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O papel das interações sociais na ideação suicida durante a pandemia pelo COVID-19

Porto Alegre, 2021

THYAGO ANTONELLI SALGADO

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Dissertação apresentada como requisito parcial para obtenção de título de Mestre em Psiquiatria à Universidade Federal do Rio Grande do Sul, Programa de Pós-Graduação em Psiquiatria e Ciências do Comportamento.

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A comissão Examinadora, abaixo assinada, aprova a Dissertação “O papel das interações sociais na ideação suicida durante a pandemia pelo COVID-19”, elaborada por Thyago Antonelli Salgado como requisito parcial para a obtenção do grau de Mestre em Psiquiatria e Ciências do Comportamento.

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Prof. Dr. Ives Cavalcante Passos (Orientador)

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RESUMO

Introdução: Embora as medidas de distanciamento social sejam necessárias para diminuir a disseminação do COVID-19, elas podem estar associadas à diminuição da quantidade de interação social (isolamento social) e à sensação subjetiva de estar só (solidão). Tanto o isolamento social quanto a solidão podem estar associados a diversos desfechos em saúde mental, incluindo a ideação suicida. A presente dissertação tem como objetivo avaliar o impacto de medidas objetivas e subjetivas das relações sociais na ideação suicida durante a pandemia pelo COVID-19. **Métodos:** Os dados são provenientes de uma pesquisa on-line longitudinal composta por três ondas de avaliação de adultos residentes no Brasil. Esta dissertação se baseia nas duas primeiras ondas (Onda 1: de 6 de maio a 6 de junho de 2020; Onda 2: de 6 de junho a 6 de julho de 2020). Avaliamos se possíveis fatores de risco relacionados às relações sociais (solidão, morar sozinho, não sair de casa e o número de dias de distanciamento social) na onda 1 estavam associados à ideação suicida na onda 1 e na onda 2 por meio de modelos de regressão múltipla. As análises foram ajustadas para variáveis sociodemográficas, de saúde mental e estilo de vida. **Resultados:** Um total de 8.104 (18-75 anos; 83.8% mulheres) participantes foram incluídos em nossa amostra transversal e 1.674 (18-75 anos; 86.5% mulheres) participantes foram incluídos em nossa amostra longitudinal. Morar sozinho (PR: 1.16; IC 95% = 1.03 – 1.30; p = 0.015), número de dias praticando distanciamento social (PR: 1.002; IC 95% = 1.000 – 1.004; p = 0.027) e solidão (PR: 1.49; IC 95% = 1.32 – 1.68; p <0.001) foram associados à ideação suicida na análise transversal da onda 1. Apenas a solidão (OR = 2.12; IC 95% = 1.06 – 4.24; p = 0.033) permaneceu como fator de risco para ideação suicida na análise longitudinal entre as duas ondas. **Conclusão:** A solidão esteve consistentemente associada à incidência de ideação suicida, enquanto outras variáveis, como morar sozinho, não sair de casa e o número de dias praticando distanciamento social, não. Portanto, medidas que abordem a sensação subjetiva de estar só são necessárias para reduzir a ideação suicida durante as pandemias.

Palavras-chave: Ideação suicida; Solidão; Isolamento social; Distanciamento social; COVID-19

ABSTRACT

Introduction: Although social distancing is necessary to decrease COVID-19 dissemination, it might also be associated with a decrease in the amount of social interaction (social isolation) and the subjective feeling of being alone (loneliness). Both social isolation and loneliness can be associated with several mental health outcomes, including suicidal ideation. This dissertation aims to evaluate the impact of objective and subjective measures of social relationships on suicidal ideation during the COVID-19 pandemic. **Methods**: Data are from a longitudinal online survey consisting of three waves of assessment of adults residing in Brazil. This dissertation is based on the first two waves (Wave 1: from May 6th to June 6th, 2020; Wave 2: from June 6th to July 6th, 2020). We assessed whether possible risk factors related to social relationships (loneliness, living alone, not leaving home and the number of days of social distancing) in wave 1 were associated with suicidal ideation in wave 1 and in wave 2 using multiple regression models. Analyzes were adjusted for sociodemographic, mental health and lifestyle variables. **Results**: A total of 8,104 (18-75 years; 83.8% women) participants were included in our cross-sectional sample and 1,674 (18-75 years; 86.5% women) participants were included in our longitudinal sample. Living alone (PR: 1.16; 95% CI = 1.03 – 1.30; p = 0.015), number of days practicing social distancing (PR: 1,002; 95% CI = 1,000 – 1,004; p = 0.027) and loneliness (PR: 1.49; 95% CI = 1.32 – 1.68; p <0.001) were associated with suicidal ideation in the cross-sectional analysis of wave 1. Only loneliness (OR = 2.12; 95% CI = 1.06 – 4.24; p = 0.033) remained a risk factor for suicidal ideation in the longitudinal analysis between the two waves. **Conclusion**: Loneliness was consistently associated with the incidence of suicidal ideation, while other variables, such as living alone, not leaving home, and the number of days practicing social distancing, were not. Measures to overcome loneliness are therefore necessary to reduce suicidal ideation during pandemics.

Keywords: Suicidal ideation; Loneliness; Social isolation; Social distancing; COVID-19

LISTA DE ABREVIATURAS E SIGLAS

ASSIST: Alcohol, Smoking and Substance Involvement Screening Test
AUDIT-C: Alcohol Use Disorders Identification Test-Concise
CEP: Comitê de Ética em Pesquisa
CI: Confidence Interval
CDC: Centers for Disease Control and Prevention
CONEP: Comissão Nacional de Ética em Pesquisa
COVID-19*:* Coronavirus Disease 2019
EUA: Estados Unidos da América
GAD-7: Generalized Anxiety Disorder-7
HCPA: Hospital de Clínicas de Porto Alegre
OR: Odds Ratio
PHQ-9: Patient Health Questionnaire-9
R-UCLA: Revised UCLA Loneliness Scale
SARS: Severe Acute Respiratory Syndrome
TCLE: Termo de Consentimento Livre e Esclarecido
W: Wave
WHO: World Health Organization
WMH: World Mental Health

SUMÁRIO

1. APRESENTAÇÃO

Este trabalho consiste na dissertação de mestrado intitulada “O papel das interações sociais na ideação suicida durante a pandemia pelo COVID-19”, apresentada ao Programa de Pós-Graduação em Psiquiatria e Ciências do Comportamento da Universidade Federal do Rio Grande do Sul.

O trabalho é apresentado em três partes, na ordem que segue:

- Introdução, Revisão da literatura, Objetivos e Considerações éticas;
- Artigo;
- Conclusões e Considerações Finais.

Importante ressaltar que este estudo proporcionou entrevistas em mídias locais e nacionais, além de palestras para a comunidade. Durante o período de mestrado, também publiquei como primeiro autor o artigo intitulado *"Neuroprogression in Post-Traumatic Stress Disorder: A Systematic Review"* na revista *Trends in Psychiatry and Psychotherapy*. Além disso, participei como primeiro autor do capítulo *“Machine learning na psiquiatria”* para o livro *“Psiquiatria para estudantes de medicina”* da editora ediPUCRS e como segundo autor dos seguintes capítulos: *“Psiquiatria de Precisão, Big Data e Machine Learning”* para o livro *“Clínica Psiquiátrica: Os fundamentos da psiquiatria”* da editora Manole, *“Precision psychiatry in bipolar disorder”* para o livro *“Biomarkers in Bipolar Disorders”* da editora Academic Press - Elsevier e *"Prediction of Suicide Risk using Machine Learning and Big Data"* para o livro *"Suicide Risk Assessment and Prevention"* da editora Springer Nature.

2. INTRODUÇÃO

A pandemia pelo novo coronavírus (*Coronavirus disease 2019* - COVID-19) foi repentina e inesperada (1). Desde dezembro de 2019, quando o primeiro caso foi relatado, a doença se espalhou rapidamente pelo mundo (2). Isso trouxe esforços sem precedentes para instituir o "distanciamento social", resultando em mudanças nos padrões de comportamento e restrições às atividades diárias (2). Embora essas medidas possam mitigar a propagação da doença, elas podem ter consequências imediatas e de longo prazo para a saúde mental e o bem-estar (2). Distanciamento social e *lockdown*, com imprevisibilidade e incerteza, são fatores de risco para problemas de saúde mental, uma vez que podem levar ao isolamento social e à solidão (1,3).

O isolamento social e a solidão são distintos. O isolamento social é visível externamente para o espectador, inferido pela falta de proximidade social e engajamento com os outros, ainda que os próprios indivíduos possam não se sentir sozinhos (4,5). A solidão é um estado psicológico subjetivo identificado por meio da introspecção, no qual um indivíduo pode se sentir sozinho mesmo em meio a uma multidão (4,5). A solidão é um estado emocional doloroso causado por uma discrepância entre as relações sociais significativas desejadas por uma pessoa e as relações presentes percebidas (6–8). O desenvolvimento desse sofrimento cronificado pode estar associado a fatores genéticos, alterações hormonais e cerebrais (9). As evidências demonstram que medidas de isolamento social (como viver sozinho) ou solidão podem ser fatores de risco para mortalidade prematura e suicídio (3,4,10–14).

Uma pesquisa do Centro de Controle e Prevenção de Doenças (CDC) dos EUA (15) divulgada em agosto de 2020 descobriu que aproximadamente o dobro de entrevistados relataram considerações sérias de suicídio nos 30 dias anteriores do que adultos nos Estados Unidos em 2018 (16), em relação ao ano anterior (10,7% versus 4,3%). É provável que os suicídios tenham aumentado na pandemia de influenza de 1918 e na epidemia de SARS de 2003 (17,18). O distanciamento social pode levar ao isolamento social e aumentar o risco de suicídio. De fato, o isolamento social relacionado à quarentena foi um fator proeminente associado ao suicídio durante surtos de doenças virais emergentes antes da pandemia de COVID-19 (19). No entanto, há uma insuficiência de estudos que exploram a associação de ideação

suicida com medidas objetivas e subjetivas das interações sociais durante a pandemia de COVID-19. Reconhecer fatores associados ao aumento do risco de ideação suicida durante a pandemia pode ajudar a projetar estratégias de prevenção ao suicídio (17).

3. REVISÃO DA LITERATURA

3.1 Epidemiologia

O suicídio é um desafio de saúde global, com aproximadamente 800.000 mortes acontecendo em todo o mundo a cada ano, o que significa uma pessoa a cada 40 segundos (20). Ao longo da vida, a prevalência mundial estimada de ideação, planos e tentativas de suicídio é de 9,2%, 3,1% e 2,7%, respectivamente, de acordo com um estudo que utilizou dados da *World Health Organization* (WHO) *World Mental Health* (WMH) *Survey Initiative*. De acordo com esse mesmo estudo, 60% das transições de ideação para planejamento e tentativa ocorrem dentro do primeiro ano após o início da ideação suicida (21). Diversos fatores de risco para ideação suicida podem ser potencializados durante pandemias, como a que estamos vivendo atualmente pela COVID-19.

3.2 Fatores de risco relacionados à pandemia

3.2.1 Interações sociais

Em virtude da velocidade de disseminação e da gravidade de alguns casos clínicos de COVID-19, muitos governos adotaram medidas necessárias de distanciamento social para reduzir o contato humano. Embora se espere que essas medidas reduzam a taxa de novas infecções, elas podem levar a prejuízos na saúde mental (18) e possivelmente aumentar as taxas de ideação suicida e tentativas de suicídio (22).

Distanciamento social significa permanecer longe de aglomerações ou agrupamentos, evitando contato com muitos indivíduos e mantendo distância (ao menos 2 metros) dos outros sempre que possível (23). Os principais modelos teóricos de suicídio enfatizam o papel que laços sociais desempenham na prevenção do suicídio (24,25). Indivíduos que sofrem de ideação suicida podem ter poucas ou não ter conexões com outras pessoas e, muitas vezes, se desconectar dos outros à medida que o risco de suicídio aumenta (25). Portanto, do ponto de vista da prevenção do suicídio, é preocupante que a estratégia de saúde pública mais crítica para a crise do COVID-19 seja o distanciamento social. Os familiares e amigos permanecem isolados dos indivíduos hospitalizados, mesmo quando sua morte é iminente. Na

medida em que essas estratégias podem envolver um isolamento social e solidão, podem também aumentar o risco de mortalidade prematura, incluindo o suicídio(22).

Isolamento social e solidão são determinantes sub-reconhecidos do estado de saúde e se associam com aumento da morbimortalidade (26,27). Uma metanálise reuniu dados de 16 estudos longitudinais e demonstrou que solidão e isolamento social estão associados a um aumento de 29% no risco de incidência de doenças coronarianas e de 32% no risco de acidente vascular cerebral (28). Uma mortalidade anual de 162.000 norte-americanos é atribuída ao isolamento social, excedendo o número de mortes por câncer ou acidente vascular cerebral (9). Outra metanálise que reuniu 70 estudos sobre a associação de déficits de interações sociais e mortalidade prematura mostrou que o isolamento social aumentou o risco de mortalidade em 29% enquanto a solidão em 26%, sendo uma magnitude semelhante a fatores de risco bem estabelecidos como obesidade e tabagismo (29).

Dada a nossa herança evolutiva, o cérebro humano busca conexões significativas com outras pessoas. Durante o início da evolução da nossa espécie, os agrupamentos sociais eram relativamente pequenos e estáveis, e a dor da solidão pode ter servido tanto para promover a conexão social necessária para a sobrevivência dos genes quanto como um impedimento para ações egoístas que eram prejudiciais ao grupo (30). Entretanto, a solidão na sociedade contemporânea pode afetar a cognição humana de maneiras por vezes mal adaptativas. O sentimento de isolamento social pode desencadear hipervigilância para ameaças sociais, o que, por sua vez, produz vieses de atenção, confirmação e memória. Indivíduos solitários são mais propensos a interpretar seu mundo social como ameaçador, manter expectativas sociais mais negativas e lembrar mais eventos sociais negativos do que os indivíduos não solitários (31).

Essas cognições aumentam a probabilidade de que os indivíduos se envolvam em processos de confirmação comportamental, por meio dos quais produzem mais interações sociais negativas e geram evidências que confirmam que apresentam pouco controle pessoal ou valor social. Assim, alteram a probabilidade de engajamento social e ativam mecanismos neurobiológicos que aumentam a ativação do eixo hipofisário adrenal (HPA) e diminuem a qualidade do sono (31–34). A ativação repetida ou crônica da vigilância de ameaças em um contexto social, juntamente com a diminuição dos processos anabólicos, pode contribuir para uma desregulação

cerebral com prejuízo cognitivo e de sistemas fisiológicos, gerando assim o aumento da morbimortalidade (31).

A mortalidade pode se dar através do suicídio, sendo que o isolamento social e a solidão podem estar associados ao risco de suicídio de forma indireta e direta. Os déficits nas relações interpessoais podem gerar prejuízos na saúde mental, incluindo fatores de risco conhecidos para o suicídio como a depressão e a ansiedade (9,35). Um estudo longitudinal que acompanhou por 6 anos uma amostra de 2.101 participantes (representativa da população norte-americana acima de 50 anos) revelou que a solidão afeta e é afetada por sintomas depressivos e que a solidão foi associada a um aumento do risco de mortalidade (36). Outro estudo avaliou dados coletados entre 2007 e 2012 de 15.010 participantes adultos da *Gutenberg Health Study (GHS)*, uma coorte prospectiva, e a solidão foi variável preditora de sintomas depressivos, sintomas de ansiedade generalizada e ideação suicida (37).

Um estudo de meta-análise que incluiu 22 estudos revelou que a solidão foi um preditor significativo tanto da ideação quanto do comportamento suicida e com evidências de que a depressão atuou como um mediador (4). Entretanto, uma recente revisão narrativa apontou que tanto a condição objetiva quanto o sentimento subjetivo de estar sozinho também são fortemente associados à suicidalidade como um fator de risco independente da depressão (38). Outro estudo de meta-análise avaliou 31 estudos (203.152 participantes) que abordaram o impacto de déficits de relações sociais (incluindo parâmetros objetivos e subjetivos) na ideação suicida de idosos. De acordo com o estudo, idosos que apresentam déficit geral em relações sociais tiveram um aumento de 57% na probabilidade de ter ideação suicida , sendo que os fatores de maior impacto foram os maus tratos na velhice e a solidão com aumento de 131% e 124% na probabilidade de ter ideação suicida, respectivamente (39).

