

# Journal Pre-proof

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Alaa Youssef, Stephanie E. Cassin, Susan Wnuk, Samantha Leung, Timothy Jackson, Sanjeev Sockalingam



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## **The Impact of COVID-19 Pandemic on Bariatric Patients' Self-Management Post-Surgery**

**Alaa Youssef**<sup>1,2,3</sup> BSc. (Hons), PhD candidate, **Stephanie E. Cassin**<sup>1,2,4</sup> Ph.D., C. Psych.,  
**Susan Wnuk**<sup>1,2</sup> Ph.D., C. Psych., **Samantha Leung**<sup>1</sup> B.Sc. (Hons), M.Sc., **Timothy Jackson**<sup>1,5</sup> MD, MPH,  
**Sanjeev Sockalingam**<sup>1,2,3,6</sup> MD, MPHE, FRCPC

<sup>1</sup> *Bariatric Surgery Program, University Health Network, Toronto, Ontario, Canada*

<sup>2</sup> *Department of Psychiatry, Temerty Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada*

<sup>3</sup> *Institute of Medical Science, University of Toronto, Toronto, Ontario, Canada*

<sup>4</sup> *Department of Psychology, Ryerson University, Toronto, Ontario, Canada*

<sup>5</sup> *Department of Surgery, University of Toronto, Toronto, Ontario, Canada*

<sup>6</sup> *Centre for Addiction and Mental Health (CAMH), Toronto, Ontario, Canada*

### **Authors' Email Addresses**

[a.youssef@mail.utoronto.ca](mailto:a.youssef@mail.utoronto.ca)

[stephanie.cassin@ryerson.ca](mailto:stephanie.cassin@ryerson.ca)

[Susan.Wnuk@uhn.ca](mailto:Susan.Wnuk@uhn.ca)

[Samantha.Leung@uhn.ca](mailto:Samantha.Leung@uhn.ca)

[timothy.jackson@uhn.ca](mailto:timothy.jackson@uhn.ca)

[Sanjeev.Sockalingam@camh.ca](mailto:Sanjeev.Sockalingam@camh.ca)

### **Corresponding Author:**

Sanjeev Sockalingam, MD, MHPE, FRCPC,

VP Education, Centre for Addiction and Mental Health

Psychosocial Director, Toronto Western Hospital- Bariatric Surgery Program

Professor, Department of Psychiatry, University of Toronto

33 Russell Street,

Toronto, Ontario, Canada

M5S 2S1

Tel.: 416 535-8501 ext. 32178

Fax: 416 532-1306

Email: [sanjeev.sockalingam@camh.ca](mailto:sanjeev.sockalingam@camh.ca)

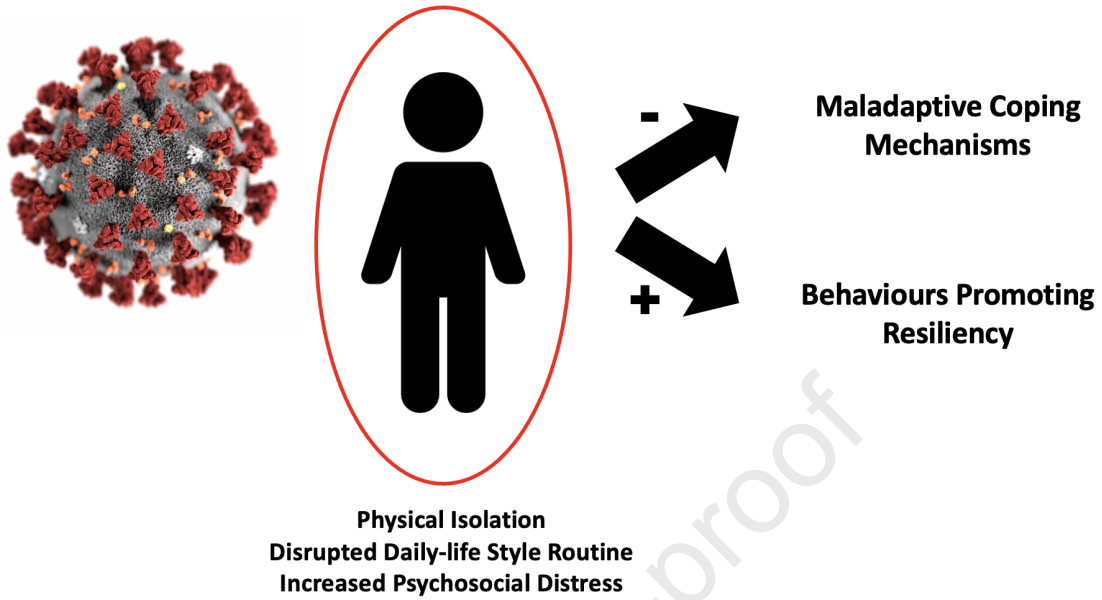
Word Count: 3914

### **Running Title: Impact of COVID-19 on Post-Bariatric Surgery Care**

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## How Did COVID-19 Impact Bariatric Patient Post-Operative Self-Management?



Journal Pre-proof

# 1 The Impact of COVID-19 Pandemic on Bariatric Patients' Self-Management Post-Surgery

## 2 Abstract

3 **Background:** The coronavirus disease 2019 (COVID-19) pandemic has had far reaching  
4 consequences on the health and well-being of the general public. Evidence from previous  
5 pandemics suggest that bariatric patients may experience increased emotional distress and  
6 difficulty adhering to healthy lifestyle changes post-surgery.

7 **Objective:** We aimed to examine the impact of the novel COVID-19 public health crisis on  
8 patients' self-management after bariatric surgery.

9  
10  
11 **Method:** In a nested-qualitative study, semi-structured telephone interviews were conducted  
12 with 23 post-operative bariatric patients who had undergone Roux-en-Y gastric bypass (RYGB)  
13 at a Canadian Bariatric Surgery Program between 2014 -2020. A constant comparative approach  
14 was used to systematically analyze the data and identify the overarching themes.

15  
16 **Results:** Participants (n=23) had a mean age of (48.82 ± 10.03) years and most were female  
17 (n=19). The median time post-surgery was 2 years (range: 6 months – 7 years). Themes  
18 describing the impact of COVID-19 pandemic on patients' post-bariatric surgery self-  
19 management included: coping with COVID-19; vulnerability factors and physical isolation;  
20 resiliency factors during pandemic; and valuing access to support by virtual care. The effects of  
21 COVID-19 on bariatric surgery after care differed based on gender and socioeconomic status.

