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Avaliação psicológica multimétodo de mulheres submetidas à cirurgia bariátrica
Multimethod psychological assessment of women undergoing bariatric surgery

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Multimethod psychological assessment of women undergoing bariatric surgery

Original Version

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To my parents, for supporting me in every decision.

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“A madureza sabe o preço exato
dos amores, dos ócios, dos quebrantos,
e nada pode contra sua ciência

e nem contra si mesma. O agudo olfato,
o agudo olhar, a mão, livre de encantos,
se destroem no sonho da existência.”

Carlos Drummond de Andrade
A Ingaia Ciência

ABSTRACT

Colombarolli, M. S. (2023). *Multimethod psychological assessment of women undergoing bariatric surgery.* (Doctoral Thesis). Faculty of Philosophy, Sciences and Letters of Ribeirão Preto, University of São Paulo, Ribeirão Preto, Brazil. Department of Psychology, University of Turin, Turin, Italy.

Obesity is a complex condition in which excessive body weight causes negative consequences for health, and is associated with increase of mortality. Treatment strategies for severe obesity include the bariatric surgery (BS), an intervention in which patients' undergo anatomical and metabolic modifications that promote restriction of food intake and absorption, leading to weight loss (WL). Psychological aspects such as affective and cognitive functioning and personality characteristics, are related to the development and severity of obesity. Psychological assessment is part of the procedures of preparation for BS and usually focus on the presence of psychopathology, which is a risk for insufficient WL. This research aimed to investigate aspects of psychological functioning in patients undergoing BS, in three different studies. The objective of Study 1 was to conduct a meta-analytic review of studies that assessed longitudinal psychological outcomes of patients submitted to bariatric surgery. We identified 751 studies, of which 26 were reviewed, and 12 were included in the meta-analysis. Study 2 compared psychological characteristics related to emotion regulation, executive functions and personality characteristics using a multimethod psychological assessment of 50 women with severe obesity (class III) undergoing BS and 29 normal-weight controls. Participants were assessed using the Difficulties in Emotion Regulation Scale (DERS), the Trail Making Test (TMT) and the Rorschach Performance Assessment System (R-PAS). Study 3 examined the association of various measures of emotion regulation, executive functions and personality to surgery status of 50 women applying for BS, from which 27 dropout of the treatment, and 23 proceeded to BS, and had their WL at 6, 12 and 18 months followed. The main results of Study 1 were that symptoms of anxiety, depression, binge eating, and body image are consistently reduced after surgery, with depressive symptoms accounting for the greater reduction. However, examination of longer follow-ups suggested that psychological functioning returns to baseline after 60 months. On Study 2, we found that patients with obesity self-reported lower levels of mental illness, although they showed poorer performance on the maximal performance

test and increased defensiveness on the typical performance test, indicating that self-report measures are subject to positive impression management. In Study 3, patients who dropped out from treatment had higher initial BMI and worse cognitive flexibility, while for the patients that proceed to surgery, indicators of emotional and cognitive functioning in all measures were associated with WL at 6 and 12 months after surgery, but only R-PAS variables related to psychological resources appeared to be associated with WL at 18 months of surgery. These results suggest that psychological assessment pre-BS should include different types of assessment measures, including maximum and a typical-performance measures, to improve effectiveness of the assessment and reduce effects of positive impression management. Multimethod approach may also contribute to a better understanding of long-term outcomes of BS by providing information on psychological aspects related to insufficient WL.

Key words: Obesity. Bariatric Surgery. Psychological Assessment. Multimethod Assessment. Rorschach.

RESUMO

Colombarolli, M. S. (2023). *Avaliação psicológica multimétodo de mulheres submetidas à cirurgia bariátrica.* (Tese de Doutorado). Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto, Brasil. Departamento de Psicologia, Universidade de Turim, Turim, Itália.

A obesidade é uma condição complexa caracterizada pelo excesso de peso corporal, que leva a consequências negativas para a saúde e está associada com o aumento da mortalidade. Dentre as estratégias para seu tratamento está a cirurgia bariátrica (CB), intervenção na qual pacientes com obesidade grau III são submetidos a procedimentos de modificação anatômica que restringe a ingestão e absorção de nutrientes, resultando em perda de peso. Aspectos psicológicos, como o funcionamento afetivo, cognitivo e da personalidade, estão relacionados com o desenvolvimento e gravidade da obesidade. A avaliação psicológica é parte dos procedimentos de preparação para a CB e geralmente tem enfoque em identificar a presença de psicopatologia, a qual está associada à perda de peso insuficiente. Este estudo buscou investigar aspectos do funcionamento longitudinal de pacientes submetidas à CB em três estudos. O Estudo 1 teve por objetivo fazer uma revisão sistemática e meta-analítica de artigos científicos que avaliaram desfechos psicológicos longitudinais em pacientes submetidos à CB. Foram identificados 751 estudos, dos quais 26 foram incluídos na revisão sistemática e 12 na meta-análise. O Estudo 2 buscou comparar características psicológicas relativas à regulação emocional, funções executivas e características de personalidade, a partir de avaliação psicológica multimétodo, em uma amostra de 50 mulheres com obesidade grau III candidatas à CB, em comparação com 29 mulheres eutróficas. As participantes foram avaliadas por meio da Escala de Dificuldades de Regulação Emocional (DERS), Teste de Trilhas (TMT) e Método de Rorschach (Sistema R-PAS). O Estudo 3 investigou a associação entre características de regulação emocional, funções executivas e personalidade com o progresso no tratamento cirúrgico e a perda de peso após 6, 12 e 18 meses da cirurgia, em mulheres com obesidade. Como resultados, o Estudo 1 identificou que sintomas de ansiedade, depressão, compulsão alimentar e imagem corporal reduzem consistentemente após a CB, sendo a redução dos sintomas depressivos a mais significativa. As mudanças tendem a retroceder após 60 meses de cirurgia. No Estudo 2 observou-se que pacientes com obesidade reportam menos adoecimento

mental, apesar de demonstrar pior desempenho em medidas de máximo desempenho, e aumento da defensividade em avaliações de desempenho típico, indicando que instrumentos de autorrelato estão sujeitas a manipulação positiva. No Estudo 3, pacientes que abandonaram o tratamento tinham maior IMC inicial e menos flexibilidade cognitiva. Entre os pacientes que realizaram a CB, indicadores do funcionamento emocional e cognitivo em todas as avaliações foram associados com perda de peso após 6 e 12 meses de tratamento, porém apenas as variáveis do Rorschach se relacionaram com a perda de peso após 18 meses da cirurgia. Tais resultados dão suporte ao uso de diferentes instrumentos na avaliação psicológica para a CB, incluindo medidas de desempenho típico e máximo, a fim de melhorar a validade da avaliação e reduzir os efeitos da manipulação positiva. A abordagem multimétodo pode contribuir, ainda, para melhorar o entendimento dos resultados a longo prazo da CB, uma vez que fornece informações complementares sobre os aspectos psicológicos relacionados à perda de peso insuficiente.

Palavras-chave: Obesidade. Cirurgia bariátrica. Avaliação psicológica. Avaliação multimétodo. Rorschach.

ABSTRACT IN ITALIANO

Colombarolli, M. S. (2023). *Valutazione psicologica di donne che richiedono di sottoporsi la chirurgia bariatrica.* (Tesi di Dottorato). Facoltá di Filosofia, Scienze e Lettere di Ribeirão Preto, Università di São Paulo, Ribeirão Preto, Brasile. Dipartimento di Psicologia, Università degli Studi di Torino, Torino, Italia.

L'obesità è una condizione complessa, in cui l'eccesso di grasso corporeo causa conseguenze negative per la salute ed è associata ad un incremento della mortalità. Fra i trattamenti disponibili per l'obesità severa c'è la chirurgia bariatrica (Bariatric Surgery; BS), un intervento in cui i pazienti sono sottoposti a modifiche anatomiche che riducono l'assimilazione del cibo, con la conseguente perdita di peso (Weight Loss; WL). Vi sono alcuni aspetti psicologici collegati allo sviluppo o alla gravità dell'obesità, come le funzioni affettive e cognitive o le caratteristiche di personalità. La valutazione psicologica fa parte delle procedure di preparazione per la BS, ed è comunemente focalizzata sulla presenza di psicopatologia, considerata un fattore di rischio ad una perdita di peso insufficiente. Questa ricerca ha lo scopo di indagare gli aspetti di funzionamento psicologico in pazienti sottoposti a BS in tre diversi studi. Nello Studio 1, l'obiettivo era condurre una revisione meta-analitica per valutare i risultati di studi longitudinali di pazienti sottoposti a BS. Abbiamo considerato 751 studi, di cui 26 sono stati inclusi nella revisione sistematica e 12 nella meta-analisi. Nello Studio 2, l'obiettivo era confrontare le caratteristiche psicologiche riguardo la regolazione emotiva, funzioni esecutive e caratteristiche di personalità, attraverso un approccio multi-metodo per la valutazione psicologica di 50 donne affette da obesità severa (Classe 3), confrontandogli a un campione di 29 donne normopeso. Le partecipanti sono state valutate usando la Difficulties in Emotion Regulation Scale (DERS), il Trail Making Test (TMT), e il Rorschach Performance Assessment System (R-PAS). Lo Studio 3 ha investigato aspetti di regolazione emotiva, funzioni esecutive e personalità in relazione alla situazione operatoria di 50 donne che hanno richiesto BS, di cui 27 hanno abbandonato il tratamento, e 23 hanno subito l'intervento, per cui la WL a 6, 12 e 18 mesi dalla CB è stata valutata. Come risultati, lo Studio 1 ha trovato che la sintomatologia di ansia, depressione, abbuffate e immagine corporea si è ridotta in modo consistente dopo l'operazione, specialmente per quel che riguarda i sintomi depressivi. Tuttavia, follow-up a distanza temporale maggiore hanno indicato una tendenza a tornare al funzionamento originario

dopo 60 mesi dall'intervento. Nel Studio 2, le pazienti con obesità riportavano livelli di salute mentale superiori, ma una performance inferiore nei test di performance massima, e profili maggiormente coartati nei test di performance tipica, mostrando come le misure self-report siano facilmente soggette a distorsioni in direzione positiva. Nello Studio 3, le pazienti che hanno abbandonato il trattamento avevano un BMI maggiore ed una minore flessibilità cognitiva nel TMT rispetto a quelle che hanno proseguito fino a sottoporsi a BS. In queste, gli indicatori di funzioni emotive e cognitive erano associati alla WL tra i 6 e i 12 mesi dopo l'operazione. Tuttavia, solo le variabili R-PAS indicative di risorse psicologiche erano correlate alla WL a 18 mesi dall'operazione. Questi risultati indicano che la valutazione psicologica pre-BS dovrebbe includere diversi tipi di strumenti diagnostici, inclusi test di performance massima e tipica, per migliorare la sua efficacia e ridurre gli effetti della distorsione degli stili di risposta. L'approccio multi-metodo, inoltre, può contribuire a migliorare la comprensione dei risultati a lungo termine della BS, fornendo informazioni sugli aspetti psicologici responsabili di una perdita di peso insufficiente.

Parole chiave: Obesità. Chirurgia bariatrica. Assessment. Multi-metodo. Rorschach.

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LIST OF ABBREVIATIONS

ABESO	Brazilian Association for Studies of Obesity and Metabolic Syndrome
APA	American Psychological Association
ASMBS	American Society for Metabolic and Bariatric Surgery
BS	Bariatric Surgery
DERS	Difficulties in Emotion Regulation Scale
EF	Executive Functions
ER	Emotion Regulation
IFSO	International Federation for the Surgery of Obesity
R-PAS	Rorschach Performance Assessment System
RIM	Rorschach Inkblot Method
SBCBM	Brazilian Society for Bariatric and Metabolic Surgery
TMT	Trail Making Test
WHO	World Health Organization
WL	Weight Loss

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1 INTRODUCTION

1.1 The Obesity Problem

Excessive body weight is a major problem in industrialized societies. Data from the World Health Organization (WHO, 2021) reveal that about five percent of deaths worldwide are directly related to obesity, and 30% of deaths are associated with obesity-comorbid conditions. Globally, 39% of adults aged 18 years and older are overweight, of which 13% are obese (WHO, 2017) In Brazil, the most recent data reveals that 18.9% of the population is obese (Brasil, 2021).