3.2.2 Medo

Outros possíveis fatores causais diretos e indiretos desse impacto negativo da pandemia na saúde mental e no suicídio também são apontados. Os prováveis efeitos nocivos da pandemia em pessoas com doença mental e na saúde mental da população em geral podem ser exacerbados, além do distanciamento físico, também pelo medo (40). Aqueles com transtornos psiquiátricos podem ter piora dos sintomas e outros podem desenvolver novos problemas de saúde mental, especialmente

depressão, ansiedade e estresse pós-traumático (todos associados a um risco aumentado de suicídio) (17).

O medo é um componente adaptativo fundamental para a sobrevivência e que envolve diversos processos biológicos de preparação para uma resposta a eventos potencialmente ameaçadores (40). Contudo, quando o medo é superdimensionado se torna nocivo e disfuncional do ponto de vista da saúde mental, podendo ser um componente chave para o desenvolvimento ou agravamento de diversos transtornos psiquiátricos. Além disso, é possível que a cobertura intensa de notícias por parte da mídia sobre os eventos da pandemia possa servir como um estressor ansiogênico adicional, especialmente para os indivíduos com problemas de saúde mental preexistentes (17).

3.2.3 Instabilidade econômica

Um terceiro fator seria a crise econômica e o desemprego. Há receio de que a combinação de eventos públicos cancelados, negócios fechados e restrição das atividades de lazer leve a uma recessão. As crises econômicas estão associadas a taxas mais altas de suicídio em comparação com períodos de relativa prosperidade (41). Desde o início do surto pela COVID-19, as empresas vêm enfrentando adversidades e demitindo funcionários. As escolas foram fechadas por períodos prolongados, forçando alguns pais a dedicar mais tempo de cuidado aos seus filhos. O mercado de ações sofreu quedas históricas, resultando em mudanças significativas nos fundos de aposentadoria. Todos esses fatores podem influenciar na saúde mental da população.

3.2.4 Profissionais de saúde

Um quarto fator seria o impacto na saúde mental dos profissionais da saúde (17). Diversos estudos documentam taxas elevadas de suicídio entre profissionais médicos e estudantes de medicina (42–44). Esse grupo de risco agora está servindo na linha de frente da batalha contra a COVID-19 e lida com vários fatores como as preocupações sobre infecção, exposição de membros da família, colegas doentes, escassez de equipamentos de proteção individual necessários, instalações sobrecarregadas e estresse no trabalho (22). Durante a pandemia, um estudo

analisou dados do *baseline* (5 de maio - 23 de julho de 2020) de uma coorte de 5.450 funcionários de hospitais espanhóis e encontraram taxas de 3,5% para ideação ativa, planos ou tentativas de suicídio nos últimos trinta dias (45). Isso sugere que os pensamentos e comportamentos suicidas entre funcionários durante o surto de COVID-19 são pelo menos três vezes maiores do que na população espanhola em geral antes do surto de COVID-19 (45).

3.2.5 Uso de substâncias psicoativas

Outro fator seria o início ou aumento do consumo de substâncias psicoativas. Uma pesquisa do Centro de Controle e Prevenção de Doenças (CDC) dos EUA divulgada em agosto de 2020 avaliou 5.412 norte americanos e revelou que 13,3% da amostra referiram ter iniciado ou aumentado o uso de substâncias (álcool ou drogas ilícitas) para lidar com o estresse ou emoções relacionadas ao COVID-19 (15). O uso abusivo de álcool ou outras substâncias psicoativas estão associadas a um maior risco de suicídio (10,24). Um estudo de metanálise que reuniu resultados de 7 estudos antes da pandemia, demonstrou que o uso agudo de álcool aumenta a chance de um comportamento suicida em 2,71 vezes quando o uso é leve e em 37,18 vezes para uso intenso dessa substância (46).

3.2.6 Gênero

Por fim, a diferença de gênero também pode ser relevante para a suicidalidade durante a pandemia. Apesar das taxas mais altas de mortes por suicídio ser em homens (15 / 100.000 em homens vs. 8 / 100.000 em mulheres, globalmente) (12), as taxas de ideação suicida e tentativa de suicídio são mais altas nas mulheres (21,47). E essa balança pode ficar mais desfavorável para as mulheres na pandemia pelo risco de aumento de fatores como a violência doméstica (17).

Um estudo longitudinal realizado com dados de 34.778 indivíduos do *University College London's (UCL's) COVID-19 Social Study*, coletados entre 21 de março e 20 de abril de 2020, sugerem que a automutilação e os pensamentos de suicídio foram maiores entre as mulheres (48). Além disso, um estudo transversal avaliou 10.067 indivíduos durante a pandemia pela COVID-19 (1 a 10 de abril de 2020) em

Bangladesh e mostrou que ser do sexo feminino é um dos fatores de risco para a ideação suicida (49).

4. JUSTIFICATIVA

A pandemia pela COVID-19 gerou um novo padrão de interações sociais devido a necessidade de distanciamento físico para contenção da transmissão do surto. Entretanto, alterações qualitativas e quantitativas em interações sociais podem estar associadas à ideação suicida. Desfechos relacionados à suicidalidade podem ser evitáveis, porém é necessário estudos que busquem compreender os fatores associados a esse desfecho para o desenvolvimento de estratégias e medidas de prevenção.

5. OBJETIVOS

5.1 Objetivo geral

- Identificar possíveis fatores de risco associados à ideação suicida na população brasileira durante a fase inicial da pandemia pela COVID-19.

5.2 Objetivos específicos

- Analisar se medidas subjetivas (como solidão) e objetivas (como distanciamento social, morar sozinho e ficar apenas em casa) das relações sociais estão associadas à ideação suicida na primeira onda de avaliação ou à incidência de ideação suicida entre a primeira e a segunda onda de avaliação.
- Analisar se variáveis sociodemográficas, de estilo de vida, de sintomas psiquiátricos e relacionadas à pandemia também estariam associadas à ideação suicida.
- Avaliar a prevalência de ideação suicida na fase inicial da pandemia.
- Analisar propriedades psicométricas da versão traduzida da escala R-UCLA neste estudo.

6. CONSIDERAÇÕES ÉTICAS

A coleta de dados foi iniciada após aprovação do projeto pelo Comitê de Ética em Pesquisa (CEP) do Hospital de Clínicas de Porto Alegre (HCPA) e pela Comissão Nacional de Ética em Pesquisa (CONEP) via Plataforma Brasil (CAAE: 30222820.4.0000.5327). Em virtude da aceitação e do preenchimento do questionário ocorrer inteiramente on-line e sem contato do participante com a equipe de pesquisa, tornou-se inviável a assinatura do TCLE formal. No entanto, na introdução do questionário, foi explicado que 1) o anonimato seria garantido na primeira etapa, 2) os dados seriam analisados apenas em conjunto, 3) o projeto tinha sido aprovado tanto pelo CEP do HCPA quanto pelo CONEP e 4) ao responder o questionário o indivíduo estaria concordando em participar do estudo.

Devido ao desenho longitudinal do estudo, propusemos a participação em outras etapas com o preenchimento de novos questionários. Nesses casos, o indivíduo que aceitasse participar compartilharia seu e-mail. Ele seria informado que, em virtude disso, haveria quebra do anonimato e apenas deveria fazer isso caso se sentisse confortável. Entretanto, os autores foram advertidos para praticarem cuidados intensivos no que tange ao sigilo dos dados e firmaram compromisso de que as informações seriam utilizadas única e exclusivamente para fins previstos nesse estudo.

Na introdução do questionário, alertamos também sobre os riscos envolvidos na participação dessa pesquisa. Como pedimos que o participante examinasse alguns pensamentos, emoções e comportamentos para responder às perguntas, seria possível que isso gerasse estresse, dado a natureza dos eventos relacionados à pandemia que estavam em andamento. Além disso, o preenchimento de algumas questões poderia gerar cansaço, aborrecimento ou constrangimento. Entretanto, para cada participante reiteramos a plena liberdade para decidir sobre a participação e a possibilidade de retirar seu consentimento em qualquer etapa da pesquisa, sem prejuízo algum. Caso ao responder a pesquisa, o participante necessitasse de ajuda psicológica, foi apresentado contato telefônico e e-mail para assistência imediata por um dos pesquisadores ou através do Centro de Valorização da Vida (CVV).

7. ARTIGO

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Loneliness, but not social distancing, is associated with the incidence of suicidal ideation during the COVID-19 outbreak: a longitudinal study

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Running title: Social isolation, loneliness, and suicidality in the pandemic.

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Abstract

Background: Although social distancing is necessary to decrease COVID-19 dissemination, it might also be associated with suicidal ideation. Therefore, we analyzed the impact of social distancing and loneliness in suicidal ideation.

Methods: We performed two waves of a snowball sample, web-based survey in Brazil (W1: from May 6th to June 6th, 2020; W2: from June 6th to July 6th, 2020). We assessed whether risk factors related to social relationships (loneliness, living alone, not leaving home, and the number of days practicing social distancing) at W1 were associated with suicidal ideation at W1 and W2 using multiple regression models. Analyses were adjusted for sociodemographic, mental health, and lifestyle variables.

Results: A total of 1,674 (18-75 years old; 86.5% females) were included in our longitudinal sample. Living alone (OR: 1.16; 95%CI = 1.03 - 1.30; p=0.015), number of days practicing social distancing (OR: 1.002; 95%CI = 1.000 - 1.004; p=0.027), and loneliness (OR: 1.49; 95%CI = 1.32 - 1.68; p<0.001) were associated with suicidal ideation in the cross-sectional analysis of W1. Only loneliness (OR= 2.12; 95%CI = 1.06 - 4.24; p = 0.033) remained significant as a risk factor to suicidal ideation in the longitudinal analysis between both waves.

Limitation: Snowball, convenience sample design limits outcome estimates. Assessments were not objectively performed.

Conclusion: Loneliness was consistently associated with the incidence of suicidal ideation, while other variables, such as living alone, not leaving home, and the number of days practicing social distancing, were not. Measures to overcome loneliness are therefore necessary to reduce suicidal ideation during pandemics.

Keywords: Suicidal ideation; Loneliness; Social distancing; COVID-19

1. Introduction

The Coronavirus Disease 2019 (COVID-19) outbreak was sudden and unexpected worldwide (Moreno et al., 2020). Since December 2019, when the first case was reported, it has swept across the world (Galea et al., 2020). This has brought unprecedented efforts to institute "social distancing", resulting in changes in behavioral patterns and restrictions of daily activities (Galea et al., 2020). While these steps can mitigate the spread of this disease, they might have immediate and long-term consequences for mental health and well-being (Galea et al., 2020). Social distancing and lockdown, along with unpredictability and uncertainty, are risk factors to mental health issues, since they might lead to social isolation and loneliness (Moreno et al., 2020; Moutier, 2020).

Objective social isolation and loneliness are distinct. The former is outwardly visible to an onlooker, inferred by the lack of social proximity and engagement with others, even though the individuals themselves may not feel alone (Cacioppo and Cacioppo, 2018; McClelland et al., 2020). Loneliness is a subjective psychological state identified through introspection, in which an individual may feel alone even within a crowd (Cacioppo and Cacioppo, 2018; McClelland et al., 2020). Loneliness is a painful emotional state caused by a discrepancy between a person's desired meaningful social relationships, and the perceived present relationships (Lee et al., 2021; Mann et al., 2017; Wang et al., 2017). Evidence demonstrates that measures of social isolation (such as living alone) or loneliness could both be major risks for premature mortality and suicide (Cerel et al., 2019; Fazel and Runeson, 2020; McClelland et al., 2020; Moutier, 2020; Naghavi and Global Burden of Disease Self-Harm Collaborators, 2019; Turecki et al., 2019; World Health Organization, 2014).

A US Centers for Disease Control and Prevention (CDC) survey (Czeisler et al., 2020) released in August 2020 found that approximately twice as many respondents reported serious considerations of suicide in the previous 30 days than did adults in the United States in 2018 (Lipari and Park-Lee, 2019), regarding the prior year (10.7% versus 4.3%). Suicides are likely to have increased in the 1918 influenza pandemic and the 2003 SARS epidemic as well (Brooks et al., 2020; Gunnell et al., 2020). Social distancing might lead to social isolation and increase the risk of suicide. In fact, quarantine-related social isolation was a prominent factor associated with suicide during emerging viral disease outbreaks before the COVID-19 pandemic (Leaune et al., 2020). However, insufficient studies explored the association of suicidal ideation with objective and subjective measures of social relationships during the COVID-19 pandemic. Recognizing whether and how the pandemic increases suicide risk can help designing suicide prevention strategies (Gunnell et al., 2020).

Aims of the study

The present study aims to analyze whether subjective (such as loneliness) and objective (such as social distancing, living alone, and staying only indoors) measures of social relationships are risk factors for suicidal ideation in the COVID-19 pandemic considering a one-month follow-up. We also tested whether sociodemographic, lifestyle and pandemic-related variables were associated with suicidal ideation. Based on previous findings, we hypothesized that measures of social relationships would be associated with suicidal ideation in both the cross-sectional and longitudinal analyses. Finally, we hypothesized that previously known risk factors for suicidal ideation (eg, depression) would be observed, especially factors that could worsen during the pandemic, such as economic factors (unemployment and financial crisis) and population with increased stress burden (health professionals).

Methods

Setting, participants, and design

The present study is part of a larger cohort project, composed of three temporal waves (0, 1, and 6 months) that aimed to investigate the impact of the COVID-19 pandemic on mental health in the Brazilian population at different stages of the pandemic. The cohort used online questionnaires as the method of data collection, due to the need of complying with recommendations of social distancing. For inclusion in the baseline cohort, participants needed to be at least 18 years old, live in Brazil at the time of data collection, and have access to the internet. For inclusion in the second wave of data collection, participants needed to provide their email address at the end of the baseline questionnaire and agree to receive an email with the specific questionnaires regarding that wave. All online questionnaires were provided to eligible participants using an online platform (*Survey Monkey*) (“Survey Monkey,” n.d.), and the baseline questionnaire was advertised through social media (Facebook, Instagram, and Whatsapp) to reach participants. The advertisement explicitly stated that the survey was anonymous.

This investigation is based on the first 2 waves of data collection of this cohort. The Wave 1 (W1) questionnaire was administered between May 6th and June 6th, 2020. The Wave 2 (W2) data collection was performed between June 6th and July 6th, 2020, in which participants who agreed to receive the questionnaire of the second wave received an email

one month after the completion of the baseline questionnaire. Considering that our study started approximately 2 months after the confirmation of the first case of COVID-19 in Brazil (Ministério da Saúde, n.d.), our analyzes refer to an early stage of the pandemic.

The study was approved by the local research ethics committee All participants signed the informed consent before answering the online questionnaires. The second wave questionnaire was only sent to those who agreed to write down their email address at the end of the baseline questionnaire. After completion of each questionnaire, contact information for suicide prevention services and mental health support centers located in Brazil were provided to participants.

This study is in accordance with the STROBE guidelines (von Elm et al., 2007). Table S1 in the supplemental material presents the STROBE checklist.

Measures

Survey instruments

The online questionnaires for data collection included validated scales, such as the 9-item Patient Health Questionnaire (PHQ-9) (Santos et al., 2013), the Generalized Anxiety Disorder-7 (GAD-7) (Moreno et al., 2016a), the Alcohol Use Disorders Identification Test-Concise (AUDIT-C) (Bradley et al., 2003; Bush et al., 1998; Meneses-Gaya et al., 2010), and the Revised UCLA Loneliness Scale (R-UCLA) (Hughes et al., 2004). In addition, the questionnaires covered sociodemographic variables, the COVID-19 pandemic and social distancing measures, alcohol and substance misuse, suicidal ideation, adverse life experiences, lifestyle variables, among other clinical variables. Both a Portuguese (original versions) and a translated English version of the questions used in this study were provided in the supplemental material (see Method S1).

Suicidal Ideation

Participants were classified as having suicidal ideation if they answered “yes” to the following question: “Over the past month, have you had any desire or thoughts about killing yourself?”.

