

The Relationship between (binge) Eating and Identity Issues in Pre-bariatric Patients

Boekaerts E^{*}, Claes L, Bouckaert W and Luyckx K

Obesity Centre Hasselt, Jessa Hospital, Salvatorstraat 20, Hasselt, Belgium.

^{*}**Corresponding author:** Els Boekaerts, Obesity Centre Hasselt, Jessa Hospital, Salvatorstraat 20, 3500 Hasselt, Belgium, Tel: +3211 335766; E-mail: els.boekaerts@jessazh.be

Received date: July 13, 2017; **Accepted date:** July 26, 2017; **Published date:** August 2, 2017

Copyright: © 2017 Boekaerts E, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Obesity is associated with high levels of psychopathology, especially among those who engage in binge eating. Patients with binge eating also report poorer long term outcomes after bariatric surgery than patients without binge eating. However, the mechanisms underlying binge eating need further investigation. The present study investigates the relationship between identity issues and the functionality of (binge) eating behaviors in bariatric surgery candidates. Results showed that pre-bariatric patients who engage in binge eating scored higher on identity confusion compared to patients without binge eating, but no difference was found for identity synthesis. Concerning the relationship between the functions of eating and identity processes, we found a positive relationship between identity confusion and external and emotional eating in patients with binge eating, but no significant relationships were found for identity synthesis. Clinical implications and suggestions for future research are discussed.

Keywords: Obesity; Bariatric Surgery; Binge eating; Identity

Introduction

Obesity is one of the leading public health concerns worldwide today. The World Health Organization [1] classifies obesity into three categories based on body mass index (BMI, kg/m²): Class I (BMI 30.0 to 34.9), Class II (BMI 35.0 to 39.9) and Class III (BMI ≥ 40). Morbid obesity refers to a BMI ≥ 40 or a BMI ≥ 35 with one of the listed obesity-related diseases, such as diabetes type 2 or sleep apnea. Bariatric surgery is now suggested as the most effective treatment for morbid obesity with significant and durable weights loss which improves obesity-related comorbidities and health-related quality of life on the long term [2]. Obesity is not only associated with an increased risk of medical disorders, but is also characterized by a high prevalence of psychiatric comorbidities [3-5]. The prevalence rate of psychopathology is even higher among bariatric surgery candidates: depression (15.6%), anxiety disorder (24%) [6-8], and binge eating (ranging from 10% to 27%) [9-12].

In the present study, we focus on pre-bariatric patients, with particular interest in those who engage in binge eating. Binge eating is defined as eating a large amount of food in a discrete period of time with a sense of loss of control [13]. During a binge eating episode, people eat more rapidly than normal, eat without feeling hungry and even continue eating despite feeling uncomfortably full. Afterwards, they feel disgusted with themselves, depressed, or guilty. Obese patients with binge eating report higher levels of psychopathology such as anxiety and depression as compared to patients who do not engage in binge eating [14,15]. Further, binge eating is also associated with higher scores on emotional and external eating when compared to obese individuals without binge eating [16-19]. The presence of binge eating (disorder) also seems to be one of the most significant features in bariatric surgery candidates, as patients with binge eating report poorer long-term surgical outcomes as compared to patients without binge eating due to continued uncontrolled eating [11,20].

Several risk factors have been hypothesized to explain the presence of binge eating in obese patients, such as negative affect (e.g. depression and low self-esteem), weight cycling, body dissatisfaction, and dietary restraint with disinhibition (i.e. binge eating) as a result [21]. In the present study, we focus on identity processes as a possible mechanism underlying binge eating in pre-bariatric obese patients. Obesity most likely has an impact on identity formation in a society in which the slim ideal dominates and in which being overweight or obese is often stigmatized [22, 23]. Being overweight can be a substantial burden in the process of identity formation during adolescence. Shetowsky [24], for example, reported that female high school students with puberty-onset obesity experienced more difficulties in the process of identity formation than peers with a normal weight. Schafer and Ferraro [22] found that perceived weight discrimination is related to weight perception (feeling overweight), above and beyond the effects of one's actual weight. They also reported that people who define themselves as being overweight or obese (i.e., who have a "weight-centered identity") report more functional disabilities (i.e., being limited in walking a mile) than obese people with the same objective weight but a broader self-image. So, the internalized stigma of being overweight can enhance the effect of one's actual weight on health-related issues, such as mobility.