22 **Conclusion:** This study showed the novel COVID-19 pandemic has impacted patients' ability to  
23 self-manage obesity and their mental health in a variety of ways. These findings suggest that  
24 patients may experience unique psychological distress and challenges requiring personalized care  
25 strategies to improve obesity self-care and overall well-being.

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## 34 **Introduction**

35 The outbreak of the novel coronavirus disease 2019 (COVID-19) has caused global disruption in  
36 everyday life (Manderson & Levine, 2020). Compared to previous pandemics, the distress and  
37 uncertainty caused by the lack of an endpoint for the COVID-19 pandemic has had a significant  
38 psychological impact on the general population mental health outcomes (Statistics Canada,  
39 2020). A recent study by Rettie and Daniels in the United Kingdom, demonstrated that the  
40 prevalence of generalized anxiety, depression, and health anxiety were higher compared to that  
41 reported in previous pandemics (Rettie & Daniels, 2020). Evidence from similar pandemics such  
42 as SARS, have shown that fear of biological disasters, uncertainty, and prevailing stigma could  
43 act as barriers to proper mental health care, especially among vulnerable groups (Brooks et al.,  
44 2020; Galea, Merchant, & Lurie, 2020; Tsamakidis et al., 2020). Of these groups, individuals with  
45 obesity are not only susceptible for poor outcomes if infected but also are more likely to  
46 experience increased psychosocial distress and poor obesity self-management in response to  
47 quarantine or self-isolation and sedentary lifestyle (Ghanemi, Yoshioka, & St-Amand, 2020;  
48 Hussain, Mahawar, & El-Hasani, 2020; Kassir, 2020; Mattioli, Pinti, Farinetti, & Nasi, 2020).

49 The impact of COVID-19 on bariatric surgery and limited access to post-operative care during  
50 this pandemic remains uncertain. However, a number of survey studies and editorials have  
51 already raised concerns over the limited access to obesity care during this pandemic (Ghanemi et  
52 al., 2020; Hussain et al., 2020; Mattioli et al., 2020; Mitchell, 2020; Sockalingam, Leung, &  
53 Cassin, 2020). An epidemiological survey by Waledzick and colleagues showed that nearly 75%  
54 of bariatric respondents (including pre-operative and post-operative patients) reported increased  
55 anxiety levels due to pandemic uncertainty (Waledziak et al., 2020). Further, approximately 30%

56 of respondents in this survey reported weight gain during COVID-19, with pre-surgery patients  
57 reporting weight gain more often than patients after bariatric surgery.

58 Further complicating the impact of COVID-19 on bariatric surgery outcomes is the relationship  
59 between COVID-19 and problematic eating behaviours. Eating psychopathology following  
60 bariatric surgery has been linked to poorer long-term outcomes, including weight regain and  
61 deteriorations in mental health-related quality of life post-surgery (Shakory et al., 2015; Taube-  
62 Schiff et al., 2015; Youssef et al., 2020). As the pandemic continues, the increased psychosocial  
63 distress during quarantine and self-isolation may lead to coping through maladaptive eating  
64 behaviors, creating a problematic feedback loop secondary to COVID-19-related distress (Pearl,  
65 2020; Sockalingam et al., 2020). Although the long-term consequences of COVID-19 related  
66 distress on obesity care and outcomes remain unclear, authors have purported that virtual care  
67 can be utilized to deliver evidence-based psychosocial care to bariatric patients to potentially  
68 lessen the effect of COVID-19 related distress on obesity self-management(Sockalingam et al.,  
69 2020).

70 Given the dearth of literature understanding the complex relationship between COVID-19  
71 distress and bariatric surgery outcomes, we conducted a qualitative study to investigate how the  
72 early phase of COVID-19, specifically weeks of self-isolation, affected patients' post-bariatric  
73 surgery care and self-management.

## 74 **Methods**

### 75 *Participants and Recruitment*

76 Participants were recruited from the Toronto Bariatric Surgery Psychosocial (Bari-PSYCH)  
77 cohort study, an ongoing longitudinal prospective study at the University Health Network-

78 Bariatric Surgery Program (UHN-BSP), formerly named Toronto Western Hospital-Bariatric  
79 Surgery Program (Nasirzadeh et al., 2018; Sockalingam et al., 2017). All bariatric surgery  
80 candidates in this program are assessed and followed-up by a multidisciplinary team comprised  
81 of nurse practitioners, psychologists, social workers, psychiatrists, dietitians and surgeons. It is  
82 worth noting that the follow-up duration for participants in this study ranged between (2-5 years)  
83 based on participant's surgery date and individual need for a follow-up beyond 2-years. The pre-  
84 surgery assessment process has been described previously in the literature and patients were  
85 followed up to 5 years post-surgery (Pitzul et al., 2014; Sockalingam et al., 2013; Thiara et al.,  
86 2018). The UHN-BSP performs two bariatric surgery procedures, the Roux-en-Y gastric bypass  
87 (RYGB) and sleeve gastrectomy (SG), with the surgeon determining surgical procedure based on  
88 surgical and medical indications (e.g. previous abdominal surgeries resulting in extensive  
89 adhesions and distorted anatomy).

90 During the period of March to June 2020, participants were recruited through the program's  
91 support group (80%), post-operative telephone visits (5%), and the patient-run Facebook group  
92 (15%). This time period corresponded with a period of significant public health restrictions  
93 including self-isolation, a pause to elective surgeries including bariatric surgery, and closure of  
94 ambulatory bariatric clinics. The UHN-BSP provided ongoing virtual visits by telephone or  
95 telemedicine as part of routine care during this study period.

96 Participants in this cohort study analysis were included if they underwent bariatric surgery  
97 between 2014-2020 and were between 18 to 65 years old. Participants who expressed interest to  
98 participate through email or phone communication were contacted by AY, a senior PhD  
99 candidate with qualitative research experience, to determine participant eligibility and provide  
100 information about the study. Patients who consented participated in semi-structured interviews.

101 The reported nested-study is part of a larger qualitative analysis examining overall patient  
102 experience with self-management post-bariatric surgery. The impact of COVID-19 on bariatric  
103 patients self-management emerged as a novel phenomenon and an independent interview guide  
104 was designed to explore this specific topic. The study was approved by the Research Ethics  
105 Board at UHN and all participants provided both a written and oral informed consent to  
106 participate in this study.