Subjective measure of social relationship

Loneliness was measured with the 3-item short form of R-UCLA (Hughes et al., 2004). The scale asks “How often do you feel you lack companionship?”, “How often do you feel left out?”, and “How often do you feel isolated from others?”. Response options for each item are “hardly ever or never”, “some of the time”, or “often” (equating to scores of 1,2, and 3, respectively). Total scores range from 3 to 9 and higher scores indicate greater loneliness (Hughes et al., 2004), with scores ≥ 6 indicating important loneliness (Steptoe et al., 2013). We used Cronbach’s α and McDonald’s ω to test internal reliability (Lucke, 2005; Raykov, 1997).

Objective measures of social relationship

Social distancing was defined in accordance with the Centers for Disease Control and Prevention (CDC) and includes measures such as staying away from agglomerations or groups of people and keeping a distance (at least 2 meters) from others whenever possible (CDC, 2020). We calculate the time spent practicing such measures with the question: "How many days have you been practicing social distancing due to the COVID-19 outbreak?".

We also asked the following questions to evaluate social isolation: "How many people have been living under the same roof as you since the COVID-19 outbreak began? (Number of people including you)" and "After the outbreak of COVID-19 in your country, how often have you left your house? (Number of days/week)". For the first question, we analyzed whether the participants lived alone or not. For the second question, we analyzed whether the participants left home at least once a week or not.

Mental Health

Depressive symptoms were measured with the PHQ-9 (Kroenke et al., 2001). A score equal to or greater than 9 is considered a positive screening result for depression in the Brazilian population (Matias et al., 2016; Santos et al., 2013). Anxiety symptoms were measured using the GAD-7 (Moreno et al., 2016b). A positive indicator of signs and symptoms of anxiety disorders is considered to be a value equal to or greater than 10. The AUDIT-C was

used to evaluate alcohol use (Bush et al., 1998). In men, a score of 4 or more is considered positive; in women, a score of 3 or more is considered positive. The questions about cocaine/crack use and benzodiazepines were based on the ASSIST (Alcohol, Smoking and Substance Involvement Screening Test) instrument (Group and WHO ASSIST Working Group, 2002), asking about use over the previous 30 days.

Statistical analysis

Data analysis was performed using SPSS V21.0. Descriptive statistics were reported in terms of mean and standard deviation (Mean(SD)), median and interquartile range (Md[1st-3rd IQR]) , or absolute and relative frequencies. We estimated Cronbach's α (assuming tau-equivalence) and McDonald's ω (not assuming tau-equivalence) to test the internal reliability of instruments not previously published in Brazilian Portuguese. Values >0.7 and >0.9 are considered of acceptable and excellent reliability (i.e. sum scores reliably measure a given construct) (Nunnally et al., 1994).

All statistical estimates were performed using survey weight. This procedure applies iterative post-stratification to match population margins to the survey sample proportions, which can approximate the demographic characteristics of the sample to the Brazilian population. We weighted our sample using Brazilian population margins regarding sex at birth, age groups, the region of residency, race/ethnicity, and household income according to the last Brazilian census (Instituto Brasileiro de Geografia e Estatística, 2010). Survey weight was trimmed to 20. Survey weight and scale reliability were run using R (R Core Team, 2020) version 4.0.3 using the packages *survey (Lumley, 2020)* (*rake* function) and *semTools (Jorgensen et al., 2020)* (*reliability* function) respectively.

Cross-sectional analyses

Initially, cross-sectional analyses were conducted on a sample of 8,104 participants who were included at baseline. Multiple Poisson regression analyses were performed to assess the sole effect of social isolation and loneliness factors on suicidal ideation at baseline with adjustments for potential confounders. We selected confounders based on existing studies (Turecki et al., 2019) and theoretical assumptions (Gunnell et al., 2020; Wasserman et al., 2020). Associations between social factors and suicidal ideation may be confounded by age, gender, sexual orientation, marital status, income, geographical area, education,

healthcare professional, unemployment, financial crisis during the pandemic, quality of family relationships, quality of friend relationships, religion, meditation, sleep quality, physical activity, childhood trauma, previous suicide attempt, family history of suicide, depressive symptoms (PHQ-9), anxiety symptoms (GAD-7), being at severe risk for alcohol abuse (AUDIT-C), cocaine/crack use, and benzodiazepines use.

Before multiple Poisson regression, we calculated univariate Poisson regression, prevalence ratios (PR), and confidence intervals (95%CI) for each possible confounding. Any variable in the univariate model that was significant at $p<0.1$ was entered in multiple Poisson regression analyses.

Longitudinal analyses

After the cross-sectional analyses, data analysis was conducted on a longitudinal subsample, comprising 1,674 individuals who completed both first and second waves of data collection (0 and 1 month).

The participants were divided into four groups: 1) Incidents (participants who had no suicidal ideation in W1 and had in W2); 2) Remitted (participants who had suicidal ideation in the W1 and did not have it in W2; 3) Absent (who did not have suicidal ideation in any wave); 4) Persistent (who had suicidal ideation in both waves). We used the chi-square with the adjusted residual test for categorical variables and Kruskal-Wallis with the Dunn's test for quantitative variables to analyze social relationship variables between these four groups.

Multinomial logistic regression analyses were then performed with 4 groups (according to the presence of suicidal ideation in the two waves) as outcome. The independent variables were the same as in the cross-sectional analyses except for cocaine/crack users due to the small number of participants with this condition, that is, we used just the variables from W1 to predict our outcome (W2). We calculated the odds ratio (OR) and confidence intervals (95%CI) for each possible confounding.

Results

Figure 1 shows the flowchart of the participants' inclusion process.

<Insert Figure 1>

In the sample included in the longitudinal study, the mean age was 38.6 (14.1) years and 86.5% were females. However, our weighted sample was very close to being representative of the Brazilian population, according to data from the last national census (Instituto Brasileiro de Geografia e Estatística, 2010). Table 1 presents the demographic and personal characteristics of respondents in the cross-sectional and longitudinal study. The rate of suicidal ideation in W1 was 22.6% and in W2, 20.3% (p=0.005). Table S2 in the supplemental material presents the variation in the rates of mental health symptoms and loneliness between W1 and W2.

<Insert Table 1>

Cross-sectional analyses in Wave 1

R-UCLA presented acceptable to good reliability (α=0.861; ω=0.791). The multiple Poisson regression analysis of W1 showed that living alone (OR=1.16; 95%CI = 1.03-1.30; p=0.015), number of days practicing social distancing (OR=1.002; 95%CI = 1.000-1.004; p=0.027), and loneliness (OR=1.49; 95%CI = 1.32-1.68; p<0.001) were associated with suicidal ideation. This analysis was adjusted for all confounding variables mentioned in the methods as they were significantly associated with suicidal ideation in the univariate Poisson analysis (Table S3 - supplementary material).

<Insert Table 2>

Longitudinal analyses

Table 3 shows the comparison of the isolation variables between the four suicidal ideation groups.

<Insert Table 3>

After adjustment for all covariates, loneliness was directly associated (OR= 2.12; 95%CI = 1.06-4.24; p=0.033) with the incidence of suicidal ideation between W1 and W2.

<Insert Table 4>

Among the adjustment covariables, female gender (OR= 2.76; 95%CI = 1.33-5.75; p = 0.007), depression (OR= 4.61; 95%CI = 1.66-12.80; p=0.003), previous suicide attempt

(OR= 2.70; 95%CI = 1.39-5.25; p=0.003), and being a health professional (OR= 2.00; 95%CI = 1.06-3.79; p=0.033) were also directly associated with the incidence of suicidal ideation. However, participants at severe risk for alcohol abuse (OR= 0.37; 95%CI = 0.18-0.78; p=0.009), users of benzodiazepine (OR= 0.47; 95%CI = 0.24-0.93; p=0.030) and being unemployed (OR= 0.43; 95%CI = 0.20-0.91; p=0.028) were inversely associated. There was no association between age and the incidence of suicidal ideation (Table S4 - supplemental material).

Discussion

This is the first longitudinal study to analyze the impact of objective and subjective social relationship measures on suicidal ideation during the COVID-19 pandemic. Despite the cross-sectional analyses showing that living alone, number of days practicing social distancing, and feeling of loneliness were associated with suicidal ideation; only feeling of loneliness remained a predictor of suicidal ideation in the longitudinal analyses, even after adjustment for multiple confounding variables. The loneliness rate was high in our sample, with 61.6% of participants scoring above the cutoff point.

Contrary to our initial hypothesis, objective measures of social relationships were not associated with an increased risk of suicidal ideation in a one-month follow-up. This result is similar to a cross-sectional study (Bryan et al., 2020) conducted from March 18 to April 4, 2020, that evaluated a representative sample of 10,625 U.S. adults. To understand these findings, we can make a comparison with other situations in which physical distance is imposed. The specific condition of physical isolation (being in isolation or segregation cells) of life in prison intensifies suicidal risk (Calati et al., 2019). However, having greater social support can be a protective factor for suicidal ideation in a prison population even with other risk factors present, such as major depressive disorder (Richie et al., 2019). During the pandemic, social distancing measures may not mean a distance in social relations because it is possible to stay connected in non-physical ways, via text, phone, or videoconferencing. Several authors have highlighted the importance of increasing communication with friends, family members, and loved ones (Fiorillo and Gorwood, 2020; Thorp, 2020). In this sense, a longitudinal study assessed a nationwide sample of 1,545 American adults and showed that participants felt more social support during the initial phase of the COVID-19 pandemic than they did before it (Luchetti et al., 2020).

Addressing loneliness is more complex and nuanced than simply increasing social connection (Lim et al., 2020). Since the number of friends or social interactions is not predictive of loneliness, increasing opportunities for social interaction and increasing social support can address social isolation more than loneliness (Masi et al., 2011). Our finding that loneliness is associated with suicidal ideation is consistent with a cross-sectional study (Killgore et al., 2020) that analyzed a representative sample of 1,013 U.S. adults on April 9-10, 2020. In this study, loneliness was elevated, with 43% of respondents scoring above published cutoffs, and was strongly associated with depression and suicidal ideation. Before the pandemic, both the objective condition of being alone (e.g. living alone) and the subjective feeling of being alone (i.e. loneliness) were associated with suicidal outcomes. However, the subjective feeling of loneliness had a major impact on both suicide ideation and suicide attempts (Calati et al., 2019). A meta-analysis of 31 studies indicated a 57% likelihood increase of suicidal ideation for elderly participants with poor social relationships. The functional (subjective) measures of social relationships (e.g. loneliness), however, were more predictive than structural (objective) measures (e.g. social isolation) (Chang et al., 2017).

The relationship between loneliness and suicidal ideation is supported by the interpersonal theory of suicide. According to the theory, suicidal ideation can be induced by the simultaneous presence of two interpersonal constructs — thwarted belongingness and perceived burdensomeness (i.e. the perception to represent a burden for others) (Joiner, 2007). Thwarted Belongingness includes loneliness and the absence of reciprocal care (Van Orden et al., 2010). Chu and colleagues conducted meta-analyses with 122 distinct published and unpublished samples and the findings supported the interpersonal theory: the interaction between thwarted belongingness and perceived burdensomeness was significantly associated with suicidal ideation (Chu et al., 2017).

Loneliness led to social, mental, and physical health problems before the Covid-19 pandemic (Killgore et al., 2020; Shah et al., 2019) and with the possible increase during the pandemic (McGinty et al., 2020), measures are needed to overcome loneliness. A meta-analysis with 50 studies of interventions to reduce loneliness shows that the most successful interventions addressed maladaptive social cognition by cognitive behavioral therapy (Masi et al., 2011). In older people, loneliness can create serious problems that could also not be alleviated with social support only (Chen et al., 2014); however, there are promising technological interventions (for example, digital applications (apps), online social networks, and social robots) that can be effective in improving emotional support, in addition to social support. These technologies are appropriate for measures of social distancing during pandemics (Pu et al., 2019).

To deal with loneliness it is also important to know the possible associated factors, because some of these factors, such as social anhedonia, can be an obstacle to treatment. Social anhedonia is characterized by social disinterest and a lack of pleasure from social contact, indicating a deficit in the need to belong (Brown et al., 2007). Tan and colleagues conducted a cross-sectional online survey with 824 undergraduate students to investigate the association between social anhedonia, loneliness, and social functioning. Both social anhedonia and loneliness were negatively correlated with social functioning and mediation analyses revealed that loneliness fully mediated the relationship between social anhedonia and overall social functioning. According to the authors, individuals who are high in social anhedonia have an innate tendency to withdraw from social interactions, which potentially reduces the opportunity for them to build or gain subjectively meaningful social networks (Tan et al., 2020). Future studies are also needed to assess how interventions in social anhedonia could impact loneliness, social functioning, and suicidal ideation.

A meta-analysis of 15 observational case-control studies (from 1965 to 2016) showed an association between anhedonia and suicidal ideation, independently of depression (Ducasse et al., 2018). Besides, other studies have shown the association between anhedonia and suicidal ideation in medical students (Loas et al., 2019) and physicians (Loas et al., 2018). Loas and colleagues found that in physicians, anhedonia can be associated with suicidal ideation, but it also functions as a mediator in the relationship between suicidal ideation and perceived burdensomeness or thwarted belongingness, supporting the interpersonal theory of suicide for this population of health professionals (Loas et al., 2018).

Being a health professional, previous history of suicide attempts, depression, and female sex were directly associated with the incidence of suicidal ideation between W1 and W2. Special attention deserves to be given to health professionals during epidemics and pandemics (Brooks et al., 2020; Gunnell et al., 2020). During the COVID-19 outbreak, a study analyzed data from the baseline assessment (May 5 – July 23, 2020) of a cohort of 5,450 Spanish hospital workers and they found a thirty-day prevalence of 3.5% for active ideation, plans, or attempts (Mortier et al., 2021). This suggests that suicidal thoughts and behaviors among hospital workers during the COVID-19 outbreak are at least three times higher than in the general Spanish population before the COVID-19 outbreak (Mortier et al., 2021). Health professionals working in hospitals should receive regular clinical screening for depression, anxiety, and suicidality by mental health workers (Xiang et al., 2020).

Previous suicide attempts and mental illness, such as depression, are known risk factors for suicide (Centers of Control Disease and Prevention n.d.). Although we do not have other studies to compare in the COVID-19 pandemic scenario, it is important to highlight that

one of the main adverse consequences of the COVID-19 pandemic is loneliness (Holmes et al., 2020) that in turn is associated with depression and suicide attempts across the lifespan. Females have also been found to have a generally higher risk of developing psychological issues during the COVID-19 pandemic period (Wang et al., 2020). Data of 34,778 individuals from the University College London COVID-19 Social Study, collected between March 21st and April 20th, 2020, suggests self-harm and thoughts of suicide were higher among women (Iob et al., 2020). Besides that, a cross-sectional study assessed 10,067 individuals during the COVID-19 pandemic (April 1-10, 2020) in Bangladesh and showed that being female is one of the risk factors for suicidal ideation (Mamun et al., 2021).

Being unemployed, at serious risk of alcohol abuse, and use of benzodiazepines were protective factors. Of note, these results are within a multiple regression framework where the effects of alcohol, benzodiazepines, and unemployment are conditioned to the effects of other variables in the model, such as loneliness, depression, anxiety, occupation, and education. Therefore, after adjusting for symptoms and socioeconomic variables, being unemployed in a pandemic situation may indicate that a subject was not exposed to work-specific stressors that could lead to suicide ideation, such as burnout. Besides, some jobs increase the possibility of contagion and some people may have felt protected by less exposure. At the same time, alcohol use and benzodiazepines use at the early stages of the pandemic may have exerted therapeutic effects and subsequently reducing the probability of self-reporting suicide ideation, especially considering the estimated regression model. Nonetheless, these variables need to be investigated with proper study design and as the main predictor to avoid Table 2 fallacy (Lederer et al., 2019).

Our cross-sectional findings indicate that in the first wave collection time there was a greater difficulty for the participants in dealing with social distancing and living alone. In fact, the rate of suicidal ideation decreased from 22.6% to 20.3% between the two waves, which may show a better adaptation to risk factors. Despite the decrease, these numbers represent a significant increase (approximately 5 times higher) about 3.8% of a previous study of the prevalence of suicidal ideation in the Brazilian population in 2013 (Carpena et al., 2019).

This study has several strengths that are worth discussing. First, the study has a longitudinal design that allows a better understanding of the cause and effect relationship between predictors and outcome. Second, our national sample recruited individuals covering all 27 federative units in Brazil and the weighting of the sample allowed the demographic characteristics to be close to the Brazilian demographic census. Third, we had a sample size that allowed us to analyze a wide range of variables and thus we corrected our findings for

several confounding factors. Fourth, this is one of the first studies to assess the impacts of the pandemic on mental health in low- and middle-income countries (LMIC).

