

Prevalence of Food Addiction and Binge Eating in an Italian sample of bariatric surgery candidates and overweight/obese patients seeking low-energy-diet therapy

Prevalenza della food addiction e del binge eating in un campione italiano di candidati alla chirurgia bariatrica e in pazienti in sovrappeso/obesi in attesa di ricevere una dietoterapia

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SUMMARY. Aim. The main aim of the present study was to investigate the prevalence of Food Addiction (FA) and clinical level of Binge Eating in an Italian sample of overweight/obese patients attending low energy-diet therapy, and in an Italian sample of obese bariatric surgery candidates. **Methods.** Participants were: i) 122 overweight/obese patients (86 women) referred to a medical center in Rome (Italy), specialized in nutritional treatment of obesity (i.e., non-surgery patients group), and ii) 281 surgery candidates (207 women) referred to the center for Bariatric Surgery at the University of Rome Tor Vergata (i.e., surgery candidates group). All patients were administered self-report measures investigating FA, binge eating, and psychopathology. **Results.** Non-surgery patients and surgery candidates did not differ in the prevalence of FA (31.1% vs 26.3%), moderate level of binge eating (32.0% vs 31.8%), and severe level of binge eating (11.05% vs 13.6%). Compared to non-surgery patients, surgery candidates reported higher prevalence in two FA symptoms: i) food consumed more than planned (13.9% vs 25.3%; $p=0.011$) and ii) persistent desire or repeated unsuccessful attempts (89.3% vs 96.8; $p=0.002$). **Discussion and Conclusion.** Our results confirm that both FA and clinical level of binge eating are common problems in both overweight/obese patients seeking low-energy-diet therapy and in obese bariatric surgery candidates, justifying the clinical utility of assessing these dysfunctional eating patterns.

KEY WORDS: bariatric surgery candidates, binge eating, food addiction, obesity, overweight.

RIASSUNTO. Obiettivo. L'obiettivo principale del presente studio è stato quello di indagare la prevalenza della food addiction (FA) e di un livello clinicamente significativo di binge eating in: i) un campione italiano di pazienti obesi/sovrappeso in attesa di ricevere una dietoterapia, e ii) in un campione italiano di obesi candidati alla chirurgia bariatrica. **Metodi.** I partecipanti sono stati: i) 122 pazienti in sovrappeso/obesi (86 donne) che si sono rivolti a un centro medico privato di Roma, specializzato nel trattamento nutrizionale dell'obesità (gruppo non bariatrico), e ii) 281 candidati (207 donne) per la chirurgia bariatrica afferenti al centro per la Chirurgia Bariatrica dell'Università di Roma Tor Vergata (gruppo di candidati bariatrici). A tutti i pazienti sono stati somministrati dei questionari finalizzati alla valutazione della FA del binge eating e della psicopatologia. **Risultati.** I due gruppi non differivano nella prevalenza della FA (31,1% vs 26,3%), nella prevalenza del binge eating moderato (32% vs 31,8%), e nella prevalenza del binge eating severo (11,05% vs 13,6%). Rispetto al gruppo dei pazienti non bariatrici, il gruppo dei pazienti candidati alla chirurgia ha riportato una maggiore prevalenza in due sintomi della FA: consumo di cibo maggiore rispetto a quello pianificato (13,9% vs 25,3%; $p=0,011$), e ii) persistente desiderio e vani tentativi di smettere (89,3% vs 96,8; $p=0,002$). **Discussione e conclusione.** I nostri risultati confermano che sia la FA sia un livello clinico di binge eating sono problemi comuni sia nei pazienti sovrappeso/obesi che ricercano una dietoterapia, sia nei pazienti che vorrebbero sottoporsi alla chirurgia bariatrica, giustificando l'assessment di questi pattern alimentari disfunzionali.

PAROLE CHIAVE: binge eating, chirurgia bariatrica, food addiction, obesità, sovrappeso.