Obesity is defined as excessive fat accumulation that may impair health (WHO, 2021). It is a multifactorial condition that emerges from environmental, genetic, and behavioral interactions. The Body Mass Index (BMI) is the most used measure of obesity, defined as the person's weight divided by the square of their height (kg/m^2), commonly assumed to be an indirect index of body fat. A BMI greater than 25 kg/m^2 indicates overweight. BMI greater than 30 kg/m^2 is classified as obesity and is considered class I if BMI is between 30 and 34.9 kg/m^2, class II for BMI between 35 and 39.9 kg/m^2, and grade III or severe obesity for BMI > 40 kg/m^2.

Although useful as a population-based estimate of obesity, the BMI is a limited measure of excessive fat accumulation and should be considered carefully in the individual assessment of obesity. Other measures of adiposity, such as waist circumference and changes in metabolism, should be considered to determine the severity of obesity. Common changes associated with excessive body fat are the increase in dyslipidemia, hypertension, and insulin resistance. These conditions are associated with an increased risk of developing noncommunicable diseases (NCD) such as coronary artery disease, Type 2 diabetes (T2D), vascular diseases, obstructive sleep apnea, dementia, and some types of cancer. They are related to poor quality of life (QoL) and increased risk of death, according to the WHO (2021).

Because multiple factors determine obesity, intervention should approach many aspects of its development (Bray & Brouchard, 2014). For instance, environmental factors related to obesity are the western societies' lifestyle, which increases access to sugar and fat-rich foods, promotes a sedentary lifestyle, and limits access to health care, sports, and leisure (Maggi et al., 2015). Lifestyle is also influenced by endogenous, individual aspects, such as genetic

predisposition and psychological factors, which can contribute to eating behavior and increase fat accumulation risk (Gallo & Cheskin, 2021; Hemmingsson, 2014; Macpherson-Sánchez, 2015; Stroebe, 2008; Sutin et al., 2011; Veit et al., 2020).

Therefore, a multidisciplinary approach is usually required to treat obesity, increasing the intervention's costs and complexity. Most health system guidelines and recommendations focus on individual aspects of obesity, and multidisciplinary treatment usually includes pharmacological, nutritional, and behavioral interventions (Bray & Bouchard, 2014). In the last two decades, however, severe obesity has been increasingly treated with a surgical approach for obesity, which opens new perspectives of understanding obesity development and treatment.

1.2 Obesity Surgery: an approach for treatment

According to Eisenbebrg et al. (2022), metabolic and bariatric surgery (BS) is currently the most effective treatment for obesity across all levels of severity (Eisenberg et al., 2022). From the first statement about the matter, published by the American National Institute of Health (NIH) in 1991, a range of surgical procedures was developed to treat severe obesity. Most rely primarily on the reduction of stomachal volume or intestinal bypass, which decreases food intake and absorption of nutrients, leading to weight loss (WL) (Eisenberg et al., 2022; Hubbard & Hall, 1991).

Current guidelines suggest that BS should be recommended to adults (18 to 65 years of age) with obesity class II or III, regardless of the presence and severity of comorbidities. It should also be recommended to patients with class I obesity that did not achieve substantial or durable WL or clinical improvement of comorbidities with nonsurgical interventions. Some evidence also suggests that BS is safe to be applied to severe obesity in the elderly (where risks are carefully considered) and younger patients (children and adolescents with BMI >120% of the 95th percentile with major comorbidities). The Brazilian Society for Metabolic and Bariatric Surgery recommends that BS be indicated to adult patients with class III obesity, or class II obesity and comorbidities, which has failed in previous attempts to control weight with nonsurgical treatments for at least two years (SBCBM, 2017).

The latest data from the International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO, 2021), retrieved from 50 countries, report that in 2021 507,298 operations were performed. Before the COVID-19 pandemic, in 2019, the number of

procedures performed across 61 countries was 833,687 (IFSO, 2019). According to the American Society for Metabolic and Bariatric Surgery, in the United States (US) only, 256,000 surgeries were performed in 2019 (ASMBS, 2021). In Brazil, data from 2019 report 68,530 procedures realized, according to Brazilian Association for Bariatric and Metabolic Surgery (SBCBM, 2020).

Prevalence estimates from the World Obesity Federation (2022) projected that, in 2020, about 15% of the world's adult population had obesity, with 17% of the female and 13% of the male population presenting BMI ≥ 30 kg/m2. Nonetheless, 76% of patients submitted to surgery between 2016 and 2020 were women (IFSO, 2021). The higher prevalence of female patients might be related to the fact that women are more likely to pursue health treatment for weight management, which makes it more likely for women to be screened, diagnosed, and counseled to seek out bariatric surgery than men (Cooper et al., 2021). Also, women suffer more social pressure related to body weight and have greater weight dissatisfaction, and women with obesity report reduced health-related QoL, which might increase motivation to seek health care regarding body weight (Song et al., 2016)

The safety and efficacy of BS are well-established in the scientific literature. Longitudinal evidence reveals that BS promotes greater and more durable WL than nonsurgical treatments (Gloy et al., 2013), with additional benefits, like remission of T2D, dyslipidemia, and hypertension up to 10 years after surgery (Adams et al., 2017). Evidence from a meta-analytic review of longitudinal studies reveals that weight loss usually peaks after two years of surgery and remains relatively stable for up to 20 years. The weight loss differs according to the procedure, with mean pooled effect size from 71% of excess weight loss (EWL%) for biliopancreatic diversion (BPS) procedures, 60% EWL for Roux-en-Y Gastric Bypass (RYGB) and 49% EWL for Laparoscopic Adjusted Gastric Band (LAGB) (O'Brien et al., 2019).

Successful WL after surgery is defined as the reduction of 50% of excess weight at 18 months (Nedelcu et al., 2016). However, evidence shows that insufficient WL (<50% EWL) varies between 20 to 40% of cases submitted to surgery (Ansari & Elhag, 2021). Conversely, weight regain (WR) after surgery has many definitions, the most common are the regain of at least 10kg from nadir weight after surgery or the regain of >25% of EWL from nadir weight. Because distinct definitions are applied, its prevalence varies widely in literature, from 4% to 23% of maximum WL 3 to 6 years post-RYGB (King et al., 2020), up to 38% post-LAGB of EWL after surgery (Ansari & Elhag, 2021).

The mechanisms leading to insufficient WL and WR after surgery are multiple. For example, some metabolic adjustments are likely to reduce the potential WL or promote WR through changes in the secretion of gut hormones related to hunger and satiety (Busetto et al., 2021), contributing to dietary non-adherence and imbalance (Magro et al., 2008). Surgical failures such as dilatations of the gastric pouch and gastrojejunostomy stoma outlet also contribute to increased food intake and WR after surgery (Ansari & Elhag, 2021). Additionally, several behavioral aspects are considered important contributors to WR, especially concerning insufficient physical activity and disordered eating behaviors. These factors are directly connected to psychological factors that increase the risk for weight recidivism, such as the presence of psychiatric disorders (Freire et al., 2021), personality features (Hoyt & Walter, 2022; Neff et al., 2021), cognitive and emotional functioning (Efferdinger et al., 2017; Manderino et al., 2015; Spitznagel, Garcia, et al., 2013; Spitznagel et al., 2014).

The individual variations in treatment outcomes have increased attention to individual aspects related to the development and treatment of obesity, especially psychological aspects, and their role in BS outcomes. Therefore, extended and comprehensive investigations of the psychological functioning of patients with severe obesity seeking bariatric surgery and their results after surgery are valuable sources of information about mechanisms related to treatment outcomes.

1.3 Obesity and bariatric surgery: the role of psychological functioning

Obesity is one of the most complex and relevant health issues of our time. The burden it places on health care systems and the economy has recently received much attention from policymakers and scientists from different areas of expertise (OECD, 2019). It is well established in the literature that obesity is a multicomponent condition that requires an understanding of environmental and individual aspects and their interaction at biological, psychological, social, and populational levels, which opens to many research possibilities (Bray & Bouchard, 2014).

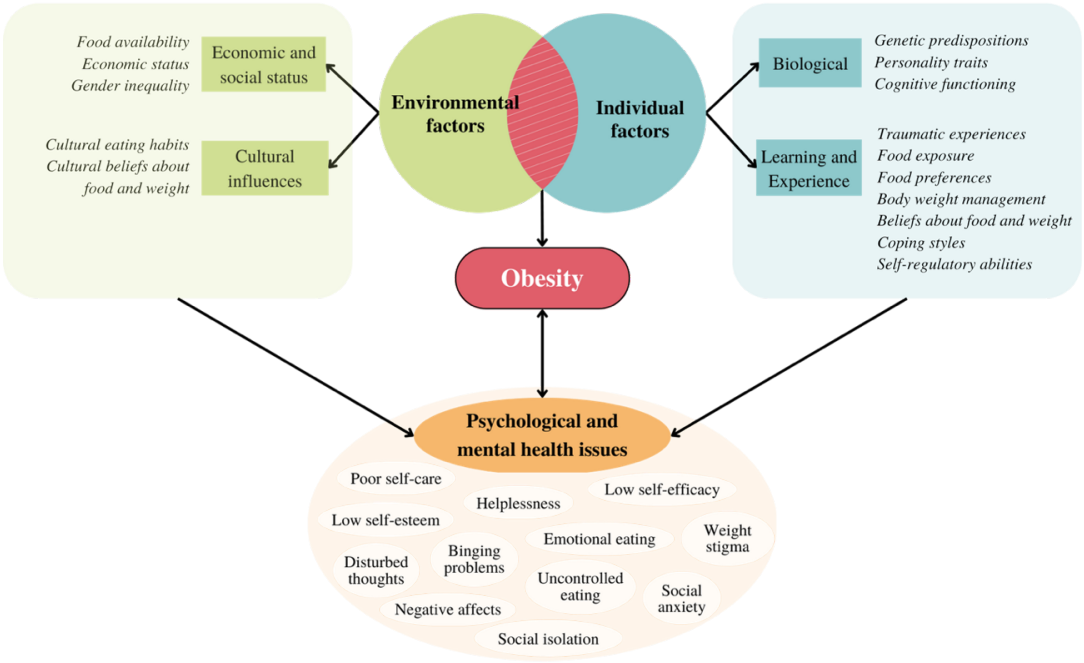
While medical perspectives on obesity development are not new, it was just in recent decades that obesity started to be treated as a populational level threat, and its environmental influences started to be a focus of attention (Bray, 2014). The increasing levels of overweight and obesity in western societies began to be investigated from sociological, economic, and even

climate-change-related perspectives (Ahima, 2014; Kanter & Caballero, 2012; Swinburn et al., 2019).

On the other hand, individual-related aspects have long been studied in health-related sciences (Barr, 1953). Research about genetic predispositions, evolutionary aspects, nutrition, and metabolic and physiological mechanisms of body weight regulation provides extensive evidence about biological factors of obesity (Burger et al., 2015; Hu et al., 2020; Makaronidis & Batterham, 2018; Ochner et al., 2013; Peters et al., 2004; Qasim et al., 2018; Sarma et al., 2021; Wallis & Raffan, 2020). More recently, however, crescent attention has been devoted to the psychological mechanisms influencing eating behavior and, therefore, interfering with body weight regulation mechanisms (Dagher et al., 2017; D'Argenio et al., 2009; Dietrich et al., 2016; Donofry et al., 2020; Houben et al., 2014; Jansen et al., 2015; Keller et al., 2019; Marcus et al., 1985; Moore et al., 2017; Rossetti & Boutrel, 2019; Wierenga et al., 2014).

The psychological aspects associated with obesity are diverse and appear to influence body weight in a variety of ways, and the mechanisms by which psychiatric conditions and obesity are linked have pushed scientific research to understand the role of mental health in obesity. Figure 1 summarizes how psychological functioning might relate to obesity and mental health status.

Figure 1.1 – Environmental and individual factors influencing obesity and psychological issues



One of the most compelling pieces of evidence in favor of the idea of psychological impact on obesity is the vast literature about the association of obesity with mental health conditions and psychopathology (Allison et al., 2009; Chen et al., 2018; Dawes et al., 2016; Dreber et al., 2015; Kalarchian et al., 2007; Malik et al., 2014; Sommer et al., 2021). For instance, a systematic review of 21 studies reporting the relationship between obesity and psychiatric conditions reveals that evidence of a bidirectional association between obesity and depression is consistent across the literature (Rajan & Menon, 2017). In a Brazilian sample of patients with severe obesity ($n = 393$), the prevalence of any psychiatric disorders assessed with clinical interview was 57.8% (Duarte-Guerra et al., 2015).

