


# Relationship between the COVID-19 pandemic, binge eating, and mental suffering in health professionals in Brazil: a cross-sectional study

Relação entre a pandemia da COVID-19, compulsão alimentar e sofrimento mental em profissionais de saúde no Brasil: um estudo transversal

Rodrigo Fernandes Weyll **Pimentel**<sup>1,2,3</sup> , Lucas Monteiro **Rodrigues**<sup>2</sup>, Rubens Leal **Rocha**<sup>2</sup>, Amália Ivine Costa **Santana**<sup>4</sup>, Pedro Carlos Muniz de **Figueiredo**<sup>1</sup>, Mirela Lucciola do Valle **Carvalho**<sup>2</sup>, Dandara Almeida Reis da **Silva**<sup>3</sup>, Vivian Marques Miguel **Suen**<sup>5</sup>, Magno Conceição das **Mercês**<sup>3,4</sup>

**ABSTRACT | Introduction:** The high levels of anxiety, stress, and depression produced by the global Coronavirus disease 2019 pandemic could trigger eating disorders. Health professionals are more exposed to these changes due to their work environment. **Objectives:** To evaluate the relationship between the COVID-19 pandemic and the onset of binge eating disorder and psychiatric disorders in Brazilian health professionals. **Methods:** This descriptive, prospective, cross-sectional study interviewed 219 Brazilian health professionals between June and October 2020 using an online questionnaire. The 7-Item Binge Eating Disorder Screener was used to diagnose binge eating disorder. The Self-Reporting Questionnaire was used to assess psychiatric disorders. The statistical analysis included calculation of absolute frequency, relative frequency, mean and standard deviation. Contingency coefficient C was used to determine the association between the variables. **Results:** A total of 35 (16%) participants reported symptoms related to binge eating disorder, while 131 (59.8%) reported psychiatric symptoms. There was an association between binge eating disorder, psychiatric disorders, and body mass index. **Conclusions:** Our findings suggest the onset of psychiatric disorders and binge eating disorders in these professionals and that elevated body mass index is directly associated with these disorders.

**Keywords |** health personnel; coronavirus infections; binge-eating disorder; psychological stress; mental disorders.

**RESUMO | Introdução:** Devido à pandemia global da doença do coronavírus 2019 (COVID-19), altos níveis de ansiedade, estresse e depressão têm sido observados na população em geral, os quais podem exacerbar os gatilhos relacionados aos transtornos alimentares. Os profissionais de saúde estão mais expostos a essas alterações devido às próprias condições de seus ambientes de trabalho. **Objetivos:** Avaliar a relação entre a pandemia da COVID-19 e o aparecimento de transtornos psiquiátricos e de compulsão alimentar em profissionais de saúde no Brasil. **Métodos:** Trata-se de um estudo descritivo e transversal. Foram entrevistados 219 profissionais de saúde do Brasil de junho a outubro de 2020 através de questionário *on-line*. Para o diagnóstico de transtorno de compulsão alimentar, foi utilizado o 7Item Binge Eating Disorder Screener. Já para a avaliação de transtorno psiquiátrico, foi utilizado o Self-Reporting Questionnaire. Para a análise estatística, foram calculadas as frequências absoluta e relativa, a média e o desvio padrão. Para a análise da associação entre as variáveis, foi utilizado o coeficiente de contingência C. **Resultados:** Observou-se que 35 (16%) participantes demonstraram apresentar sintomas relacionados a transtorno de compulsão alimentar. Um total de 131 (59,8%) participantes demonstraram apresentar sintomas relacionados a transtorno psiquiátrico. Houve associação entre a presença de transtornos psiquiátricos e de compulsão alimentar e a classificação do estado nutricional pelo índice de massa corpórea. **Conclusões:** Nossos achados sugerem que houve um surgimento de transtornos psiquiátricos e de compulsão alimentar nos profissionais entrevistados e que o índice de massa corpórea elevado está diretamente associado à presença desses transtornos.

**Palavras-chave |** pessoal de saúde; infecções por coronavírus; transtorno da compulsão alimentar; estresse psicológico; transtornos mentais.

<sup>1</sup> Serviço de Nutrologia, Complexo Hospitalar Universitário Professor Edgard Santos, Salvador, BA, Brazil.