INTRODUCTION

Obesity [i.e., body mass index (BMI) ≥ 30 kg/m²] and overweight (BMI ≥ 25 kg/m²) are often characterized by several

dysfunctional eating patterns, especially binge eating¹⁻³. A recent meta-analysis on 68 studies showed that, among patients seeking and undergoing bariatric surgery, Binge Eating Disorder (BED) is frequently diagnosed (about 17%)⁴. Similar-

ly, in large samples of non-bariatric obese seeking weight loss treatments, it has been reported, using self-report questionnaire, a prevalence of clinical level of binge eating of roughly 20%^{5,6}.

Binge eating is not the only dysfunctional eating pattern observed in both bariatric and non-bariatric obese. Among bariatric patients and overweight/obese adults seeking weight-loss treatments, Food Addiction (FA) appears to be a significant problem. Indeed, across published studies, the prevalence of FA ranges between 14% and 57% and between 15% and 25% respectively for bariatric patients⁷⁻¹² and overweight/obese patients seeking weight-loss treatments¹³⁻¹⁷.

To the best of our knowledge, no studies have investigated the prevalence of both FA and binge eating in these clinical samples. Therefore, the major aim of the present study was to extend these previous findings investigating the prevalence of these dysfunctional eating patterns in an Italian sample of overweight/obese patients seeking low-energy-diet therapy as well as in an Italian sample of obese bariatric surgery candidates. Investigating the prevalence of clinical level of binge eating and FA is compelling because it has been reported the association between these dysfunctional eating patterns and more negative treatment outcomes (e.g., poorer weight loss outcomes)^{2,9,18-20}.

MATERIALS AND METHODS

Participants

The study sample comprised: i) 122 overweight/obese patients (86 women and 36 men) referred to a medical center in Rome (Italy), specialized in nutritional treatment of obesity (i.e., non-surgery patients group), and ii) 281 surgery candidates (207 women and 74 men) referred to the center for Bariatric Surgery at the University of Rome Tor Vergata (i.e., surgery candidates group).

Non-surgery patients had an average BMI of 31.72 kg/m² (SD=6.59; range: 25.04-53.40) and an average age of 41.92 years (SD=13.53; range: 18-73). In this group, there were 68 (55.7%) overweight and 54 (44.3%) obese patients. Surgery candidates had an average BMI of 44.01 kg/m² (SD=7.82; range: 31.10-74.36) and an average age of 44.16 years (SD=11.17; range: 18-70). All patients were assessed at the time of study entry. Inclusion criteria were: age of 18 or higher; BMI of ≥ 25 kg/m² for non-surgery patients; BMI of ≥ 30 for surgery candidates. Exclusion criteria were: history of neurologic diseases; purging and non-purging compensatory behaviours, the presence of any condition affecting the ability to complete the assessment, including the denial of informed consent. A checklist with dichotomous items was used to assess inclusion criteria and exclusion criteria. After receiving information about the aims of the study, all patients provided written consent to participate. The study was in accordance with the Helsinki declaration standards and was approved either by the ethics review board of the European University or by the Institutional Ethic Review Committee of the University of Rome Tor Vergata.

Measures

All of the participants were administered the Italian version of the Yale Food Addiction Scale (YFAS)²¹, the Binge Eating Scale (BES)⁵, and the Symptom Check List-90-R (SCL-90)²². Sociode-

mographic and clinical information were retrieved from medical files.

The YFAS²³ is a unifactor 25-item self-report measure of addictive eating behaviors with regards to hyper-palatable foods according to the 4th edition of Diagnostic and Statistical Manual of Mental Disorders (text revision) criteria (DSM-IV-TR)²⁴ for drug addiction. The YFAS includes dichotomous and Likert scale formats with two scoring alternatives: a symptom count version and a diagnostic version (i.e., FA diagnosis is met when three symptoms and clinically significant impairment are present). The YFAS has demonstrated satisfactory psychometric properties in different samples and countries²⁵. In the present study, Cronbach's α of the YFAS was 0.88.