Eating psychopathology and eating disorders (EDs) are also frequently associated with obesity development and severity. A prevalence study with 12,337 adults 17 to 100 years of age from the United States (US) showed that 8% of participants with obesity had a diagnosis of an ED during their lifetime, 4%of whom had been diagnosed in the past 12 months (Duncan

et al., 2017). Conversely, studies investigating eating behavior psychopathology found that up to 33% of participants with obesity reported EDs symptoms (Tsekoura et al., 2021). The prevalence is greater among women with overweight and obesity, for which the presence of disordered eating behaviors is about 30%, versus 15% for men (Nagata et al., 2017).

Personality disorders (PDs) also appear to be associated with obesity. An extensive systematic review found evidence that the prevalence of PDs in the population with obesity is higher than those in general populational and increases with BMI, reaching 23.4% of patients with obesity class III. The most common are Cluster C personality disorders, especially obsessive-compulsive PD, characterized by rigidity, perfectionism, restriction of affects, and intimacy avoidance. Avoidant PD, which includes social-related anxiety and inhibition related to the fear of negative evaluation and rejection, is also present in this group (Gerlach et al., 2016).

Besides psychiatric diagnosis and psychopathology, other aspects of psychological functioning were also investigated among individuals with obesity, especially those related to the risk of overeating. Specifically, crescent evidence about the aspects of cognitive and affective functioning related to obesity is available in the literature. For instance, many studies provide evidence for the interaction between obesity and cognitive impairment, such as memory, attention and executive functioning problems indicate an important relationship between cognitive functioning and body weight regulation across the lifespan (Figley et al., 2016; Gunstad et al., 2010; Handley et al., 2016; Setkowicz et al., 2015). Similarly, affective aspects such as emotional awareness, emotion regulation, and impulsivity also seem to play a role in eating behavior and obesity status (Benzerouk et al., 2020; de Campora et al., 2016; Hemmingsson, 2014; Sainsbury et al., 2019; Steward et al., 2019)

The growing interest in how psychological characteristics contribute to the development of obesity and how they affect its treatment makes it a fruitful area of research for psychology. In the present study, we meant to contribute to the knowledge about obesity treatment with bariatric surgery by observing the affective, cognitive, and personality aspects of individuals with obesity applying for surgery. We also investigated what psychological instruments of different natures tell us about patients' functioning, and their progression toward treatment.

This document is the product of the research conducted in the course of my Doctoral Graduation in Psychology, on the concentration area of Psychological Processes and Health. This research was accomplished with the co-tutorship agreement between University of Sao

Paulo (Brazil) and University of Turin (Italy), which provided the means and support for its fulfilment. The research comprised an extensive literature review, data collection and analysis, and discussion of the main findings, integrating expertise and knowledge from both research contexts (Brazilian and Italian). In conducting the research, the main focus was to contribute to the clinical psychology related to obesity.

Therefore, the text is presented in such a way that the reader is initially provided with the theoretical and empirical background on the role of affective, cognitive, and personality aspects of psychological functioning in obesity (Chapter 2). Next, the methodological approaches used are presented, including the research questions, definition of variables of interest, hypothesis, and research methods employed (Chapter 3), followed by the presentation of the three empirical works derived from the research, presented as manuscripts (Chapters 4 to 6). Finally, concluding remarks and considerations about the results achieved and their implications for future studies and the field are presented (Chapter 7).

2 CONCEPTUAL AND EMPIRICAL FOUNDATIONS

Despite the complexity of the obesity problem, the most common explanations at the individual level rely on the simplistic view of the "eat less, exercise more" approach. The reasons one would fail to limit their energy intake at a level that puts them at a condition of risk is somewhat difficult to explain by health professionals, reinforcing stigmatizing views of people with obesity as lazy, weak, and failures. The fact that the behavioral aspects of obesity are so complex and require the comprehension of many levels of individuals' functioning makes it a promising area of research by psychologists.

The understanding of how psychological factors directly affect body metabolism and gene expression of fat accumulation and obesity is still very scarce and limited (Capuron et al., 2011; Peters et al., 2004; Sutin et al., 2010). Therefore, most psychological studies on the relationship between individual factors and obesity rely on its mediation role in eating behavior and lifestyle (Herman & Polivy, 2011). Because at an individual level obesity relates to excessive caloric intake and low-caloric expenditure as a direct result of behaviors, psychology research is digging deep inside the determinants of health and eating behaviors. Although it does not exhaust the whole psychology-obesity relationship, it certainly gives it a good start.

The study of the psychological determinants of health behaviors involves the understanding of the different processes that increases the frequency of healthy behaviors, i.e., behaviors that promote physical and mental well-being (Hall et al., 2013; Kucera et al., 2007). As with any behavior, many aspects are involved in this outcome. At the individual level, the aspects that influence a person's ability to promote and maintain their well-being include the ability to perceive and understand body reactions and changes, to gather information about possible aspects of the environment of their behavior that could explain these reactions, and to be able to plan and apply behavior changing strategies to modify health outcomes, in the short and longer-term (Hall et al., 2018; Neff et al., 2021; Wiers et al., 2018).

How well an individual can employ all these processes depends greatly on their individual predispositions and traits. For instance, children regarded as more conscientious have better health status at midlife, presenting healthier eating and less smoking, indicating that personality traits are important predictors of health behavior (Hampson et al., 2007). Similarly, recent studies analyzing the compliance with authorities' recommended health behaviors regarding COVID-19 spread showed that individuals with higher levels of agreeableness were

more compliant to the recommendations and presented more compassion towards others (Willroth et al., 2021). Another study found that participants that greater beliefs in their own ability to control their health were more aware of risk behaviors associated with chronic diseases, which might contribute to their adherence to treatment approaches (Hamilton & Lobel, 2015). These examples illustrate how individual characteristics, such as personality traits or an individual's beliefs about themselves, influence their attitudes towards their own health, and health treatments.

The current study focuses on three specific psychological processes and their relationship to severe obesity and its treatment: emotion regulation, executive functions, and personality. We sought to understand how these psychological variables might relate to obesity by investigating them in patients with severe obesity and comparing them to individuals with the same socioeconomic and developmental background without obesity. We also aimed to understand the psychological influences on obesity surgery outcomes by understanding how these processes relate to weight loss after bariatric surgery. In the following sections, we provide a thorough narrative synthesis of the evidence about the relationship between affective, cognitive, and personality aspects and obesity and considerations regarding the assessment approach in the field.

2.1 Affective aspects related to obesity

Emotions are psychological experiences involving cognitive, phenomenological, physiological, and behavioral aspects, usually in response to environmental demands for adaptation. Affective states are directly related to our moods and drives and therefore play a significant role in human's ability to control behavior consciously (Gross, 2014). Perspectives on emotional functioning usually include emotion perception, physiological and cognitive processing, and cognitive (mental) and behavioral responses as part of the emotional experience (Smith & Lane, 2015).

Many aspects of the affective experience might be related to obesity. For instance, there is evidence that changes in emotional functioning, such as those related to emotional perception, play a role in obesity. Specifically, interoceptive awareness, which is the processing and central representation of afferent body signals, an essential aspect of emotional perception (Critchley & Garfinkel, 2017), is impaired in individuals with obesity (Herbert & Pollatos, 2014; Madden et al., 2012). Reduced sensitivity to internal signals might impact obesity by two possible

mechanisms. First, the impaired ability to identify precisely internal clues related to bodily needs makes it harder for individuals to differentiate signs of hunger and satiety, which might disturb the regulation of food intake. Another is that these individuals have difficulty distinguishing emotional experiences from physiological signals related to hunger, which can also impact food consumption (Bertin et al., 2019; Herbert, 2020; Willem et al., 2021).

Another aspect of emotional experience studied recently is the hedonic value related to food and eating. Palatability relates to the sensory properties of the food that can evoke pleasure responses in the brain. It is usually associated with energy-dense foods with high-fat and high-carbohydrates content. From an evolutionary standpoint, pleasure related to food consumption increases the capacity to eat larger amounts of food when available, protects the body from starvation, and helps accumulate energy (Rossetti & Boutrel, 2019; Williams, 2019). The hedonic responses related to food consumption are an essential aspect of emotional experience and behavior regulation because it directly affects the motivation to eat, and it has been suggested that it might play a role in increasing levels of obesity (Ehrlich et al., 2019; Soussignan et al., 2019; Stroebe et al., 2008).

One proposed aspect of the relationship between obesity and the increased hedonic value of food is the concept of food addiction. This model assumes that the hedonic response from the consumption of palatable foods increases the frequency of overeating, leading to dysregulation of reward systems, increasing pleasure responses, and generating craving states and withdrawal responses, much like drug-induced responses. This cycle leads to a consistent increase in the consumption of high-palatable foods in an addictive cycle that increases energy intake and, therefore, fat accumulation (Cottone, 2019; Gupta et al., 2020; Jiménez-Murcia et al., 2019; Rossetti & Boutrel, 2019).

Based on the DSM-5 criteria for substance-related and addictive disorders, proposed criteria for food addiction includes the presence of overeating, difficulty in cutting down or stopping eating, time spent in seeking and consuming food, social, emotional, and physical consequences related to overeating, increased tolerance, withdrawal symptoms, craving and impairment (Fernandez-Aranda et al., 2018). The Yale Food Addiction Scale (YFAS) is the most used measure of food addiction validated (Gearhardt et al., 2009, 2016). A systematic review of studies investigating the prevalence of food addiction in various samples found that between 15 to 25% of individuals with obesity and 30 to 50% of patients with severe obesity

seeking bariatric surgery report high levels of food addiction. Comparatively, the prevalence in nonclinical, populational samples varied from 8 to 15% (Oliveira et al., 2021).

Another aspect of affective functioning related to obesity is impulsivity, which refers to the tendency to act motivated by immediate reward instead of considering later and potentially more favorable outcomes (Rochat et al., 2018). Impulsive behavior is an aspect of emotional experience where intense emotions urge the individual to respond promptly, which might incur possible negative consequences. Theoretical models about impulsivity usually pose that it depends on greater sensitivity to emotional arousal and reduced ability to modulate responses (Claes et al., 2005; Fischer et al., 2018).

From that perspective, the relationship between impulsivity and fat accumulation might be related to different mechanisms. One possible mechanism is the inability to control eating behavior when confronted with foods with great hedonic value (which promotes immediate reward), as posed by the food addiction model (Meule et al., 2017; Murphy et al., 2014; Pivarunas & Conner, 2015). Another possibility is that individuals with impulsive traits have higher emotional sensitivity and might feel more compelled to use food to modulate negative emotions or might feel more compelled to overeat when excited (Benzerouk et al., 2020; Tice et al., 2001). Recent evidence reveals that personality traits and cognitive and neural measures of impulsivity are correlated with BMI and that individuals with obesity have greater responsiveness to food cues. Also, some studies point to the evidence that the presence of impulsive-related symptoms, such as gambling and alcohol consumption, is correlated with higher calorie intake in individuals with and without obesity (Ellickson-Larew et al., 2013; Schiff et al., 2015).

Finally, obesity has also been associated with the ability to regulate emotions. Emotion regulation (ER) can be described as the process by which the individual, conscious or unconsciously, influences the experience and expression of emotions to adapt to environmental demands. This influence is related to the ability to modulate emotional and behavioral responses in emotionally demanding situations (Gross, 1999, 2014). There are explicit and implicit processes of ER, the first of which comprise the conscient effort to initiate and monitor emotional states and requires insight and ability on how to modulate behavior; the second encompasses unconscious reactions, automatically evoked from an environmental stimulus, and are not submitted to conscient monitoring or insight (Etkin et al., 2015, 2016). Currently, individual differences on ER are divided into three approaches. The first focuses on the specific

processes of ER (for instance, emotional suppression or emotion reappraisal). The second is based on the ability to cope with stress. The third approach focuses on emotional competencies, which include an array of processes, skills, and competencies that indirectly influence the capacity of ER (John & Eng, 2014).

A large number of studies have investigated the association between ER and disordered eating behaviors and obesity, providing evidence that poor abilities to regulate emotions might increase overeating and therefore increase body weight. For instance, a longitudinal study with mothers and their offspring revealed that difficulties in ER of the mothers were related to problems in breast-feed and predicted greater BMI of the babies at three years of age (de Campora et al., 2016). Similarly, a study with 110 adolescents (aged between 10 and 16) observed that ER was significantly related to emotional eating, suggesting that eating was used as an ER strategy (Vandewalle et al., 2014). A systematic review corroborated this hypothesis by reuniting evidence that emotional dysregulation is consistent across samples with obesity and binge eating disorder, suggesting that negative emotions are probably regulated through eating (Leehr et al., 2015).