Our study also has some limitations. First, we followed social distancing recommendations and did a self-report survey online, but, as with any survey of this type, there may be variations in the way some questions are interpreted by participants. Second, our weighted sample has demographic characteristics very close to the Brazilian demographic census but it is not fully compatible and the last Brazilian census was made a decade ago (2010). Therefore, we need to be cautious when interpreting the rates as a representative prevalence of the Brazilian population. Third, the outcome of this study is a complex and delicate question and participants with suicidal ideation may choose not to answer due to the sensitivity of the topic. Conversely, it is possible that the population with these symptoms would be more willing to respond because of their interest in the subject. Fourth, our cross-sectional findings should also be viewed with caution due to the possibility of reverse causality. Finally, we had a significant loss of participants between the two waves of evaluation and this may have happened for several reasons, such as worsening mental health status, suicide in the interval of evaluations, loss of interest in following the study, among others. Despite the limitations, this study provides valuable information about the impact of social relationships on suicidal ideation during the early stage of the COVID-19 pandemic. Since the evolution of the COVID-19 pandemic is still unpredictable and mental health problems are likely to persist even after its complete control, our results can help guide the development of psychological interventions to minimize the effects of the pandemic on suicide.

In summary, loneliness was consistently associated with the incidence of suicidal ideation in a one-month follow-up during the initial stage of the COVID-19 pandemic, while objective social relationship variables related to social isolation, such as living alone, not leaving home, and the number of days practicing social distancing, were not. Therefore, interventions that address the subjective feeling of loneliness will be necessary to reduce suicidal ideation during pandemics.

References

Bradley, K.A., Bush, K.R., Epler, A.J., Dobie, D.J., Davis, T.M., Sporleder, J.L., Maynard, C., Burman, M.L., Kivlahan, D.R., 2003. Two Brief Alcohol-Screening Tests From the Alcohol Use Disorders Identification Test (AUDIT). Archives of Internal Medicine. https://doi.org/10.1001/archinte.163.7.821

Brooks, S.K., Webster, R.K., Smith, L.E., Woodland, L., Wessely, S., Greenberg, N., Rubin, G.J., 2020. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. Lancet 395, 912–920.

Brown, L.H., Silvia, P.J., Myin-Germeys, I., Kwapil, T.R., 2007. When the need to belong goes wrong: the expression of social anhedonia and social anxiety in daily life. Psychol. Sci. 18, 778–782.

Bryan, C.J., Bryan, A.O., Baker, J.C., 2020. Associations among state-level physical distancing measures and suicidal thoughts and behaviors among U.S. adults during the early COVID-19 pandemic. Suicide Life Threat. Behav. 50, 1223–1229.

Bush, K., Kivlahan, D.R., McDonell, M.B., Fihn, S.D., Bradley, K.A., 1998. The AUDIT alcohol consumption questions (AUDIT-C): an effective brief screening test for problem drinking. Ambulatory Care Quality Improvement Project (ACQUIP). Alcohol Use Disorders Identification Test. Arch. Intern. Med. 158, 1789–1795.

Cacioppo, J.T., Cacioppo, S., 2018. The growing problem of loneliness. Lancet 391, 426.

Calati, R., Ferrari, C., Brittner, M., Oasi, O., Olié, E., Carvalho, A.F., Courtet, P., 2019. Suicidal thoughts and behaviors and social isolation: A narrative review of the literature. J. Affect. Disord. 245, 653–667.

Carpena, M.X., Martins-Silva, T., Costa, F.S., Darley, R., Loret de Mola, C., 2019. Contextual risk factors of depression and suicidal thoughts in Brazilian adults: a multilevel analysis. Braz J Psychiatry 41, 433–436.

CDC, 2020. Social Distancing, Quarantine, and Isolation [WWW Document]. Centers for Disease Control and Prevention. URL https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html (accessed 4.11.20).

Centers of Controle Disease and Prevention, n.d. Risk and Protective Factors [WWW Document]. Suicide Prevention. URL https://www.cdc.gov/suicide/factors (accessed 2.9.21).

Cerel, J., Brown, M.M., Maple, M., Singleton, M., van de Venne, J., Moore, M., Flaherty, C., 2019. How Many People Are Exposed to Suicide? Not Six. Suicide Life Threat. Behav. 49, 529–534.

Chang, Q., Chan, C.H., Yip, P.S.F., 2017. A meta-analytic review on social relationships and suicidal ideation among older adults. Soc. Sci. Med. 191, 65–76.

Chen, Y., Hicks, A., While, A.E., 2014. Loneliness and social support of older people in China: a systematic literature review. Health Soc. Care Community 22, 113–123.

Chu, C., Buchman-Schmitt, J.M., Stanley, I.H., Hom, M.A., Tucker, R.P., Hagan, C.R., Rogers, M.L., Podlogar, M.C., Chiurliza, B., Ringer, F.B., Michaels, M.S., Patros, C.H.G., Joiner, T.E., 2017. The interpersonal theory of suicide: A systematic review and meta-analysis of a decade of cross-national research. Psychol. Bull. 143, 1313–1345.

Czeisler, M.É., Lane, R.I., Petrosky, E., Wiley, J.F., Christensen, A., Njai, R., Weaver, M.D., Robbins, R., Facer-Childs, E.R., Barger, L.K., Czeisler, C.A., Howard, M.E., Rajaratnam, S.M.W., 2020. Mental Health, Substance Use, and Suicidal Ideation During the COVID-19 Pandemic - United States, June 24-30, 2020. MMWR Morb. Mortal. Wkly. Rep. 69, 1049–1057.

Ducasse, D., Loas, G., Dassa, D., Gramaglia, C., Zeppegno, P., Guillaume, S., Olié, E., Courtet, P., 2018. Anhedonia is associated with suicidal ideation independently of depression: A meta-analysis. Depress. Anxiety 35, 382–392.

Fazel, S., Runeson, B., 2020. Suicide. N. Engl. J. Med. 382, 266–274.

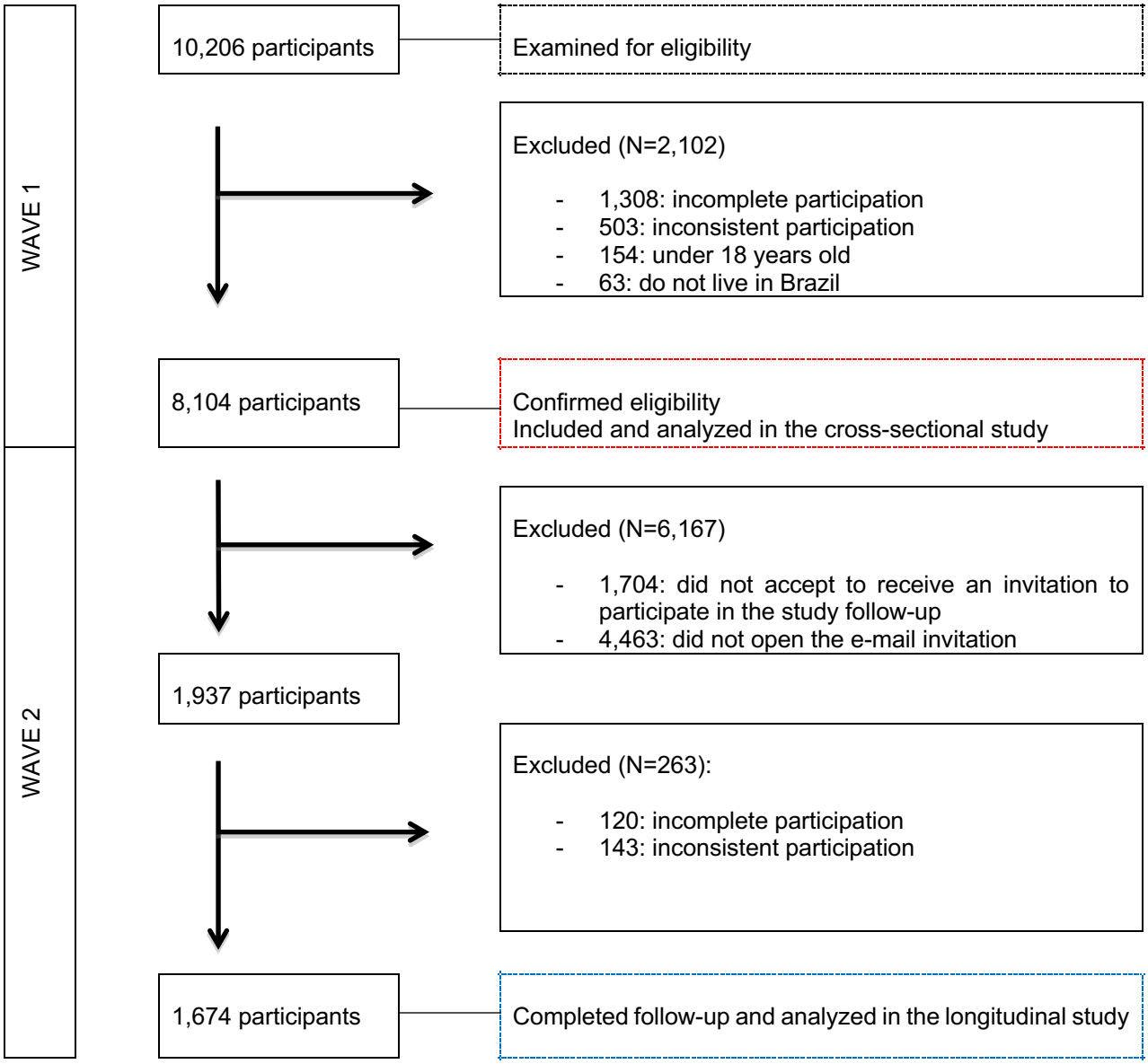
Fiorillo, A., Gorwood, P., 2020. The consequences of the COVID-19 pandemic on mental health and implications for clinical practice. Eur. Psychiatry 63, e32.

Galea, S., Merchant, R.M., Lurie, N., 2020. The Mental Health Consequences of COVID-19 and Physical Distancing. JAMA Internal Medicine. https://doi.org/10.1001/jamainternmed.2020.1562
Group, W.A.W., WHO ASSIST Working Group, 2002. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility. Addiction. https://doi.org/10.1046/j.1360-0443.2002.00185.x
Gunnell, D., Appleby, L., Arensman, E., Hawton, K., John, A., Kapur, N., Khan, M., O'Connor, R.C., Pirkis, J., COVID-19 Suicide Prevention Research Collaboration, 2020. Suicide risk and prevention during the COVID-19 pandemic. Lancet Psychiatry 7, 468–471.
Holmes, E.A., O'Connor, R.C., Perry, V.H., Tracey, I., Wessely, S., Arseneault, L., Ballard, C., Christensen, H., Cohen Silver, R., Everall, I., Ford, T., John, A., Kabir, T., King, K., Madan, I., Michie, S., Przybylski, A.K., Shafran, R., Sweeney, A., Worthman, C.M., Yardley, L., Cowan, K., Cope, C., Hotopf, M., Bullmore, E., 2020. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. Lancet Psychiatry 7, 547–560.
Hughes, M.E., Waite, L.J., Hawkley, L.C., Cacioppo, J.T., 2004. A Short Scale for Measuring Loneliness in Large Surveys. Research on Aging. https://doi.org/10.1177/0164027504268574
Instituto Brasileiro de Geografia e Estatística, 2010. Sinopse do censo demográfico : 2010. IBGE.
Iob, E., Steptoe, A., Fancourt, D., 2020. Abuse, self-harm and suicidal ideation in the UK during the COVID-19 pandemic. Br. J. Psychiatry 217, 543–546.
Joiner, T., 2007. Why People Die by Suicide. Harvard University Press.
Jorgensen, T.D., Pornprasertmanit, S., Schoemann A M Rosseel, 2020. SemTools: Useful tools for structural equation modeling.
Killgore, W.D.S., Cloonan, S.A., Taylor, E.C., Dailey, N.S., 2020. Loneliness: A signature mental health concern in the era of COVID-19. Psychiatry Res. 290, 113117.
Kroenke, K., Spitzer, R.L., Williams, J.B., 2001. The PHQ-9: validity of a brief depression severity measure. J. Gen. Intern. Med. 16, 606–613.
Leaune, E., Samuel, M., Oh, H., Poulet, E., Brunelin, J., 2020. Suicidal behaviors and ideation during emerging viral disease outbreaks before the COVID-19 pandemic: A systematic rapid review. Prev. Med. 141, 106264.
Lederer, D.J., Bell, S.C., Branson, R.D., Chalmers, J.D., Marshall, R., Maslove, D.M., Ost, D.E., Punjabi, N.M., Schatz, M., Smyth, A.R., Stewart, P.W., Suissa, S., Adjei, A.A., Akdis, C.A., Azoulay, É., Bakker, J., Ballas, Z.K., Bardin, P.G., Barreiro, E., Bellomo, R., Bernstein, J.A., Brusasco, V., Buchman, T.G., Chokroverty, S., Collop, N.A., Crapo, J.D., Fitzgerald, D.A., Hale, L., Hart, N., Herth, F.J., Iwashyna, T.J., Jenkins, G., Kolb, M., Marks, G.B., Mazzone, P., Moorman, J.R., Murphy, T.M., Noah, T.L., Reynolds, P., Riemann, D., Russell, R.E., Sheikh, A., Sotgiu, G., Swenson, E.R., Szczesniak, R., Szymusiak, R., Teboul, J.-L., Vincent, J.-L., 2019. Control of Confounding and Reporting of Results in Causal Inference Studies. Guidance for Authors from Editors of Respiratory, Sleep, and Critical Care Journals. Ann. Am. Thorac. Soc. 16, 22–28.
Lee, S.L., Pearce, E., Ajnakina, O., Johnson, S., Lewis, G., Mann, F., Pitman, A., Solmi, F., Sommerlad, A., Steptoe, A., Tymoszuk, U., Lewis, G., 2021. The association between loneliness and depressive symptoms among adults aged 50 years and older: a 12-year population-based cohort study. The Lancet Psychiatry. https://doi.org/10.1016/s2215-0366(20)30383-7
Lim, M.H., Eres, R., Vasan, S., 2020. Understanding loneliness in the twenty-first century: an update on correlates, risk factors, and potential solutions. Soc. Psychiatry Psychiatr. Epidemiol. 55, 793–810.
Lipari, R.N., Park-Lee, E., 2019. Key substance use and mental health indicators in the United States: results from the 2018 National Survey on Drug Use and Health. Substance Abuse and Mental Health Services Administration. Published.
Loas, G., Lefebvre, G., Rotsaert, M., Englert, Y., 2018. Relationships between anhedonia,