Erikson [25,26] described identity formation ("who am I?") as a central developmental task that starts during adolescence and continues throughout life. He defines identity synthesis as a coherent sense of self, stable over time and across situations; identity confusion refers to a poorly structured sense of identity with a lack of self-knowledge and uncertainty about one's goals, values, and beliefs. Individuals for whom identity synthesis predominates over identity confusion are aware of their strengths and weaknesses and are better able to adjust to certain circumstances than the more confused individuals [25,26]. Literature suggests that identity confusion is negatively related to adaptive psychosocial functioning and positively related to maladaptive psychosocial functioning such as anxiety and depression [27,28]. The opposite is found for identity synthesis.

In the present study, we are particularly interested in the relationship between identity synthesis and confusion and the functionality of (disturbed) eating behaviors in pre-bariatric patients. Several studies have shown positive associations between identity-related issues and the functions of eating behaviors. The escape theory of Heatherton and Baumeister [29] states that individuals with binge eating try to escape threats to their self-esteem, possibly stemming from challenging identity-related decisions, by focusing their attention to the immediate present (i.e., the food) and, hence, away from the self. Such a mechanism may result in disinhibition and, subsequently in binge eating. Relatedly, Schupack-Neuberg and Nemeroff [30] found that university students with binge eating report higher levels of identity confusion than normal controls. They also found that identity confusion is positively related to escape from the self during a binge. The functional model of bulimia nervosa [31] states that binge eating is not simply the passive result of cognitive narrowing. However, binge eating is intended as an active coping mechanism to deal with the distress resulting from identity-related decisions, as the distress of overeating may be easier to bear than the distress accompanying identity threats. O'Neil and Adams [32] reported that female university students engage in binge eating to avoid dealing with identity-related issues. Other studies [33, 34] found a direct relation between binge eating and a diffuse-avoidant identity style, characterized by avoiding making identity-related decisions [35,36].

The present study is guided by two research questions. First, we investigate whether pre-bariatric patients with binge eating show higher levels of identity confusion and/or lower levels of identity synthesis compared to pre-bariatric patients without binge eating controlled for gender and age, given that they may struggle more with identity-related issues and comorbid psychopathology. Based on the literature [30], we hypothesize that pre-bariatric patients with binge eating will score higher on identity confusion compared to patients without binge eating. Given that no literature is available on identity synthesis, we tentatively explore this dimension as well. Second, we investigate the relationship between the functions of eating and identity-related issues after controlling for age and gender. Based on prior studies, which show a positive relationship between negative emotions and identity confusion [31, 33, 34, 37], we hypothesize that emotional eating will be positively related to identity confusion. However, no studies are available about the relationship between the functions of eating (emotional, external and restraint eating) and identity synthesis. So, our study is exploratory in that respect. In examining the relationship between the functions of eating and identity confusion/synthesis, we also differentiate between patients with and without binge eating given that earlier research showed a functional relationship between binge eating and identity confusion whereby binge eating seemed to be a manner to escape from identity-related distress [31,32,37].

Materials and Method

Participants and procedure

Our sample consisted of 240 pre-bariatric patients of whom 170 (70.8%) were female and 70 (29.2%) were male. The mean age of the sample was 41 year (SD=12.68), with no significant age difference between male and female patients [$F(1, 238)=2.65, p = 0.105$]. The mean BMI was 42.12 (SD=4.67), with no significant gender difference concerning BMI [$F(1, 238)=0.002, ns$]. Overall, 77 patients (32.1%) showed a BMI between 35 and 39.99 (Class II obesity), 141 patients

(58.8%) had a BMI between 40 and 44.99 (Class III obesity), and 22 patients (9.2%) reported a BMI equal or higher than 45.

Of the 240 pre-bariatric patients, 160 patients (66.7%) did not engage in binge eating, whereas 80 patients (33.3%) regularly engaged in binge eating during the last 28 days. Female pre-bariatric patients (37.6%) more often engaged in binge-eating compared to male pre-bariatric patients (22.9%) [$X^2(1)=4.88, p<0.05$]. Additionally, pre-bariatric patients with binge eating (Mage=37.65, SD=11.76) were significantly younger than pre-bariatric patients without binge eating (Mage=42.68, SD=12.82) [$F(1, 238)=8.66, p < 0.01$].

Data were collected in a bariatric surgery clinic in Hasselt, Belgium. All patients received an informed consent letter prior to participation in the study, and were interviewed by an experienced psychologist as part of their pre-bariatric assessment. Furthermore, they filled out a battery of self-report questionnaires, which were used as part of the regular assessment and for research purposes, if the patient agreed to participate in the study. The study procedure was approved by the ethical board of the Hospital. Subjects voluntarily participated in the study and received no compensation for participation. Their (UN) willingness to participate had no impact on their treatment, as mentioned in the informed consent form.