This body of evidence points to the influence of emotional aspects on increased body weight and obesity. However, psychological functioning derives from complex interactions of emotions with other individual aspects, especially the ones related to cognitive abilities, which will be explored in the following topic.

2.2 Cognitive aspects related to obesity

Cognitive functions comprise numerous mental resources involved in intellectual and reasoning tasks, and include the ways individuals use cognitive resources to adapt to the environment and deliberately respond to external and internal demands (APA, n.d.). It includes intellectual capacities but, more importantly, how individuals use rational resources in everyday life.

The executive functions (EFs) are the core cognitive processes of regulation of intentional behavior. They include the ability to select and integrate perceptive inputs with information from experience to plan behavioral responses that might favor outcomes (Hofmann et al., 2012). The EFs are the distinctive set of abilities that allow humans to choose their behavior and make decisions based on the expectations of results. Therefore, they are directly

related to many health-related behaviors, such as eating behavior (Bogg & Roberts, 2013; Hall & Fong, 2013).

The theoretical models about the EFs postulate that EFs are comprised of three main components: a) working memory, which is the ability to store relevant information for decision-making for a short period; b) cognitive flexibility, or the ability to intentionally shift the focus of attention and choose the most relevant aspects of the situation in which pay attention; and c) inhibitory control, the ability to inhibit the attention to competing internal and external stimulus that might interfere with adaptation and decision making (Barkley, 1997; Miyake et al., 2000). These components work together to allow the individual to deliberately plan behavioral responses according to the projection of their outcomes and inhibit irrelevant or conflicting thoughts that might make adaptation difficult. For that reason, impairment in these components is related to difficulties in social adaptation and mental health problems, including EDs and disordered eating (Dohle et al., 2018; Syan et al., 2019).

A number of studies have demonstrated the link between EFs and obesity. For instance, some studies identified that patients with obesity had poorer performance in learning and memory tasks and alterations in impulse regulation and reward systems, pointing to a deficit in inhibitory control (Blanco-Gómez et al., 2015; Schiff et al., 2015; Zhang & Coppin, 2018). Another study with 207 adult individuals with obesity (51% female), derived from a community-dwelling population from Canada, showed that poorer performance on the Trail Making Test (TMT) was significantly associated with higher BMI and worse metabolic conditions (Fergenbaum et al., 2009). A systematic review of the literature found evidence that patients with obesity have impairment in EFs, especially working memory, and have an increased risk of developing dementia, including Alzheimer's disease (Handley et al., 2016). Similarly, in a meta-analytic review of 74 studies that assessed EFs with the Wisconsin Card Sorting Test (WCST) and the TMT parts A and B in patients with EDs and obesity, the authors found that EFs were consistently impaired in these patients (Wu et al., 2014).

In samples with severe obesity applying to surgical treatment, evidence reveals that EFs are related to surgical outcomes. For instance, in a study where 30 female patients applying for bariatric surgery were compared to 30 eutrophic women, researchers found positive and significative correlations between BMI and performance on TMT part B, which measures specifically cognitive flexibility. They also found that greater BMI was related to poorer inhibition control in these patients (Cserjési et al., 2009). In another study, researchers

investigated 57 patients submitted to bariatric surgery (87% of which were females) and found evidence that cognitive performance increased after 24 months of surgery, especially those related to EFs. They also observed that the increased performance was related to reducing inflammatory markers and improving comorbidities such as T2D and hypertension (Spitznagel, Alosco, et al., 2013). Similarly, in a systematic review of the literature on cognitive functioning in bariatric patients, the authors found that these patients have moderate cognitive impairment compared to non-obese controls but that the difference in performance was partially reverted after surgery (Spitznagel et al., 2015).

Many hypotheses have been proposed to explain this consistent relationship between obesity and deficits in EFs. For instance, some authors argue that EFs have a central role in self-regulation and that impaired abilities to regulate impulses and control emotional responses might affect eating behavior (Hofmann et al., 2009, 2012). Conversely, regulating negative affect requires cognitive effort and might increase EFs overload, which carries attentional focus to immediate situations and impacts the ability to plan long-term behavior. Consequently, this might increase the risk of using less adaptive strategies for ER and coping, such as eating a rewarding food to immediately reduce anxiety (Heatherton & Baumeister, 1991; Heatherton & Wagner, 2011).

In summary, existing research suggests that the intertwined cognitive and affective aspects that influence self-regulation are a possible clue to understanding the psychological influence on the development and treatment of obesity. Cognitive and affective components are also embedded in personality, a concept that integrates self-regulatory features to determine overall behaviors related to obesity.

2.3 Personality aspects related to obesity

The ways affective and cognitive functioning interact with internal beliefs and motivations give origin to our typical ways of responding to environmental demands. The term "personality" in psychology usually refers to the stable and consistent patterns of individuals' emotional, mental, and behavioral characteristics, including aspects related to their inner traits and predispositions, goals, motives, abilities, and attitudes (John et al., 2008). Including in these patterns are most of the habits and attitudes that, in the long run, might affect people's health.

Research about personality traits and health outcomes shows that personality might affect health through direct and indirect processes (Turiano et al., 2021). For instance, some

personality traits, like Conscientiousness, are associated with healthier behaviors such as increased frequency of exercising, lower levels of alcohol and tobacco consumption, and better adherence to pharmacological and behavioral interventions. Neuroticism, however, is related to the increased use of substances to regulate emotions and increased stress levels, which impair health (Hall et al., 2013; Joireman et al., 2012; Siegrist et al., 2022; Sutin et al., 2011).

Personality seems to relate to health also by direct physiological pathways. Evidence shows that individuals with higher levels of Neuroticism, which usually experience intense negative emotions and emotional distress, usually have increased activation of the hypothalamic-pituitary-adrenal (HPA) axis. This physiological pathway regulates the release of stress-related hormones that prepare the body to cope with threatening situations. However, the hyper-activation of these mechanisms is linked to increased stress and adverse metabolic outcomes, such as elevated cortisol levels and increased blood pressure (DeSoto & Salinas, 2015; Nater et al., 2010; Portella et al., 2005; Tyrka et al., 2005).

Research focusing specifically on the relationship between personality traits and obesity reveals that some personality traits predict BMI over the life course. For instance, a longitudinal study examining the association between personality traits and body weight found that higher Neuroticism and lower Conscientiousness increased vulnerability to overweight and obesity (Brummett et al., 2006). The evidence on the longitudinal predictive value of personality traits on BMI across the lifespan is consistent across the literature. Still, it is believed that this relationship is mediated by the ability to engage in healthier behaviors that affect BMI, such as calory consumption and level of activity (Ellickson-Larew et al., 2013; Munro et al., 2011; Poston et al., 1999).

Some studies also focused on dynamic aspects of personality concerning obesity and its treatment. For instance, one study assessed the personality functioning of patients with obesity submitted to a behavioral modification treatment and observed that emotional difficulties and depressive symptoms assessed with the Rorschach Inkblot Method (Comprehensive System; CS) were highly prevalent in the sample (Elfhag, Rössner, et al., 2004). Also, features related to perceptual and thinking problems were linked to lower weight loss in these patients (Elfhag et al., 2003).

When looking at individuals that undergo BS, many studies investigated the predictive value of personality features in surgery outcomes, with inconsistent results. While some studies found little or no predictive value of personality traits in the WL outcomes of patients submitted

to surgery (Grana et al., 1989a; Larsen et al., 2004; Poston et al., 1999), other studies showed a different trend. For instance, a study conducted in Spain with 139 patients with severe obesity, of both sexes, submitted to surgery found that the personality trait "cooperativeness" of the Temperament and Character Inventory (TCI) was related to greater WL. The authors suggest that individuals with more empathy and tolerance are more socially active and value social support, which helps treatment adherence (Agüera et al., 2015). Another study showed that the "persistence" trait was also related to WL after surgery in a sample with 333 adult patients of both sexes submitted to surgery in a private clinic of Brazil (Gordon et al., 2014). Similarly, a longitudinal study that assessed archival data from 194 patients submitted to surgery in a medical center from the United States (US) revealed that those presenting fewer Anxiety-Related Problems, fewer Alcohol Problems, and moderate elevations in Mania trait in the Personality Assessment Inventory (PAI) showed greater WL after surgery. It has been discussed that self-confidence, ambitiousness, and better coping strategies to deal with negative affects have better outcomes (Hoyt & Walter, 2022).

Studies that assessed dynamic aspects of the personality of bariatric surgery patients with the Rorschach showed that perceptual distortions, poorer resources to control impulses, and emotional immaturity had greater binge eating symptoms, which is a risk factor for weight regain after surgery (Ribeiro et al., 2011a; Venzon & Alchieri, 2014). In a similar study with patients that were treated using a gastric balloon, a less invasive approach for reducing the volume of food ingestion, patients that lost more weight had more psychological resources, fewer problems of interpersonal relationships, and greater emotional maturity on the Rorschach (CS) (Pinto, 2011).

These suggestive, albeit inconclusive, results indicate that, at some level, assessment measures and studies' designs influence how we understand the relationship between psychological factors and obesity. In the case of personality assessment, it seems that results derived from self-reported personality traits diverge and, at some level, contradict those from implicit measures, such as those from the Rorschach. Although this lack of consistency is not uncommon in the field of psychological assessment (Meyer et al., 2018), it might have implications for understanding the psychological functioning of obesity patients.

2.4 Psychological assessment in the obesity surgery

This overview of psychological aspects related to obesity, although non-exhausting, provides evidence that the way we measure broad psychological functions such as cognitive, affective, and personality characteristics in patients with obesity might bring different conclusions. Previews literature reviews show that most of the psychological assessments in this field focus on the severity of psychiatric symptoms, such as anxiety, depression, and eating disorders, using self-report measures or clinical interviews (Flores, 2014; Marek et al., 2016; Pull, 2010). Very few and sparse studies applied varied assessment methods, and investigating the underlying psychological dynamics of patients with obesity is very rare. Many studies focused on the stigmatizing view of the patient with obesity as "psychologically disturbed" (Friedman & Brownell, 1995; Grana et al., 1989b; Wee et al., 2013). The fact that persistent patterns of psychological impairment emerge in research about outcomes of obesity treatment reinforces the idea that the psychological assessment seems poorly used or has limited relevance by professionals working with these patients (Rutledge et al., 2020). Understanding what types of problems lead to these limitations and the possible ways to confront them is an essential feature of psychological research in this field (Marek et al., 2016, 2017; Martin-Fernandez et al., 2021).

2.4.1 Current issues in the psychological assessment of bariatric patients

The limited and conflicting psychological evidence in this field points to how the psychological investigation is conducted among these patients. Previous discussions have been made about how psychological research is frequently focused on the psychometric value of the instruments at the cost of addressing the clinical utility of the assessment methods in specific contexts (McGrath, 2001). In that sense, the somehow erratic results regarding the predictive value of psychological assessment in bariatric surgery may be attributable to two possible standpoints: a *validity* problem and a *scope* problem. The first refers to the ability of the evaluation measures to provide clinically useful information about patients in the bariatric context, including the psychometric properties of the measures in bariatric samples and also factors related to the procedures of the assessment (the *when*, the *how,* and the *why* of the assessment). The second comprises the focus of the assessment carried out in this context, or

the *what* of the assessment. Table 2.1 demonstrates what each of these problems refers to in the context of bariatric surgery assessment.

Table 2.1. Problems related to the reliability and the scope of the psychological assessments in bariatric surgery.

Feature	Definition	Type of problem
When	At what moment of the treatment will the assessment be carried out? How long should the assessment procedures take? How many times should the patient be re-assessed?	Validity
How	In what ways will the patient be assessed? Which types of measures and in which order of administration are the results more consistent, reliable, and precise? Who should be conducting the assessment?	Validity
Why	What is the purpose of the assessment? Is it oriented towards patient-centered goals or treatment-related outcomes? How will the results of the assessment be used in the treatment? What types of procedures are going to be administered based on these results?	Validity / Scope
What	What should be assessed? What specific features of this component or feature are most relevant for the assessment? What type of information is most beneficial to the assessment goals?	Scope

Regarding the reliability problem, any psychological assessment procedure must consider how to measure a specific trait or characteristic of a person and reduce interference of sources of error in this measurement. How these errors are controlled refers to how well *the specific type of measure* (whatever type it is) can capture *this specific feature* of *this specific subject* being assessed in *these specific conditions.* In the bariatric surgery assessment, it means that the measure should be able to determine individuals' specific psychological characteristics, considering that they have a great motivation to be submitted to surgery to treat this very frustrating and unfavorable problem. This subject, therefore, has specific motivations and ways by which the experience of his condition and the possibility of treating it might interfere with the assessment procedures to which he is submitted during pre-surgery procedures. For that reason, the precision of the assessment should contemplate how these motivations, the moment of the assessment, and the type of measure (self-report, informant-report, observation,

performance-based) might affect the measures' ability to capture the characteristic of interest reliably.