### 107 *Data Collection*

108 Patients participated in individual, in-depth, semi-structured interviews, lasting approximately 40  
109 to 60 minutes in duration. Initial interviews (n=4) started with convenience sampling and then  
110 purposeful sampling, aiming for maximum variation in gender, age, and time since surgery to  
111 capture variation in patients' experiences and care needs during this pandemic. The interview  
112 used open-ended questions spanning across four domains: patients' demographics, support,  
113 physical and mental well-being, and self-management prior to and during the pandemic (see  
114 Appendix A). Examining individuals' pre-COVID and current status during the pandemic  
115 allowed for a constant comparison of changes in individuals' health status and self-management  
116 capacity. Interviews were recorded with participants' permission and transcribed by an  
117 independent professional transcription service.

### 118 *Data Analysis*

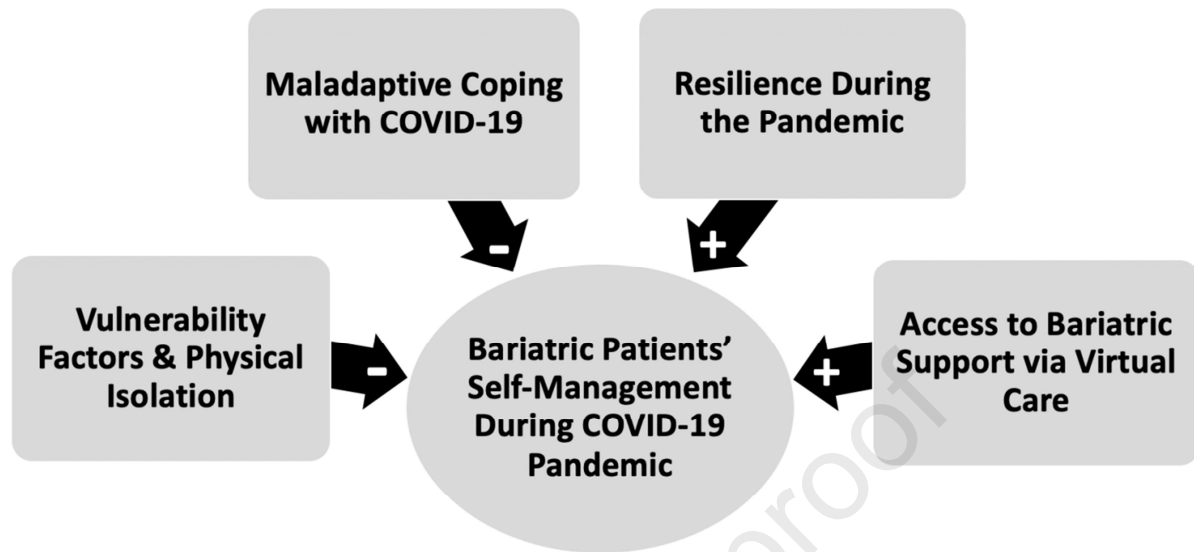
119 A constant comparative approach was used to simultaneously collect and analyze data. Analysis  
120 of interview transcripts was iterative and inductively driven, using line-by-line coding, open  
121 coding, focused coding, and axial coding, following the grounded theory systematic analysis  
122 approach (Charmaz, 2014). This analytical approach informed our purposeful sampling approach  
123 and allowed us to compare experiences, views, situations, and contexts from the same and



124 different individuals. Through the data collection and analysis process, the researcher AY  
125 independently coded the data from an exploratory lens and generated a code book. All codes  
126 were verified by SS, principal investigator and psychiatrist at the UHN-BSP. Furthermore,  
127 iterative and bi-weekly discussions with research team members (SL, SC, SW, and SS), allowed  
128 for triangulation of the data from multiple perspectives to critically appraise and identify  
129 overarching themes.

### 130 **Results**

131 Twenty-three phone interviews were completed between March to June 2020. Of all 23  
132 participants, 19 (82%) were females and 5(18%) were males. The mean age of this cohort was  
133  $50\pm 8.49$  years and the mean time since surgery was 2.45 years (range: 6 months - 7 years). Most  
134 participants were Caucasian (87%), followed by Arab (9%), and South Asian (4%). Table.1  
135 summarizes study sample characteristics and Table. 2 presents individuals' profile and self-  
136 reported concerns related to physical isolation during this pandemic. Qualitative analysis of  
137 interview data yielded the following 4 themes: coping with COVID-19; vulnerability factors and  
138 physical isolation; resiliency factors during pandemic; and valuing access to support by virtual  
139 care, a cross-cutting theme (Figure 1).



140

141 Fig.1 This diagram illustrates the various factors influencing bariatric patients' self-management  
 142 during COVID-19.

### 143 **Theme 1: Coping with COVID-19**

144 COVID-19 caused significant disruption in patients' everyday life. Participants reported that  
 145 stay-at-home, public health orders, changes in daily routine, and the pandemic uncertainty were  
 146 major contributors to psychosocial distress. Trying to cope with this distress, participants  
 147 described finding themselves in a "weird mindset" engaging in new behaviours, such as unusual  
 148 shopping behaviours (e.g., buying a big bag of chips) and engaging in emotional eating. Notably,  
 149 while some participants described coping through maladaptive behaviours, other participants  
 150 tried to seek positive strategies, such as being more physically active, avoiding triggering foods,  
 151 baking as a soothing tactile activity, and reviewing mindful eating strategies to mitigate  
 152 problematic eating behaviours, such as emotional eating and grazing (Table. 3).

### 153 **Engaging in Emotional Eating Behaviours**

154 Participants described engaging in emotional eating as a way to cope with feelings of anxiety or  
155 boredom triggered by the pandemic scale and uncertainty. Importantly, despite increased  
156 emotional eating during the pandemic, patients described an increased awareness of types of  
157 food, quantity, and hunger cues.

158 P5: "I have found myself in particular emotionally eating, which is what I used to do. But  
159 I'm aware of it. It's not that I've been eating terrible food, but maybe I'm not spacing my  
160 food out as best as I could. Maybe I'm not hydrating as much as I could. So, I'm aware of  
161 that. This current global situation I think may be causing challenges that I may not have  
162 had otherwise." (F, 1.5 year)

### 163 **Developing positive self-coping strategies**

164 All participants highlighted the tendency to cope in maladaptive ways during distress. Some participants  
165 described developing positive strategies to mitigate the COVID-19 related distress. For example,  
166 participants (2-years or more post-surgery) described trying to be more self-conscious of their emotions  
167 and engaged in virtual community programs to maintain their daily lifestyle routine.

