, doctorate)		19 (34.5%)
Residence	Indigenous land		0
	Rural		0
	Urban		55 (100%)

(*table continues*)

Table 1 (*continued*)

Characteristic			*N* (%)
Household income	No fixed income		2 (3.6%)
	Up to 1*x* minimum wage up to R$1,045.00)		4 (7.3%)
	From 1*x* to 3*x* minimum wage (R$1,046.00–R$3,135.00)		19 (34.5%)
	From 3*x* to 5*x* minimum wage (R$3,136.00–R$5,225.00)		9 (16.4%)
	From 5*x* to 15*x* minimum wage (R$5,226.00–R$15,675.00)		18 (32.7%)
	More than 15*x* minimum wage (more than R$15,675.00)		3 (5.5%)
Use of mental health service	Participant does not use any service		41 (74.5%)
	Private psychiatric treatment		5 (9.1%)
	Private psychotherapy		10 (18.2%)
	Public psychiatric treatment, outpatient (Centro de Atenção Psicossocial)		0
	Acute inpatient centers		0
	Residential therapeutic service		0
	Psychiatric or psychotherapy treatment on primary health settings		0
	Group settings on public services		3 (5.5%)
City under lockdown or community containment	Yes		48 (87.3%)
	No		7 (12.7%)
Average frequency that respondent leaves the house per week	Less than once per week		26 (47.3%)
	1–2 times per week		12 (21.8%)
	3–4 times per week		6 (10.9%)
	Every day		11 (20%)
	If 3–4 times per week or everyday, did you leave the house because you were working?	Yes	18 (90%)
		No	2 (10%)

Note. AFAB = assigned female at birth.
[a] In the Brazilian public mental health system, most cases are dealt with at outpatient clinics (Centro de Atenção Psicossocial) rather than inpatient services or psychiatric hospitals.

saturation of categories was based on theme accumulation curves (Tran et al., 2017), with an initial sample of 50 participants proposed for drawing an interim theme accumulation curve; if the local slope of the curve is above 0.05, another 50 participants would be recruited, and the process was reanalyzed until saturation was reached. Again, since community containment schemes in Brazil began to decline, we opted to stop collecting data, and ended with 55 respondents. The local slope of the theme accumulation curve fell consistently below 0.05 after 33 participants, suggesting that the sample size was more than enough to reach saturation (Supplemental Figure 1).

Phase 1: Quantitative Survey

Hypotheses

Higher loneliness levels have been associated with higher reliance on passive coping strategies, including behavioral distancing and stressor avoidance, in the general population (Cacioppo et al., 2000). Thus, the first hypothesis that was tested in this work was that *in isolated individuals, loneliness activates distancing and escape–avoidance coping strategies with intensities that are directly correlated with symptoms of anxiety and common health disorders.*

Seeking social support can also be related to how feelings of loneliness are associated with distress in isolated individuals (Xiao et al., 2020). The second hypothesis that was tested in this work was that, *in isolated individuals, poor reliance on social support coping strategies increase the effects of loneliness on symptoms of anxiety and common mental disorders*.

Since loneliness, under community confinement, is mostly imposed from the outside, its effects might be mediated by a sense of External Entrapment (Gilbert & Allan, 1998). The third hypothesis that was tested in this work was that, *in isolated individuals, External Entrapment moderates the effects of loneliness such that the higher the feelings of entrapment, the higher the effects*

of loneliness on symptoms of anxiety and common mental disorders.

Information consumption is an important factor in psychological distress during pandemics and disasters (Sell et al., 2017; Thompson et al., 2017). While media information can lead to distress, it can also lead to the use of positive reappraisal strategies that can moderate the effects of higher media consumption. Thus, the fourth hypothesis that was tested in this work was that *in both isolated and nonisolated individuals, intense reliance on positive reappraisal coping strategies decrease (moderate) the effects of information consumption on symptoms of anxiety and common mental disorders*.

Survey Instruments

For this quantitative survey phase, participants responded to an online form on Google Forms. The form presented a socioeconomic questionnaire, and its results are presented on Supplemental Table 1. The form also presented two questions on isolation practices: "How often have you been leaving your house per week?" and "If you answered 3–4 times per week or Everyday, did you leave the house because you were working?." The first question was used to construct four levels of isolation ("Less than once per week," "1–2 times per week," "3–4 times per week," and "Every day").

Primary (common mental disorders symptoms) and secondary (anxiety symptoms) endpoints were assessed through responses to the SRQ-20, an instrument that is used to screen symptoms of common mental disorders (Mari & Williams, 1986), and through the Outpatient and Hospital Patients Anxiety Scale, and instrument that is used to quantify degree of intensity regarding physical and psychological symptoms related to anxiety and illness (Oliveira & Sisto, 2004).

The covariates and mediators were measured using well-established scales and instruments. Loneliness was measured using the Brazilian adaptation of the UCLA Loneliness Scale (Barroso et al., 2016). Coping strategies were assessed through the Brazilian adaptation of the Folkman and Lazarus Ways of Coping Questionnaire (Savóia et al., 1996). Feelings of external entrapment were analyzed using the Portuguese adaptation of the Entrapment Scale (Carvalho et al., 2011). Sources of information were investigated using inventory of sources, with a question asking the frequency (less than once per week; 1–3 times per week; more than 4 times per week; once per day; 2–3 times per day; more than 4 times per day) that the respondent consulted one of seven information sources on updates on the COVID-19 pandemic (Radio; Television; Printed or online newspapers; Twitter, Facebook, or Instagram; Whatsapp and other instant messengers; Youtube videos; and/or Podcasts).

Individuals were not required to answer all questions; therefore, in some individuals missing values were present. As an a priori criteria for exclusion, if more than 25% of the values for a single instrument or scale were missing for one participant, all data from that participant was to be excluded; however, that did not happen for any participant. We also did not detect random responding (using infrequency scales with error balancing thresholds (Kim et al., 2018).

Data Analysis

To analyze quantitative data with mediation models, we used generalized linear model (GLM) mediation models based on Baron and Kenny's causal steps method (Baron & Kenny, 1986). For Hypotheses 1 and 2, the model was applied using isolation levels as factor, loneliness as covariate, and scores on either the Escape/Avoidance, the Distancing, or the Social Support subscales of the Ways of Coping Questionnaire as mediator. For Hypothesis 3, the mediator was score on the External Entrapment subscale of the Entraptment Scale. For Hypothesis 4, each of the media sources (Radio; Television; Printed or online newspapers; Twitter, Facebook, or Instagram; Whatsapp and other instant messengers; Youtube videos; and/or Podcasts) was assessed independently, with frequency of use as factor, and scores in the Positive Reappraisal subscale of the Ways of Coping Questionnaire as moderator. In all situations, factors were coded with simple contrasts, and covariates were scaled by centering around mean ± 1 standard deviation. Estimates are reported with 95% confidence intervals around the estimate. All models were run using the jamovi module "jAMM" (Gallucci, 2019).