The idea of a reliability problem is supported by the fact that patients who undergo bariatric surgery consistently score lower on measures of problematic behavioral characteristics than do patients with obesity who do not undergo surgery (Butt et al., 2021; Rosik, 2005). These data suggest that, at some level, these patients are inclined to hide their problems. Therefore, self-reported measures have a limited ability to capture inherent characteristics that they might consider problematic to reveal (Ambwani et al., 2013; Wedin, 2017). Conversely, some studies indicate that patients with obesity have low self-awareness and are poor informants about their emotional states, with difficulties recognizing and labeling emotions (Aviram-Friedman et al., 2018; Fernandes et al., 2018; Willem et al., 2019, 2021). These results indicate that the way some characteristics are assessed might interfere with the interpretation of data and defy expectations about how specific psychological processes related to obesity.

The scope problem refers to the utility of the measures in the assessment context, i.e., what *specific information* should be obtained and *how that information will be used* for the treatment. In this sense, the bariatric surgery assessment should be focused on specific goals, either patient-centered or treatment-related, and the type of information derived from the evaluation should be used to improve treatment success.

Recent criticism about the utility of psychological assessment in bariatric surgery is related to the inconsistency in defining which goals are relevant to the field (Rutledge et al., 2020). While some assessments are only concerned with describing the presence and severity of psychopathology, others focus on patient-related characteristics that increase the probability of better outcomes and provide insight into practical psychological interventions for this population (Pull, 2010). Although both scopes are valid and relevant, the way psychological assessment has been conducted in the field seems almost erratic until this date. As stated by Meyer et al. (2001),

> the key that determines when assessment is appropriate is the rationale for using specific instruments with a particular patient under a unique set of circumstances to address a distinctive set of referral questions. *An assessment should not be performed if this information cannot be offered to patients, referring clinicians, and third-party payers*. (p. 129).

Previous discussions have addressed the scope problem by offering new perspectives on pre-bariatric evaluation goals. It includes expanding the view from counterindication and predictive factors to focusing on psychosocial and behavioral factors related to initial obesity development and might contribute to poorer surgical outcomes. Also, it has been argued that assessment should include patient-centered goals that are clinically relevant to the treatment, such as improvement of quality of life and other health-related aspects (Rutledge et al., 2020). Although this approach provides fruitful perspectives on improving the utility of psychological assessment pre-bariatric surgery, more research is needed to understand if it enhances the investigation quality of clinically relevant treatment outcomes. The validity problem, however, is closely linked to the ability of these assessment questions to be addressed. Therefore, a deeper look at how assessment procedures are chosen and used is central to improving the quality of information.

2.4.2 The multimethod approach to psychological assessment of bariatric patients

2.4.2.1 An overview of the multimethod psychological assessment in clinical settings

Psychological assessment includes a full array of procedures and techniques that psychologists use to understand individuals' behavior and answer specific clinically-relevant questions (Groth-Marnat, 2009). In doing so, psychologists must "select assessment tools that demonstrate sufficient validity evidence for their uses, sufficient score reliability, and sound psychometric properties" (APA, 2020). Psychological assessment differs from psychological testing as it aims to answer a specific and clinically-relevant question instead of simply providing a nomothetic test score of the individual regarding a particular trait or characteristic and comparing it to some reference sample. In that sense, validity evidence should not rely solely on the instrument's psychometric properties but on its ability to answer the clinical demands of the assessment properly (McGrath, 2001).

A consensus in the assessment literature is that no clinical question can be meaningfully answered by only one source of information (Mihura, 2012). This results from two problems: a) the inherent underrepresentation of a construct when assessed by a single method (Meyer, 2001); and b) because the context of assessment, individual characteristics, and specific questions to be answered altogether influence the validity of the measure, i.e., its ability to provide a relevant response to the clinical issue being addressed (APA, 2020). Moreover,

attention has been applied to understanding the processes engaged in different types of assessment measures and what it informs about the construct being assessed in the last decades (Meyer & Kurtz, 2006). Data gathered from various tests usually provides the clinician with a more comprehensive set of information that enriches the interpretation of results and their practical implications (Bornstein, 2007). A taxonomy of test categories and the underlying processes it requires was proposed by Bornstein (2007) and is summarized in Table 2.

Table 2.2. Classification of psychological tests according to the processes elicited by each type of measure.

Test category	Definition	Processes engaged
Self-report or self-attribution	It consists of a series of descriptive sentences where the individual is asked to attribute the degree to which they identify, or the frequency to which they engage, in specific behaviors.	Introspection, memory recollection, conscious motivation, deliberate self-representation
Performance-based or Stimulus attribution	In these tests, a series of ambiguous, evocative stimuli are presented to which the individual is asked to attribute meaning.	Attention, perceptive integration, memory recollection, cognitive style, response inhibition, language, affective states, behavioral expression
Constructive	The person is required to create or construct an image or description based on specific parameters provided by the tester	Attention, memory recollection, cognitive style, behavioral abilities
Behavioral or Observational	This type of test measures indexes of a person's behavior exhibited in vivo through a direct observation or specific assessment tool	It depends on the specific behavior being measured
Informant-report	Test scores are derived from informant ratings or judgments of a person's pattern of behaviors	Informants' memory recollection, information biases, cognitive styles, motivations, and affective states

Note. Based on Meyer and Kurtz (2006) and Bornstein (2007).

The multimethod psychological assessment, therefore, consists of an approach to the clinical assessment that deliberately includes different test methods to address different processes underlying relevant psychological characteristics of interest and provide a more meaningful interpretation of assessment results. This method strengthens psychological assessment quality by minimizing the inherent limitations of different methods and offering

information about test scores divergences and convergences that helps the clinician to understand patients' functioning in a dynamic and integrated way (Bornstein, 2014).

Multimethod assessment is beneficial for addressing different types of bias that might emerge from the clinical assessment. The first one refers to the inherent characteristics of the construct being measured using specific lenses. As described in Table 2.2, the processes underlying test scores provide the assessor with the possibility to interpret fundamental aspects of the responses on the measured construct and, therefore, possible sources of scores' bias, such as self-perception biases, memory distortions, or cognitive and information-processing style. For instance, it is known that the measure of implicit processes is better carried with performance-based measures, as opposed to self- or informant-report scales, because of the inherent problem of attribution error due to observation bias, personal motives, and heuristic errors in memory recollection. However, when individuals' beliefs and motives are an essential focus of the assessment, self-attribution tests might be more valuable, as they capture individuals' perceptions, narratives, and underlying affective influences on how they perceive themselves.

Beyond processes underlying test scores, other individual and contextual factors might interfere with the validity of assessment results. For example, assessment scores might be influenced by respondents' moods or anxiety levels, which interfere with the retrieval of mnemonic information and therefore impair individuals' typical way of processing test stimuli. Also, the testing context, including reasons for the referral to assessment, conditions of the assessment, relationship with the assessor, possible consequences and expectations from the assessment procedures, and results, can influence how individuals respond to assessment tasks. In bariatric surgery settings, all these aspects are possibly implicated in how results are obtained, as the next section will elucidate.

2.4.2.2 Contributions of the multimethod psychological assessment to bariatric surgery

Despite the consistent evidence supporting the usefulness of multimethod psychological assessment over unimodal practices, it is still not a dominant practice in psychological research (Bornstein, 2014). The bariatric surgery assessment is not an exception in that sense, considering that usually facilities that treat obesity patients rely on limited human and material resources, which calls for cost-effective procedures regarding psychological assessment (Bauchowitz et al., 2005; Marek et al., 2016). As presented in previous sections, however, the

cost-effectiveness of current psychological assessment practices is under scrutiny as it continues to provide inconsistent results and derive information with limited utility for obesity treatment (Greenberg et al., 2009; Rutledge et al., 2020).

Aspects related to the scope and validity of assessment measures in this context must be addressed by researchers to overcome these issues. In that sense, when looking specifically at validity issues, the multimethod psychological assessment provides a possible strategy to improve the way psychological characteristics are measured and interpreted in the bariatric surgery field. Recent reviews show that the use of psychological tests is limited in the area, and assessments usually rely on single instruments assessing broadband characteristics or symptom assessment scales (American Psychological Association & APA Task Force on Psychological Assessment and Evaluation Guidelines, 2020; Marek et al., 2016). Although psychometrically sound measures are available, they do not necessarily provide a comprehensive picture of the psychological aspects involving the treatment of obesity, as previously discussed.

One possible contribution of multimethod psychological assessment to the field of bariatric surgery is to provide clinicians with an integrated framework for the interpretation of patients' dynamics and characteristics that were possibly related to weight gain and, therefore, their risk of unsuccessful outcomes after surgery (Bornstein, 2016; Mihura, 2012). Current assessment practices rely greatly on assessing psychopathology. Still, consistent evidence implicates that self-regulatory and personality processes are straightly related to obesity development and severity and might mediate the relationship between obesity and psychopathology (Claudon et al., 2012; Federico et al., 2019; Hoyt & Walter, 2022; Micanti et al., 2017; Monell et al., 2020; Parcet et al., 2020; Schäfer et al., 2017; Stapleton et al., 2020; Strimas, 2021; Wolz et al., 2015). Similarly, many studies with patients submitted to surgery provide evidence that the individuals' ability to adapt to changes after surgery and adhere to behavioral and clinical interventions are better predictors of weight-loss maintenance than specific psychopathology (Carlson, 2017; Eynde et al., 2021; Hout et al., 2005, 2009; Raman et al., 2013; Robitzsch et al., 2020). This capacity relies greatly upon patients' characteristics and functioning and should be adequately known and engaged by clinicians during treatment for optimal results.

Another possible contribution of the multimethod approach is to reduce the effect of impression management and response style on the results of the psychological assessment of these patients (Bornstein, 2016). Previous studies suggest that patients being assessed during

pre-surgical preparation are motivated to manage their responses to psychological tests and picture what they consider to be a less-problematic version of themselves by denying symptoms and behavioral problems (Ambwani et al., 2013; Wedin, 2017). Weight stigma and the great frustration process related to the treatment of obesity may motivate these patients to manipulate (deliberately or not) the way of responding to assessment questions (Puhl et al., 2017; Roberto et al., 2012; Wee et al., 2013; Weineland et al., 2013). The multimethod approach provides a unique possibility to assess the role of these motivations in the response process of these patients, as well as increment the interpretation of test results of different natures by understanding how conceptions about self and others and the context of assessment represent the attitudes and motivations of the patients towards treatment.

Finally, the multimethod assessment might provide insight into how patients with obesity respond to different types of measures and how these processes relate specifically to obesity. In that sense, it might address the specific goal of understanding the underlying psychological processes related to obesity in an integrated way, which is still a non-answered question in psychological literature about obesity (Bean et al., 2008; Collins et al., 2016; Hemmingsson, 2014; Hout et al., 2004; Robinson et al., 2020). This has important implications for how we understand the psychological determinants of obesity and might contribute to prevention and treatment strategies that reduce the impact of this health condition on individuals and societies.

In the current research, we aimed to contribute to this field by applying a multimethod psychological assessment of patients undergoing bariatric surgery and providing initial evidence about its informative potential on the comprehension of obesity surgery outcomes. The next chapter presents the methodological approach for chasing these goals.

3 METHODOLOGICAL CONSIDERATIONS

The aim of the present study was to deepen the understanding of psychological aspects related to severe obesity and to find out how they associate with BS outcomes. To this end, we adopted a multimethod psychological assessment approach in which instruments of distinct natures and objectives assessed different facets of cognitive and affective functioning. In this section, we present the main objectives of this study and the methodological design used to achieve these objectives.

3.1 Goals

The main goal of the present study was to investigate aspects of psychological functioning associated with emotion regulation, executive functions, and personality characteristics in women with severe obesity (class III) undergoing bariatric surgery compared with eutrophic women. We aimed to identify the association of the assessed variables with the weight-loss in the patients who underwent surgery.