The BES²⁶ is a 16-item self-report widely used to assess binge eating severity (i.e., behavioral manifestations and the feelings/cognitions manifestations related to such behavior). Marcus et al.²⁷ identified three different levels of severity: individuals scoring 17 or less were considered not reporting significant binge eating, those scoring between 18 and 26 were considered moderate binge eaters and those scoring 27 and above were considered severe binge eaters. The total score ranged from 0 to 46. The Cronbach's α in the present sample was 0.88.

The SCL-90-R²⁸ is a 90-item questionnaire on 5-point Likert scale (0-4) assessing general psychopathology and providing a global severity index (GSI) which is designed to measure overall psychological distress. Higher scores indicate more psychological distress. The Cronbach's α in the present sample was 0.95.

Statistical analyses

All analyses were performed with SPSS 19.0 statistical package for the social sciences (IBM, Armonk, NY, USA). Differences between groups (non-surgery patients group vs surgery candidates) were analyzed with independent *t*-tests for dimensional variables, and Chi-squared tests (χ^2) for NxN contingency tables. Effect sizes were calculated with Cohen's *d* and with Cramer's *v* respectively for *t*-tests and Chi-squared tests.

RESULTS

Differences between groups are reported in Table 1. Compared to non-surgery patients, surgery candidates have an higher BMI (31.72 \pm 6.59 vs 44.01 \pm 7.82; $p<0.001$). No significant differences were observed for socio-demographic variables. No significant differences were also reported for the prevalence of FA (31.1% vs 26.3%), moderate level of binge eating (32% vs 31.8%), severe level of binge eating (11.05% vs 13.6%), and in the co-occurrence of FA and severe binge eating (7.4% vs 9.3%). Although groups did not differ for the YFAS total score, compared to non-surgery patients, surgery candidates reported higher prevalence in two FA symptoms: i) food consumed more than planned (13.9% vs 25.3%; $p=0.011$) and ii) persistent desire or repeated unsuccessful attempts to quit (89.3% vs 96.8; $p=0.002$). No significant differences were observed in the GSI and in the BES total score.

DISCUSSION

The main aim of this study was to investigate the prevalence of FA and clinical level of binge eating in an Italian

Prevalence of Food Addiction and Binge Eating in an Italian sample of bariatric surgery candidates

Table 1. Bivariate analyses.