suicidal ideation and suicide attempts in a large sample of physicians. PLoS One 13, e0193619.
Loas, G., Solibieda, A., Rotsaert, M., Englert, Y., 2019. Suicidal ideations among medical students: The role of anhedonia and type D personality. PLoS One 14, e0217841.
Luchetti, M., Lee, J.H., Aschwanden, D., Sesker, A., Strickhouser, J.E., Terracciano, A., Sutin, A.R., 2020. The trajectory of loneliness in response to COVID-19. Am. Psychol. 75, 897–908.
Lucke, J.F., 2005. The α and the ω of congeneric test theory: An extension of reliability and internal consistency to heterogeneous tests. Appl. Psychol. Meas. 29, 65–81.
Lumley, T., 2020. Survey: analysis of complex survey samples.
Mamun, M.A., Sakib, N., Gozal, D., Bhuiyan, A.I., Hossain, S., Bodrud-Doza, M., Al Mamun, F., Hosen, I., Safiq, M.B., Abdullah, A.H., Sarker, M.A., Rayhan, I., Sikder, M.T., Muhit, M., Lin, C.-Y., Griffiths, M.D., Pakpour, A.H., 2021. The COVID-19 pandemic and serious psychological consequences in Bangladesh: A population-based nationwide study. J. Affect. Disord. 279, 462–472.
Mann, F., Bone, J.K., Lloyd-Evans, B., Frerichs, J., Pinfold, V., Ma, R., Wang, J., Johnson, S., 2017. A life less lonely: the state of the art in interventions to reduce loneliness in people with mental health problems. Soc. Psychiatry Psychiatr. Epidemiol. 52, 627–638.
Masi, C.M., Chen, H.-Y., Hawkley, L.C., Cacioppo, J.T., 2011. A meta-analysis of interventions to reduce loneliness. Pers. Soc. Psychol. Rev. 15, 219–266.
Matias, A.G.C., Fonsêca, M. de A., Gomes, M. de L. de F., Matos, M.A.A., 2016. Indicators of depression in elderly and different screening methods. Einstein 14, 6–11.
McClelland, H., Evans, J.J., Nowland, R., Ferguson, E., O'Connor, R.C., 2020. Loneliness as a predictor of suicidal ideation and behaviour: a systematic review and meta-analysis of prospective studies. J. Affect. Disord. 274, 880–896.
McGinty, E.E., Presskreischer, R., Han, H., Barry, C.L., 2020. Psychological Distress and Loneliness Reported by US Adults in 2018 and April 2020. JAMA 324, 93–94.
Meneses-Gaya, C., Zuardi, A.W., Loureiro, S.R., Hallak, J.E.C., Trzesniak, C., de Azevedo Marques, J.M., Machado-de-Sousa, J.P., Chagas, M.H.N., Souza, R.M., Crippa, J.A.S., 2010. Is the full version of the AUDIT really necessary? Study of the validity and internal construct of its abbreviated versions. Alcohol. Clin. Exp. Res. 34, 1417–1424.
Ministério da Saúde, n.d. Painel Coronavírus [WWW Document]. Coronavírus Brasil. URL https://covid.saude.gov.br/ (accessed 1.20.21).
Moreno, A.L., DeSousa, D.A., Ana Maria Frota Lisbôa, Manfro, G.G., Salum, G.A., Koller, S.H., Osório, F.L., Crippa, J.A.S., 2016a. Factor Structure, Reliability, and Item Parameters of the Brazilian-Portuguese Version of the GAD-7 Questionnaire. Temas em Psicologia. https://doi.org/10.9788/tp2016.1-25
Moreno, A.L., DeSousa, D.A., Souza, A.M.F.L.P., Manfro, G.G., Salum, G.A., Koller, S.H., Osório, F. de L., Crippa, J.A. de S., Others, 2016b. Factor structure, reliability, and item parameters of the brazilian-portuguese version of the GAD-7 questionnaire. Temas em Psicologia 24, 367–376.
Moreno, C., Wykes, T., Galderisi, S., Nordentoft, M., Crossley, N., Jones, N., Cannon, M., Correll, C.U., Byrne, L., Carr, S., Chen, E.Y.H., Gorwood, P., Johnson, S., Kärkkäinen, H., Krystal, J.H., Lee, J., Lieberman, J., López-Jaramillo, C., Männikkö, M., Phillips, M.R., Uchida, H., Vieta, E., Vita, A., Arango, C., 2020. How mental health care should change as a consequence of the COVID-19 pandemic. Lancet Psychiatry 7, 813–824.
Mortier, P., Vilagut, G., Ferrer, M., Serra, C., de Dios Molina, J., López-Fresneña, N., Puig, T., Pelayo-Terán, J.M., Pijoan, J.I., Emparanza, J.I., Espuga, M., Plana, N., González-Pinto, A., Ortí-Lucas, R.M., de Salázar, A.M., Rius, C., Aragonès, E., Del Cura-González, I., Aragón-Peña, A., Campos, M., Parellada, M., Pérez-Zapata, A., Forjaz, M.J., Sanz, F., Haro, J.M., Vieta, E., Pérez-Solà, V., Kessler, R.C., Bruffaerts, R., Alonso, J., MINDCOVID Working Group, 2021. Thirty-day suicidal thoughts and behaviors among hospital workers during the first wave of the Spain COVID-19 outbreak. Depress. Anxiety. https://doi.org/10.1002/da.23129
Moutier, C., 2020. Suicide Prevention in the COVID-19 Era: Transforming Threat Into

Opportunity. JAMA Psychiatry. https://doi.org/10.1001/jamapsychiatry.2020.3746
Naghavi, M., Global Burden of Disease Self-Harm Collaborators, 2019. Global, regional, and national burden of suicide mortality 1990 to 2016: systematic analysis for the Global Burden of Disease Study 2016. BMJ 364, l94.
Nunnally, J., Jum, N., Bernstein, I.H., Bernstein, I., 1994. Psychometric Theory. McGraw-Hill Companies,Incorporated.
Pu, L., Moyle, W., Jones, C., Todorovic, M., 2019. The Effectiveness of Social Robots for Older Adults: A Systematic Review and Meta-Analysis of Randomized Controlled Studies. Gerontologist 59, e37–e51.
Raykov, T., 1997. Scale Reliability, Cronbach's Coefficient Alpha, and Violations of Essential Tau-Equivalence with Fixed Congeneric Components. Multivariate Behav. Res. 32, 329–353.
R Core Team, 2020. A language and environment for statistical computing.
Richie, F.J., Bonner, J., Wittenborn, A., Weinstock, L.M., Zlotnick, C., Johnson, J.E., 2019. Social Support and Suicidal Ideation Among Prisoners with Major Depressive Disorder. Arch. Suicide Res. 1–8.
Santos, I.S., Tavares, B.F., Munhoz, T.N., de Almeida, L.S.P., da Silva, N.T.B., Tams, B.D., Patella, A.M., Matijasevich, A., 2013. Sensibilidade e especificidade do Patient Health Questionnaire-9 (PHQ-9) entre adultos da população geral. Cadernos de Saúde Pública. https://doi.org/10.1590/s0102-311x2013001200006
Shah, S.G.S., Nogueras, D., van Woerden, H., Kiparoglou, V., 2019. Effectiveness of digital technology interventions to reduce loneliness in adults: a protocol for a systematic review and meta-analysis. BMJ Open 9, e032455.
Steptoe, A., Shankar, A., Demakakos, P., Wardle, J., 2013. Social isolation, loneliness, and all-cause mortality in older men and women. Proc. Natl. Acad. Sci. U. S. A. 110, 5797–5801.
Survey Monkey [WWW Document], n.d. . SurveyMonkey Inc. URL pt.surveymonkey.com
Tan, M., Shallis, A., Barkus, E., 2020. Social anhedonia and social functioning: Loneliness as a mediator. Psych J 9, 280–289.
Thorp, H.H., 2020. Time to pull together. Science 367, 1282.
Turecki, G., Brent, D.A., Gunnell, D., O'Connor, R.C., Oquendo, M.A., Pirkis, J., Stanley, B.H., 2019. Suicide and suicide risk. Nat Rev Dis Primers 5, 74.
Van Orden, K.A., Witte, T.K., Cukrowicz, K.C., 2010. The interpersonal theory of suicide. Psychological.
von Elm, E., Altman, D.G., Egger, M., Pocock, S.J., Gøtzsche, P.C., Vandenbroucke, J.P., STROBE Initiative, 2007. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. Ann. Intern. Med. 147, 573–577.
Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C.S., Ho, R.C., 2020. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. Int. J. Environ. Res. Public Health 17. https://doi.org/10.3390/ijerph17051729
Wang, J., Lloyd-Evans, B., Giacco, D., Forsyth, R., Nebo, C., Mann, F., Johnson, S., 2017. Social isolation in mental health: a conceptual and methodological review. Soc. Psychiatry Psychiatr. Epidemiol. 52, 1451–1461.
Wasserman, D., Iosue, M., Wuestefeld, A., Carli, V., 2020. Adaptation of evidence-based suicide prevention strategies during and after the COVID-19 pandemic. World Psychiatry 19, 294–306.
World Health Organization, 2014. Preventing Suicide: A Global Imperative. World Health Organization.
Xiang, Y.-T., Yang, Y., Li, W., Zhang, L., Zhang, Q., Cheung, T., Ng, C.H., 2020. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. Lancet Psychiatry 7, 228–229.

Figure 1. Flowchart of participants selection



*Inconsistent participation is detailed in the supplementary material (see Method S2)

Table 1. Demographic and personal characteristics of participants

Variable	Cross-sectional study (n=8,104)		Longitudinal study* (n=1,674)	
	n (%)	Weighted sample (%)	n (%)	Weighted sample (%)
Age				
18 – 30 years	3026 (37.3)	30.6	662 (39.5)	32.2
30 – 39 years	2559 (31.6)	24.2	532 (31.8)	25.7
40 – 49 years	1332 (16.4)	18.0	248 (14.8)	16.1
50 – 59 years	822 (10.1)	15.4	159 (9.5)	14.9
≥ 60 years	365 (4.5)	11.8	73 (4.4)	11.0
Sex				
Female	6791 (83.8)	56.1	1448 (86.5)	61.1
Male	1313 (16.2)	43.9	226 (13.5)	38.9
Sexual orientation				
Heterosexual	6816 (84.1)	77.7	1398 (83.5)	77.7
No Heterosexual	1288 (15,9)	22.3	276 (16.5)	22.3
Marital status				
No partner	3655 (45.1)	55.8	793 (47.4)	62.3
With partner	4449 (54.9)	44.2	881 (52.6)	37.7
Living alone	807 (10.0)	15.3	175 (10.5)	18.5
Leaving home	6792 (83.8)	83.2	1377 (82.3)	87.3
Education				
Elementary/Middle/ High School	1326 (16.4)	32.6	206 (12.3)	21.0
Undergraduate	3705 (45.7)	46.4	772 (46.1)	50.9
Postgraduate	3073 (37.9)	21.0	696 (41.6)	28.1

* Data from the baseline

Table 1. (Continued)

Variable	Cross-sectional study (n=8,104)		Longitudinal study* (n=1,674)	
	n (%)	Weighted sample (%)	n (%)	Weighted sample (%)
Income				
A/B	2830 (34.9)	9.3	654 (39.1)	12.7
C	1694 (20.9)	7.8	333 (19.9)	9.2
D/E	3580 (44.2)	82.9	687 (41.0)	78.1
Region				
North	500 (6.2)	8.4	73 (4.4)	7.4
Northeast	2008 (24.8)	29.1	324 (19.4)	26.6
Midwest	843 (10.4)	7.8	133 (7.9)	8.9
Southeast	2430 (30.0)	37.8	568 (33.9)	36.9
South	2323 (28.7)	17.0	576 (34.4)	20.2
Color				
White	4253 (52.5)	50.1	959 (57.3)	48.4
Not White	3851 (47.5)	49.9	715 (42.7)	51.6
Unemployed	1322 (16.3)	33.7	274 (16.4)	32.0
Healthcare professional	2448 (30.2)	19.5	517 (30.9)	21.3

* Data from the baseline

Table 2. Multiple Poisson Regression Analysis to assess the isolated effect of social isolation factors on suicidal ideation in Wave 1

Variables	Prevalence of SI (%)	Crude PR (CI 95%)	Adjusted* PR (CI 95%)	p
Leaving home				
Yes	19.2%	1.04 (0.91 – 1.18)	0.99 (0.88 – 1.13)	0.927
No	19.7%	1.00	1.00	
Living alone				
Yes	21.1%	1.13 (1.00 – 1.28)	1.16 (1.03 – 1.30)	**0.015**
No	18.9%	1.00	1.00	
Social distancing (time)	--	1.000 (1.000 - 1.001)	1.002 (1.000 – 1.004)	**0.027**
R- UCLA Positive				
Yes	27.1%	3.06 (2.69 – 3.47)	1.49 (1.32 - 1.68)	**<0.001**
No	8.7%	1.00	1.00	

* adjusted for age, gender, sexual orientation, marital status, income, geographical area, education, healthcare professional, unemployment, financial crisis during the pandemic, quality of family relationships, quality of friend relationships, religion, meditation, sleep quality, physical activity, childhood trauma, previous suicide attempt, family history of suicide, GAD-7, PHQ-9, cocaine / crack use, benzodiazepines use and AUDIT-C. Abbreviations: SI, Suicidal Ideation; PR, Prevalence Ratio; CI, Confidence Interval; AUDIT-C, Alcohol Use Disorders Identification Test - Concise ; GAD-7, Generalized Anxiety Disorder 7-item; PHQ-9, Patient Health Questionnaire 9-item ; R-UCLA, three-item short form of the Revised University of California, Los Angeles Loneliness Scale.

Table 3. Association of social isolation / loneliness between suicidal ideation groups

Variables	No SI (n=1,227; 73.3%)	Remitted (n=108; 6.4%)	Incidents (n=70; 4.2%)	Persistents (n=270; 16.1%)	P
Leaving home - n(%)	1,035 (84.4)[a]	83 (76.9)	52 (74.3)	213 (78.9)	**0.012**
Living alone – n(%)	203 (16.5)[b]	20 (18.5)	5 (7.1)[b]	81 (30.0)[a]	**<0.001**
Social distancing (yes) – n(%)	1,179 (96.1)	106 (99.1)	66 (94.3)	259 (96.3)	0.366
Social distancing time (days) – median (P25 – P75)	52 (44 – 60)[1]	55 (50 – 60)[12]	51,4 (60 – 61)[12]	60 (49 – 63)[2]	**<0.001**
R-UCLA positive > 6 – n(%)	670 (54.6)[b]	58 (53.7)[b]	55 (78.6)[a]	248 (91.9)[a]	**<0.001**

[ı] positive association by adjusted residual test to 5% significance; [b] negative association by adjusted residual test o 5% significance; [1,2] equal numbers do not differ by Dunn's test at 5% significance. Abbreviations: SI, Suicidal deation; R-UCLA, three-item short form of the Revised University of California, Los Angeles Loneliness Scale.

Table 4 – Multiple Multinomial Logistic Regression Analysis to assess the adjusted effect of isolation factors on suicidal ideation groups between W1 and W2 (longitudinal).

Variables	No SI	Remitted		Incidents		Persistents	
		OR (IC 95%)	P*	OR (IC 95%)	P*	OR (IC 95%)	P*
Leaving home	1.00	0.66 (0.37-1.18)	0.160	0.54 (0.29-1.02)	0.057	0.64 (0.39-1.05)	0.078
Living alone	1.00	3.02 (1.56-5.85)	**0.001**	0.65 (0.24-1.78)	0.400	2.52 (1.48-4.31)	**0.001**
Social distancing time (days)	1.00	1.01 (0.99-1.02)	0.321	1.00 (0.99-1.02)	0.874	1.01 (1.00-1.02)	**0.020**
R-UCLA positive	1.00	0.31 (0,18-0,54)	**<0.001**	2.12 (1.06-4.24)	**0.033**	3.95 (2.25-6.96)	**<0.001**

* adjusted for age, gender, sexual orientation, marital status, income, geographical area, education, profession, unemployment, financial crisis during the pandemic, quality of family relationships, quality of friend relationships, religion, meditation, sleep quality, physical activity, childhood trauma, previous suicide attempt, family history of suicide, GAD-7, PHQ-9, benzodiazepines use and AUDIT-C

8. Considerações Finais e Conclusão

As restrições populacionais às interações sociais normais em contextos de trabalho, lazer, educação e comunidade que foram instituídas durante a crise de saúde pública da COVID-19 nos forçaram a prestar atenção à maneira como interagimos e vivemos uns com os outros. A interação social deficitária pode estar associada a uma diversidade de prejuízos na saúde física e mental, contribuindo para uma mortalidade precoce, inclusive por suicídio. Podemos avaliar as interações sociais através de medidas objetivas da quantidade de relações sociais apresentadas, mas também subjetivas sobre o quão a pessoa se sente inserida nas relações. O objetivo dessa dissertação foi analisar o impacto de medidas objetivas e subjetivas de relacionamentos sociais na ideação suicida durante a pandemia pelo COVID-19.

Este estudo tem vários pontos fortes que valem a pena destacar. Em primeiro lugar, o estudo tem um desenho longitudinal que permite um melhor entendimento da relação de causa e efeito entre os preditores e o desfecho analisado. Em segundo lugar, nossa amostra nacional recrutou indivíduos abrangendo todas as 27 unidades federativas do Brasil e a ponderação da amostra permitiu que as características demográficas fossem próximas às do censo demográfico brasileiro. Terceiro, tínhamos um tamanho de amostra que nos permitiu analisar uma ampla gama de variáveis e, portanto, corrigimos nossas descobertas para vários fatores de confusão. Quarto, este é um dos primeiros estudos a avaliar os impactos da pandemia na saúde mental em países de baixa e média renda (LMIC).