The secondary goals of this study were:

1. To systematically and meta-analytically review the literature about the longitudinal outcomes related to the psychological functioning of patients submitted to bariatric surgery;
2. To describe and compare women with class III obesity to eutrophic women regarding:
    a. The severity of psychopathology, depressive and anxiety symptoms using the SRQ-2,0, PHQ-9, and the BAI;
    b. Emotion regulation difficulties with DERS;
    c. Cognitive processes related to executive functions with the Trail Making Test (TMT);
    d. Personality functioning using the Rorschach Inkblot Method (R-PAS);
3. To describe and compare women with class III obesity that proceeds to bariatric surgery to those that drop out from treatment;
4. To investigate the relationship between women's psychological functioning before surgery and their longitudinal weight loss after 6, 12, and 18 months of surgery.

3.2 Design

The present research is comprised by three different studies, each using a specific methodological approach to achieve its goals, as follows:

Study 1: This study was a systematic review with meta-analysis of longitudinal psychological outcomes of bariatric surgery (Chapter 4).

Study 2: This study was a cross-sectional study with a case-control design that compared psychological variables related to emotion regulation, executive functions and personality in a clinical group of women with severe obesity versus a non-clinical, community dwelling sample of women (Chapter 5).

Study 3: This was a prospective longitudinal study examining the association between pre-surgery assessment variables and weight loss at 6, 12, and 18 months after surgery (Chapter 6)

3.3 Variables of interest

In the current investigation, the psychological functioning of patients was described by specific variables related to affective, cognitive, and personality processes, defined as follows.

3.3.1 Emotion regulation (affective functioning)

Emotional functioning was defined as the competencies of emotion regulation, according to the multidimensional model of Gratz and Roemer (2004). This approach defines emotion regulation as a set of competencies consisting of a) acknowledging and comprehension of emotional states; b) acceptance of emotional experiences; c) the ability to control impulsive behaviors when experiencing intense emotions; d) the capacity to apply goal-directed behavior under intense emotional states; d) ability to flexibly use ER strategies according to situational demands.

These competencies are measured by the Difficulties in Emotion Regulation Scale (DERS, Gratz & Roemer, 2004). It is a self-report instrument in which individuals refer to their

difficulties related to each of the competencies, which provides a general index of their perceived ability to regulate emotions.

3.3.2 Executive functions (cognitive functioning)

Cognitive functioning was outlined as the cognitive processes related to the ability to voluntarily control complex behavior, defined as executive functions. These processes include many components, including attention, memory, and information processing.

In the current study, we sought to capture these abilities by measuring two specific aspects of executive functions: a) processing speed, which is an inherent marker of the cognitive efficacy in processing perceptual stimuli, and b) cognitive flexibility, or the ability to shift attention and reasoning to different stimuli to favor adaptability to contextual demands. These two aspects of cognitive functioning were measured using the Trail Making Test (TMT, Strauss, Sherman, & Spreen, 2006), a measure of maximum performance in which individuals are required to visually scan and connect a sequence of numbers and letters in crescent and alphabetic order as fast as possible.

3.3.3 Personality processes

This conceptually broad term refers to a series of traits and characteristics that influence how one thinks, feels, and behaves. How these traits are measured provides different perspectives on the personality processes, which can be implicit or explicit, conscious or unconscious. This study focused on the personality features that emerge from the combination of implicit processes and deliberate strategies during a typical performance task involving stimulus attribution, verbal communication, and interactive behavior (Bornstein, 2012; Meyer, 2017).

These features were assessed by the Rorschach Inkblot Method, using the Rorschach Performance Assessment System (R-PAS, (Meyer et al., 2011), a behavioral experiment in which personality processes are engaged, and the examiner can observe the "personality in action", being therefore characterized as a typical performance measure. The test provides information about four domains of personality function, related to: a) engagement and cognitive processing, which refers to the way individuals possess and apply psychological resources to problem-solving; b) perception and thinking problems, or the way one can observe and mentally

process external information in a more accurate or distorted manner; c) stress and distress, or the impact that implicit affective processes have in the way the person deals with environmental demands; and d) self and others representation, which captures aspects related individuals' needs and expectations when interacting with others.

3.4 Hypotheses

We aimed to test the following hypotheses:

Hypothesis I: Women with severe obesity applying to bariatric surgery have higher levels of clinical symptoms related to anxiety and depression, more difficulties in emotion regulation, and poorer performance of executive functions compared with eutrophic women.

Hypothesis II: Women with severe obesity who apply for surgery present indicators of poorer emotional processing and fewer cognitive resources on the Rorschach, compared with eutrophic women.

Hypothesis III: Women who drop out from surgery have more (and more severe) clinical symptoms, greater emotion dysregulation, and worse cognitive performance.

Hypothesis IV: Women reporting less difficulty with emotion regulation and better cognitive performance lose more weight at all follow-up visits after bariatric surgery.

Because the investigation of the relationship between Rorschach and weight loss is exploratory, we did not formulate any preliminary hypothesis about this association.

3.5 Considerations about impact of COVID-19 on the research

In the process to carry on this research, considerations should be made about the procedures taken to achieve the goals of these studies. Initially, this research aimed to investigate various characteristics of psychological functioning in patients undergoing obesity surgery, in comparison with non-clinical participants with the same socioeconomic background. To this end, we conducted a psychological assessment of patients of a public service in Brazil that offers treatment for severe obesity using bariatric surgery. Additionally, we aimed to follow the patients who underwent surgery, in order to investigate the prospective value of the variables assessed by using a longitudinal approach. For this, we planned to obtain data from follow-up visits of patients after surgery up to 24 months after surgery. Another goal of this study was to integrate a sample of Brazilian and Italian patients assessed with

multimethod assessment procedures and to assess the impact of cultural background on outcomes. These goals were to be achieved in collaboration with researchers from a bariatric surgery center in Italy.

However, the pandemic COVID-19 posed a challenge to the continuation of the original research. At the time of the global outbreak of the COVID-19 pandemic, the initial evaluation of bariatric surgery service patients and nonclinical participants was nearly complete. Although the sample size was limited, it was possible to address one of the main goals of this research, which was to assess the psychological functioning of patients undergoing surgery compared with a nonclinical, community-based sample.

However, the remaining objectives, i.e., longitudinal study and cross-cultural comparison, could only be partially achieved because of the limitations imposed by the pandemic. In particular, the study of patients undergoing surgery was suspended due to the restrictions in place in both countries (Brazil and Italy). In addition, many of the patients studied could not undergo surgery because all elective procedures were suspended from 2020 to mid-2021. Furthermore, follow-up visits of patients that were previously submitted to surgery were suspended, and services provided limited care to patients with critical outcomes. Therefore, it was not possible to conduct a longitudinal study of patients scheduled for surgery after December 2019 and to obtain a sufficient sample from Italy for cross-cultural comparison.

In that context, and bearing in mind the exigences of a doctoral research, we considered the outcomes of bariatric surgery from a longitudinal perspective by systematically reviewing the literature on outcomes related to patient psychological functioning in studies using a longitudinal design. Although this solution does not answer the specific initial research questions, we believe it contributes to the field by using a robust methodological approach to investigate quantitatively the relationship between psychological functioning and bariatric surgery.

In the following chapters, the manuscripts resulting from the current investigation are presented, each focusing on a main objective of this research. For each study, a detailed methodological design and discussion of the results are given. Later, a comprehensive discussion of all the results derived from this research and their implications for the field follows.

4 MANUSCRIPT 1: LONG-TERM PSYCHOLOGICAL FUNCTIONING OF BARIATRIC PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF LONGITUDINAL STUDIES

5 MANUSCRIPT 2: SELF-REPORTS DON'T TELL THE WHOLE STORY: A STUDY OF CANDIDATES FOR BARIATRIC SURGERY USING A MULTIMETHOD APPROACH

6 MANUSCRIPT 3: EXPLORING THE UTILITY OF THE RORSCHACH TEST IN PREDICTING WEIGHT-LOSS AFTER BARIATRIC SURGERY

7 CONCLUSIONS

Obesity is a complex condition in which individual and environmental aspects interact, causing the dysregulation of body weight. Psychological aspects influence behaviors that can contribute to the development of obesity and its treatment. Therefore, this study aimed to contribute to the knowledge about the psychological aspects related to severe obesity by investigating characteristics of psychological functioning of women with severe obesity (class III) undergoing bariatric surgery, in comparison to eutrophic women. We specifically focused on the characteristics of emotion regulation, executive functions and personality characteristics. We additionally aimed to identify the how the assessed psychological variables would relate to the patients' weight-loss after surgery.

Each of the three manuscripts presented addresses one of the specific goals that guided this investigation. The first manuscript sought to systematically review the literature on the long-term psychological functioning of patients undergoing bariatric surgery. The second manuscript focused on the comparative analysis of the psychological functioning of women with class III obesity applying for bariatric surgery versus eutrophic women. The third manuscript examined the relationship of various psychological characteristics to the treatment course of patients undergoing bariatric surgery.

In summary, three broad conclusions derive from the presented results:

1) Up to 48 months after surgery, there is a significant reduction in psychological symptoms, particularly depression, anxiety, binge eating, and body dissatisfaction; thereafter, aspects of psychological functioning such as self-esteem, affectivity, and psychopathology appear to return to pre-surgery levels.
2) Individuals with severe obesity who apply for BS respond differently to self-report instruments and to measures that capture implicit psychological processes (typical- and maximum-performance instruments). Responses to self-report instruments are likely affected by the response style of patients applying for surgery. More precisely, it appears that the responses of BS candidates to self-report instruments are characterized by a positive response bias, which could be related to the socially desirable response behavior and/or the limited self-perception of these patients.
3) The information provided by different sources of information is related differently with WL outcomes, which suggests that psychological processes not directly under

individuals' conscious control might be more informative of long-term outcomes than self-reported characteristics.

These findings have important implications for the field of bariatric surgery assessment. First, the evidence on the limited long-term effects of BS on psychological functioning points to the possibility that psychological problems could onset or reappear some years after surgery, which can represent a risk for weight regain. This has important implications for how psychological assessment is planned and used in the field, and for its potential to provide information about patients' weaknesses and strengths that should be considered in the treatment of obesity.

Another implication of this study is the demonstration that self-report measures, especially those assessing psychopathology and emotional functioning, are vulnerable to positive response bias in BS patients. This finding complements previous evidence about the effects of socially desirable responding in this context, and thus emphasizes that assessment protocols that are restricted to self-report measures are limited. The hypothesis of positive impression management seems to best explain these results. However, impaired cognitive abilities, low self-esteem, and reduced psychological resources could also influence how individuals respond to these measures.

Nonetheless, the different information derived from self-report and performance-based measures enhance the understanding of the psychological functioning of patients undergoing surgery by providing complementary information characteristics. Therefore, they help to increase the validity of the assessment by offsetting the limitations of self-report measures and highlighting possible psychological outcomes of patients on medium- and long-term after surgery, which has important implications for treatment planning.

Overall, this study contributes to the literature on psychological assessment of bariatric surgery patients by providing insights relevant to assessment recommendations for the field. Obesity is a challenging, chronic health condition that requires long-term management. The involvement of psychological aspects in this condition requires that clinical psychologists support treatment through evidence-based procedures of assessment and intervention. We advocate that multimethod psychological assessment is a strategy for improving effectiveness and utility in the assessment of bariatric patients, as it has been in many other areas of psychological assessment in which it is used. In this way, psychological evaluation provides

important insights into the long-term management of these patients for clinicians and healthcare providers in this field.

In addition, clinicians should keep in mind that obesity treatment is not just about reducing body weight, but about the totality of environmental and individual aspects that contribute to body weight dysregulation. At the individual level, this means that psychological characteristics that once contributed to the onset and severity of obesity can interfere with treatment progression if not addressed properly, and are therefore an essential component of obesity treatment. Therefore, beyond the WL and the immediate health and psychological improvements promoted by surgery, the long-term success of obesity treatment should consider long-term and broader positive effects on patients' health behaviors.

In interpreting these results, some limitations of the study should be noted. The most important one relates to the low statistical power of our analyses, which is due to the small sample size. In addition, the multiple significance tests performed in these studies as well as the a large number of variables considered in this research also increase the probability of a type II error. Thus, additional research on the usefulness of a multimethod psychological assessment in larger samples of BS patients would be beneficial. Another limitation regards the generalizability of the results, as the sample came from a single center of bariatric surgery, from the Brazilian public health system. Patients applying for bariatric surgery can have different backgrounds, and it is common for patients from public health systems to differ from those treated in the private context. Future studies should address the characteristics of patients applying for surgery in other cultural and socioeconomic contexts, and assess the effect of these variables on outcomes.