Steps Toward Maximizing Power

As stated in Participants section, while we aimed for 80% power in sample size calculation for Phase 1, the decline in social isolation in Brazil led to interruption of the study, which is

expected to decrease power; indeed, a posteriori power for Hypothesis 1 was calculated as 73%. In spite of that, we sought to maximize power by taking the following steps before the study begun:

1. Improvement of measures: We sought to use instruments which were validated in Brazil, and calculated reliability measures after data collection.
2. Detecting random responding: Manipulation checks were inserted into each of the instruments in the form of infrequency scales (Kim et al., 2018).
3. Sample sizes: Sample sizes were determined based on the Fritz & Mackinnon (2007) model (regression coefficients $\alpha = 0.14$, $\beta = 0.14$, and $\tau' = 0.14$) aiming for a 80% power.

Phase 2: Qualitative Survey

Hypothesis

No a priori hypothesis on the specific nature of the subjective experiences of social isolation were established. We proposed that the semantic field of social isolation should present a complex and multidimensional nature; therefore, while methods and analysis strategies were preregistered, results from this phase should be seen as exploratory in nature.

Cognitive Free Writing Task

After answering the socioeconomic survey, participants were asked to write freely on a question prompt: "What comes to your mind when you think about physical isolation?" Participants had no time or word limit to answer to the prompt.

Data Analysis

Data were analyzed using Thematic Content Analysis (Bardin, 2013). Thematic content analysis is a typology of the classic Bardin content analysis, widely used in qualitative research in Social Psychology, as well as in the human and social sciences. From the participants' textual production, the units of analysis were identified, their frequencies checked, and those that saturated the most were identified and organized into thematic categories, which were later conceptualized and presented.

Ethical Note

Participants signed online informed consent forms before data collection begun. The project was cleared by an Institutional Review Board (Universidade Federal do Pará, Instituto de Ciências da Saúde), under opinion #4.042.090. A version of the opinion in Portuguese can be found at https://osf.io/zdb69/

Results

Table 1 presents sample characteristics (demographic data) for both phases of the study.

Quantitative Survey

Table 2 presents descriptive statistics for SRQ-20, anxiety, and loneliness scores separated by gender, family income, and use of health services. In general, nonbinary individuals appear to show higher SRQ-20 and anxiety scores, followed by cisgender women and men; the small sample size of nonbinary individuals makes these estimates unreliable, however. Individuals reporting no family income, or more than 15 minimum wages, tended to present smaller scores for both SRQ-20 and anxiety scales, as well as loneliness. Finally, individuals in temporary residential services and not using mental health services had the lowest scores in all scales. Negative correlations were observed between age and SRQ-20 score ($r^2 = -0.341$), illness anxiety ($r^2 = -0.222$), and loneliness ($r^2 = -0.213$). As analysis of the relationships between these variables were not preregistered, only descriptive statistics are given.

Loneliness, Social Isolation, and Coping Strategies

An exploratory analysis (unplanned at preregistration) of instrument reliabilities in the present study was also made, with following results: SRQ-20: $\alpha = 0.898$; Outpatient and Hospital Patients Anxiety Scale: $\alpha = 0.906$; UCLA Loneliness Scale: $\alpha = 0.952$; Ways of Coping Questionnaire: $\alpha = 0.929$; Entrapment Scale: $\alpha = 0.961$. The descriptive analysis, presented in Table 3, reveals a number of differences between social isolation levels regarding the

Table 2

Summary Statistics for Endpoints and Main Covariate Used in the Model by Gender, Housesold Income, and Mental Health Service Use

Variable	SRQ-20	Illness anxiety	Loneliness
Gender			
Male	7.75 ± 5.11	60.2 ± 11.8	21.8 ± 15.4
Female	9.59 ± 5.32	65.8 ± 11.9	24.1 ± 15.8
Nonbinary	15.0 ± 7.07	63.5 ± 14.8	25.0 ± 7.07
Household income			
No fixed income	6.9 ± 4.84	54.6 ± 10.0	18.3 ± 12.6
Up to 1*x* minimum wage (up to R$1,045.00)	8.88 ± 5.76	67.7 ± 13.2	26.4 ± 17.0
From 1*x* to 3*x* minimum wage (R$1,046.00–R$3,135.00)	10.2 ± 5.19	66.6 ± 13.2	26.5 ± 16.3
From 3*x* to 5*x* minimum wage (R$3,136.00–R$5,225.00)	8.95 ± 5.37	63.7 ± 10.5	22.3 ± 14.1
From 5*x* to 15*x* minimum wage (R$5,226.00–R$15,675.00)	8.7 ± 4.9	61.9 ± 10.5	20.1 ± 14.9
More than 15*x* minimum wage (more than R$15,675.00)	5.71 ± 5.42	61.4 ± 12.0	17.1 ± 12.6
Mental health service use [a]			
Participant does not use any service	8.81 ± 5.25	63.9 ± 11.9	23.0 ± 15.9
Private psychiatric treatment	11.8 ± 5.65	70.0 ± 13.7	29.1 ± 14.8
Private psychotherapy	10.4 ± 5.41	65.7 ± 13.2	26.0 ± 13.9
Public psychiatric treatment, outpatient (Centro de Atenção Psicossocial)	11.7 ± 3.79	66.0 ± 7.81	29.7 ± 19.4
Acute inpatient centers	6.0 ± 7.07	66.5 ± 20.5	22.5 ± 26.2
Residential therapeutic service	12.0 ± 9.9	62.5 ± 20.5	21.5 ± 16.3
Psychiatric or psychotherapy treatment on primary health settings	10.0 ± 1.41	77.0 ± 4.24	24.5 ± 6.36
Group settings on public services	14.0	75.0	45.0

Note. SRQ-20 = Self-Report Questionnaire-20.
[a] Individuals can be under treatment in more than one service/modality.

outcomes (SRQ-20 and anxiety scores), the covariate (loneliness), and the mediators (coping strategies, entrapment). There appears to be a steep decline in SRQ-20 scores, with individuals who left the house 3–4 times per week or every day showing lower scores than individuals who left the house less than once per week. Social isolation did not appear to change anxiety, nor reliance on specific coping strategies; however, as discussed in the "Study limitations" section (Study Limitations), below, given that the study had lower power than originally planned, this lack