Nosso estudo tem algumas limitações. Seguimos as recomendações de distanciamento social e fizemos uma pesquisa de autorrelato *on-line*, mas, como em qualquer pesquisa desse tipo, pode haver variações na forma como algumas perguntas são interpretadas pelos participantes. Em segundo lugar, nossa amostra ponderada tem características demográficas muito próximas às do censo demográfico brasileiro, mas não é totalmente compatível e o último censo brasileiro foi feito há uma década (2010). Portanto, devemos ser cautelosos ao interpretar as taxas como uma prevalência representativa da população brasileira. Terceiro, os temas abordados por este estudo são complexos e delicados e os participantes com ideação suicida podem optar por não responder devido à sensibilidade do tópico. Por outro lado, é possível que a população com esses sintomas esteja mais disposta a responder devido ao seu interesse pelo assunto.

Por fim, tivemos uma perda significativa de participantes entre as duas ondas de avaliação e isso pode ter acontecido por diversos motivos, como piora do estado de saúde mental, suicídio no intervalo das avaliações, perda de interesse em acompanhar o estudo, entre outros. Apesar das limitações, este estudo fornece informações valiosas sobre o impacto das relações sociais na ideação suicida durante o estágio inicial da pandemia pelo COVID-19.

Em resumo, este foi o primeiro estudo longitudinal a analisar o impacto tanto de medidas objetivas quanto subjetivas de relacionamentos sociais na ideação suicida durante a pandemia de COVID-19. A solidão foi consistentemente associada à incidência de ideação suicida em um mês de acompanhamento durante a fase inicial da pandemia mesmo após ajuste para múltiplas variáveis de confusão. Enquanto variáveis objetivas de relacionamento social como morar sozinho, não sair de casa e o número de dias praticando o distanciamento social não foram associadas.

Como a evolução da pandemia pelo COVID-19 ainda é imprevisível e os problemas de saúde mental como a solidão provavelmente persistirão mesmo após seu controle, nossos resultados podem ajudar a orientar o desenvolvimento de intervenções psicológicas para minimizar os efeitos da pandemia e do pós pandemia sobre o suicídio. A atenção inadequada que tem sido dada a essa questão se reflete em investimento insuficiente em monitoramento, investigação de causas, fatores de manutenção e avaliação de estratégias para reduzir a prevalência e o impacto da solidão. Isso precisa ser corrigido, já que o impacto da solidão a longo prazo na saúde pública pode ser revertido pelos esforços colaborativos de profissionais e pesquisadores multidisciplinares para gerar políticas e programas baseados em evidências.

9. Referências

1. Moreno C, Wykes T, Galderisi S, Nordentoft M, Crossley N, Jones N, et al. How mental health care should change as a consequence of the COVID-19 pandemic. Lancet Psychiatry. 2020 Sep;7(9):813–24.

2. Galea S, Merchant RM, Lurie N. The Mental Health Consequences of COVID-19 and Physical Distancing [Internet]. Vol. 180, JAMA Internal Medicine. 2020. p. 817. Available from: http://dx.doi.org/10.1001/jamainternmed.2020.1562

3. Moutier C. Suicide Prevention in the COVID-19 Era: Transforming Threat Into Opportunity. JAMA Psychiatry [Internet]. 2020 Oct 16 [cited 2020 Oct 19]; Available from: https://jamanetwork.com/journals/jamapsychiatry/fullarticle/2772135

4. McClelland H, Evans JJ, Nowland R, Ferguson E, O'Connor RC. Loneliness as a predictor of suicidal ideation and behaviour: a systematic review and meta-analysis of prospective studies. J Affect Disord. 2020 Sep 1;274:880–96.

5. Cacioppo JT, Cacioppo S. The growing problem of loneliness. Lancet. 2018 Feb 3;391(10119):426.

6. Wang J, Lloyd-Evans B, Giacco D, Forsyth R, Nebo C, Mann F, et al. Social isolation in mental health: a conceptual and methodological review. Soc Psychiatry Psychiatr Epidemiol. 2017 Dec;52(12):1451–61.

7. Mann F, Bone JK, Lloyd-Evans B, Frerichs J, Pinfold V, Ma R, et al. A life less lonely: the state of the art in interventions to reduce loneliness in people with mental health problems. Soc Psychiatry Psychiatr Epidemiol. 2017 Jun;52(6):627–38.

8. Lee SL, Pearce E, Ajnakina O, Johnson S, Lewis G, Mann F, et al. The association between loneliness and depressive symptoms among adults aged 50 years and older: a 12-year population-based cohort study [Internet]. Vol. 8, The Lancet Psychiatry. 2021. p. 48–57. Available from: http://dx.doi.org/10.1016/s2215-0366(20)30383-7

9. Jeste DV, Lee EE, Cacioppo S. Battling the modern behavioral epidemic of loneliness: Suggestions for research and interventions. JAMA Psychiatry. 2020 Jun 1;77(6):553–4.

10. Turecki G, Brent DA, Gunnell D, O'Connor RC, Oquendo MA, Pirkis J, et al. Suicide and suicide risk. Nature Reviews Disease Primers [Internet]. 2019;5(1). Available from: http://dx.doi.org/10.1038/s41572-019-0121-0

11. Fazel S, Runeson B. Suicide. N Engl J Med. 2020 Jan 16;382(3):266–74.

12. World Health Organization. Preventing Suicide: A Global Imperative. World Health Organization; 2014. 89 p.

13. Naghavi M, Global Burden of Disease Self-Harm Collaborators. Global, regional, and national burden of suicide mortality 1990 to 2016: systematic analysis for the Global Burden of Disease Study 2016. BMJ. 2019 Feb 6;364:l94.

14. Cerel J, Brown MM, Maple M, Singleton M, van de Venne J, Moore M, et al. How Many People Are Exposed to Suicide? Not Six. Suicide Life Threat Behav. 2019 Apr;49(2):529–34.

15. Czeisler MÉ, Lane RI, Petrosky E, Wiley JF, Christensen A, Njai R, et al. Mental Health, Substance Use, and Suicidal Ideation During the COVID-19 Pandemic - United States,

June 24-30, 2020. MMWR Morb Mortal Wkly Rep. 2020 Aug 14;69(32):1049–57.

16. Lipari RN, Park-Lee E. Key substance use and mental health indicators in the United States: results from the 2018 National Survey on Drug Use and Health. Substance Abuse and Mental Health Services Administration Published. 2019;

17. Gunnell D, Appleby L, Arensman E, Hawton K, John A, Kapur N, et al. Suicide risk and prevention during the COVID-19 pandemic. The Lancet Psychiatry. 2020;7(6):468–71.

18. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. Lancet. 2020 Mar 14;395(10227):912–20.

19. Leaune E, Samuel M, Oh H, Poulet E, Brunelin J. Suicidal behaviors and ideation during emerging viral disease outbreaks before the COVID-19 pandemic: A systematic rapid review. Prev Med. 2020 Dec;141:106264.

20. World Health Organization. World Health Statistics 2017: Monitoring Health for the SDGs, Sustainable Development Goals. World Health Organization; 2017. 112 p.

21. Nock MK, Borges G, Bromet EJ, Alonso J, Angermeyer M, Beautrais A, et al. Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. Br J Psychiatry. 2008 Feb;192(2):98–105.

22. Reger MA, Stanley IH, Joiner TE. Suicide Mortality and Coronavirus Disease 2019-A Perfect Storm? JAMA Psychiatry [Internet]. 2020 Apr 10; Available from: http://dx.doi.org/10.1001/jamapsychiatry.2020.1060

23. CDC. Social Distancing, Quarantine, and Isolation [Internet]. Centers for Disease Control and Prevention. 2020 [cited 2020 Apr 11]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html

24. Turecki G, Brent DA. Suicide and suicidal behaviour. Lancet. 2016 Mar 19;387(10024):1227–39.

25. Van Orden KA, Witte TK, Cukrowicz KC, Braithwaite SR, Selby EA, Joiner TE Jr. The interpersonal theory of suicide. Psychol Rev. 2010 Apr;117(2):575–600.

26. Smith BJ, Lim MH. How the COVID-19 pandemic is focusing attention on loneliness and social isolation. Public Health Res Pract [Internet]. 2020 Jun 30;30(2). Available from: http://dx.doi.org/10.17061/phrp3022008

27. Hawkley LC, Cacioppo JT. Loneliness matters: a theoretical and empirical review of consequences and mechanisms. Ann Behav Med. 2010 Oct;40(2):218–27.

28. Valtorta NK, Kanaan M, Gilbody S, Ronzi S, Hanratty B. Loneliness and social isolation as risk factors for coronary heart disease and stroke: systematic review and meta-analysis of longitudinal observational studies. Heart. 2016 Jul 1;102(13):1009–16.

29. Holt-Lunstad J, Smith TB, Baker M, Harris T, Stephenson D. Loneliness and social isolation as risk factors for mortality: a meta-analytic review. Perspect Psychol Sci. 2015 Mar;10(2):227–37.

30. Cacioppo JT, Patrick W. Loneliness: Human Nature and the Need for Social Connection. W. W. Norton & Company; 2008. 336 p.

31. Cacioppo JT, Hawkley LC. Perceived social isolation and cognition. Trends Cogn Sci.

2009 Oct 1;13(10):447–54.

32. Cacioppo JT, Ernst JM, Burleson MH, McClintock MK, Malarkey WB, Hawkley LC, et al. Lonely traits and concomitant physiological processes: the MacArthur social neuroscience studies. Int J Psychophysiol. 2000 Mar;35(2-3):143–54.

33. Adam EK, Hawkley LC, Kudielka BM, Cacioppo JT. Day-to-day dynamics of experience–cortisol associations in a population-based sample of older adults. Proc Natl Acad Sci U S A. 2006 Nov 7;103(45):17058–63.

34. Steptoe A, Owen N, Kunz-Ebrecht SR, Brydon L. Loneliness and neuroendocrine, cardiovascular, and inflammatory stress responses in middle-aged men and women. Psychoneuroendocrinology. 2004 Jun;29(5):593–611.

35. Courtin E, Knapp M. Social isolation, loneliness and health in old age: a scoping review. Health Soc Care Community. 2017 May;25(3):799–812.

36. Luo Y, Hawkley LC, Waite LJ, Cacioppo JT. Loneliness, health, and mortality in old age: a national longitudinal study. Soc Sci Med. 2012 Mar;74(6):907–14.

37. Beutel ME, Klein EM, Brähler E, Reiner I, Jünger C, Michal M, et al. Loneliness in the general population: prevalence, determinants and relations to mental health. BMC Psychiatry. 2017 Mar 20;17(1):97.

38. Calati R, Ferrari C, Brittner M, Oasi O, Olié E, Carvalho AF, et al. Suicidal thoughts and behaviors and social isolation: A narrative review of the literature. J Affect Disord. 2019;245:653–67.

39. Chang Q, Chan CH, Yip PSF. A meta-analytic review on social relationships and suicidal ideation among older adults. Soc Sci Med. 2017 Oct;191:65–76.

40. Yao H, Chen J-H, Xu Y-F. Patients with mental health disorders in the COVID-19 epidemic. Lancet Psychiatry. 2020 Apr;7(4):e21.

41. Oyesanya M, Lopez-Morinigo J, Dutta R. Systematic review of suicide in economic recession. World J Psychiatry. 2015 Jun 22;5(2):243–54.

42. Marcon G, Massaro Carneiro Monteiro G, Ballester P, Cassidy RM, Zimerman A, Brunoni AR, et al. Who attempts suicide among medical students? Acta Psychiatr Scand. 2020 Mar;141(3):254–64.

43. Rotenstein LS, Ramos MA, Torre M, Segal JB, Peluso MJ, Guille C, et al. Prevalence of Depression, Depressive Symptoms, and Suicidal Ideation Among Medical Students: A Systematic Review and Meta-Analysis. JAMA. 2016 Dec 6;316(21):2214–36.

44. Dutheil F, Aubert C, Pereira B, Dambrun M, Moustafa F, Mermillod M, et al. Suicide among physicians and health-care workers: A systematic review and meta-analysis. PLoS One. 2019 Dec 12;14(12):e0226361.

45. Mortier P, Vilagut G, Ferrer M, Serra C, Molina JD, López-Fresneña N, et al. Thirty-day suicidal thoughts and behaviors among hospital workers during the first wave of the Spain COVID-19 outbreak. Depress Anxiety. 2021 May;38(5):528–44.

46. Borges G, Bagge CL, Cherpitel CJ, Conner KR, Orozco R, Rossow I. A meta-analysis of acute use of alcohol and the risk of suicide attempt. Psychol Med. 2017 Apr;47(5):949–57.

47. Borges G, Nock MK, Haro Abad JM, Hwang I, Sampson NA, Alonso J, et al. Twelve-month prevalence of and risk factors for suicide attempts in the World Health Organization World Mental Health Surveys. J Clin Psychiatry. 2010 Dec;71(12):1617–28.

48. Iob E, Steptoe A, Fancourt D. Abuse, self-harm and suicidal ideation in the UK during the COVID-19 pandemic. Br J Psychiatry. 2020 Oct;217(4):543–6.

49. Mamun MA, Sakib N, Gozal D, Bhuiyan AI, Hossain S, Bodrud-Doza M, et al. The COVID-19 pandemic and serious psychological consequences in Bangladesh: A population-based nationwide study. J Affect Disord. 2021 Jan 15;279:462–72.

10. ANEXOS

10.1 Material suplementar do artigo

Supplemental material of "Loneliness, but not social distancing, is associated with the incidence of suicidal ideation during the COVID-19 outbreak: a longitudinal study"

Table of Contents:

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Table S1. STROBE Statement—Checklist of items that should be included in reports of ***cohort studies***

	Item No	Recommendation	Pages
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1-2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	3
Introduction			
Background /rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5,6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5,6
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	5,6
		(*b*) For matched studies, give matching criteria and number of exposed and unexposed	-
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-8

Bias	9	Describe any efforts to address potential sources of bias	8-9
Study size	10	Explain how the study size was arrived at	-
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	8,9
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	8,9
		(*b*) Describe any methods used to examine subgroups and interactions	9
		(*c*) Explain how missing data were addressed	9
		(*d*) If applicable, explain how loss to follow-up was addressed	9
		(*e*) Describe any sensitivity analyses	8-9
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Figure 1
		(b) Give reasons for non-participation at each stage	Figure 1
		(c) Consider use of a flow diagram	Figure 1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	10, Table 1
		(b) Indicate number of participants with missing data for each variable of interest	Figure 1
		(c) Summarise follow-up time (eg, average and total amount)	10, Figure 1
Outcome data	15*	Report numbers of outcome events or summary measures over time	10

Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10,11 Tables 1,2,3, and 4
		(*b*) Report category boundaries when continuous variables were categorized	10,11
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	-
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	11
Discussion			
Key results	18	Summarise key results with reference to study objectives	11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-14
Generalisability	21	Discuss the generalisability (external validity) of the study results	14
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	15

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.

Table S2. Variation in the prevalence of social isolation factors, mental health symptoms and loneliness between W1 and W2.

Variables	Onda 1	Onda 2	p
Leaving home – n(%)	1382 (82.6)	1462 (87.3)	**<0.001**
Social distancing – n(%)	1611 (96.2)	1504 (89.8)	**<0.001**
Days of social distancing – median (P25 – P75)	54 (45 – 60)	30 (20 – 30)*	-
PHQ positive – n(%)	1258 (73.9)	1258 (75.1)	0.261
GAD positive – n(%)	1159 (69.2)	1070 (63.9)	**<0.001**
AUDIT C positive – n(%)	414 (24.7)	359 (21.4)	**0.001**
R-UCLA positiva > 6 – n(%)	1031 (61.6)	1044 (62.3)	0.502
Suicidal ideation– n(%)	378 (22.6)	340 (20.3)	**0.005**

* Time between the two waves. Abbreviations: W1, Wave 1; W2, Wave 2; AUDIT-C, Alcohol Use Disorders Identification Test - Concise; GAD-7, Generalized Anxiety Disorder 7-item; PHQ-9, Patient Health Questionnaire 9-item; R-UCLA, three-item short form of the Revised University of California, Los Angeles Loneliness Scale.

Table S3. Univariate Poisson regression analysis to assess the effect of several factors on suicidal ideation in W1.