<sup>2</sup> Curso de Medicina, Universidade Salvador, Salvador, BA, Brazil.

<sup>3</sup> Departamento de Ciências da Vida, Universidade do Estado da Bahia, Salvador, BA, Brazil.

<sup>4</sup> Programa de Pós-Graduação em Ciências da Saúde, Universidade Federal da Bahia, Salvador, BA, Brazil.

<sup>5</sup> Divisão de Nutrologia, Departamento de Clínica Médica, Faculdade de Medicina de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto, SP, Brazil.

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## INTRODUCTION

Coronavirus 2019 disease (COVID-19) is now a global pandemic. By April 15, 2020, the World Health Organization (WHO) had reported 1,914,916 confirmed cases of infection (with 123,010 deaths), with almost every country in the world affected.<sup>1</sup> Significant medical complications, morbidity, and the rapid international spread have led to the prompt public health measures around the world. Most countries have decided to isolate positive cases and their close contacts and limit social interaction to reduce transmission. As a result, it is very likely that there will be an increase in unhealthy eating habits, sedentary lifestyles, deprivation from outdoor activities, and increased screen time.<sup>2</sup>

During pandemics, daily activities stop or slow down and social distancing is encouraged to reduce human interaction and, thus, new infections.<sup>3</sup> However, the routine of health professionals is the opposite. Due to the exponential increase in health care demand, these professionals face long work shifts, often with few resources and poor infrastructure,<sup>4</sup> as well as the need for personal protective equipment, which can cause physical discomfort and difficulty breathing.<sup>5</sup>

Previous studies have shown that epidemics and outbreaks are followed by drastic individual and social psychosocial impacts that eventually become more widespread than the epidemic itself.<sup>6,7</sup> Due to the current pandemic, high levels of anxiety, stress, and depression have been observed in the general population.<sup>8,9</sup> Psychosocial stress and orders to stay at home can exacerbate eating disorders (ED), in addition to presenting a challenging environment for individuals with anorexia nervosa, bulimia nervosa, and binge eating disorder (BED).<sup>10,11</sup> People with ED are at high physical risk (for example, frailty in anorexia nervosa, electrolyte disturbances in bulimia nervosa, and cardiovascular risk in BED), psychological stress due to confinement, and suffering due to uncertainty and disruptions in psychological treatment.<sup>12</sup>

After the 2003 severe acute respiratory syndrome (SARS-CoV) outbreak, it was found that dietary restrictions triggered psychiatric disorders in a

Chinese population.<sup>13</sup> Work, overload, and stress-related symptoms make health professionals especially vulnerable to psychiatric disorders.<sup>14</sup> Several studies have shown that this class of workers reports high rates of depressive symptoms, anxiety, insomnia, and anguish, which impacts eating and exercise habits.<sup>15,16</sup> Many professionals report that, due to the use of personal protective equipment, they spend about 6 hours without being able to eat or go to the bathroom, which results in further changes in eating behavior.<sup>17</sup>

Given such evidence and the scarcity of studies on this issue, this study aimed to assess the relationship between the COVID-19 pandemic and the emergence of BED and mental suffering in a sample of Brazilian health professionals.

## METHODS

Between June and October 2020, this descriptive, prospective, cross-sectional study used social networks and e-mail to invite health professionals (doctors, nurses, speech therapists, dentists, nursing technicians, physical therapists, nutritionists and psychologists) from public and private hospitals in Brazil to answer an online questionnaire prepared in Microsoft Forms®. The instrument was completed by 219 professionals, a non-probabilistic convenience sample.

Health professionals aged 18 to 60 years of both sexes who worked in public or private Brazilian hospitals in the fight against COVID-19, whether in the healthcare or administrative sphere, were included. Individuals who reported having been diagnosed with any psychiatric disorder related to ED (anorexia, bulimia and/or BED) were excluded.

BED is characterized by recurrent episodes of binge eating that are accompanied by a feeling of lack of control and heightened anxiety about eating behaviors.<sup>18</sup> The 7-Item Binge Eating Disorder Screener, a brief screening instrument developed by Herman et al. that is comparable to existing tools and is widely used in clinical settings, was used to diagnose BED.<sup>18</sup>

The Self-Reporting Questionnaire, which was developed by Harding et al.,<sup>19</sup> was used to assess

psychiatric disorders. This questionnaire was chosen because it has been translated, tested, and validated for urban Brazilian populations.<sup>20,21</sup> The questionnaire consists of 20 items, dichotomized into “yes” or “no” responses, that address physical symptoms and psycho-emotional disorders. Following Mari et al.,<sup>20</sup> the cut-off score used in this study was 8, with higher scores considered probable cases of psychological disorders.