Measures

To assess the presence/absence of binge eating in our pre-bariatric surgery group, we used the Eating Disorder Examination - Questionnaire [38]. The EDE-Q is a self-report measure of disordered eating over a 28-day period. It comprises four subscales: Dietary Restraint, Weight Concern, Shape Concern and Eating Concern. The EDE-Q also assesses different forms of overeating and compensating behaviors, including objective binge eating episodes as described in item 16 (“...how many times have you eaten an unusual large amount of food in a short period of time?”) and 17 (“...how many times did you feel a loss of control during such a binge as described in item 16?”). We used the scores on item 17 as a measure of binge eating, where a value greater than 0 was classified as the presence of binge eating.

To assess the level of identity confusion and identity synthesis, we applied the Erikson Psychosocial Stage Inventory (EPSI) [39]. The EPSI consists of 12 items, to be rated on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Six items measure identity synthesis (e.g. “I know what kind of person I am”) ($\alpha=0.67$) and six items measure identity confusion (e.g. “I feel confused”) ($\alpha=0.76$).

Finally, to assess the triggers of the eating behaviors of the pre-bariatric patients, the Dutch Eating Behavior Questionnaire (DEBQ) [40] was applied. The DEBQ consists of 33 items, to be rated on a five-point scale ranging from ‘never’ to ‘very often’, and assesses three scales: “restraint eating” (e.g. “trying not to eat between meals”) ($\alpha=0.89$), “external eating” (e.g. “tempted by delicious foods”) ($\alpha=0.83$), and “emotional eating” (e.g. “desire to eat when depressed”) ($\alpha=0.96$). Each of these scales has good convergent, discriminative and concurrent validity [40].

Analyses

To investigate whether pre-bariatric patients with (out) binge eating showed significant differences in identity confusion and synthesis, we performed a MANCOVA with the presence/absence of binge eating and gender as independent variables, EPSI identity confusion/synthesis as dependent variables, and age as covariate. We included both gender

and age as control variables, given that pre-bariatric patients with(out) binge eating showed gender and age differences.

Furthermore, to investigate the association between the functions of eating behaviors of pre-bariatric patients and identity confusion/synthesis, we performed hierarchical regression analyses with the NVE scales (restraint, external and emotional eating) as dependent variables; and gender, the z-transformed variables age and identity confusion/synthesis, and their interactions as independent variables. In the first step we included age and gender, in the second step identity confusion/synthesis, and in the third step all two-way interaction terms 'age*identity confusion/synthesis', 'gender*identity confusion/synthesis', and 'age*gender'. In the fourth and final step, we included the three-way interaction terms of the previous mentioned variables 'age*gender*identity confusion' and 'age*gender*synthesis'. We performed each of these analyses in the total sample and in the samples of pre-bariatric patients with and without binge eating separately.

Results

The MANCOVA with identity confusion/synthesis as dependent variables and the presence/absence of binge eating and gender as independent variables, and age as covariate, showed a significant main effect for the presence/absence of binge eating [Wilk's Lambda=.970, F(2, 234)=3.56, p<.05]; but no significant effect for gender [Wilk's Lambda=.986, F(2, 234)=1.70, ns], for age [Wilk's Lambda=.999, F(2, 234)=0.08, ns], nor for the interaction of presence/absence of binge eating* gender [Wilk's Lambda=0.997, F(2, 234)=0.41, ns]. The results of the univariate ANOVAs (see Table 1) showed that pre-bariatric patients with binge eating showed significantly more identity confusion compared to pre-bariatric patients without binge eating. However, on identity synthesis, both groups did not differ significantly.

	Pre-bariatric patients without binge eating		Pre-bariatric patients with binge eating		F(1,235)	Partial η ²
	M	(SD)	M	(SD)		
Identity confusion	2.25	0.69	2.58	0.73	5.468*	0.023
Identity synthesis	3.76	0.58	3.72	0.6	0.007	0

*p<0.05

Table 1: Means (standard deviations) on EPSI identity confusion and synthesis of pre-bariatric patients with and without binge eating controlled for gender and age.