168 P13: "I think I very often just need to refocus. I think about the Mindful Eating and what I need to  
169 do. I think about how I have to get back on track. Even though I don't go to the gym now, I  
170 workout at home. I bought a bunch of weights, I workout at home and I do a lot of  
171 programs. And I still speak to a lot of people within the fitness community and we figure  
172 out other things." (F, 2.5 years)

### 173 **Engaging in End-of-World Eating**

174 During the peak period of the pandemic, some participants described COVID-19 as a life-ending  
175 "apocalypse" and therefore, engaged in eating habits that provided momentary pleasure.

176 P8: "I found that the last little while in the whole COVID situation, I thought .... if this is  
177 the apocalypse, I might as well enjoy myself. I might as well eat the cupcake. It was

178           like, what's the point? But now seven or eight weeks into this, reality dawns and you  
179           feel like doing what we're supposed to do, whatever, we're not going to get sick,  
180           there's a really low probability of getting ill. So, you have to get yourself healthy,  
181           and that means getting more of that weight off." (F, 4 years)

## 182 **Dealing with Pandemic Uncertainty**

183   Participants in their early post-operative period (6 months to 2 years) described having feelings  
184   of anxiety, fearing how the pandemic might impact their follow-up appointments and accessing  
185   bariatric care if needed. In particular, participants with co-existing mental illness or with poor  
186   weight loss outcomes were more likely to be worried and concerned about the impact of this  
187   pandemic on their surgery long-term outcomes.

188           P5: "Nobody knows what the timeframe is going to be around COVID and what that's  
189           going to mean. I would say that for patients who have had surgery and have been  
190           caught in this unfortunate situation. COVID hit right before my 1-year anniversary,  
191           which is a critical time." (F, 1.5 year)

192           P6: "I was struggling with getting the rest of the weight off, so the nutritionist said she  
193           would see me again in June. But, I'm not sure what will happen now." (F, 1.5 year)

## 194 **Theme 2: Vulnerability Factors and Physical Isolation**

195   Patients reported significant disruptions to their daily lifestyle routine as a result of stay-at-home  
196   orders, triggered by fears of food insecurity, sedentary lifestyle, and feelings of social isolation.  
197   Bariatric patients perceived these triggering factors as creating a stressful environment that made  
198   it more difficult to adhere to the recommended dietary guidelines and to self-manage their  
199   physical and mental well-being during quarantine (Table. 3).

### 200 **Fearing Food Insecurity**

201 Participants perceived shopping during the pandemic to be very stressful. While some reported  
202 fearing availability of particular food types, others perceived their food insecurity to be triggered  
203 by the lack of food supplies and panic-buying environment.

204 P8: "I'm coping but in bad ways. Do you know what I mean? I found that a lot of the  
205 issue around food itself and food insecurities and going into stores and seeing empty  
206 shelves has triggered something in me that's almost primal. So, consequently, if I go into  
207 a store and I've been telling Name-X this too that we're buying things that we haven't  
208 bought in years for fear that we won't be able to buy them." (F, 4 years)

### 209 **Losing Daily Lifestyle Routine**

210 Participants perceived maintaining their daily routine to be critical for successful self-  
211 management. Following their daily routine often resulted in meal regularity, improved food  
212 choice, and helped control grazing.

213 P13: "I do a lot more grazing. Now with COVID-19, the whole pandemic, meal prepping  
214 is definitely difficult. I don't work, so it's easy for me to go into the fridge, anytime. So, I  
215 have to really be a little bit more stringent and prep what foods I use to make containers. I  
216 don't anymore" (F, 4 years)

### 217 **Losing Work/Life Balance**

218 Participants described working from home during the pandemic to be mentally stressful and  
219 exhausting. They reported an increased distress due to lack of physical interactions with co-  
220 workers, increased workload, and working from home to have influenced their eating habits with  
221 respect to meal regularity and preparation.

222 P12:” Well, I don’t know how to explain, my workload is just insane. I’m in conference  
223 calls eight to nine hours a day so it’s hard for me. Before you would leave work, and  
224 sometimes you don’t get to your laptop at home, so you have that free time. Now I don’t  
225 have that work/life balance. I’m always on my laptop, and I find it difficult to cook. I’ll  
226 eat something, like, toast or a bar, a protein bar. I don’t know how to explain, but I just  
227 can’t find the words” (F, 3 years)

### 228 **Lacking Social Support and Struggling with Self-Isolation**

229 Participants described feeling confined, isolated, frustrated, and being at their lowest point  
230 emotionally due to limited social interactions. Participants perceived home confinement created a  
231 challenging environment for individuals struggling with emotional eating and/or depression.

232 P19: “I don’t have a lot of friends and people here locally that I can count on. And with  
233 my condition, I couldn’t go outside, so I had to have somebody to get me my groceries  
234 and stuff like that. So, that’s again another aspect of depression, which has nothing to do  
235 with the sickness at all. That’s how COVID has given me a whole different depression  
236 and I think that’s when I got to the lowest point of everything is during the COVID.” (F,  
237 4 years)

238 P18: “I’m finding it very difficult to work from home. I’m not really fond of that because I  
239 like the social interaction. I’m on my own so it’s rather isolating” (F, 5 years)

### 240 **Theme 3: Resilience During the Pandemic**

241 Some participants perceived quarantine as a minimal burden with respect to maintaining their  
242 lifestyle and self-management. These patients reported being able to maintain social support and  
243 connection virtually and to adhere to regular routines and maintain lifestyle changes despite the  
244 disruptions of the pandemic. Exploring factors promoting successful self-management,

245 participants reported a greater sense of financial security, felt well-supported, and did not have  
246 any pre-existing mental health conditions. Importantly, these individuals—were more likely to be  
247 males and to be married (Table. 3).

248 P14: “Honestly, it did not impact anything at all for me. I’m extremely introverted  
249 anyways. I’m not a super social person and I don’t go out a lot. So, on both the  
250 psychological and the nutritional level, it really didn’t impact me that much. .... So,  
251 instead of losing roughly four kilograms every month when I would start being active, I  
252 only lost 1.5 kilograms or something. So, of course, it did slow down the process of me  
253 getting healthy again or losing the weight again. But it did not eliminate it. So, I still  
254 lost weight, but it’s just much lower than typically the past three years.” (M, 3 years)

255 P15: In my personal case, COVID-19 has not impacted me at all, partially because I have  
256 got a gym in my basement. I didn’t have to suffer because all the gyms and the fitness  
257 centres were closed. People suffer to not exercise. In that term, I didn’t have that  
258 problem. In terms of food, I maintained the very same program as before this COVID  
259 situation. I would say I got extremely minimally impacted based on my lifestyle. I’m not  
260 talking about the work, and working from home and stuff, but if we talk about only the  
261 program related to the post-surgery, it’s almost no impact to me. (M, 9 months)

#### 262 **Theme 4: Valuing Access to Support by Virtual Care [Cross-cutting Theme]**

263 Participants described how accessing bariatric support through virtual care during the pandemic  
264 helped boost their self-efficacy, set realistic behavioral goals, and reinforced mindful eating  
265 strategies to combat emotional eating or grazing (Table. 3).