Table 3

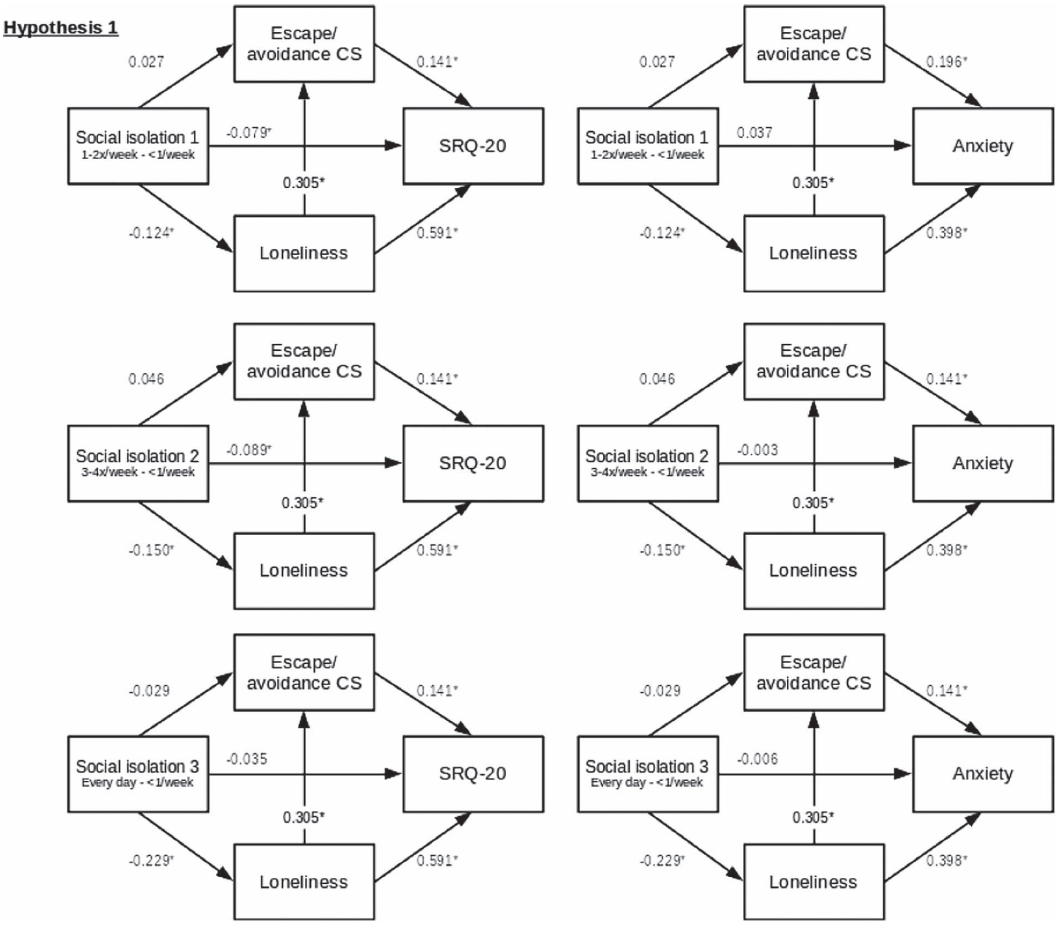
Summary Statistics for Variables Used in the Model by Frequency of Leaving the House During the COVID-19 Pandemic

	Social isolation data			
Variable	Less than once per week *M* ± *SD*	1–2 times per week *M* ± *SD*	3–4 times per week *M* ± *SD*	Every day *M* ± *SD*
Endpoints				
SRQ-20	10.3 ± 5.19	8.49 ± 5.05	7.14 ± 5.11	7.25 ± 5.67
Illness anxiety	65.3 ± 12.1	64.9 ± 12.5	62.7 ± 11.4	60.9 ± 11.3
Loneliness	26.8 ± 15.5	22.5 ± 15.0	18.9 ± 16.3	15.6 ± 13.9
Coping strategies				
Distancing CS	9.96 ± 4.1	9.91 ± 4.21	9.28 ± 4.36	8.65 ± 4.72
Escape/avoidance CS	5.72 ± 2.19	5.67 ± 2.17	5.72 ± 2.4	5.02 ± 2.66
Social support CS	8.43 ± 4.01	9.39 ± 4.32	9.21 ± 3.66	7.92 ± 3.7
Positive reappraisal CS	12.5 ± 5.84	13.6 ± 5.56	14.4 ± 5.78	12.1 ± 5.76
External entrapment	18.5 ± 12.6	15.4 ± 12.0	15.3 ± 13.4	9.96 ± 11.3

Note. COVID-19 = coronavirus disease; *SD* = standard deviation; SRQ-20 = Self-Report Questionnaire-20; CS = coping strategy.

Figure 1

Standardized Regression Coefficients β for the Relationship Between Social Isolation Contrasts and SRQ-20 (A) or Illness Anxiety (B) Symptoms as Mediated by Escape/Avoidance Coping Strategies and Loneliness



Note. Social isolation 1 = contrast between individuals who left their houses 1x–2x/week versus individuals who left their house < 1x/week. Social isolation 2 = contrast between individuals who left their house 3x–4x/week versus individuals who left their house < 1x/week. Social isolation 3 = contrast between individuals who left their house every day versus individuals who left their house < 1x/week. SRQ-20 = Self-Report Questionnaire-20.

of effect can represent a false negative. A steep decline in loneliness scores were also observed, again with individuals who left the house 3–4 times per week or every day showing lower scores than individuals who left the house less than once per week. However, social isolation appears to change feelings of external entrapment, with participants that left the house everyday showing lower scores than participants that left the house less than once per week.

The relationship between loneliness and SRQ-20 scores was mediated by escape/avoidance coping depending on the level of social isolation. As Figure 1A illustrates, for the contrast between individuals who left their houses 1*x*–2*x*/week versus those who left their houses less than once per week ("social isolation 1"), as well as for the contrast between individuals who left their houses 3*x*–4*x*/week versus those who left their houses less than once per week ("social isolation 2"), the effect of leaving the house on SRQ-20 was significant and negative. However, the contrast between individuals who left their houses every day versus those who left their houses less

than once per week ("social isolation 3"), this direct effect was not significant. Supplemental Table 1 presents indirect effects, which suggest that, when compared with individuals leaving the house every day, for individuals in greater isolation, the relationship between isolation and SRQ-20 symptoms was mediated by loneliness and by reliance on escape/avoidance coping strategies. Effect sizes were relatively small, however: for each "step down" in social isolation, anxiety decreases by 0.06–0.16 points in the scale when loneliness and escape/avoidance coping strategies are accounted for.

The relationship between loneliness and anxiety scores was also mediated by escape/avoidance coping depending on the level of social isolation. As Figure 1B illustrates, none of the direct effects were significant. Supplemental Table 1 presents indirect effects, which suggest that, for individuals in greater isolation, when compared to all other levels, the relationship between isolation and anxiety symptoms was mediated by loneliness and by reliance on escape/avoidance coping strategies. Again, effect sizes were relatively small: for each "step down" in social isolation, anxiety decreases by 0.2–0.5 points in the scale.

The relationship between loneliness and SRQ-20 scores was mediated by distancing coping depending on the level of social isolation. As Figure 2A illustrates, for contrasts social isolation 1 and social isolation 2, the effect of leaving the house on SRQ-20 was significant and negative. However, the contrast between individuals who left their houses every day versus those who left their houses less than once per week ("social isolation 3"), this direct effect was not significant. Supplemental Table 2 presents indirect effects, which suggest that, in contrasts social isolation 2 and social isolation 3, for individuals in greater isolation, the relationship between isolation and SRQ-20 symptoms was mediated by loneliness and by reliance on distancing coping strategies. Effect sizes were relatively small, however: for each "step down" in social isolation, anxiety decreases by 0.11–0.15 points in the scale when loneliness and distancing coping strategies are accounted for.