Another limitation concerns the variables examined in this study, which are limited to important affective and cognitive variables and personality dynamics. Although these variables are relevant, they do not include all possible relevant variables that can be assessed in this population. Moreover, it is possible that other self-report measures that capture other aspects of emotion regulation, affective functioning, and psychopathology would yield different results. The extent to which this affects the conclusions of the study should be the focus of future studies. In addition, follow-up of all patients would help to understand the impact of time on outcomes, both in those who underwent surgery and in those who discontinued it or opted for other treatments.

In light of the findings reported, future research is encouraged to address other questions of relevance for the field. In particular, an important question is whether there is a psychological profile that poses a risk for severe obesity and whether it has implications for treatment. Our study suggests that it is possible that some implicit measures, such as the maximum performance and typical performance tests that we used, could shed light on understanding the underlying dynamics of patients with obesity and their impact on surgical outcome.

In this sense, another suggestion for further studies would be to investigate how psychological functioning evolves throughout the obesity treatment process, taking into account the very long-term outcomes (five or more years) of patients undergoing bariatric surgery treatment. Because the weight regain rates are not despisable, it is important to understand how the process of weight loss and regain impacts psychological health and the implications for obesity management in patients with recidivist obesity.

Future research should also focus attention on the response process of patients applying for bariatric surgery. The identification of positive reponse bias in the different types of measures requires that researchers investigate the nature and motivations behind the patient response process. The use of measures that include validity scales is encouraged to control for the effect of response manipulation.

It is important to note that the results presented here come from the Doctoral research in Psychology, conducted in co-tutorship between the University of São Paulo (Brazil) and the University of Turin (Italy), in an agreement signed in 2019. At the University of São Paulo, the research group Psychodiagnostics Research Center provided technical and operational support for the development of the research. The research included a 17-month doctoral exchange period in the Evidence-Based Psychological Assessment research group of the Department of Psychology at the University of Turin. This period was financially supported by the Coordination of Superior Level Staff Improvement (CAPES), with a Doctoral Exchange Scholarship (CAPES-PRINT - 88887.466456/2019-00), and by the University of Turin, with a mobility and cultural exchange grant (UA.A200.ADIR.A500.COTUTATEN). This opportunity contributed notably to the improvement of the quality of the work and provided access to academic knowledge and expertise that could be shared with other Brazilian researchers.

In conclusion, the present study sought to contribute to the field of clinical psychology applied to the context of obesity treatment by investigating different approaches to the psychological assessment of patients applying for bariatric surgery. Despite the methodological

and contextual limitations described above, we expect that the results and discussion presented here will help improve current practice in the managment of patients with obesity by providing clinicians and researchers with insights into psychological assessment in this context.

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APPENDIX A – INFORMED CONSENT FORM

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

Venho convidá-lo a participar, como voluntário(a), da pesquisa intitulada "*Regulação emocional, funções executivas e características de personalidade em pacientes candidatos à cirurgia bariátrica*", que tem por objetivo estudar de que forma características de personalidade, a maneira como as pessoas lidam com emoções e como o funcionamento das ideias podem se relacionar com a obesidade. Esta pesquisa está sendo desenvolvida como minha pesquisa de Doutorado no Departamento de Psicologia da Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto (FFCLRP-USP), na Universidade de São Paulo (USP), com orientação da Profª Dra. Sonia Regina Pasian. Para esse trabalho venho convidá-lo(a) a participar de um encontro individual comigo onde irá responder a alguns questionários e instrumentos de avaliação psicológica, estimando-se um tempo de 60 a 90 minutos. A participação nessas atividades poderá lhe causar algum desconforto em função de tratarmos de emoções e de ideias, mas nada diferente de sua rotina de vida. Portanto, consideramos que o risco em sua participação no trabalho é mínimo. Enquanto pesquisadora (responsável pelo estudo) estarei à sua disposição para quaisquer questões. Caso algum desconforto lhe ocorra, você pode falar abertamente comigo, de modo que buscarei as medidas mais atenuar essa situação, podendo orientá-lo sobre serviços de atendimento psicológico existentes a seu alcance, embora realizados em outros locais, no ritmo possível desses serviços.

Se você aceitar participar da pesquisa, não estará obtendo benefícios diretos ou remuneração. Também não terá nenhuma despesa por participar da pesquisa. Ao participar você estará contribuindo para o conhecimento científico sobre o tema da obesidade. Você não terá custos financeiros nesta pesquisa; caso haja despesas com transporte e/ou alimentação, você será ressarcido por mim, porém não receberá nenhuma remuneração por participar dessa pesquisa.

Você tem o direito e a liberdade de desistir da participação em qualquer fase da pesquisa, seja antes ou depois da coleta dos dados, independentemente do motivo e sem nenhum prejuízo a sua pessoa. Você não terá qualquer consequência negativa em deixar de participar do estudo, caso assim julgue mais adequado.

Os resultados da pesquisa serão analisados e publicados em termos totais, procurando-se características comuns entre os participantes. Por isso, sua identidade não será divulgada, sendo garantido o sigilo de suas respostas mesmo quando os dados forem publicados.

Coloco-me disponível para eventuais dúvidas e necessidades, por meio do telefone (92) 99209-3264 e e-mail: maira.colombarolli@gmail.com. Além disso, em caso de dúvidas sobre questões éticas desta pesquisa, você pode entrar em contato com o Comitê de Ética em Pesquisa da Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto – FFCLRP-USP. Avenida Bandeirantes, 3900 - Bloco 23 - Casa 37 - 14040-901 - Ribeirão Preto - SP – Brasil, Fone: (16) 3315-4811, E-mail: *coetp@ffclrp.usp.br*

Desde já agradecida, conto com sua participação.

_____

Prof. Dra. Sonia Regina Pasian
Orientadora – CRP: 06/24.018-0
Docente do Departamento de Psicologia da FFCLRP-USP

_____

Maíra Stivaleti Colombarolli
Aluna de Doutorado

CONSENTIMENTO

A partir das informações recebidas, declaro que fui informado sobre o que as pesquisadoras querem fazer e porque precisam da minha colaboração, e entendi a explicação. Por isso, eu concordo em participar da pesquisa, sabendo que não vou ganhar nada e que posso sair do estudo quando quiser. Este documento é emitido em duas vias que serão ambas assinadas por mim e pelas pesquisadoras, ficando uma via com cada um de nós. _____, ___/___/201__.

_____

Nome Completo

Pesquisadores Responsáveis:

Maíra Stivaleti Colombarolli (CRP 20/05049), Psicóloga e aluna de doutorado do Programa de Pós-Graduação em Psicologia da FFCLRP-USP / E-mail: maira.colombarolli@gmail.com

Profa. Dra. Sonia Regina Pasian – Docente do Programa de Pós Graduação em Psicologia da FFCLRP-USP

Centro de Pesquisas em Psicodiagnóstico – Departamento de Psicologia – Faculdade de Ciências e Letras – Universidade de São Paulo | Av. Bandeirantes, 3900 – Monte Alegre – Ribeirão Preto (SP) – CEP: 14.040-901 E-mail: srpasian@ffclrp.usp.br

APPENDIX B – SOCIODEMOGRAPHIC AND HEALTH STATUS FORM

Nome: _____ Prontuário: _____
Sexo: Masculino ( ) Feminino ( ) Data de Nascimento: _____/_____/_____ Idade: _____
Local de Nascimento: Cidade:_____ Estado: _____ País:_____
Local de Residência: Cidade:_____ Estado: _____ Ingresso no Serviço: _____/_____/_____
Anos de Escolaridade (11 anos até E.M.):_____ anos (Curso Superior? _____)
Profissão/Ocupação: _____ Estado Civil: _____
Religião:

( ) Católica ( ) Espírita ( ) Evangélica ( ) Protestante
( ) Umbanda ( ) Budista ( ) Adventista ( ) Ateu
( ) Espiritualizado, porém sem religião ( ) Outra Qual? _____

DADOS SOCIOECONÔMICOS (ABEP, 2016)

Indicadores de classificação econômica familiar atual, marcar com X:

Itens Domésticos	0	1	2	3	4+
Automóvel					
Empregados mensalistas					
Máquina de lavar (excluir tanquinho)					
Banheiros					
DVDs					
Geladeiras					
Freezers (independente ou duplex)					
Computadores e laptops					
Lava-louças					
Microondas / forno elétrico					
Motocicletas (uso recreativo)					
Máquinas secadoras de roupa					

Água utilizada no domicílio:	
Rede	(1)
Poço ou nascente	(2)
Outro	( )
Rua do domicílio:	
Asfaltada / Pavimentada	(1)
Terra/Cascalho	(2)
Escolaridade do Chefe Financeiro:	
Analfabeto / Fundamental I incompleto	(1)
Fundamental I completo / Fundamental II incompleto	(2)
Fundamental II completo / Médio incompleto	(3)
Médio completo / Superior incompleto	(4)
Superior completo	(5)

Somatório Atual e Classe: ____/____

Associação Brasileira de Empresas de Pesquisa, 2016. Critério de Classificação Econômica Brasil. ABEP. Disponível em: http://www.abep.org/criterio-brasil.

DADOS DE SAÚDE

Peso atual: _____ kg **Altura atual:** _____ m **IMC:** _____ kg/m2

PARA PACIENTES DE PESO NORMAL:

Você já sofreu de sobrepeso ou obesidade em algum período da vida (exceto gravidez)? ( ) Sim ( ) Não

Você já sofreu algum acidente ou queda que resulto em trauma crânio-encefálico (bateu a cabeça) de forma que perdeu a consciência (desmaiou) ou precisou de internação ou tratamento? ( ) Não ( ) Sim

Se sim, há quanto tempo? Como tratou/cuidou? Houve consequências?

_____

PARA PACIENTES OBESOS:

Na idade adulta (depois dos 18 anos), qual foi o seu maior/menor peso (e quando)?

_____

Descreva brevemente seu histórico de peso.

_____

_____

Quando você começou a fazer tratamentos para perda de peso?

_____

Quais métodos anteriores você já usou para tentar emagrecer?

( ) Dietas da moda
( ) Dietas com acompanhamento de nutricionista
( ) Atividade física (com e sem acompanhamento)
( ) Remédios para emagrecer
( ) Psicoterapia
( ) Outros: _____

Você atingiu o seu objetivo de perda de peso em algum deles, em qualquer tentativa anterior? ( ) Sim ( ) Não
Quando? Como? _____

Você tem história familiar de alguma das seguintes doenças?

( ) Hipertensão
( ) Diabetes
( ) Colesterol alto
( ) Doenças cardíacas (infarto)
( ) Doenças vasculares (problemas de circulação, entupimento de veias)
( ) Acidente Vascular Cerebral (derrame)
( ) Obesidade
( ) Doenças neurodegenerativas/demências (Doença de Alzheimer, Doença de Parkinson, outras demências)
( ) Outras:_____

Você já sofreu algum acidente ou queda que resulto em trauma crânio-encefálico (bateu a cabeça) de forma que perdeu a consciência (desmaiou) ou precisou de internação ou tratamento? ( ) Não ( ) Sim

Se sim, há quanto tempo? Como tratou/cuidou? Houve consequências?

_____

TESTE DE TRILHAS PARTE A: _____ PARTE B: _____

OBS: _____

ANNEX 1 – ETHICS COMMITTEE APPROVAL

Universidade de São Paulo
Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto
Comitê de Ética em Pesquisa
Campus de Ribeirão Preto

Of.CEtP/FFCLRP-USP/057-dgfs.

Ribeirão Preto,14 de julho de 2017.

Prezado(a) Pesquisador(a),

Comunicamos a V. Sa. que o projeto de pesquisa intitulado **"Regulação emocional, funções executivas e características de personalidade em candidatos à cirurgia bariátrica"** foi analisado pelo Comitê de Ética em Pesquisa da FFCLRP-USP, em sua 168ª Reunião Ordinária, realizada em 13.07.2017, e enquadrado na categoria: **APROVADO** (CAAE nº 66591717.4.0000.5407).

Solicitamos que eventuais modificações ou emendas ao projeto de pesquisa sejam apresentadas ao CEP, de forma sucinta, identificando a parte do projeto a ser modificada e suas justificativas. De acordo com a Resolução nº466 de 12/12/2012, devem ser entregues relatórios semestrais e, ao término do estudo, um relatório final sempre via Plataforma Brasil.