The patients self-reported weight and height at the time of response to determine body mass index (BMI). Since the data were only collected online, the researchers could not measure anthropometric data objectively.

Absolute and relative frequencies were calculated for categorical variables, while the mean and standard deviation were calculated for continuous variables. Statistical analysis was performed using Microsoft Excel® for Windows®, version 2019. To determine the association between categorical variables, the contingency coefficient *C* was used, with  $p < 0.05$  considered statistically significant.

All procedures conformed to Resolution 466/2012 on research involving human beings.<sup>22</sup> All participants provided written informed consent prior to inclusion. This study was approved by the State University of Bahia Research Ethics Committee (CAAE 32374020.7.0000.0057; N° 4074759).

## RESULTS

A total of 219 health professionals, mean age was 35.6 ( $\pm 13.6$ ) years, completed the questionnaire. The other participant characteristics are shown in Table 1.

A total of 35 (16%) participants reported BED-related symptoms. The relationships between BED and sex and between BED and occupation were not statistically significant ( $p = 0.8997$  and  $p = 0.4305$ , respectively). There was, however, an association between BED and BMI ( $p = 0.03$ ). The data are summarized in Table 2.

A total of 131 (59.8%) participants reported symptoms of psychiatric disorders. The relationships between psychiatric disorders and sex and between

psychiatric disorders and occupation were not significant ( $p = 0.4493$  and  $p = 0.3483$ , respectively). There was, however, an association between psychiatric disorders and BMI ( $p = 0.05$ ). The data are summarized in Table 3.

## DISCUSSION

The WHO, the U.S. Centers for Disease Control and Prevention, and other health authorities around the world currently working to contain the COVID-19 pandemic recommend social distancing and quarantine measures. However, the impact of the pandemic on the population's mental health, especially that of health professionals, must also be emphasized.

Our results showed a higher prevalence of BED in women, which was similar to the results of Mohammadi et al.,<sup>23</sup> who assessed the role of sex in different psychiatric disorders. These authors found a positive relationship between increased BMI and psychiatric disorders only in women.

**Table 1.** Participant characteristics in numbers (n) and percentages (%)

Variable	n	%
Sex		
Female	183	83.6
Male	36	16.4
Profession		
Psychologist	6	2.7
Dentist	7	3.2
Speech therapist	9	4.1
Technician	9	4.1
Physical therapist	16	7.3
Nutritionist	16	7.3
Nurse	74	33.8
Physician	82	37.4
Body mass index		
Underweight	6	2.7
Eutrophic	104	47.5
Overweight	71	32.4
Obesity grade I	29	13.2
Obesity grade II	8	3.7
Obesity grade III	1	0.5

Our study assessed the relationship between BED and mental suffering in health professionals during the COVID-19 pandemic. Compared to the neuropsychiatric manifestations that occurred in previous coronavirus outbreaks, it is clear that SARS-CoV-2 carries the same risk.<sup>24</sup> Approximately 60% of the participants in this study had psychological symptoms, of whom 32.8% were physicians and 35.9% were nurses. These results agree with Chan et al.,<sup>25</sup> who studied the psychological impact of the 2003 SARS-CoV outbreak in a Singapore hospital. They found that 35% of the physicians and 25% of the nurses had a psychiatric disorder.<sup>25</sup>

Lai et al.<sup>16</sup>, another recent study that corroborates our results, analyzed factors associated with the mental health of health professionals exposed to COVID-19. The authors reported that female nurses aged 26 to 40 years had a higher prevalence

of depressive symptoms, anxiety, insomnia, and stress. Nurses work on the front lines with COVID-19 patients and are constantly challenged physically and psychologically to provide high quality care. A number of stress factors influence the psychological response of health professionals to infectious disease epidemics, such as a feeling of vulnerability or loss of control over the situation, in addition to concern for both their own health and that of others and family members, since they can be active transmitters of the disease.<sup>26</sup>