The relationship between loneliness and anxiety scores was also mediated by distancing coping strategies depending on the level of social isolation. As Figure 2B illustrates, none of the direct effects were significant. Supplemental Table 3 presents indirect effects, which suggest that, for individuals in greater isolation, when compared to all other levels, the relationship between isolation and anxiety symptoms was mediated by loneliness and by reliance on distancing coping strategies. Again, effect sizes were relatively small: for each "step down" in social isolation, anxiety decreases by 0.23–0.59 points in the scale.

Reliance on social support does not appear to impact the effect of social isolation on SRQ-20 symptoms. As Figure 3 illustrates, while in contrast social isolation 1 was a predictor of reliance on social support coping strategies (with individuals who left the house 1*x*–2*x*/week relying more on seeking social support than individuals who left the house less than once per week), this relationship was not significant at other isolation contrasts. Moreover, reliance on social support coping strategies did not predict loneliness levels. However, at all levels of the social isolation contrasts, reliance on social support predicted SRQ-20 symptoms (Figure 3A), with individuals who sought *more* social support showing more symptoms (a change of one point in the social support subscale indicating a change of 0.1833 point in the SRQ-20 score). The direct effects of the first two social isolation contrasts ("social isolation 1" and "social isolation 2") were also statistically significant, while indirect effects were not (Supplemental Table 4).

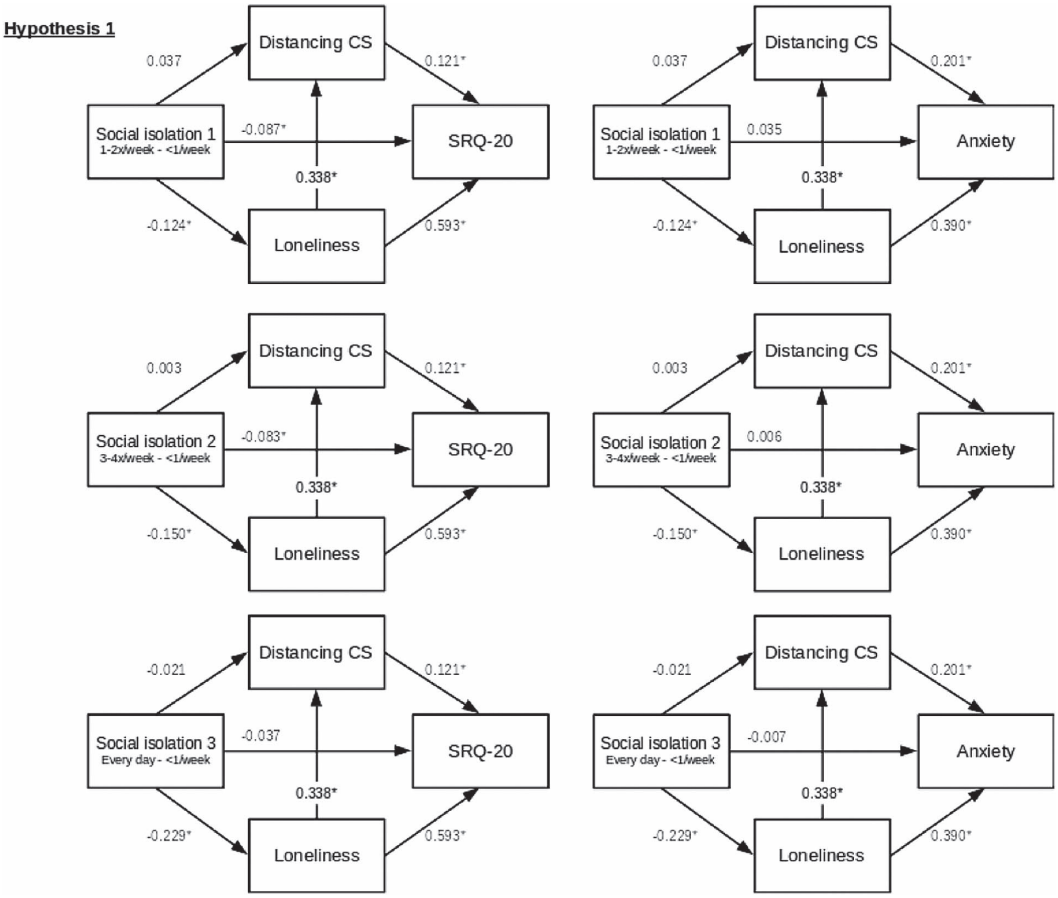
A similar pattern was observed with illness anxiety (Figure 3B). While both mediators were significantly associated with higher anxiety, both direct (Figure 3B) and indirect (Supplemental Table 4) effects were not statistically significant.

Loneliness, Social Isolation, and External Entrapment

External entrapment was examined as a moderator of the relation between social isolation-induced loneliness and SRQ-20 scores. Loneliness and external entrapment were entered as the first step in the regression analysis. In the second step, the interaction term between external entrapment and loneliness was entered, and it explained a significant increase in SRQ-20 scores ($\Delta R^2 = 0.609$, $\chi^2 = 17.4$, $p < .001$). Thus, external entrapment appears to be a significant moderator in the relationship between loneliness and SRQ-20 symptoms. However, simple effects suggest that slopes did not significantly vary across levels of social

Figure 2

Standardized Regression Coefficients β for the Relationship Between Social Isolation Contrasts and SRQ-20 (A) or Illness Anxiety (B) Symptoms as Mediated by Distancing Coping Strategies and Loneliness



Note. Social Isolation 1 = contrast between individuals who left their houses 1*x*–2*x*/week versus individuals who left their house < 1x/week. Social isolation 2 = contrast between individuals who left their house 3*x*–4*x*/week versus individuals who left their house < 1*x*/week. Social isolation 3 = contrast between individuals who left their house every day versus individuals who left their house < 1*x*/week.

* $p < .05$.

isolation (Supplemental Table 5). Moreover, a 1 *SD* increase in external entrapment *weakened* the relationship between loneliness and SRQ-20 scores, contrary to what we hypothesized.