266 P9: “I had a phone appointment with the bariatric clinic. The [psychiatrist] was able to  
267 reduce my anxiety and panic attacks by giving me medication, it was taking a while for  
268 the community psychiatrist. I’ve been on a waiting list for them to call me. So, I was able  
269 to call the social worker who put me in touch with the psychiatrist at the program, and the  
270 bariatric team got me on the proper medication to help me start feeling better.” (F, 9  
271 months)

272 P7: “I guess it’s more so that I have certain thought patterns and feelings and ways of  
273 doing things and then at the end we also go over my weight and eating stuff. It’s very,  
274 very helpful.” (F, 5 years)

275 In addition to individual virtual appointments, patients valued accessing online support groups as  
276 a way to stay socially connected, seek advice from peers and healthcare professionals, and better  
277 self-manage their health and well-being during the uncertainty of COVID-19. Virtual support  
278 groups were a “constant refresher” and an opportunity to share and learn coping strategies from  
279 others with similar concerns. Virtual support groups promoted resiliency, reduced feelings of  
280 self-isolation and promoted access to experts’ advice.

281 P19: “Yes accessing bariatric care during this time has been good. You would have people  
282 encouraging you, okay, try and get some exercise done, give you alternatives. Well,  
283 people can still think of their own. Do an alternative, make sure you do some steps in, do  
284 something. Make sure, now that you’re not being as active, maybe you want to look at  
285 your nutrition, eat differently. It would have been good.” (F, 9 months)

286 **Discussion**



287 The current COVID-19 pandemic has caused significant disruption in individuals' daily lives and  
288 increased psychosocial distress on a global scale. Compared to the general population,  
289 individuals with obesity are more vulnerable to infection, sedentary lifestyle, and experiencing  
290 significant mental health distress (Kassir, 2020). Although a number of editorials have  
291 highlighted the increased risk in psychosocial distress secondary to the stay-at-home orders and  
292 changes in daily lifestyle routines (Mattioli et al., 2020; Pearl, 2020; Sockalingam et al., 2020),  
293 this qualitative study is the first to describe the impact of COVID-19 on post-operative bariatric  
294 patients' self-management. In particular, exploring the perspective of a diverse sample of  
295 bariatric patients who were early post-surgery (i.e. 6-months post-surgery) to several years post-  
296 surgery (i.e. up to 7 years post-surgery) provided novel insights into the impact of COVID-19 on  
297 obesity self-management and individuals' care needs.

298  
299 Four main themes highlighted the impact of the COVID-19 pandemic on bariatric patients' self-  
300 management post-surgery. These themes included: coping with COVID-19, vulnerability factors  
301 and physical isolation, resiliency factors during pandemic, and valuing access to bariatric support  
302 by virtual care. Overall, participants thought the pandemic resulted in enormous mental health  
303 distress requiring them to find strategies to cope with this evolving pandemic situation.  
304 Differences in participants' coping strategies, specifically their use of maladaptive versus  
305 adaptive approaches, were accounted for in part by individuals' unique challenges and their self-  
306 reported complex relationship with food. For example, while some patients found baking to be  
307 soothing and a means of staying connected, others found cooking and being self-isolated at home  
308 to be a triggering environment for emotional eating and grazing.

309

310 Furthermore, the psychosocial distress secondary to COVID-19 impacted participants' obesity  
311 self-management capabilities disproportionately. Some participants described being confused and  
312 ambivalent about their shopping behaviours during the pandemic, buying large amounts and  
313 unnecessary items due to fears of food insecurity. Others described feeling at their "lowest point"  
314 due to being confined in their home and feeling socially isolated. Interestingly, participants with  
315 co-existing mental illness (30% of the sample) who had continued access to bariatric support  
316 through virtual care during the pandemic found that connecting with their bariatric care team was  
317 extremely helpful in managing their eating habits, being cognitively aware of their emotional  
318 status, and developing self-compassion and acceptance of their reactions to this unprecedented  
319 situation. This support was important to participants because it not only boosted their self-  
320 efficacy to self-manage their eating behaviours but also instilled in patients the motivation to  
321 maintain their daily routine during the pandemic.

322 Notably, there may be a gender-specific response to psychosocial distress. In this study, women  
323 were more likely to use food to cope with stress, whereas men were more likely to have had  
324 better self-control or and coped through other strategies. This finding is consistent with the  
325 existing literature on alcohol use trends during COVID-19, which showed that women were  
326 more likely to consume larger amounts of alcohol due to stress, while men consumed more  
327 alcohol due to boredom during COVID-19 (Canadian Centre on Substance Use and Addiction,  
328 2020). In addition, the theme of self-managing physical and mental well-being appeared to be  
329 influenced by health inequities. Participants who reported feeling "minimal impact" of COVID-  
330 19 on their health and lifestyle were more likely to have "financial security", space and  
331 equipment at home to stay physically active, and emotional support. Thus, this theme

332 underscored the strong influence of socioeconomic status on the level of psychosocial distress  
333 and individuals' ability to maintain their healthy lifestyle during times of uncertainty.

334

335 Overall, findings from this study with respect to increased psychosocial distress in bariatric  
336 patients align with epidemiological findings by Waledzick and colleagues where approximately  
337 75% (n=800) of survey respondents indicated increased level of anxiety concerning their health  
338 and 20% attributed their increased anxiety to limited access to bariatric care during the  
339 pandemic(Waledziak et al., 2020). Our results also support studies on changes in eating habits  
340 and changes in daily routine due to stay-at-home orders (Mattioli et al., 2020; Mitchell, 2020;  
341 Pearl, 2020). Importantly, this qualitative study is the first to provide insights to experiences and  
342 care needs of post-surgery bariatric patients who may be susceptible to maladaptive coping  
343 mechanisms during times of uncertainty. Findings from this study underscore the importance of  
344 time to follow-up after bariatric surgery on patients' self-reported concerns during physical  
345 isolation. For example, participants who had their bariatric surgery completed within 1-year,  
346 were less likely to report concerns including emotional eating and fear of weight regain as they  
347 were still within their peak weight loss period and perceived higher levels of self-regulation due  
348 to the physical control of the surgery (Table.1). An important implication of this study is  
349 underscoring the potential of virtual care to promote access to bariatric care and support to  
350 deliver evidence-based treatment to mitigate distress and help patients set realistic behavioural  
351 goals that support self-managing their eating habits and emotional well-being during isolation  
352 (Hussain et al., 2020).