| Variables | Non-surgery (N = 122) | Surgery candidates (N = 281) | Test Statistics | p | Effect size |
|--------------------------------------|--------------------------|---------------------------------|------------------------------------|------------------|--------------------------|
| Age M±DS | 41.92±13.53 | 44.16±11.17 | t ₄₀₁ = -1.72 | 0.09 | -0.18 ^a |
| BMI M±DS | 31.72±6.59 | 44.01±7.82 | t ₄₀₁ = -15.17 | <0.001 | -1.70^a |
| Women N (%) | 86 (72.9) | 207 (73.7) | χ ² ₁ = 0.43 | 0.51 | 0.03 ^b |
| Married or living with partner N (%) | 50 (41.0) | 135 (50.9) | χ ² ₁ = 3.32 | 0.07 | 0.09 ^b |
| Employed N (%) | 97 (79.5) | 189 (71.9) | χ ² ₁ = 2.55 | 0.11 | 0.08 ^b |
| BES total score M±DS | 13.50±9.30 | 14.09±10.28 | t ₄₀₁ = -0.55 | 0.59 | -0.06 ^a |
| BES > 17 N (%) | 39 (32.0) | 89 (31.8) | χ ² ₁ = 0.01 | 0.97 | 0.002 ^b |
| BES > 27 N (%) | 14 (11.5) | 38 (13.6) | χ ² ₁ = 0.33 | 0.70 | 0.03 ^b |
| FA Diagnosis N (%) | 38 (31.1) | 74 (26.3) | χ ² ₁ = 0.98 | 0.32 | 0.05 ^b |
| FA + BES (> 27) N (%) | 9 (7.4) | 26 (9.3) | χ ² ₁ = 0.39 | 0.53 | 0.03 ^b |
| YFAS total score M±DS | 2.59±1.80 | 2.91±1.89 | t ₄₀₁ = -1.59 | 0.11 | -0.17 ^a |
| Consumed more than planned N (%) | 13 (13.9) | 71 (25.3) | χ ² ₁ = 6.40 | 0.011 | 0.13^b |
| Repeated unsuccessful attempts N (%) | 109 (89.3) | 272 (96.8) | χ ² ₁ = 9.16 | 0.002 | 0.15^b |
| Great deal of time spent N (%) | 29 (23.8) | 94 (33.5) | χ ² ₁ = 3.76 | 0.052 | 0.10 ^b |
| Important activities given up N (%) | 25 (20.5) | 57 (20.3) | χ ² ₁ = 0.01 | 0.96 | 0.002 ^b |
| Use despite consequences N (%) | 49 (49.2) | 142 (50.5) | χ ² ₁ = 3.67 | 0.06 | 0.09 ^b |
| Tolerance N (%) | 58 (47.5) | 123 (43.8) | χ ² ₁ = 0.49 | 0.48 | 0.04 ^b |
| Withdrawal N (%) | 29 (23.8) | 59 (21.0) | χ ² ₁ = 0.38 | 0.54 | 0.03 ^b |
| Impairment or distress N (%) | 40 (32.8) | 86 (30.6) | χ ² ₁ = 1.89 | 0.66 | 0.02 ^b |
| GSI M±DS | 0.72±0.59 | 0.63±0.55 | t ₄₀₁ = 1.43 | 0.16 | 0.16 ^a |

Note: ^a= Cohen's d; ^b= Cramer's V.

Abbreviation: DS= standard deviation; BMI= Body Mass Index; BES= Binge Eating Scale; FA= Food Addiction; YFAS= Yale Food Addiction Scale; GSI= Global Severity Index.

sample of overweight/obese patients seeking low-energy-diet therapy and in bariatric surgery candidates.

Our results are in line with previous studies investigating dysfunctional eating patterns in samples with similar socio-demographic variables^{5,12,16,21}. In the present study the prevalence of FA clinical level of binge eating, and disordered eating symptoms did not differ between two groups. However, our results showed that surgery candidates reported more diminished control over consumption of hyper-palatable food, as well as a more persistent desire or repeated unsuccessful attempts to quit. In bariatric surgery candidates, these features may explain the failure of diet therapy and it may negatively influence weight-loss after surgery²⁹.

Our results are not in accordance with previous studies reporting a lower amount of problematic eating behaviors and psychopathology in patients seeking non-surgical weight loss treatment compared to bariatric patients^{30,31}. The discrepancies between these results and the present research could be explained by several variables. First, our sample could be different in terms of socio-demographic (e.g., mean age) and clinical variable (e.g., mean BMI). The discrepancies may be also related by differences in study designs and methods (i.e., self-report vs structured interview). However, as already observed³², it is possible that patients who attended the psychosocial evaluation prior to surgery might minimize their

psychological distress to obtain clearance for surgery. Finally, another possible explanation is in accordance with the hypothesis of a non-linear relationship between FA and BMI³³, suggesting that FA might increase in the overweight and obese individuals, coming to rest at severe obesity level. Similarly, it has been hypothesized that the influence of BMI on binge eating had a ceiling effect meaning that when a level of BMI was reached the eating disorder could not worsen³⁴.

Regardless of its limitations (e.g. the use of self-report, the use of the old version of YFAS), our results confirm that both binge eating and FA are common problems in overweight and obese seeking different weight-loss treatments, justifying the clinical utility of assessing these dysfunctional eating pattern through reliable, valid and multiple methods (i.e., self-reports and clinical interviews)^{5,34}.

Compliance with ethical standards.

Conflicts of interests: the authors declare that they have no conflict of interest.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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