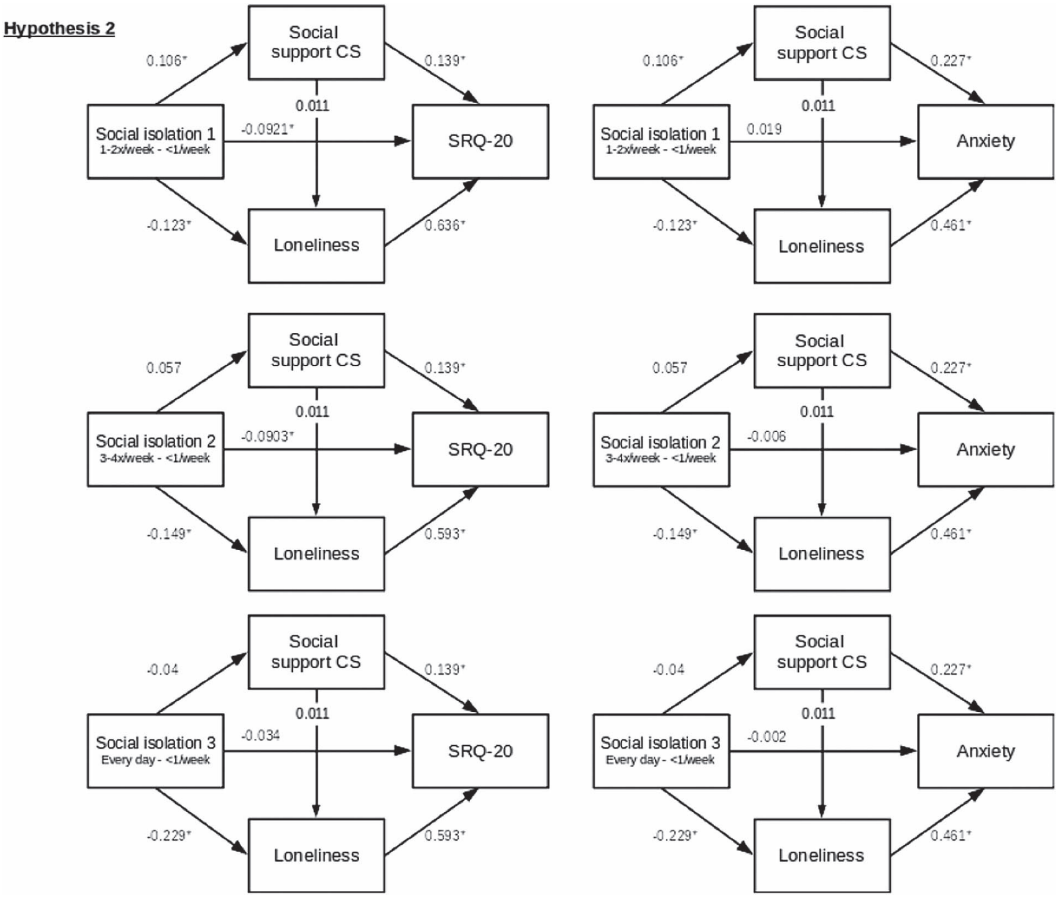
Similarly, when we examined external entrapment as a moderator of the relation between social isolation-induced loneliness and illness anxiety, slopes did not significantly vary across levels of social isolation nor across levels of external entrapment (Supplemental Table 5). The interaction term did not significantly explain a significant increase in illness anxiety scores ($\Delta R^2 = 0.975$, $\chi^2 = 0.00418, p = .948$). Thus, external entrapment does not moderate the effects of social isolation-induced loneliness and illness anxiety scores.

Patterns of Media Consumption

Descriptive statistics for each type of media can be found on Table 4. The table suggests that, for "traditional" media (radio, TV, printed or online newspapers), frequency of consumption of COVID-19-related information does not appear to modulate psychological distress. However, for social media (Facebook, Twitter, Instagram), the higher the frequency of looking or consuming

Figure 3

Standardized Regression Coefficients β for the Relationship Between Social Isolation Contrasts and SRQ-20 (A) or Illness Anxiety (B) Symptoms as Mediated by Social Support Coping Strategies and Loneliness



Note. Social isolation 1 = contrast between individuals who left their houses 1*x*–2*x*/week versus individuals who left their house < 1*x*/week. Social isolation 2 = contrast between individuals who left their house 3*x*–4*x*/week versus individuals who left their house < 1*x*/week. Social isolation 3 = contrast between individuals who left their house every day versus individuals who left their house < 1*x*/week. SRQ-20 = Self-Report Questionnaire-20.
* $p < .05$.

information on COVID-19, the higher the psychological distress; the reliance on positive reappraisal coping strategies did not vary with frequency. The frequency of instant messenger use for COVID-19-related information did not appear to be related to SRQ-20 score, but frequency-dependent increases in illness anxiety and positive reappraisal were apparent. Increased frequency of YouTube videos or podcasts for COVID-19-related information appeared to increase illness anxiety, but not SRQ-20 scores or positive reappraisal.

Reliance on positive reappraisal coping strategies was examined as a moderator of the relation between frequency of consumption of information related to COVID-19 and SRQ-20 scores or illness anxiety scores. Frequency of media (radio, TV, print or online newspapers, social networks, instant messengers, Youtube, podcasts) information and positive reappraisal coping strategies were entered as the first step in the regression analysis. In the second step, the interaction term between these variables was entered. Separate tests were made for each of the information sources. Slopes did not significantly differ from zero at any level of the moderator for radio or TV for neither endpoint (Supplemental Table 6); in