Shah et al.<sup>27</sup> studied patients who suffered from Middle Eastern respiratory syndrome, severe acute respiratory syndrome, influenza, and Ebola, finding an unequivocal relationship between neuropsychiatric symptoms and infectious outbreaks in high-risk populations (both healthcare professionals and

**Table 2.** Participant characteristics regarding binge eating disorder (BED) symptoms presented in numbers (n) and percentage (%)

Variable	With BED		Without BED	
	n	%	n	%
Sex				
Female	30	85.7	153	83.2
Male	5	14.3	31	16.8
Profession				
Psychologist	0	0.0	6	3.3
Dentist	1	2.9	6	3.3
Speech therapist	1	2.9	8	4.3
Technician	2	5.7	7	3.8
Physical therapist	1	2.9	15	8.2
Nutritionist	0	0.0	16	8.7
Nurse	14	40.0	60	32.6
Physician	16	45.7	66	35.9
Body mass index*				
Underweight	0	0.0	6	3.3
Eutrophic	9	25.7	95	51.6
Overweight	15	42.9	56	30.4
Obesity grade I	9	25.7	20	10.9
Obesity grade II	2	5.7	6	3.3
Obesity grade III	0	0.0	1	0.5

\* p=0.03.

**Table 3.** Participant characteristics regarding psychiatric disorders (psychological disorders) presented in numbers (n) and percentage (%)

Variable	With psychiatric disorders		Without psychiatric disorders	
	n	%	n	%
Sex				
Female	112	85.5	71	80.7
Male	19	14.5	17	19.3
Profession				
Psychologist	4	3.1	2	2.3
Dentist	3	2.3	4	4.5
Speech therapist	7	5.3	2	2.3
Technician	7	5.3	2	2.3
Physical therapist	8	6.1	8	9.1
Nutritionist	12	9.2	4	4.5
Nurse	47	35.9	27	30.7
Physician	43	32.8	39	44.3
Body mass index*				
Underweight	4	3.1	2	2.3
Eutrophic	52	39.7	52	59.1
Overweight	45	34.4	26	29.5
Obesity grade I	22	16.8	7	8.0
Obesity grade II	7	5.3	1	1.1
Obesity grade III	1	0.8	0	0.0

\* p=0.05.

patients). There are similarities between these previous outbreaks and the COVID-19 pandemic, since they resulted in an increasing sense of foreboding and fear, heightened feelings of anxiety and panic, and post-traumatic stress disorder symptoms. Moreover, evidence suggests that these adverse cognitive and psychiatric sequelae can have lasting effects on people at risk, which is even more worrisome.<sup>27</sup>

We also found a direct association between high BMI and the onset of psychiatric disorders. Both disorders increase the morbidity and mortality rate, especially when they overlap.<sup>23</sup> Gutiérrez et al.<sup>28</sup> analyzed the relationship between BMI and psychiatric status in a Spanish population, finding that the association between psychiatric disorders, such as depression and adjustment disorder, and high BMI can be explained through the relationship between stress and body weight.

An Australian longitudinal study by Harding et al.<sup>29</sup> found that stressful events in the last 12 months had a positive association with weight gain, consequently increasing BMI and resulting in psychiatric disorders.<sup>29</sup> Compared to standard living conditions, the anxiety and tedium of quarantine are considered risk factors for high food consumption, including poor quality food. Impaired nutritional habits can lead to weight gain.

Our study also found a direct association between BED and high BMI. The relationship between eating disorders and BMI is already well known in the literature. Our findings corroborate those of Stice et al.,<sup>30</sup> who studied the risk factors for future eating disorders. They found that a BMI below the normal value increases the risk of anorexia nervosa, while a high BMI increases the risk of bulimia nervosa and BED, ie, disorders are associated with more unregulated diets.<sup>30</sup> Termoshuizen et al.<sup>31</sup> studied the impact of COVID-19 on individuals with ED, finding that worsening ED behaviors were broadly consistent with self-reported ED (eg, greater food restriction in anorexia nervosa and increased binge eating in bulimia nervosa and BED).

It should be pointed out that, despite evidence of an association between high BMI and psychiatric

disorders in this study, the researchers could not objectively measure the respondents' anthropometric data, which could represent a measurement bias. In addition, the convenience sample, which self-reported the presence or absence of psychiatric disorders, may have involved a selection bias due to undercoverage, since the data were collected online. It should also be pointed out that this type of study can attract more respondents who are interested in the topic, which is another type of selection bias.

