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

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 eating. 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%).
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%–14.

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)2,5,18-20.

### 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)23, the Binge Eating Scale (BES)5, and the Symptom Check List-90-R (SCL-90)23, Sociode-

### RESULTS

Differences between groups are reported in Table 1. Compared to non-surgery patients, surgery candidates have an higher BMI (31.72±6.59 vs 44.01±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
sample of overweight/obese patients seeking low-energy-di- et 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. 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 surgery.

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. 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 observed, 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 BMI, 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 worsen.

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).

Compliance with ethical standards.

Conflicts of interest: 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.

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Table 1. Bivariate analyses.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Non-surgery (N = 122)</th>
<th>Surgery candidates (N = 281)</th>
<th>Test Statistics</th>
<th>p</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age M±DS</td>
<td>41.92±13.53</td>
<td>44.16±11.17</td>
<td>t&lt;sub&gt;401&lt;/sub&gt;= -1.72</td>
<td>0.09</td>
<td>-0.18*</td>
</tr>
<tr>
<td>BMI M±DS</td>
<td>31.72±6.59</td>
<td>44.01±7.82</td>
<td>t&lt;sub&gt;401&lt;/sub&gt;= -15.17</td>
<td>&lt;0.001</td>
<td>-1.70*</td>
</tr>
<tr>
<td>Women N (%)</td>
<td>86 (72.9)</td>
<td>207 (73.7)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 0.43</td>
<td>0.51</td>
<td>0.03*</td>
</tr>
<tr>
<td>Married or living with partner N (%)</td>
<td>50 (41.0)</td>
<td>135 (50.9)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 3.32</td>
<td>0.07</td>
<td>0.09*</td>
</tr>
<tr>
<td>Employed N (%)</td>
<td>97 (79.5)</td>
<td>189 (71.9)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 2.55</td>
<td>0.11</td>
<td>0.08*</td>
</tr>
<tr>
<td>BES total score M±DS</td>
<td>13.50±9.30</td>
<td>14.09±10.28</td>
<td>t&lt;sub&gt;401&lt;/sub&gt;= -0.55</td>
<td>0.59</td>
<td>-0.06*</td>
</tr>
<tr>
<td>BES &gt; 17 N (%)</td>
<td>39 (32.0)</td>
<td>89 (31.8)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 0.01</td>
<td>0.97</td>
<td>0.002*</td>
</tr>
<tr>
<td>BES &gt; 27 N (%)</td>
<td>14 (11.5)</td>
<td>38 (13.6)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 0.33</td>
<td>0.70</td>
<td>0.03*</td>
</tr>
<tr>
<td>FA Diagnosis N (%)</td>
<td>38 (31.1)</td>
<td>74 (26.3)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 0.98</td>
<td>0.32</td>
<td>0.05*</td>
</tr>
<tr>
<td>FA + BES (≥ 27) N (%)</td>
<td>9 (7.4)</td>
<td>26 (9.3)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 0.39</td>
<td>0.53</td>
<td>0.03*</td>
</tr>
<tr>
<td>YFAS total score M±DS</td>
<td>2.59±1.80</td>
<td>2.91±1.89</td>
<td>t&lt;sub&gt;401&lt;/sub&gt;= -1.59</td>
<td>0.11</td>
<td>-0.17*</td>
</tr>
<tr>
<td>Consumed more than planned N (%)</td>
<td>13 (13.9)</td>
<td>71 (25.3)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 6.40</td>
<td>0.011</td>
<td>0.13*</td>
</tr>
<tr>
<td>Repeated unsuccessful attempts N (%)</td>
<td>109 (89.3)</td>
<td>272 (96.8)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 9.16</td>
<td>0.002</td>
<td>0.15*</td>
</tr>
<tr>
<td>Great deal of time spent N (%)</td>
<td>29 (23.8)</td>
<td>94 (33.5)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 3.76</td>
<td>0.052</td>
<td>0.10*</td>
</tr>
<tr>
<td>Important activities given up N (%)</td>
<td>25 (20.5)</td>
<td>57 (20.3)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 0.01</td>
<td>0.96</td>
<td>0.002*</td>
</tr>
<tr>
<td>Use despite consequences N (%)</td>
<td>49 (40.2)</td>
<td>142 (50.5)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 3.67</td>
<td>0.06</td>
<td>0.09*</td>
</tr>
<tr>
<td>Tolerance N (%)</td>
<td>58 (47.5)</td>
<td>123 (43.8)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 0.49</td>
<td>0.48</td>
<td>0.04*</td>
</tr>
<tr>
<td>Withdrawal N (%)</td>
<td>29 (23.8)</td>
<td>59 (21.0)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 0.38</td>
<td>0.54</td>
<td>0.03*</td>
</tr>
<tr>
<td>Impairment or distress N (%)</td>
<td>40 (32.8)</td>
<td>86 (30.6)</td>
<td>χ²&lt;sub&gt;4&lt;/sub&gt;= 1.89</td>
<td>0.66</td>
<td>0.02*</td>
</tr>
<tr>
<td>GSI M±DS</td>
<td>0.72±0.59</td>
<td>0.63±0.55</td>
<td>t&lt;sub&gt;401&lt;/sub&gt;= 1.43</td>
<td>0.16</td>
<td>0.16*</td>
</tr>
</tbody>
</table>

Note: a: Cohen’ 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.
Informed consent: Informed consent was obtained from all individual participants included in the study.

REFERENCES