Table 4
Summary Statistics for Variables Used in the Model by Media Consumption

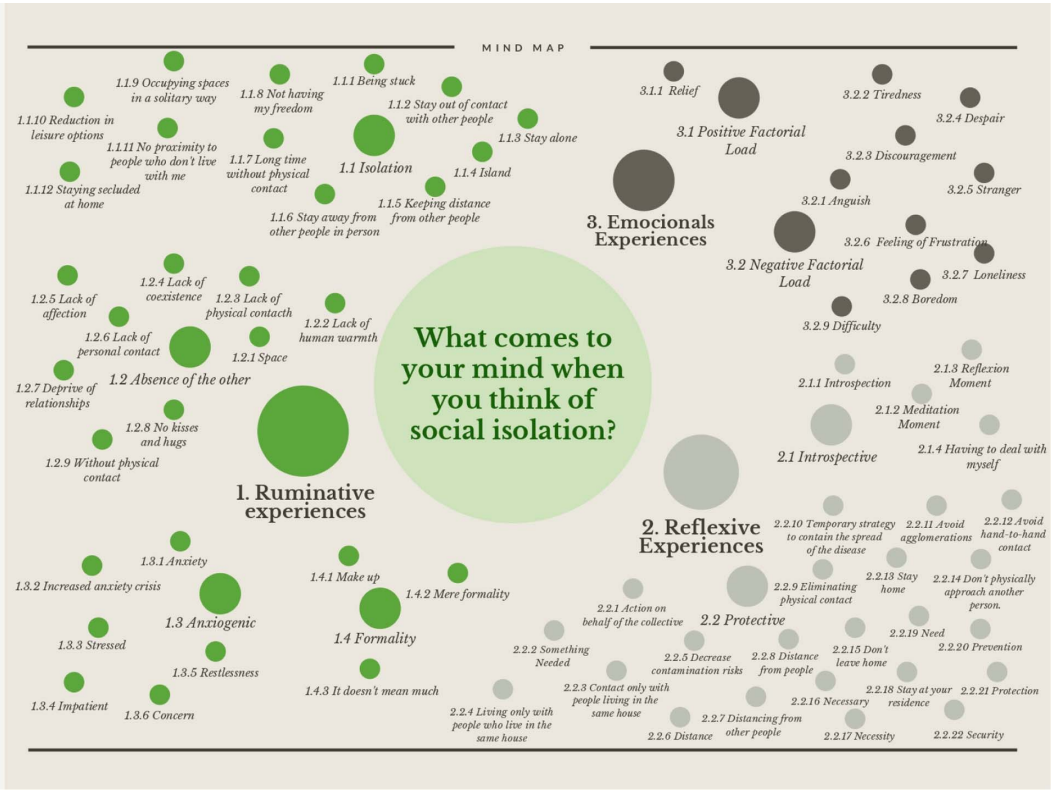
Variable	Less than 1*x*/week *M* ± *SD*	1*x*–3*x*/week *M* ± *SD*	>4*x*/week *M* ± *SD*	1*x*/day *M* ± *SD*	2*x*–3*x*/day *M* ± *SD*	>4*x*/day *M* ± *SD*
			Media consumption data			
			Radio			
N	352	30	15	8	2	3
Endpoints						
SRQ-20	9.15 ± 5.25	9.43 ± 6.11	11.3 ± 3.92	7.25 ± 6.45	2.0 ± 2.83	12 ± 3.61
Illness anxiety	64.3 ± 11.8	65.9 ± 13.4	67.0 ± 9.7	63.9 ± 10.1	40.5 ± 3.54	59.0 ± 10.6
Positive reappraisal CS	12.9 ± 5.76	12.6 ± 5.8	13.7 ± 5.49	15.6 ± 5.1	11.5 ± 6.36	8.67 ± 6.03
			TV			
N	141	111	91	51	24	10
Endpoints						
SRQ-20	9.06 ± 5.39	9.42 ± 5.25	10.1 ± 5.22	7.8 ± 5.0	7.71 ± 5.43	12.9 ± 6.42
Illness anxiety	63.4 ± 12.3	64.1 ± 11.1	66.2 ± 12.4	65.1 ± 13.5	62.5 ± 9.6	71.7 ± 15.0
Positive reappraisal CS	12.8 ± 6.08	12.9 ± 5.82	13.5 ± 5.14	12.3 ± 5.99	12.8 ± 5.41	13.0 ± 4.64
			Printed or online newspapers			
N	155	77	91	42	24	32
Endpoints						
SRQ-20	8.33 ± 5.18	8.62 ± 5.43	11.2 ± 4.74	9.07 ± 5.12	8.92 ± 5.2	10.5 ± 6.02
Illness anxiety	63.1 ± 12.3	64.2 ± 10.8	68.4 ± 12.2	61.8 ± 9.19	62.7 ± 11.2	66.6 ± 13.8
Positive reappraisal CS	13.2 ± 5.32	12.8 ± 6.03	13.3 ± 5.78	11.8 ± 6.06	11.5 ± 5.83	13.4 ± 5.71
			Social networks (Facebook, Twitter, Instagram)			
N	56	80	126	61	34	70
Endpoints						
SRQ-20	7.38 ± 5.64	8.61 ± 5.08	10.6 ± 4.94	8.28 ± 5.45	7.79 ± 5.16	10.9 ± 4.84
Illness anxiety	60.4 ± 11.3	65.9 ± 13.1	66.3 ± 11.7	63.2 ± 10.9	60.7 ± 11.6	67.4 ± 12.1
Positive reappraisal CS	13.4 ± 5.45	13.9 ± 5.49	13.1 ± 5.77	13.6 ± 5.45	10.4 ± 6.59	12.5 ± 5.69
			Instant messengers (WhatsApp, Telegram)			
N	123	78	105	46	19	53
Endpoints						
SRQ-20	9.33 ± 5.16	8.51 ± 5.61	10.0 ± 4.98	8.15 ± 5.68	7.47 ± 4.97	10.3 ± 5.42
Illness anxiety	62.2 ± 11.2	63.7 ± 12.2	67.1 ± 12.5	64.1 ± 11.0	62.5 ± 11.1	68.3 ± 12.9
Positive reappraisal CS	11.5 ± 5.43	13.8 ± 5.8	13.5 ± 5.8	13.6 ± 6.05	12.4 ± 5.51	13.6 ± 5.26
			YouTube videos			
N	223	59	63	36	13	18
Endpoints						
SRQ-20	9.07 ± 5.27	10.0 ± 5.34	9.62 ± 4.89	7.89 ± 5.21	8.62 ± 6.4	11.4 ± 4.77
Illness anxiety	63.7 ± 11.2	67.5 ± 12.8	63.2 ± 11.3	63.5 ± 12.5	60.7 ± 10.3	72.9 ± 14.8
Positive reappraisal CS	13.0 ± 5.71	11.5 ± 5.89	13.4 ± 5.41	13.5 ± 5.98	13.0 ± 6.38	14.3 ± 5.67
			Podcasts			
N	302	48	30	14	5	5
Endpoints						
SRQ-20	9.03 ± 5.1	10.0 ± 5.74	10.3 ± 6.04	8.0 ± 4.08	15.4 ± 1.34	13.0 ± 6.2
Illness anxiety	64.0 ± 11.3	65.2 ± 13.5	65.8 ± 11.4	61.4 ± 8.93	83.0 ± 20.1	75.6 ± 16.2
Positive reappraisal CS	13.1 ± 5.69	12.1 ± 5.66	12.7 ± 5.87	11.4 ± 5.83	15.8 ± 7.16	11.6 ± 6.54

Note. CS = coping strategy; *SD* = standard deviation of the mean; SRQ-20 = Self-Report Questionnaire-20.
Total sample size for each media type does not add to the final sample size due to missing data.

both cases, frequency of media use was not a significant predictor of SRQ-20 scores nor illness anxiety. Slopes significantly differed from zero at the mean or 1 *SD* below the mean of positive reappraisal, but not for the high level (1 *SD* above the mean), for newspapers and social networks for SRQ-20, but not illness anxiety; in both cases frequency of media use was a significant and positive predictor of SRQ-20 scores. Slopes did not differ from zero at any level of the moderator

Figure 4

Representation of Responses and Categories Found in the Qualitative Survey



for instant messengers as predictors of SRQ-20 scores, but a significant and positive relation with illness anxiety scores was found at low (1 *SD* below the mean) and average (mean) values of IM use frequency. Slopes did not differ from zero at any level of the moderator for Youtube videos as predictors of SRQ-20 and illness anxiety scores. Finally, slopes significantly differed from zero at the mean of positive reappraisal for SRQ-20, but not for low (1 *SD* below the mean) or high (1 *SD* above the mean), for individuals seeking information from podcasts; for illness anxiety, slopes significantly differed from zero at the average and high levels of podcasts use frequency.

Qualitative Survey

The qualitative survey data, when subjected to the Thematic Content Analysis model (Bardin, 2013), suggested the emergence of emic meanings that point to three types of experience, namely: reflective, ruminative, and emotional (Figure 4). The category that saturated the most was "Reflective Experiences," which comprises a set of self-focusing experiences of a purposeful character, when experiencing physical isolation during the pandemic. This category is made up of two subcategories, *Protective Reflective Experiences* and *Introspective Reflective Experiences*. The first of them reveals an emic repertoire characterized by ideas that isolation is "necessary," has a "preventive" character, generates "security," and lends itself to "reducing the risk of contagion" and to "protection of the community." However, it is worth noting that, even in a less expressive way, the nature of this experience also mobilized a repertoire of sense and meaning that points to an introspection movement caused by physical isolation, as can be seen in the subcategory *Introspective Reflective Experiences*, represented by units of analysis "introspection," "moment of meditation," "moment of reflection," and "giving some time to myself."