Since this is a current topic, the literature is still scarce. In the coming months and years, further studies will deepen our understanding of long-term neuropsychiatric sequelae in both COVID-19 patients and health professionals.

## CONCLUSIONS

The present study investigated the relationship between the COVID-19 pandemic and psychological and eating disorders in front-line health professionals. Our findings suggest an onset of psychiatric disorders and BED in these professionals and that a high BMI was directly associated with these disorders.

## AUTHOR CONTRIBUTIONS

RFPW was responsible for study conceptualization, data curation, formal analysis, investigation, methodology, project administration, resources, visualization, writing – original draft and writing – review & editing. LMR, RLR, AICS, PCMF, MLVC and DARS participated in the study conceptualization, investigation, methodology, validation and writing – original draft. VMMS participated in the study conceptualization, investigation and methodology. MCM participated in the study conceptualization, data curation, formal analysis, investigation, methodology, project administration, resources, supervision and writing – review & editing. All authors have read and approved the final version submitted and take public responsibility for all aspects of the work.



## REFERENCES

- World Health Organization (WHO). Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected. Interim guidance. Geneva: WHO; 2020 [cited 2020 Nov. 12]. Available from: <https://www.who.int/publications/i/item/10665-331495>
- Balanza-Martínez V, Atienza-Carbonell B, Kapczinski F, De Boni RB. Lifestyle behaviours during the COVID-19 - time to connect. *Acta Psychiatr Scand*. 2020;141(5):399-400.
- Wilder-Smith A, Freedman DO. Isolation, quarantine, social distancing and community containment: pivotal role for old-style public health measures in the novel coronavirus (2019-nCoV) outbreak. *J Travel Med*. 2020;27(2):taaa020.
- Shigemura J, Ursano RJ, Morganstein JC, Kurosawa M, Benedek DM. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry Clin Neurosci*. 2020;74(4):281-2.
- Huang JZ, Han MF, Luo TD, Ren AK, Zhou XP. [Mental health survey of medical staff in a tertiary infectious disease hospital for COVID-19]. *Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi*. 2020;38(3):192-5.
- Li Z, Ge J, Yang M, Feng J, Qiao M, Jiang R, et al. Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. *Brain Behav Immun*. 2020;88:916-9.
- Ornell F, Schuch JB, Sordi AO, Kessler FHP. „Pandemic fear“ and COVID-19: mental health burden and strategies. *Braz J Psychiatry*. 2020;42(3):232-5.
- Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. 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*. 2020;17(5):1729.
- Zhu Y, Chen L, Ji H, Xi M, Fang Y, Li Y. The risk and prevention of novel coronavirus pneumonia infections among inpatients in psychiatric hospitals. *Neurosci Bull*. 2020;36(3):299-302.
- Hensley L [Internet]. Why the coronavirus pandemic is triggering those with eating disorders. *Global News*; 2020 [cited 2020 Nov. 12]. Available from: <https://globalnews.ca/news/6735525/eating-disorder-coronavirus/>
- McMenemy [Internet]. Coronavirus and eating disorders: 'I feel selfish buying food'. *BBC News*; 2020 [cited 2020 Nov. 12]. Available from: <https://www.bbc.com/news/uk-england-51962964>
- Grave RD [Internet]. Coronavirus disease 2019 and eating disorders: what do people with eating disorders have to address during the pandemic? *Psychology Today*; 2020 [cited 2020 Nov. 12]. Available from: <https://www.psychologytoday.com/us/blog/eating-disorders-the-facts/202003/coronavirus-disease-2019-and-eating-disorders>
- Mihashi M, Otsubo Y, Yinjuan X, Nagatomi K, Hoshiko M, et al. Predictive factors of psychological disorder development during recovery following SARS outbreak. *Health Psychol*. 2009;28(1):91-100.
- Malta M, Rimoin AW, Strathdee SA. The coronavirus 2019-nCoV epidemic: is hindsight 20/20? *EClinicalMedicine*. 2020;20:100289.
- Sepulveda AR, Whitney J, Hankins M, Treasure J. Development and validation of an Eating Disorders Symptom Impact Scale (EDSIS) for carers of people with eating disorders. *Health Qual Life Outcomes*. 2008;6:28.
- Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Netw Open*. 2020;3(3):e203976.
- Zhang WR, Wang K, Yin L, Zhao WF, Xue Q, Peng M, et al. Mental health and psychosocial problems of medical health workers during the COVID-19 epidemic in China. *Psychother Psychosom*. 2020;89(4):242-50.
- Herman BK, Deal LS, DiBenedetti DB, Nelson L, Fehnel SE, Brown TM. Development of the 7-Item Binge-Eating Disorder Screener (BEDS-7). *Prim Care Companion CNS Disord*. 2016;18(2):10.4088/PCC.15m01896.
- Harding TW, de Arango MV, Baltazar J, Climent CE, Ibrahim HH, Ladrado-Ignacio L, et al. Mental disorders in primary health care: a study of their frequency and diagnosis in four developing countries. *Psychol Med*. 1980;10(2):231-41.
- Mari JJ. Psychiatric morbidity in three primary medical care clinics in the city of Sao Paulo. Issues on the mental health of the urban poor. *Soc Psychiatry*. 1987;22(3):129-38.
- Gonçalves DM, Stein AT, Kapczinski F. Avaliação de desempenho do Self-Reporting Questionnaire como instrumento de rastreamento psiquiátrico: um estudo comparativo com o Structured Clinical Interview for DSM-IV-TR. *Cad Saude Publ*. 2008;24(2):380-90.
- BRASIL. Ministério da Saúde. Conselho Nacional de Saúde. Resolução n. 466, de 12 de dezembro de 2012. Aprova diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos. Brasília, Diário Oficial da União, 12 dez. 2012.
- Mohammadi MR, Mostafavi SA, Hooshyari Z, Khaleghi A, Ahmadi N. Body mass index status across different psychiatric disorders in a national survey amongst children and adolescents: to identify the role of gender. *Iran J Psychiatry*. 2019;14(4):253-64.
- Honigsbaum M. A history of the great influenza pandemics: death, panic and hysteria, 1830-1920. London: I.B. Tauris & Company; 2013.
- Chan AO, Huak CY. Psychological impact of the 2003 severe acute respiratory syndrome outbreak on health care workers in a medium size regional general hospital in Singapore. *Occup Med (Lond)*. 2004;54(3):190-6.