Variables	Total sample n (%)	Weighted sample (%)	Prevalence of SI	Prevalence ratio (CI 95%)	p
Region					
North	500 (6.2)	8.4	17.8%	1.20 (0.96–1.50)	0.109
Northeast	2008 (24.8)	29.1	22.8%	1.61 (1.36–1.90)	**<0.001**
Midwest	843 (10.4)	7.8	25.6%	1.94 (1.58–2.37)	**<0.001**
Southeast	2430 (30.0)	37.8	17.9%	1.20 (1.01–1.42)	**0.033**
South	2323 (28.7)	17.0	14.2%	1.00	
Gender					
Female	6791 (83.8)	56.1	19.7%	1.11 (1.01–1.22)	**0.035**
Male	1313 (16.2)	43.9	18.8%	1.00	
Age					
18 – 30	3026 (37.3)	30.6	28.0%	4.97 (3.82–6.47)	**<0.001**
30 – 39	2559 (31.6)	24.2	18.8%	3.42 (2.61–4.49)	**<0.001**
40 – 49	1332 (16.4)	18.0	15.6%	2.72 (2.05–3.61)	**<0.001**
50 – 59	822 (10.1)	15.4	17.3%	3.19 (2.41–4.23)	**<0,001**
≥ 60	365 (4.5)	11.8	5.8%	1.00	
Heterosexual					
Yes	6816 (84.1)	77.7	16.3%	0.57 (0.52–0.62)	**<0.001**
No	1288 (15.9)	22.3	29.5%	1.00	

Table S3. Continued

Variables	Total sample n (%)	Weighted sample (%)	Prevalence of SI	Prevalence ratio (CI 95%)	p
Marital status					
With partner	4449 (54.9)	44.2	17.0%	1.23 (1.12–1.36)	**<0.001**
No partner	3655 (45.1)	55.8	21.1%	1.00	
Living alone					
Yes	807 (10.0)	15.3	21.1%	1.13 (1.00–1.28)	**0.048**
No	7297 (90.0)	84.7	18.9%	1.00	
Children					
Yes	3219 (39.7)	48.2	15.8%	0.70 (0.63–0.77)	**<0.001**
No	4885 (60.3)	51.8	22.5%	1.00	
Income					
A/B	2830 (34.9)	9.3	7.6%	1.00	
C	1694 (20.9)	7.8	13.1%	2.52 (1.45–4.37)	**0.001**
D/E	3580 (44.2)	82.9	21.2%	4.41 (2.73–7.13)	**<0.001**
Education					
Elementary/ Middle/ High School	1326 (16.4)	32.6	19.7%	1.39 (1.18–1.63)	**<0.001**
Undergraduate	3705 (45.7)	46.4	22.1%	1.65 (1.41–1.92)	**<0.001**
Postgraduate	3073 (37.9)	21.0	12.4%	1.00	

Table S3. Continued

Variables	Total sample n (%)	Weighted sample (%)	Prevalence of SI	Prevalence ratio (CI 95%)	p
Unemployed					
Yes	1322 (16.3)	33.7	23.6%	1.31 (1.20–1.44)	**<0.001**
No	6782 (83.7)	66.3	17.1%	1.00	
Healthcare professional					
Yes	2448 (30.2)	19.5	12.9%	0.63 (0.54–0.74)	**<0.001**
No	5656 (69.8)	80.5	20.8%	1.00	
Religion					
Yes	4173 (51.5)	55.4	16.0%	0,66 (0.60–0.73)	**<0.001**
No	3931 (48.5)	44.6	23.4%	1.00	
Childhood trauma					
Yes	3254 (40.2)	44.2	31.4%	3.43 (3.07–3.83)	**<0.001**
No	4850 (59.8)	55.8	9.6%	1.00	
Family suicide					
Yes	1109 (13.7)	16.7	24.0%	1.34 (1.20–1.49)	**<0.001**
No	6995 (86.3)	83.3	18.3%	1.00	
Leaving home					
Yes	6792 (83.8)	83.2	19.2%	1.04 (0.91–1.18)	0.563
No	1312 (16.2)	16.8	19.7%	1.00	

Table S3. Continued

Variables	Total sample n (%)	Weighted sample (%)	Prevalence of SI	Prevalence ratio (CI 95%)	p
Pandemic financial crisis					
Yes	4924 (60.8)	74.7	21.2%	1.50 (1.32–1.71)	**<0.001**
No	3180 (39.2)	25.3	13.6%	1.00	
Physical activity					
Yes	3412 (42.1)	38.7	14.2%	1.55 (1.39–1.72)	**<0.001**
No	4692 (57.9)	61.3	22.5%	1.00	
Relationship with family					
Bad / Regular	3462 (42.7)	49.5	26.1%	2.04 (1.84–2.26)	**<0.001**
Good / Excellent	4642 (57.3)	50.5	12.6%	1.00	
Relationship with friends					
Bad / Regular	4071 (50.2)	55.3	23.6%	1.70 (1.53–1.88)	**<0.001**
Good / Excellent	4033 (49.8)	44.7	13.9%	1.00	
Sleep quality					
Bad / Regular	5810 (71.7)	75.9	22.0%	2.05 (1.77–2.38)	**<0.001**
Good / Excellent	2294 (28.3)	24.1	10.5%	1.00	

Table S3. Continued

Variables	Total sample n (%)	Weighted sample (%)	Prevalence of SI	Prevalence ratio (CI 95%)	p
Benzodiazepines user					
Yes	1503 (18.5)	23.1	27.1%	1.57 (1.43–1.74)	**<0.001**
No	6601 (81.5)	76.9	16.9%	1.00	
Cocaine / Crack user					
Yes	49 (0.6)	0.9	39.5%	2.18 (1.65–2.87)	**<0.001**
No	8055 (99.4)	99.1	19.1%	1.00	
AUDIT Positive					
Yes	2583 (31.9)	24.8	21.0%	1.13 (1.02–1.26)	**0.022**
No	5521 (68.1)	75.2	18.7%	1.00	
GAD Positive					
Yes	5292 (65.3)	66.6	25.6%	3.62 (3.11–4.22)	**<0.001**
No	2812 (34.7)	33.4	6.8%	1.00	
PHQ Positive					
Yes	5734 (70.8)	69.4	26.5%	9.23 (7.22–11.8)	**<0.001**
No	2370 (29.2)	30.6	2.9%	1.00	
R- UCLA Positive					
Yes	4186 (51.7)	57.7	27.1%	3.06 (2.69–3.47)	**<0.001**
No	3918 (48.3)	42.3	8.7%	1.00	

Abbreviation: W1, Wave 1, SI, suicidal ideation.

Table S4 – Multinomial Logistic Regression Analysis to assess the adjusted effect of variables on suicidal ideation groups between W1 and W2 (Longitudinal)

Variables	**No SI**	**Remitted**		**Incidents**		**Persistents**	
		OR (IC 95%)	**P**	**OR (IC 95%)**	**P**	**OR (IC 95%)**	**P**
Leaving home	1.00	0.66 (0.37-1.18)	0.160	0.54 (0.29-1.02)	0.057	0.64 (0.39-1.05)	0.078
Living alone	1.00	3.02 (1.56-5.85)	**0.001**	0.65 (0.24-1.78)	0.400	2.52 (1.48-4.31)	**0.001**
Social distancing time (days)	1.00	1.01 (0.99-1.02)	0.321	1.00 (0.99-1.02)	0.874	1.01 (1.00-1.02)	**0.020**
R-UCLA positive	1.00	0.31 (0.18-0.54)	**<0.001**	2.12 (1.06-4.24)	**0.033**	3.95 (2.25-6.96)	**<0.001**
Region							
North	1.00	0.16 (0.03-1.05)	0.056	0.45 (0.12-1.64)	0.225	3.20 (1.35-7.60)	**0.008**
Northeast	1.00	1.22 (0.60-2.50)	0.582	0.77 (0.36-1.64)	0.495	1.43 (0.73-2.80)	0.299
Midwest	1.00	3.82 (1.47-9.93)	**0.006**	1.61 (0.62-4.17)	0.330	5.49 (2.44-12.4)	**<0.001**
Southeast	1.00	1.05 (0.53-2.06)	0.897	0.63 (0.30-1.32)	0.222	2.40 (1.22-4.69)	**0.011**
South	1.00	1.00	-	1.00	-	1.00	-
Gender Female	1.00	0.64 (0.36-1.16)	0.141	2.76 (1.33-5.75)	**0.007**	0.36 (0.23-0.57)	**<0.001**
Heterosexual	1.00	0.63 (0.34-1.16)	0.136	0.68 (0.34-1.37)	0.278	0.30 (0.20-0.47)	**<0.001**
Having a partner	1.00	1.50 (0.88-2.56)	0.136	1.03 (0.59-1.79)	0.922	1.36 (0.87-2.14)	0.175
Unemployed	1.00	3.61 (2.10-6.20)	**<0.001**	0.43 (0.20-0.91)	**0.028**	0.46 (0.29-0.73)	**0.001**
Healthcare professional	1.00	2.16 (1.21-3.86)	**0.009**	2.00 (1.06-3.79)	**0.033**	1.59 (0.93-2.70)	0.089
Financial Crisis	1.00	0.83 (0.47-1.47)	0.517	1.15 (0.61-2.17)	0.668	1.81 (1.08-3.04)	**0.026**
Family relationship (Bad/Regular)	1.00	2.26 (1.33-3.84)	**0.003**	1.59 (0.91-2.81)	0.107	3.22 (2.05-5.06)	**<0.001**
Friendship relationship (Bad/Regular)	1.00	0.99 (0.58-1.70)	0.971	1.14 (0.63-2.05)	0.673	1.12 (0.70-1.79)	0.642

Table S4. Continued

Variables	No SI	Remitted		Incidents		Persistents	
		OR (IC 95%)	P	OR (IC 95%)	P	OR (IC 95%)	P
Physical Activity	1.00	1.05 (0.64-1.73)	0.839	1.52 (0.84-2.74)	0.163	1.20 (0.79-1.82)	0.405
Sleep Quality (Bad/Regular)	1.00	1.07 (0.54-2.12)	0.843	0.79 (0.39-1.63)	0.528	0.93 (0.51-1.71)	0.824
Meditation	1.00	0.72 (0.44-1.19)	0.204	1.22 (0.67-2.24)	0.518	0.83 (0.54-1.29)	0.418
Religion	1.00	0.42 (0.26-0.69)	**0.001**	0.59 (0.34-1.02)	0.059	0.40 (0.27-0.59)	**<0.001**
Childhood Trauma	1.00	1.26 (0.76-2.07)	0.371	1.38 (0.79-2.43)	0.259	2.18 (1.39-3.43)	**0.001**
Users of benzodiazepine	1.00	0.76 (0.44-1.30)	0.313	0.47 (0.24-0.93)	**0.030**	0.74 (0.48-1.14)	0.173
Family suicide	1.00	0.49 (0.24-1.00)	**0.049**	1.29 (0.67-2.49)	0.446	1.19 (0.72-1.97)	0.507
Previous suicide attempt	1.00	3.16 (1.68-5.95)	**<0.001**	2.70 (1.39-5.25)	**0.003**	3.18 (1.98-5.11)	**<0.001**
Education	1.00						
Elementary/Middle/High School	1.00	0.42 (0.17-1.03)	0.058	0.56 (0.20-1.59)	0.275	1.64 (0.89-3.03)	0.112
Undergraduate	1.00	2.23 (1.24-4.02)	**0.008**	1.35 (0.69-2.63)	0.384	0.75 (0.45-1.25)	0.268
Postgraduate	1.00	1.00		1.00		1.00	
Household Income							
A/B	1.00	1.00		1.00		1.00	
C	1.00	1.32 (0.43-4.05)	0.628	0.77 (0.29-2.07)	0.601	1.16 (0.40-3.37)	0.783
D/E	1.00	1.07 (0.42-2.70)	0.891	0.54 (0.24-1.23)	0.143	1.53 (0.62-3.77)	0.354
AUDIT positive	1.00	0.28 (0.15-0.52)	**<0.001**	0.37 (0.18-0.78)	**0.009**	0.82 (0.52-1.29)	0.392
GAD positive	1.00	1.69 (0.85-3.35)	0.133	0.83 (0.39-1.79)	0.633	4.44 (2.06-9.59)	**<0.001**
PHQ positive	1.00	14.3 (5.41-38.0)	**<0,001**	4.61 (1.66-12.8)	**0.003**	45.1 (10.8-189)	**<0.001**

Abbreviations: W1, Wave 1; W2, Wave 2; SI, suicidal ideation

QUESTIONNAIRE (ENGLISH VERSION)

1. Outcome: **Suicidal ideation (Wave 1 and Wave 2)**

Over the past month, have you had any desire or thoughts about killing yourself?

- ❑ Yes
- ❑ No

2. **Predictors**

2.1 Objective measures of social relationship

2.1.1 Social Distancing

Do you consider yourself to be practicing “social distancing” measures because of the COVID-19 outbreak (according to the Johns Hopkins Medicine, social distancing includes: working or studying from home, cancelling or postponing large meetings, maintaining social contact by electronic devices instead of in person, staying at least 2 meters away from others)?

- ❑ Yes
- ❑ No

If yes, for how long have you been under social distancing measures due to the COVID-19 outbreak? (number of days; if your answer to the previous question was “no”, put 0).

2.1.2 Living Alone

How many people have been living under the same roof as you since the COVID-19 outbreak began? (Number of people including you)

2.1.3 Leaving Home

After the outbreak of COVID-19 in your country, how often have you left your house? (Number of days/week)

2.2 Subjective measure of social relationship (UCLA - Loneliness)

How often do you feel that you lack companionship?

- ❏ Hardly ever
- ❏ Sometimes
- ❏ Often

How often do you feel left out?

- ❏ Hardly ever
- ❏ Sometimes
- ❏ Often

How often do you feel isolated from others?

- ❏ Hardly ever
- ❏ Sometimes
- ❏ Often

3. Confounding variables

3.1 Age:

Year of Birth: (YYYY)

3.1.2 Geographical area

Which Brazilian state do you live in?

3.1.3 Gender

What is your biological sex?

- ❑ Female
- ❑ Male
- ❑ I prefer not to answer

3.1.4 Sexual orientation

What is your sexual orientation?

- ❑ Heterosexual
- ❑ Homosexual
- ❑ Bisexual
- ❑ Other
- ❑ I prefer not to answer

3.1.5 Marital Status

What is your current marital status?

- ❑ Single
- ❑ Dating
- ❑ Married/Domestic Partnership
- ❑ Divorced
- ❑ Widowed

3.1.6 Income:

Your household's monthly income, including primary family members living in the same roof, is:

- ❑ Under R$ 1.045,00
- ❑ Between R$ 1.045,00 and R$ 3.135,00
- ❑ Between R$ 3.135,00 and R$ 5.225,00

- ❑ Between R$ 5.225,00 and R$ 15.675,00
- ❑ Over R$ 15.675,00

3.1.7 Education

What is your education level?

- ❑ Elementary school (incomplete)
- ❑ Elementary school
- ❑ High school (incomplete)
- ❑ High school
- ❑ Undergraduate degree (incomplete)
- ❑ Undergraduate degree
- ❑ Graduate degree (incomplete or complete)

3.1.8 Unemployment

Are you currently working?

- ❑ Yes, with an employment contract
- ❑ Yes, without an employment contract
- ❑ Yes, I am a civil servant
- ❑ I am currently studying
- ❑ Unemployed
- ❑ Retired

3.1.9 Healthcare professional

Are you a healthcare professional?

- ❑ Yes
- ❑ No

3.1.10 Financial crises during pandemic

Do you believe that your monthly income has been or will be reduced during the COVID-19 outbreak?

- ❑ Yes
- ❑ No

3.1.11 Quality of family relationships

How would you define the quality of your family relationships at the present moment?

- ❑ Poor
- ❑ Average
- ❑ Good
- ❑ Excellent

3.1.12 Quality of friend relationships

How would you define the quality of your relationships with friends at the present moment?

- ❑ Poor
- ❑ Average
- ❑ Good
- ❑ Excellent

3.1.13 Physical activity

At the present moment, how much physical activity do you engage in per week?

- ❑ I am not exercising
- ❑ Less than 30 minutes/week
- ❑ Between 30-75 minutes/week
- ❑ Between 75-150 minutes/week

❑ More than 150 minutes/week

3.1.14 Sleep quality

How would you define the quality of your sleep at the present moment?

❑ Poor

❑ Average

❑ Good

❑ Excellent

3.1.15 Meditation

Over the past month, on average how many minutes of meditation have you practiced per day?