However, the data revealed that the subjective experiences lived during the physical isolation have also had a tense and anxious impact on the self, which is evident when the category "Ruminative Experiences" emerges, which consists of four subcategories: isolation; absence of the other, anxiety, and formality. The *Isolation* subcategory refers to a repertoire of meaning that describes the act of being and feeling alone, without contact with other people, having limited one's ability to come and go, which can be perceived by the units of analysis "being alone," "being islanded," "being stuck," and "not having my freedom." *Absence of the Other* is the subcategory that brings together a repertoire with meanings that point to how longing for relationships and face-to-face encounters with other people has resulted in the respondents' lives, which can be perceived through the following units of analysis: "lack of human warmth," "lack of coexistence," "lack of demonstration of affection," and "lack of face-to-face contact." We identified the subcategory *Anxiety* by joining expressions such as "anxiety," "worry," "stress," "increased anxiety attacks," and "restlessness"; this subcategory integrates a meaning that points to signs of the presence of psychological distress or worsening of existing poor mental health conditions. The last subcategory of this group was called *Formality*, and refers to the collection of expressions that allude to a sense of compliance with the norm, which is not interpreted as very important and superficial, as can be observed in the following units of analysis: "mere formality," "does not mean much," and "to put a make up in the situation."

Less expressive, but also noticeable, was the presence of emotional elements when the respondents referred to the physical isolation caused by the SARS-CoV 2 pandemic. The emergence of the category "Emotional Experiences" reveals a repertoire of meaning present in subjective experiences with both positive and negative factor loadings. When observing the subcategory *Positive Factor Load*, it appears that it expresses a sense of relief, which can be observed by an analogous unit of analysis. In turn, more significant was the subjective experience marked emotional elements of negative gradient—the subcategory *Negative Factor Load –*, which caused a more tense and anxious experience, from the emotional and sentimental point of view, of physical isolation, which can be perceived in the units of analysis "discouragement," "tiredness," "anguish," "boredom," and "loneliness." It is also worth noting that, in addition to the emotional experiences that are more easily identified and named, another one of a less delineated nature that is difficult to symbolize was also identified, represented by the "strange" unit of analysis.

Discussion

Main Findings

Using self-report data collected through the internet, the present work examined the relationship between loneliness and psychological distress at different levels of social isolation during the COVID-19 pandemic in Brazil, as well as how intrapersonal factors (coping strategies, external entrapment) affect this relationship. The relationship between media consumption of COVID-19-related information and psychological distress was also examined, as well as how coping strategies influence this relationship. We found support for the hypothesis that reliance on escape–avoidance and distancing coping strategies mediated the effects of social isolation-induced loneliness for psychological distress in the Brazilian population. However, we did not find support for the hypothesis that reliance on social support coping strategies significantly altered the effects of social isolation-induced loneliness on psychological distress. We also did not find support for the hypothesis that external entrapment moderated the effects of loneliness. We also found that the impact of reliance on positive reappraisal coping strategies on the relationship between frequency of media use for COVID-19-related information and psychological distress depended on the type of media, with individuals who sought information from print or online newspapers, social networks, and podcasts at higher frequencies consistently showing more psychological distress; however, higher levels of positive reappraisal coping strategies *increased* this impact instead of decreasing it. Interestingly, at the qualitative survey we also found that individuals interpreted isolation as producing self-assessment with protective and introspective dimensions, but also ruminative and emotional experiences of distress.

Loneliness has long been described as a factor that induces psychological distress, and as a result can be understood as a risk factor for many mental disorders (Hawkley & Cacioppo, 2003; Weiss, 1973). If not

accompanied by extensive policies on protecting mental health, community confinement strategies can lead to feelings of loneliness that can make managing stressful situations more difficult (i.e., can lead to nonadaptive coping strategies) and generate psychological distress (Holmes et al., 2020). Indeed, at least one meta-analysis (Prati & Mancini, 2021) found that lockdowns had small effects on mental health symptoms, but studies were highly heterogeneous, making it difficult to assess the roles of social support, loneliness, and general distress. The Brazilian response to the SARS-CoV2 pandemic, however, has been mixed, with social isolation being weakly enforced by government officials (Prado, 2020; Zhu et al., 2020). As a result, in Brazil social isolation became more a matter of individual practices than collective reasoning.

We found that for individuals who reported more strict social isolation practices (i.e., individuals who reported leaving their houses less than once a week), feelings of loneliness were higher than for individuals who reported less strict social isolation practices, and this was accompanied by increased psychological distress. In fact, using SRQ-20, we found that 76.9% of the female respondents and 58.0% of the male respondents that reported leaving their houses less than once a week showed clinically significant scores (i.e., above the gender-defined cut-off points; Mari & Williams, 1986), while these proportions fell below 65% for females and 44% for males that reported leaving their houses more than 3 times per week. Thus, not only was an increase in psychological distress observed, but this increase can be clinically relevant. These symptoms were also accompanied by feelings of anxiety related to illness, medical practices, and health-related routines, as evaluated by a scale for ambulatory patients (Oliveira & Sisto, 2004).

A subsample of participants also participated in Phase 2 of the research, responding to a cognitive free writing task in which they had to introspect about isolation. We found that these participants reported self-assessment of reflective character with protective and introspective dimensions; however, this reflective self-assessment was also articulated to ruminative and emotional experiences that were markedly tense, anxious, and disparaging about self-scrutiny. The ruminative dimension is exemplary of feelings of loneliness and entrapment, in concordance with results from the quantitative survey.

Morin (2002) argues that we spend much of our time analyzing our private thoughts and feelings, which shows the importance of observing how and how often we use introspection and can identify the effects on self-focus on our behavior. Self-awareness studies (Fenigstein et al., 1975; Joireman et al., 2002; Trapnell & Campbell, 1999) indicate that people generally engage in two types of self-analysis, one of a self-reflective character, which requires a purposeful assessment of the self, and another of self-ruminative character, which denotes a tense and anxious assessment of the self. Thus, in line with the current literature in the area, the findings of the present qualitative study reveal an emic repertoire of sense and significance of the subjective experience of physical isolation caused by the SARS-CoV2, characterized by a major presence of a reflective character self-assessment with protective and introspective dimensions; however, this reflective self-assessment was also articulated to ruminative and emotional experiences that were markedly tense, anxious, and disparaging about the self's self-scrutiny. Overall, the results of the qualitative survey agree with the results from the quantitative survey in that they suggest psychologically distressing experiences and meanings, but also add that, for some individuals, these experiences can also represent meaningful moments to seek protection and to engage in self-care.