353

354 The main strength of this qualitative study is capturing a detailed account of the impact of  
355 COVID-19 pandemic on bariatric patients' post-surgical experiences coping and self-managing  
356 their physical and mental well-being during this pandemic. This study included both male and  
357 female participants, therefore allowing to examine gender-specific response. A possible  
358 limitation to this study is the lack of ethnic diversity due to the small sample size and limitations  
359 to recruitment during the pandemic. Although our sample size (n=23) was relatively small, we  
360 adopted a rigorous qualitative analysis approach: independently coding the data, iterative  
361 research team discussions, and validating emerging themes with a number of participants.  
362 Theoretical saturation was achieved through our sampling methods with over 18 hours of  
363 interview data and 500 pages of transcripts for our analysis.

#### 364 **Conclusion**

365 This study investigated the impact of COVID-19 on bariatric patients' post-operative self-  
366 management during quarantine or self-isolation. Findings from this study revealed how the  
367 increased mental health distress secondary to the COVID-19 pandemic has negatively impacted  
368 individuals' capacity to self-manage their eating-habits and emotional well-being during  
369 quarantine. As a result, patients had to develop new coping strategies to mitigate COVID-19  
370 related distress. While some were able to find positive coping strategies to stay connected and  
371 maintain their daily lifestyle routine, majority of participants reported coping in maladaptive  
372 ways. Moreover, findings from this study bolster the importance of leveraging virtual care to  
373 maintain access to obesity care during COVID-19 restrictions and to provide personalized  
374 support to mitigate the long-term unintended consequences of this pandemic.

375 **Conflict of interest:** None to Declare

376

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449 **Tables**450 **Table 1: Study Sample Demographic Characteristics**

<b>Sample Characteristics</b>	<b>N(%) or Mean <math>\pm</math> SD</b>	<b>Range</b>	
Gender			451
Female	18 (82%)		452
Male	4 (18%)		453
Age(years)	48.82 $\pm$ 10.03	37-66 years	454
Type of Surgery			455
Roux-en-Y gastric bypass (RYGB)	18 (82%)		456
Sleeve gastrectomy (SG)	4 (18%)		457
Surgery Complication			458
Yes	8 (36%)		459
No	14 (64%)		460
Post-op (years)	2.45 $\pm$ 1.54	6 months - 7 years	461
Occupation			462
Full-time	15 (65%)		463
Retired	3 (13%)		464
Unemployed	5 (21%)		465
Relationship Status			466
Married	9 (39%)		467
Single	9 (39%)		468
Divorced	7 (22%)		469
Ethnicity			470
Caucasian			471
Arab	19 (87%)		472
South Asian	2 (9%)		473
	1 (4%)		474
Psychiatric Diagnosis			475
Yes	8 (36%)		476
No	15 (65%)		477

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472 **Table.2:** Participants demographic characteristics and self-reported concerns in response to

Themes	Codes				Examples			
	ID	Gender	Age	Type of Surgery	Post-op Year	Relationship Status	Self-Reported Emotional Eating	Physically Active
	1	F	52	RYGB	1.5	M	✓	N
	2	F	43	RYGB	2.5	S		Y
	3	F	55	RYGB	3.5	M		N
	4	F	42	SG	2	S		N
	5	F	42	RYGB	1.5	S	✓	N
	6	F	58	RYGB	1.5	S		N
	7	F	47	RYGB	5	S	✓	N
	8	F	65	RYGB	5	S	✓	N
	9	F	52	RYGB	9 months	S	✓	N
	10	F	48	RYGB	9months	D		N
	11	M	65	SG	6 months	M		N
	12	F	42	RYGB	3	D	✓	N
	13	F	42	RYGB	2	M		Y
	14	M	37	SG	3	M		Y
	15	M	42	SG	9 months	M		Y
	16	M	42	RYGB	3.5	M		Y
	17	F	48	RYGB	4	M	✓	N
	18	F	66	RYGB	5	S	✓	N
	19	F	55	RYGB	4	D	✓	N
	21	F	57	RYGB	4	M		Y
	22	F	47	RYGB	9 months	D	✓	N
	23	F	23	RYGB	2	S	✓	Y

473 COVID-19 pandemic physical isolation

474

475

476 Sleeve gastrectomy (SG); Roux-en-Y gastric bypass(RYGB); Married(M), Single(S),

477 Divorced(D); No(N), Yes(Y)

478

479 **Table 3: Themes Describing the Impact of the COVID-19 Pandemic on Bariatric Patients Self-**480 **Management**



	<p><b>Engaging in emotional eating</b></p>	<p>P5: “I have found myself in particular, I have found myself emotionally eating, which is what I used to do. But I’m aware of it. It’s not that I’ve been eating terrible food, but maybe I’m not spacing my food out as best as I could. Maybe I’m not hydrating as much as I could. So, I’m aware of that. This current global situation I think may be causing challenges that I may not have had otherwise.” (F, 1.5 Y)</p> <p>P20: “I think, definitely, boredom triggers it. If I make myself busy, which ... I can tell you all the right things. It’s doing them that’s the... if I’m busy, it doesn’t matter what the busy is, I definitely don’t. I am more sort of ... I eat regular meals at regular times, as opposed to that constant grazing. And I know, then, because you can actually eat more if you are grazing, and it usually ends up being ... it’s not ... I don’t like sweets. I don’t have a sweet tooth. But it’ll be even things like nuts. Sure, they are protein, but they are also really high calorie. I eat more of those kinds of snacky foods.” (F, 1Y)</p> <p>P8: “Ask me when the last time was I made an apple pie. Again, three years ago maybe. So, I was making an apple pie. I was literally kneading pastry. They said that this thing about people baking is that it’s a tactile thing, that people are so longing to touch, and they can’t, that they have gone into this thing. It’s why people are making bread. It’s the run on the flour and all that in the store, is just because baking is very soothing, it reminds them of their childhoods, whatever. It’s all of that sort of stuff. So, I think that people’s relationships with food is really complicated, and especially if you’re someone who has had a problem with obesity” (F, 4Y)</p> <p>P20: “When COVID hit, I didn’t go shopping for at least the first month, and then it was another month after that, I think, I had to go to Costco because I ran out of all my vitamins. It was just a very stressful experience just because of what is going on with COVID and the masks and the people up in your face. It was a completely, spontaneous, emotion-driven, “I have to have those Doritos.” Everything else in my basket was healthy, but it was just that one thing. That will happen occasionally”. (F, 1Y)</p>
	<p><b>Engaging in “end-of-world” eating</b></p>	<p>P8: “ I found that the last little while in the whole COVID situation, I thought ...if this is the apocalypse, I might as well enjoy myself. I might as well eat the cupcake. It was like, what’s the point? But now seven or eight weeks into this, reality dawns and you feel like doing what we’re supposed to do, whatever, we’re not going to get sick, there’s a really low probability of getting ill. So, you have to get yourself healthy, and that means getting more of that</p>