❑ I do not practice meditation

❑ Less than 10 minutes

❑ Between 10 and 20 minutes

❑ More than 20 minutes

3.1.16 Religion

Are you a practitioner of any religion?

❑ Yes

❑ No

3.1.17 Childhood trauma

Did you suffer any kind of trauma or were a victim of maltreatment (harassment, neglect, discrimination and/or abuse) during your childhood/adolescence?

❑ Yes

❑ No

3.1.18 Family history of suicide:

Has anyone in your family committed suicide (grandparents, parents, children, aunts, uncles, siblings, cousins)?

- ❑ Yes
- ❑ No

3.1.19 Previous suicide attempt:

Have you ever committed any suicide attempt? (A potentially self-injurious act committed with at least some wish to die as a result of the act).

- ❑ I have never attempted to commit suicide
- ❑ I have attempted to commit suicide once
- ❑ I have attempted to commit suicide twice
- ❑ I have attempted to commit suicide three times or more

3.1.20 Depressive symptoms (PHQ-9)

Over the last 2 weeks, how often have you had little interest or pleasure in doing things?

- ❑ Not at all
- ❑ Several days
- ❑ Over half the days
- ❑ Nearly every day

Over the last 2 weeks, how often have you been feeling down, depressed, or hopeless?

- ❑ Not at all
- ❑ Several days
- ❑ Over half the days
- ❑ Nearly every day

Over the last 2 weeks, how often have you had trouble falling or staying asleep, or sleeping too much?

- ❑ Not at all
- ❑ Several days
- ❑ Over half the days
- ❑ Nearly every day

Over the last 2 weeks, how often have you been feeling tired or having little energy?

- ❑ Not at all
- ❑ Several days
- ❑ Over half the days
- ❑ Nearly every day

Over the last 2 weeks, how often have you been with poor appetite or overeating?

- ❑ Not at all
- ❑ Several days
- ❑ Over half the days
- ❑ Nearly every day

Over the last 2 weeks, how often have you been feeling bad about yourself, or that you are a failure or have let yourself or your family down?

- ❑ Not at all
- ❑ Several days
- ❑ Over half the days
- ❑ Nearly every day

Over the last 2 weeks, how often have you been having trouble concentrating on things, such as reading the newspaper or watching television?

- ❑ Not at all
- ❑ Several days
- ❑ Over half the days
- ❑ Nearly every day

Over the last 2 weeks, how often have you been moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety or restless that you have been moving around a lot more than usual?

- ❑ Not at all
- ❑ Several days
- ❑ Over half the days
- ❑ Nearly every day

Over the last 2 weeks, how often have you had thoughts that you would be better off dead, or of hurting yourself?

- ❑ Not at all
- ❑ Several days
- ❑ Over half the days
- ❑ Nearly every day

3.1.21 Anxiety symptoms (GAD-7)

Over the last 2 weeks, how often have you been feeling nervous, anxious, or on edge?

- ❑ Not at all
- ❑ Several days
- ❑ Over half the days

❑ Nearly every day

Over the last 2 weeks, how often have you not been able to stop or control worrying?

❑ Not at all

❑ Several days

❑ Over half the days

❑ Nearly every day

Over the last 2 weeks, how often have you been worrying too much about different things?

❑ Not at all

❑ Several days

❑ Over half the days

❑ Nearly every day

Over the last 2 weeks, how often have you had trouble relaxing?

❑ Not at all

❑ Several days

❑ Over half the days

❑ Nearly every day

Over the last 2 weeks, how often have you been so restless that it's hard to sit still?

❑ Not at all

❑ Several days

❑ Over half the days

❑ Nearly every day

Over the last 2 weeks, how often have you become easily annoyed or irritable?

❑ Not at all

❑ Several days

❑ Over half the days

❑ Nearly every day

Over the last 2 weeks, how often have you been feeling afraid as if something awful might happen?

❑ Not at all

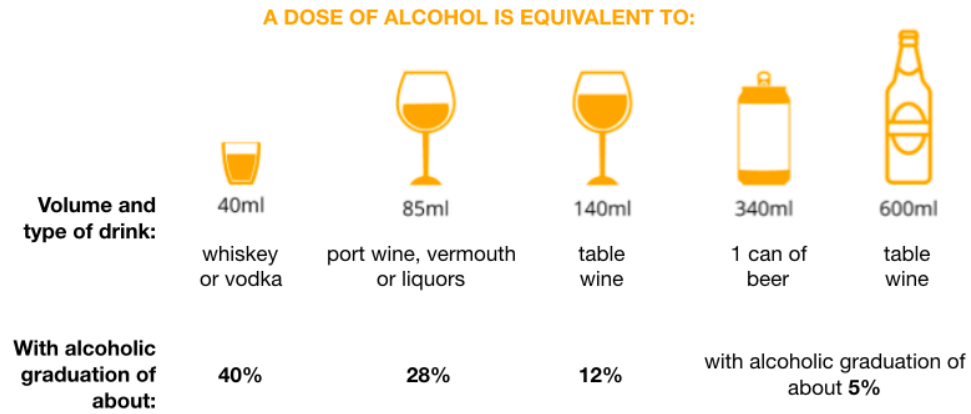
❑ Several days

❑ Over half the days

❑ Nearly every day

3.1.22 Alcohol abuse (AUDIT-C modified for the last 30 days)

Considering the past 30 days, how often do you have a drink containing alcohol (consider a "drink" to be a can or bottle of beer, a glass of wine, a wine cooler, or one cocktail or a shot of hard liquor like scotch, gin, or vodka)?



❑ Never

❑ Monthly or less

❑ 2 to 4 times a month

❑ 2 to 3 times a week

❑ 4 or more times a week

Considering the past 30 days, how many standard drinks containing alcohol do you have on a typical day?

❑ Zero, 1 or 2

❑ 3 or 4

❑ 5 or 6

❑ 7 to 9

❑ 10 or more

Considering the past 30 days, how often do you have 6 or more drinks on one occasion?

❑ Never

❑ Less than monthly

❑ Monthly

❑ Weekly

❑ Daily or almost daily

3.1.23 Cocaine/crack use

Considering the past 30 days, have you used cocaine or crack?

❑ No

❑ Less than weekly

❑ Weekly or daily

3.1.23 Benzodiazepines use

Considering the past 30 days, how many times have you used benzodiazepines (this class of psychoactive medications includes examples such as clonazepam, diazepam, bromazepam, alprazolam (Xanax), lorazepam)?

- ❑ None
- ❑ 1 or 2 times
- ❑ Weekly
- ❑ Daily or almost daily

QUESTIONNAIRE - PORTUGUESE VERSION

1. Desfecho: **Ideação suicida (Onda 1 and Onda 2)**

No último mês, você tem ou teve desejo ou pensamentos de tirar sua própria vida?

- ❑ Sim
- ❑ Não

2. **Preditores**

2.1 Medidas objetivas de relacionamentos sociais

2.1.1 Distanciamento social

Você considera estar praticando medidas de “distanciamento social” por conta do surto de COVID-19?

De acordo com o Instituto de Medicina Johns Hopkins essas medidas incluem pontos como: trabalhar e/ou estudar em casa, cancelar ou adiar reuniões, manter contato social por dispositivos eletrônicos ao invés de pessoalmente e ficar pelo menos 2 metros longe de outras pessoas)?

- ❑ Sim
- ❑ Não

Se sim, há quantos dias está em distanciamento social por conta do surto de COVID-19? (se não, coloque "0")

2.1.2 Viver sozinho

Quantas pessoas estão em casa com você durante esse período de surto? (número de pessoas incluindo você)

2.1.3 Sair de casa

Após o início do surto de COVID-19 no seu país, quantos dias por semana, em média, você tem saído de casa?

2.2 Medida subjetiva de relacionamentos sociais (UCLA - Solidão)

Com que frequência você se sente com falta de companhia?

- ❑ Quase nunca
- ❑ Algumas vezes
- ❑ Frequentemente

Com que frequência você se sente abandonado?

- ❑ Quase nunca
- ❑ Algumas vezes
- ❑ Frequentemente

Com que frequência você se sente isolado de outras pessoas?

- ❑ Quase nunca
- ❑ Algumas vezes
- ❑ Frequentemente

3. Confounding variables

3.1 Idade:

Ano de nascimento: (YYYY)

3.1.2 Área geográfica

Em que estado brasileiro você mora?

3.1.3 Gênero

Qual é o seu sexo designado ao nascimento?

- ❑ Feminino
- ❑ Masculino
- ❑ Prefiro não responder

3.1.4 Orientação sexual

Qual a sua orientação sexual?

- ❑ Heterossexual
- ❑ Homossexual
- ❑ Bissexual
- ❑ Outro
- ❑ Prefiro não responder

3.1.5 Estado civil

Qual seu estado civil atual?

- ❑ Solteiro
- ❑ Namorando
- ❑ Casado (a)/ União Estável
- ❑ Divorciado
- ❑ Viúvo (a)

3.1.6 Renda:

Sua renda familiar mensal, considerando todos os integrantes de sua família que moram em seu domicílio, é em torno de :

- ❑ Menos do que R$ 1.045,00
- ❑ De R$ 1.045,00 a R$ 3.135,00
- ❑ De R$ 3.135,00 a R$ 5.225,00
- ❑ De R$ 5.225,00 a R$ 15.675,00
- ❑ Mais de R$ 15.675,00

3.1.7 Educação

Qual o seu grau de escolaridade:

- ❑ Ensino fundamental incompleto
- ❑ Ensino fundamental completo
- ❑ Ensino médio incompleto
- ❑ Ensino médio completo
- ❑ Ensino superior incompleto
- ❑ Ensino superior completo
- ❑ Pós- graduação (incompleta ou completa)

3.1.8 Desemprego

Você está atualmente trabalhando?

- ❑ Sim, com carteira assinada
- ❑ Sim, trabalho de forma informal/autônomo
- ❑ Sim, sou funcionário público
- ❑ Eu estou estudando
- ❑ Desempregado

- ❑ Aposentado

3.1.9 Profissional da saúde

Você é um profissional de saúde?

- ❑ Sim
- ❑ Não

3.1.10 Crise financeira durante a pandemia

Você acha que sua renda financeira mensal está comprometida durante o momento do surto de COVID-19 no país?

- ❑ Sim
- ❑ Não

3.1.11 Qualidade de relação com familiares

Quanto aos seus relacionamentos familiares, você considera que no momento atual estejam:

- ❑ Ruins
- ❑ Regulares
- ❑ Bons
- ❑ Excelentes

3.1.12 Qualidade de relação com amigos

Quanto aos seus relacionamentos com amigos(as), você considera que no momento atual estejam:

- ❑ Ruins
- ❑ Regulares
- ❑ Bons
- ❑ Excelentes

3.1.13 Atividade física

No momento atual, quantos minutos você tem praticado de atividade física por semana?

- ❑ Não estou fazendo atividade física
- ❑ Menos que 30 minutos
- ❑ Entre 30-75 minutos
- ❑ Entre 75-150 minutos
- ❑ Acima de 150 minutos

3.1.14 Qualidade do sono

Como você define a qualidade do seu sono atualmente?

- ❑ Ruim
- ❑ Regular
- ❑ Bom
- ❑ Excelente

3.1.15 Meditação

No último mês, em média quantos minutos você tem praticado de meditação por dia?

- ❑ Não pratico meditação
- ❑ Menos que 10 minutos
- ❑ Entre 10-20 minutos
- ❑ Acima de 20 minutos

3.1.16 Religião

Você é membro praticante de alguma religião?

- ❑ Sim

❑ Não

3.1.17 Trauma na infância

Você sofreu algum tipo de trauma ou foi vítima de maus tratos (assédio, negligência, discriminação e/ou abuso) durante sua infância/adolescência?

❑ Yes

❑ No

3.1.18 História familiar de suicídio:

Alguém da sua família (avós, pais, filhos, tios, irmãos, primos) já se suicidou?

❑ Sim

❑ Não

3.1.19 Tentativa prévia de suicídio:

Você já realizou alguma tentativa de suicídio? Na tentativa de suicídio, o indivíduo tem o intuito de tirar a própria vida.

❑ Nunca realizei nenhuma tentativa de suicídio

❑ Já realizei uma tentativa de suicídio

❑ Já realizei duas tentativas de suicídio

❑ Já realizei três ou mais tentativas de suicídio

3.1.20 Sintomas depressivos (PHQ-9)

Nas últimas duas semanas, com que frequência você teve pouco interesse ou pouco prazer em fazer as coisas?

❑ Nenhum dia

❑ Menos de uma semana

❑ Uma semana ou mais

- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você se sentiu para baixo, deprimido(a) ou sem perspectiva?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você teve dificuldade para pegar no sono ou permanecer dormindo ou dormiu mais do que de costume?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você se sentiu cansado(a) ou com pouca energia?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você teve falta de apetite ou comeu demais?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais

- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você se sentiu mal consigo mesmo(a) ou achou que é um fracasso ou que decepcionou sua família ou a você mesmo(a)?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você teve dificuldade para se concentrar nas coisas (como ler o jornal ou ver televisão)?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você teve lentidão para se movimentar ou falar (a ponto das outras pessoas perceberem), ou ao contrário, esteve tão agitado(a) que você ficava andando de um lado para o outro mais do que de costume?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você pensou em se ferir de alguma maneira ou que seria melhor estar morto(a)?

- ❑ Nenhum dia

- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

3.1.21 Sintomas de ansiedade (GAD-7)

Nas últimas duas semanas, com que frequência você se sentiu nervoso(a), ansioso(a) ou muito tenso(a)?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você não foi capaz de impedir ou controlar suas preocupações?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você se preocupou muito com diversas coisas?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência teve dificuldade para relaxar?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você ficou tão agitado(a) que se tornou difícil permanecer sentado(a)?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você ficou facilmente aborrecido(a) ou irritado(a)?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

Nas últimas duas semanas, com que frequência você sentiu medo como se algo horrível fosse acontecer?

- ❑ Nenhum dia
- ❑ Menos de uma semana
- ❑ Uma semana ou mais
- ❑ Quase todos os dias

3.1.22 Abuso de álcool (AUDIT-C modificado para os últimos 30 dias)

Em relação aos últimos 30 dias, com que frequência você toma bebidas alcoólicas?

- ❑ Nunca
- ❑ 1 vez por mês
- ❑ De 2 a 4 vezes por mês
- ❑ De 2 a 3 vezes por semana
- ❑ 4 ou mais vezes por semana

Em relação aos últimos 30 dias, nas ocasiões em que você bebe, quantas doses consome tipicamente? Observação: 1 dose-padrão = 40mL de vodka ou 40mL de pinga ou 40mL de uísque ou 1 taça de vinho de mesa ou 1 lata de cerveja, conforme a imagem abaixo:

- ❑ Não bebo
- ❑ 1 ou 2
- ❑ 3 ou 4
- ❑ 5 ou 6
- ❑ 7, 8 ou 9
- ❑ 10 ou mais

Em relação aos últimos 30 dias, com que frequência você toma 6 ou mais doses em uma única ocasião?

- ❑ Nunca
- ❑ Menos do que uma vez ao mês
- ❑ Mensalmente
- ❑ Semanalmente
- ❑ Todos ou quase todos os dias

3.1.23 Uso de Cocaine/crack

Em relação aos últimos 30 dias, você fez uso de cocaína ou crack?

- ❑ Não
- ❑ Menos que semanalmente
- ❑ Semanalmente ou Diariamente

3.1.23 Uso de Benzodiazepínico

Em relação aos últimos 30 dias, com que frequência você utilizou benzodiazepínicos (esses remédios incluem o Rivotril, Frontal, Lexotan, clonazepam, diazepam, bromazepam, alprazolam, lorazepam, etc.)?

- ❑ Não usei nos últimos 30 dias
- ❑ 1 ou 2 vezes
- ❑ Semanalmente
- ❑ Diariamente ou quase todos os dias

Inconsistencies in answering the questionnaire

We excluded 503 participants in wave 1 and 143 in wave 2 due to errors and inconsistencies in the responses to the questionnaire. The inconsistencies mentioned above in the two waves were mainly due to two questions. The first question was whether the participants were practicing social distancing and in the second question we asked how long they had been practicing. We excluded participants who said they were practicing social distancing in the first question, but filled 0 days in the second question, as well as those who said they were not practicing social distancing and filled a time of one or more days of social distancing. Additionally, some participants filled their birthday and not the year of birth, making it impossible to calculate their age.