Atenciosamente,

Prof.ª Dr.ª Marina Rezende Bazon
Coordenadora

Ao(À) Senhor(a)
Maíra Stivaleti Colombarolli
Programa de Pós-graduação em Psicologia da FFCLRP/USP

CEP - Comitê de Ética em Pesquisa da FFCLRP USP
Fone: (16) 3315-4811 Avenida Bandeirantes, 3900 - bloco 01 da Administração - sala 07
14040-901 - Ribeirão Preto - SP - Brasil
Homepage: http://www.ffclrp.usp.br - e-mail: coetp@ffclrp.usp.br

ANNEX 2 – SELF-REPORT QUESTIONNAIRE (SRQ-20)

SRQ-20 (SELF-REPORT QUESTIONNAIRE)
QUESTIONÁRIO DE AUTO RELATO

Nome:_____ Data: _____/_____/_____

Instruções

Estas questões são relacionadas a certas dores e problemas que podem ter lhe incomodado nos últimos 30 dias. Se você acha que a questão se aplica a você e você teve o problema descrito nos últimos 30 dias, responda SIM. Por outro lado, se a questão não se aplica a você e você não teve o problema nos últimos 30 dias, responda NÃO.

1. O Sr(a). tem dores de cabeça com frequência?	SIM ( )	NÃO ( )
2. Tem falta de apetite?	SIM ( )	NÃO ( )
3. O Sr(a). dorme mal?	SIM ( )	NÃO ( )
4. O Sr(a). fica com medo com facilidade?	SIM ( )	NÃO ( )
5. Suas mãos tremem?	SIM ( )	NÃO ( )
6. O Sr(a). se sente nervoso(a), tenso(a) ou preocupado(a)?	SIM ( )	NÃO ( )
7. Sua digestão não é boa ou sofre de perturbação digestiva?	SIM ( )	NÃO ( )
8. O Sr(a). não consegue pensar com clareza?	SIM ( )	NÃO ( )
9. Sente-se infeliz?	SIM ( )	NÃO ( )
10. O Sr(a). chora mais que o comum?	SIM ( )	NÃO ( )
11. Acha difícil apreciar (gostar de) suas atividades diárias?	SIM ( )	NÃO ( )
12. Acha difícil tomar decisões?	SIM ( )	NÃO ( )
13. Seu trabalho diário é um sofrimento? Tormento? Tem dificuldade em fazer seu trabalho?	SIM ( )	NÃO ( )
14. O Sr(a). não é capaz de ter um papel útil em sua vida?	SIM ( )	NÃO ( )
15. O Sr(a). perdeu o interesse nas coisas?	SIM ( )	NÃO ( )
16. Acha que é uma pessoa que não vale nada?	SIM ( )	NÃO ( )
17. O pensamento de acabar com sua vida já passou por sua cabeça?	SIM ( )	NÃO ( )
18. O Sr(a). se sente cansado(a) o tempo todo?	SIM ( )	NÃO ( )
19. O Sr(a). tem sensações desagradáveis no estômago?	SIM ( )	NÃO ( )
20. Fica cansado com facilidade?	SIM ( )	NÃO ( )
ESCORE TOTAL		

Santos, K. O. B., de Araújo, T. M., & de Oliveira, N. F. (2009). Estrutura fatorial e consistência interna do Self-Reporting Questionnaire (SRQ-20) em população urbana. *Cad. saúde pública*, *25*(1), 214-222.

ANNEX 3 – PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

QUESTIONÁRIO SOBRE A SAÚDE DO/A PACIENTE – 9
(Portuguese for Brazil version of the PHQ-9)

Nome: _____ Data: _____/_____/_____

Durante as últimas 2 semanas, com que freqüência você foi incomodado/a por qualquer um dos problemas abaixo?	Nenhuma vez	Vários dias	Mais da metade dos dias	Quase todos os dias
1. Pouco interesse ou pouco prazer em fazer as coisas				
2. Se sentir "para baixo", deprimido/a ou sem perspectiva				
3. Dificuldade para pegar no sono ou permanecer dormindo, ou dormir mais do que de costume				
4. Se sentir cansado/a ou com pouca energia				
5. Falta de apetite ou comendo demais				
6. Se sentir mal consigo mesmo/a – ou achar que você é um fracasso ou que decepcionou sua família ou você mesmo/a				
7. Dificuldade para se concentrar nas coisas, como ler o jornal ou ver televisão				
8. Lentidão para se movimentar ou falar, a ponto das outras pessoas perceberem? Ou o oposto – estar tão agitado/a ou irrequieto/a que você fica andando de um lado para o outro muito mais do que de costume				
9. Pensar em se ferir de alguma maneira ou que seria melhor estar morto/a				

ESCORES:

0 + _____+_____+_____

= Total:_____

Se você assinalou qualquer um dos problemas, indique o grau de dificuldade que os mesmos lhe causaram para realizar seu trabalho, tomar conta das coisas em casa ou para se relacionar com as pessoas?

Nenhuma dificuldade	Alguma dificuldade	Muita dificuldade	Extrema dificuldade
☐	☐	☐	☐

OSÓRIO, FL; MENDES, AV; CRIPPA, JAS; LOUREIRO, SR. Study of discriminative validity of the PHQ-9 and PHQ-2 in a sample of Brazilian women in the contexto f primary health care. *Perspectives in Psychiatric Care*, v. 45, p. 216-227, 2009.

ANNEX 4 – DIFFICULTIES IN EMOTION REGULATION SCALE (DERS-16)

ESCALA DE DIFICULDADES DE REGULAÇÃO EMOCIONAL (DERS-16)

Nome:_____ Data: _____/_____/_____

Instruções: Por favor, indique com que frequência as afirmativas se aplicam a você marcando o número apropriado de acordo com a escala abaixo (1-5) no espaço ao lado de cada item.

Escala:

+ FALSO → + VERDADEIRO

1	2	3	4	5
Quase nunca (0-10%)	Às vezes (11-35%)	Cerca de metade do tempo (35-65%)	A maior parte do tempo (66-90%)	Quase sempre (91-100%)

		1	2	3	4	5
1.	Eu tenho dificuldade de compreender meus sentimentos	( )	( )	( )	( )	( )
2.	Fico confuso sobre como estou me sentindo	( )	( )	( )	( )	( )
3.	Quando estou chateado, tenho dificuldade em fazer meu trabalho	( )	( )	( )	( )	( )
4.	Quando estou chateado, fico fora de controle	( )	( )	( )	( )	( )
5.	Quando estou chateado, eu acredito que ficarei me sentindo assim por muito tempo	( )	( )	( )	( )	( )
6.	Quando estou chateado, eu acredito que acabarei me sentindo muito deprimido	( )	( )	( )	( )	( )
7.	Quando estou chateado, tenho dificuldade em me concentrar em outras coisas	( )	( )	( )	( )	( )
8.	Quando estou chateado, me sinto fora de controle	( )	( )	( )	( )	( )
9.	Quando estou chateado, sinto vergonha de mim mesmo por me sentir assim	( )	( )	( )	( )	( )
10.	Quando estou chateado, sinto como se fosse fraco	( )	( )	( )	( )	( )
11.	Quando estou chateado, tenho dificuldade em controlar minhas ações	( )	( )	( )	( )	( )
12.	Quando estou chateado, acredito que não exista nada que eu possa fazer que me faça sentir melhor	( )	( )	( )	( )	( )
13.	Quando estou chateado, fico irritado comigo mesmo por me sentir assim	( )	( )	( )	( )	( )
14.	Quando estou chateado, começo a me sentir muito mal comigo mesmo	( )	( )	( )	( )	( )
15.	Quando estou chateado, tenho dificuldade para pensar sobre outras coisas	( )	( )	( )	( )	( )
16.	Quando estou chateado, eu me sinto sobrecarregado pelas minhas emoções	( )	( )	( )	( )	( )

Miguel, F. K., Giromini, L., Colombarolli, M. S., Zuanazzi, A. C., & Zennaro, A. (2016). A Brazilian Investigation of the 36- and 16-Item Difficulties in Emotion Regulation Scales. *Journal of Clinical Psychology*. http://doi.org/10.1002/jclp.22404

ANNEX 5 – INVITATION SHARED THROUGH SOCIAL MEDIA FOR RECRUITTING NON CLINICAL PARTICIPANTS

Objetivos: *identificar e comparar características de personalidade, funcionamento cognitivo e regulação das emoções em mulheres com e sem obesidade (grau III)*

Público-alvo:

- **MULHERES COM IDADE ENTRE 25 E 50 ANOS**
- **SEM HISTÓRICO DE OBESIDADE** – ATUALMENTE COM PESO NORMAL PARA A SUA ALTURA
- **DISPONIBILIDADE PARA PARTICIPAÇÃO INDIVIDUAL** (em horário agendado)

CONTATO: Maíra Colombarolli (doutoranda)
mcolombarolli@usp.br
WhatsApp: (92) 99209-3264

ANNEX 6 – SUBMISSION CONFIRMATION OF MANUSCRIPT 1

Gmail Maíra Colombarolli <maira.colombarolli@gmail.com>

JBME-D-22-00673 - Submission Confirmation
2 mensagens

International Journal of Behavioral Medicine <em@editorialmanager.com> 8 de dezembro de 2022 às 16:57
Responder a: International Journal of Behavioral Medicine <zyreenamae.liwanag@springernature.com>
Para: Maíra Stivaleti Colombarolli <mcolombarolli@usp.br>

Dear Mrs. Stivaleti Colombarolli,

Thank you for submitting your manuscript,
"Long-term psychological functioning of bariatric patients: A systematic review and meta-analysis of longitudinal studies", to International Journal of Behavioral Medicine

The submission id is: JBME-D-22-00673
Please refer to this number in any future correspondence.

During the review process, you can keep track of the status of your manuscript by accessing the following web site:

https://www.editorialmanager.com/jbme/

We have sent an e-mail to all co-authors of this submission asking them to confirm their co-authorship. You can see the status of co-authorship confirmations under "Author Status" in your author main menu. Please check with your co-authors in case somebody does not confirm within reasonable time. In case of acceptance, a paper might not be published with outstanding co-author confirmations.

You will need to log in to the journal:

Your username is: MStivaleti Colombarolli-879

If you forgot your password, you can click the 'Send Login Details' link on the EM Login page at https://www.editorialmanager.com/jbme/.

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With kind regards,

Journals Editorial Office JBME
Springer

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Although for now you don't have to do anything, we would like to let you know about your upcoming options.

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International Journal of Behavioral Medicine <em@editorialmanager.com> 8 de dezembro de 2022 às 16:57

ANNEX 7 – SUBMISSION CONFIRMATION OF MANUSCRIPT 2

Gmail Maíra Colombarolli <maira.colombarolli@gmail.com>

PIAL-D-23-00002 - Acknowledgement of Receipt

Psychological Injury and Law <em@editorialmanager.com> 16 de janeiro de 2023 às 14:00
Responder a: Psychological Injury and Law <officemanager.gyoungphd@gmail.com>
Para: Maíra Stivaleti Colombarolli <maira.colombarolli@gmail.com>

Dear Ms. Stivaleti Colombarolli:

Thank you for submitting your manuscript, "Self-reports don't tell the whole story: A study of candidates for bariatric surgery using a multimethod approach", to Psychological Injury and Law. The manuscript number is #PIAL-D-23-00002

The submission id is: PIAL-D-23-00002
Please refer to this number in any future correspondence.

During the review process, you can keep track of the status of your manuscript by accessing the following web site:

Your username is: mcolombarolli
If you forgot your password, you can click the 'Send Login Details' link on the EM Login page at https://www.editorialmanager.com/pial/.

Alternatively, please call us at 001-630-468-7784 (outside the US)/(630)-468-7784 (within the US) anytime from Monday to Friday.

With kind regards,

The Editorial Office
Psychological Injury and Law

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ANNEX 8 – SUBMISSION CONFIRMATION OF MANUSCRIPT 3

Gmail Maíra Colombarolli <maira.colombarolli@gmail.com>

Submission Confirmation for Exploring the utility of the Rorschach test in predicting weight-loss after bariatric surgery

1 mensagem

Rorschachiana <em@editorialmanager.com> 23 de janeiro de 2023 às 21:05
Responder a: Rorschachiana <journal@internationalrorschachsociety.com>
Para: Maíra Stivaleti Colombarolli <maira.colombarolli@gmail.com>

Dear Ms Stivaleti Colombarolli,

Thank you for submitting your paper entitled "Exploring the utility of the Rorschach test in predicting weight-loss after bariatric surgery" to Rorschachiana. The manuscript number is ROR-D-23-00002.

You will be able to check on the progress of your paper by logging in to Editorial Manager as an author. The URL is https://www.editorialmanager.com/ror/.

Kind regards,

Rorschachiana

In compliance with data protection regulations, you may request that we remove your personal registration details at any time. (Use the following URL: https://www.editorialmanager.com/ror/login.asp?a=r). Please contact the publication office if you have any questions.