		<p>weight off.” (F, 4Y)</p> <p>P8: “We were doing all their shopping .... our neighbour down the street, really athletic woman, we said, we’re going shopping, was there anything she wanted. I want a big bag of chips. And I thought she was joking. And I said, yeah, yeah. And she said, no, I want a big bag of chips. And I went, okay. And then we both sort of looked at each other in the store and went, well, if Name-X is getting a big bag of chips, we need a big bag of chips. So, there has been this weird mindset” (F, 4Y)</p> <p>P20: “I found shopping during COVID very stressful and ended up eating chips that I shouldn’t have eaten, things like that.” (F, 1Y)</p>
	<p><b>Finding positive self-coping strategies during isolation</b></p>	<p>P1: “I’m crocheting a blanket now because I figure if my hands are busy, I’m not going to be eating.” (F, 1Y)</p> <p>P13: I think I very often just need to refocus. I think about the Mindful Eating and what I need to do. I think about how I have to get back on track. Even though I don’t go to the gym now, I workout at home. I bought a bunch of weights, I workout at home and I do a lot of programs. And I still speak to a lot of people within the fitness community and we figure out other things. (F, 2.5 Y)</p> <p>P17: “I’ve been taking up crocheting. I used to crochet back in the day. I took up crocheting. I read a little bit. I watch TV. So, that’s my time and that’s how I’ve been really winding down at the end of the night. That’s what I usually do.” (F, 4Y)</p> <p>P20: “Normally, I avoid buying it. It’s the type of thing that if I have it in my home, it calls to me” (F, 1 Y)</p>
	<p><b>Coping with the pandemic uncertainty</b></p>	<p>P5: “Nobody knows what the timeframe is going to be around COVID and what that’s going to mean. I would say that for patients who have had surgery and have been caught in this unfortunate situation. COVID hit right before my 1-year anniversary, which is a critical time.” (F, 1.5Y)</p> <p>P6: “I was struggling with getting the rest of the weight off, so the nutritionist said she would see me again in June. But, I’m not sure what will happen now.” (F, 1.5 Y)</p> <p>P23: “We’ve all joked about the COVID-15 that we put on. I think everybody joked about it, but it’s serious. Definitely, for someone like me in this program, that’s a big deal to put that weight on. It’s not as easy for us just to take that weight off.”</p> <p>P5: “Let’s say every bariatric patient, as every person in the world, is going through a difficult time right now for different reasons. For people who struggle with their mental health, and many people struggled with their mental health even before</p>

		the surgery, this is also a form of trauma, this is also a trigger, this pandemic.” (F, 1Y)
<b>Triggering Factors Related to Social-Isolation</b>	<b>Fearing food insecurity</b>	P8: “ I’m coping but in bad ways. Do you know what I mean? I found that a lot of the issue is around food itself and food insecurities and going into stores and seeing empty shelves has triggered something in me that’s almost primal. So, consequently, if I go into a store and I’ve been telling Name-X this too that we’re buying things that we haven’t bought in years for fear that we won’t be able to buy them.” (F, 4Y)
	<b>Losing daily lifestyle routine</b>	<p>P13: “I do a lot more grazing. Now with COVID-19, the whole pandemic, meal prepping is definitely difficult. I don’t work, so it’s easy for me to go into the fridge, anytime. So, I have to really be a little bit more stringent and prep my meals. I don’t anymore” (F, 4Y)</p> <p>P13:” It’s been very tough. Yeah, my gym isn’t open anymore and I used to go to the gym every single day, for two hours every morning. It’s not open and it was very tough when that changed. It put me off. I think that once I do my exercise in the morning, I feel better during the day. I have my routine in the morning, and I eat better during the day. Since that change, it’s been very tough. (F, 2.5Y)</p> <p>P18: “Definitely, definitely, definitely because you’re home all the time. You’re eating all your meals at home. You’re munching at home. It’s a stressful situation. It’s a pandemic, the nature of which we’ve never been through in our lifetime, and what the hell? What’s going on?” (F, 5Y)</p> <p>P23: “I think when you’re getting into a new routine that is a new lifestyle, slipping back into older habits can be detrimental to your mental health and to your physical well-being. So, certainly, I think I indulged in it for a little while because I was not feeling well, and I was sick for those 30 days that I was in quarantine and just needed to rest. There was boredom, and there was all sorts of stuff that just leads to snacking”</p>
	<b>Losing work/life balance</b>	P12: “Well, I don’t know how to explain, my workload is just insane. I’m in conference calls eight to nine hours a day so it’s hard for me. Before you would leave work, and sometimes you don’t get to your laptop at home, so you have that free time. Now I don’t have that work/life balance. I’m always on my laptop, and I find it difficult to cook, especially the weeks I don’t have the kids. I’ll eat something, like, toast or a bar, a protein bar. I don’t know how to explain, but I just can’t find the words” (F, 3Y)
	<b>Struggling with self-isolation</b>	

P17: The fact that I can't go out, that I'm confined to my house. And then when I do have to go out, it's basically to go do grocery shopping. I don't just go out leisurely like I used to. Some weekends I would feel like, let me just go browse in the mall and that type of thing. I would not do that today. Any time I leave the house it's for necessities. So, I find that's very **challenging** and very **frustrating**. And we're **confined** in a condominium" (F, 4Y)

P18: "I'm finding it very difficult to work from home. I'm not really fond of that because I like the **social interaction**. I'm on my own so it's rather isolating" (F, 5Y)