26. Shih FJ, Gau ML, Kao CC, Yang CY, Lin YS, Liao YC, et al. Dying and caring on the edge: Taiwan's surviving nurses' reflections on taking care of patients with severe acute respiratory syndrome. *Appl Nurs Res.* 2007;20(4):171-80.
27. Shah K, Kamrai D, Mekala H, Mann B, Desai K, Patel RS. Focus on mental health during the coronavirus (COVID-19) pandemic: applying learnings from the past outbreaks. *Cureus.* 2020;12(3):e7405.
28. Gutiérrez-Bedmar M, Martínez EV, García-Rodríguez A, Muñoz-Bravo C, Mariscal A. Psychiatric status across body mass index in a mediterranean Spanish population. *PLoS One.* 2015;10(12):e0145414.
29. Harding JL, Backholer K, Williams ED, Peeters A, Cameron AJ, Hare MJ, et al. Psychosocial stress is positively associated with body mass index gain over 5 years: evidence from the longitudinal AusDiab study. *Obesity (Silver Spring).* 2014;22(1):277-86 .
30. Stice E, Gau JM, Rohde P, Shaw H. Risk factors that predict future onset of each DSM-5 eating disorder: Predictive specificity in high-risk adolescent females. *J Abnorm Psychol.* 2017;126(1):38-51.
31. Termorshuizen JD, Watson HJ, Thornton LM, Borg S, Flatt RE, MacDermod CM, et al. Early impact of COVID-19 on individuals with self-reported eating disorders: A survey of ~1,000 individuals in the United States and the Netherlands. *Int J Eat Disord.* 2020;53(11):1780-90.

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Correspondence address: Rodrigo Fernandes Weyll Pimentel - Rua Augusto Viana, s/n - Bairro Canela - CEP: 40.110-060 - Salvador (BA), Brazil - E-mail: [rodrigo.pimentel@ebserh.gov.br](mailto:rodrigo.pimentel@ebserh.gov.br)