In the present work, we found that relying on escape–avoidance and distancing coping strategies mediated the impacts of loneliness on psychological distress. Both are a maladaptive coping mechanism that are characterized by experiential avoidance of the thoughts, feelings, and other internal experiences that can create additional stress and weaken the ability to deal with further stressors that are associated with COVID-19, including loss of financial security and loss of loved ones. Experiential avoidance is a key construct of acceptance and commitment therapy (Hayes et al., 1999), which could represent an important tool for interventions. While engaging with internal experiences related to COVID-19 can be initially distressing, in the long term it can be beneficial to understand the experiential dimensions of these feelings to reduce the impacts of loneliness.

Surprisingly, while social capital has been associated as a protective factor in the Chinese samples at the beginning of the pandemic (Xiao et al., 2020), we did not find that reliance on social

support coping strategies significantly altered the effects of social isolation-induced loneliness both SRQ-20 scores and illness anxiety in the Brazilian population. Social isolation has been, from the start, a divisive and highly politically charged issue in Brazil (Miguel et al., 2021; Prado, 2020), which could explain these results. Importantly, as discussed in the "Limitations" subsection, below, the premature ending of our study, due to decreases in social isolation indices in Brazil, led to a lower than desired power, and therefore the lack of effect of social support can also be interpreted as a false negative. If that is not the case, however, since seeking social support during the pandemic mostly entails online interactions, this strategy could "backfire" by making it acutely obvious that face-to-face social encounters are risky. The data from the qualitative survey strengthens this explanation, as individuals commonly report missing physical contact or contact with those that do not share the same house.

Moreover, we found that external entrapment was a significant moderator in the relationship between loneliness and SRQ-20, but not illness anxiety; however, we also found that this moderation did not change at any level of social isolation, suggesting that the sense of external entrapment is an important factor in loneliness-related psychological distress independent of self-isolation practices during the pandemic. A possible explanation for this lack of variation across levels is that external entrapment represents a feeling of lack of control (Gilbert & Allan, 1998; Gilbert & Gilbert, 2003) that was also felt by individuals who were less isolated, as 83.9% of the individuals who reported leaving the house everyday did so because of occupational demands. Nonetheless, higher levels of entrapment weakened the relationship between loneliness and SRQ-20 scores, an effect that was opposite to what was hypothesized.

Finally, we found that high frequency of social media, printed or online newspapers, and podcasts significantly increased distress. Surprisingly, higher levels of positive reappraisal *increased* this effect, suggesting that, while these sources of information can lead to cognitively reframing COVID-19-related stressors as more positive, this in fact results in more distress. This can be related to the fact that much disinformation on COVID-19 also circulates on social networks and podcasts (Fortaleza, 2020) and that the tone of these sources can lead to distorted perceptions of risk (Sell et al., 2017; Thompson et al., 2017), producing conflicting cognitions.

Generality of Findings

While findings from the present studies illuminate the impacts of social isolation/community containment on mental health-related variables, and has been framed as such, wider implications can also be derived. First, given the probability of further COVID-19 waves in the near future, our findings can help in the construction of policies to buffer the impact of further isolation. These findings can also help in the construction of mental health policies in any future pandemic. Specific policies could include recommendations targeted to individuals as well as to institutions, framing mental health attention mainly at the community level, and seeking alternative social support measures, teaching specific coping strategies to vulnerable populations, and addressing media disinformation. A set of recommendations has been built by two Brazilian mental health professionals in a technical report of the results of this project, in Portuguese; the technical report is available online (https://archive.org/details/relatorio-executivo-covid-19-isolamento-social-e-sofrimento-psiquico or https://osf.io/ct7u9/). Second, our findings show a mediating effect of escape–avoidance and withdrawal coping strategies on the effects of loneliness on mental health-related variables; while it has long been appreciated that loneliness is a multidimensional construct that can include its own coping strategies (e.g., Cacioppo et al., 2002; Heinrich & Gullone, 2006; Van Buskirk & Duke, 1991), very few studies described the relationship between loneliness and more general coping strategies.

Study Limitations

The most important limitation of our study concerns statistical power. While we attempted to reach the highest possible statistical power a priori by adequate use of sample size and using strategies to maximize confidence in the instruments that were used, the decline in social isolation levels in Brazil introduced the difficult decision of terminating data collection before reaching the minimum sample size that was defined at preregistration. As a result, our results were reached with a lower power than intended. Thus, results should be taken with a grain of salt.

Another relevant limitation of the present study is the possible lack of representation of different segments of the Brazilian population in our samples. Gender was unequally distributed in both samples (73.2% women in the Phase 1 sample, 81.8% women in the Phase 2 sample); while gender has not been consistently shown to impact loneliness (e.g., Allen & Oshagan, 1995), other factors could impact the effects of community containment in mental health—for example, community containment can lead to increased vulnerability of women to domestic violence (Marques et al., 2020) and to an overload of domestic work and care burden of women (Power, 2020). In the Phase 1 sample, cisgender women appeared to show higher loneliness and distress in general than men. Moreover, our Phase 1 sample included only 0.7% noncisgendered participants; while currently little is known about the impacts of loneliness and social isolation in transgender individuals and what is the actual proportion of transgender individuals in the Brazilian population, the low representation of these individuals in our sample limits the scope of our findings. As a result of the sample composition, our results might not perfectly generalize to other populations, including men and non-Brazilian populations/cultures, as well as older individuals, rural communities, and later stages of the pandemic.

Another associated limitation of the sample composition is related to how sociopolitical and cultural variables could impact views on social isolation and public health policies, especially in the context of the politicization of such measures among right-wing political groups in Brazil (e.g., Farias & Pilati, 2021). While political views of participants were unknown, most of responders in Phase 1 had socioeconomic characteristics not fully representative of the general Brazilian population—for example, most participants had higher schooling and family income than the general population, and most participants were from urban rather than rural or indigenous households. It is possible that participants in the present study were more likely to adhere to social isolation measures and view them as "necessary evils," but it is currently unknown how this would affect loneliness-related mental health issues.

Finally, baseline characteristics of participants were not known in the present study, as previous history of mental health problems was not investigated. While we describe that individuals making use of mental health services at the time of the study had higher scores in all scales in relation to individuals in temporary residential services and individuals not making use of mental health services, these results should be interpreted as exploratory, as they were not preregistered. History of common mental health disorders could lead to biases in the results, as individuals showing more anxiety and/or depression could be more likely to socially isolate or already have high loneliness levels before the start of the pandemic, as well as show nonadaptive coping strategies. Yao et al. (2020), for example, suggested that people with mental health conditions could be more substantially influenced by the emotional responses brought by the COVID-19 epidemic, including loneliness and its deleterious consequences. Indeed, Asmundson et al. (2020) found that individuals with anxiety-related disorders exhibited higher COVID-related stress than those with no mental health disorder, and higher effects than those with mood disorders; importantly, they also found that individuals with anxiety-related or mood disorders were also more likely to self-isolate than individuals with no diagnosed mental health disorder. Our results do not allow comparisons to be made with Asmundson et al. (2020) results, and specific investigations with populations under mental health treatments should be made to address this issue.

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