P19: "After moving to Toronto and working and then getting sick, I would say for the last four years I have not worked. So, I don't have a lot of friends and people here locally that I can count on. And with my condition, I couldn't go outside, so I had to have somebody to get me my groceries and stuff like that. So, that's again another aspect of depression, which has nothing to do with the sickness at all. That's how COVID has given me a whole different depression and I think that's when I got to the lowest point of everything is during the COVID." (F, 4Y)

Valuing Access to Support by Virtual Care	<p><b>Accessing Bariatric Care During the Pandemic</b></p>	<p>P19: “Yes accessing bariatric care during this time has been good. You would have people encouraging you, okay, try and get some exercise done, give you alternatives. Well, people can still think of their own. Do an alternative, make sure you do some steps in, do something. Make sure, now that you’re not being as active, maybe you want to look at your nutrition, eat differently. It would have been good.” (F, 9 months)</p> <p>P22: “I would say that the webinars that are now online are great. I was having trouble getting to Toronto for the support group because of the time of the day was too early for me to get there, so I wasn’t going. But having them online, that is great, I think, if we have those now online. Because then I can go, and I can have the reinforcement.” (F, 5Y)</p> <p>P9: “I had a phone appointment with the bariatric clinic. The [psychiatrist] was able to reduce my anxiety and panic attacks by giving me medication, it was taking a while for the community psychiatrist. I’ve been on a waiting list for them to call me. So, I was able to call the social worker who put me in touch with the psychiatrist at the program, and they [the bariatric team] got me on the proper medication to help me start feeling better.” (F, 9 months)</p> <p>P8: “A little bit of everything. She’s [psychologist] not a nutritionist, so it’s not about the nutrition part so much. It’s about setting goals and understanding what’s happening, both with me and the world, that it’s not just me. There are a lot of people that this is going on for. And helping me work through my thoughts about how I feel about it. I think everyone when they’ve regained some of the weight, you just feel like a failure.” (F, 4Y)</p> <p>P7: “It’s not necessarily just about the food, applying more of an emotional and mental kind of help over things that I have difficulties with. It was just so out of control when I did eat a lot. I think just in general to have support, like emotionally, for weight is really important.” (F, 5Y)</p>
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<b>Factors Promoting Resiliency</b>	<b>Maintaining daily routine and self-managing well-being</b>	<p>P16: “I would say it was fine, prior to the COVID-19, I was actually working from home all the time. I only went to the office anywhere from two to three days of the month. There was not much of a change in my schedule from working from home. Aside from that I don’t know if social distancing changed my lifestyle.” (M, 3.5Y)</p> <p>P14: “Honestly, it did not impact anything at all for me. I’m extremely introverted anyways. I’m not a super social person and I don’t go out a lot. So, on both the psychological and the nutritional level, it really didn’t impact me that much. .... So, instead of losing roughly four kilograms every month when I would start being active, I only lost 1.5 kilograms or something. So, of course, it did slow down the process of me getting healthy again or losing the weight again. But it did not eliminate it. So, I still lost weight, but it’s just much lower than typically the past three years.” (M, 3Y)</p> <p>P15: In my personal case, COVID-19 has not impacted me at all, partially because I have got a gym in my basement. I didn’t have to suffer because all the gyms and the fitness centres were closed. People suffer to not exercise. In that term, I didn’t have that problem. In terms of food, I maintained the very same program as before this COVID situation. I would say I got extremely minimally impacted based on my lifestyle. I’m not talking about the work, and working from home and stuff, but if we talk about only the program related to the post-surgery, it’s almost no impact to me. (M, 9months)</p>
	<b>Financial security</b>	<p>P6: “I’m adapting and coping...At least I’m getting my pension every month, regardless. I don’t have to worry about getting paid. Even when I worked, if I was still working, if I wasn’t retired, I would still be getting my paycheque, whether I was working from home or not working. That’s huge for a lot of people.” (F, 1.5Y)</p> <p>P5: “If you lose your income, if you lose the ability to go to the gym and be active, if you lose the ability to be able to buy the foods that you need to eat that keep you on track, it’s hugely disruptive.” (F, 1.5Y)</p>

481

482 **Figures**

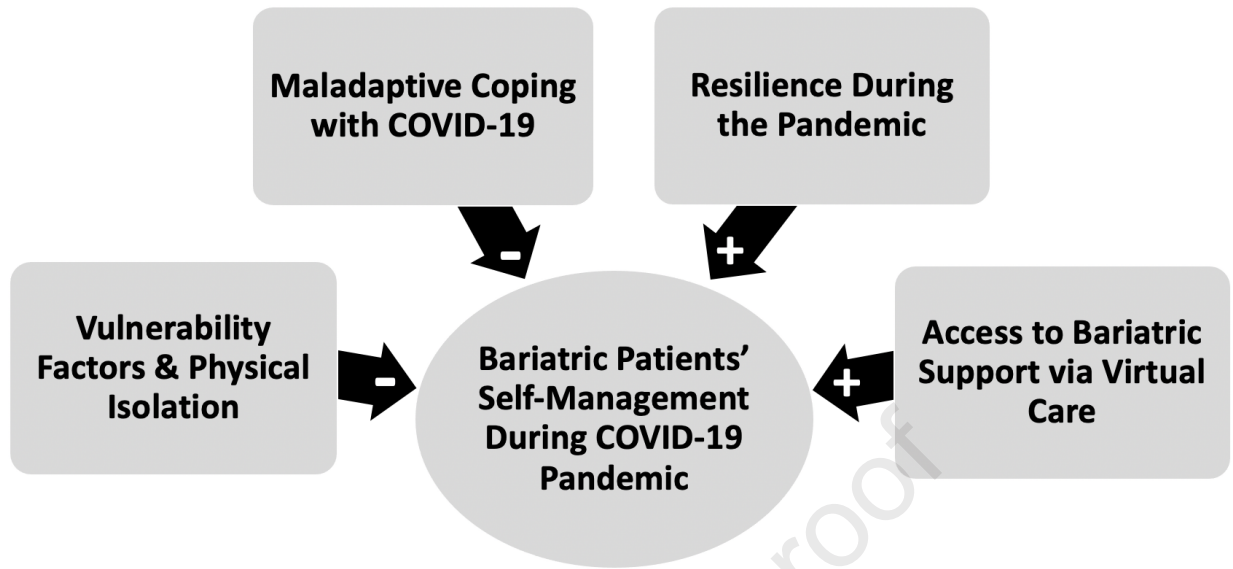
483 Fig.1 This diagram illustrates the various factors influencing bariatric patients’ self-management

484 during COVID-19.

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Journal Pre-proof



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