The results of the associations between identity confusion/syntheses and the three functions of eating (external, emotional, and restraint) controlled for age and gender are displayed in Tables 2 a,b,c and Tables 3 a,b,c for respectively the total sample, the sample of patients without binge eating, and the sample of patients with binge eating. Given that none of the two- and three-way interaction terms were significant, we only reported the results of the main effects of identity confusion / synthesis, gender, and age. In the total sample, identity confusion was significantly positive associated with external and emotional eating (Table 2a).

	Restraint Eating	External Eating	Emotional Eating

	Beta	R ²	Beta	R ²	Beta	R ²
Step 1						
Gender	-0.23***	-	-0.03	-	-0.21**	-
Age	0.04	0.052	-.21**	0.045	-0.03	0.046
Step 2						
Gender	-0.23**	-	-0.01	-	-0.18**	-
Age	0.05	-	-0.21**	-	-0.03	-
Confusion	0.02	0.052	0.13*	0.062	0.24***	0.102

*p<0.05, **p<0.01, ***p<0.001

Table 2a: Results of the stepwise regression analyses with the NVE scales (restraint, external and emotional eating) as dependent variables, gender and age as control variables and EPSI confusion as predictor (N = 240).

Furthermore, restraint and emotional eating were significantly related to being female and external eating to being younger. In the sample of patients without binge eating (Table 2b), no significant relationships were found between identity confusion and the three functions of eating behaviors.

	Restraint Eating		External Eating		Emotional Eating	
	Beta	R ²	Beta	R ²	Beta	R ²
Step 1						
Gender	-0.22**	-	-0.02	-	-0.23**	-
Age	0.1	0.056	-.25**	0.064	-0.03	0.057
Step 2						
Gender	-.21**	-	-0.02	-	-.23**	-
Age	0.1	-	-.24**	-	-0.05	-
Confusion	0.05	0.059	-0.07	0.068	0.11	0.069

*p<0.05, **p<0.01, ***p<0.001

Table 2b: Results of the stepwise regression analyses with the NVE scales (restraint, external and emotional eating) as dependent variables, gender and age as control variables and EPSI confusion as predictor in prebariatric without binge eating (N = 160).

The relationship between age/gender and eating functions were similar as in the total sample. Finally in the sample of patients with binge eating (Table 2c), we found – similar to the total sample – positive associations between identity confusion and external and emotional eating.

	Restraint Eating		External Eating		Emotional Eating	
	Beta	R ²	Beta	R ²	Beta	R ²
Step 1						
Gender	-0.27*	-	0.09	-	-0.07	-
Age	-0.15	0.103	0.02	0.009	0.2	0.015

Step 2						
Gender	-0.27*	-	0.14	-	-0.03	-
Age	-0.16	-	0.07	-	0.25*	-
Confusion	-0.04	0.104	0.34**	0.062	0.32**	0.105

*p<0.05, **p<0.01, ***p<0.001

Table 2c: Results of the stepwise regression analyses with the NVE scales (restraint, external and emotional eating) as dependent variables, gender and age as control variables and EPSI confusion as predictor in prebariatric patients with binge eating (N=80).

Restraint eating was significantly related to being female; and emotional eating with being older. Concerning the relationship between identity synthesis and the functions of eating behaviors controlled for age and gender (Table 3a, 3b), we can conclude that in both the total sample (Table 3a) and in the sample of patients without binge eating (Table 3b) there were no significant relations between identity synthesis and the three functions of eating.

	Restraint Eating		External Eating		Emotional Eating	
	Beta	R ²	Beta	R ²	Beta	R ²
Step 1						
Gender	-0.23***	-	-0.03	-	-0.21**	-
Age	0.04	0.052	-0.21**	0.045	-0.03	0.046
Step 2						
Gender	-0.24***	-	-0.02	-	-0.20**	-
Age	0.04	-	-0.21**	-	-0.03	-
Synthesis	0.08	0.059	-0.08	0.051	-0.1	0.056

*p<0.05, **p<0.01, ***p<0.001

Table 3a: Results of the stepwise regression analyses with the NVE scales (restraint, external and emotional eating) as dependent variables, gender and age as control variables and EPSI synthesis as predictor (N=240).

However, restraint and emotional eating were related to being female and external eating to being younger (see Table 3 a, 3b).

	Restraint Eating		External Eating		Emotional Eating	
	Beta	R ²	Beta	R ²	Beta	R ²
Step 1						
Gender	-0.22**	-	-0.02	-	-0.23**	-
Age	0.1	0.056	-0.25***	0.064	-0.03	0.057
Step 2						
Gender	-0.22**	-	-0.02	-	-0.23**	-
Age	0.1	-	-0.25***	-	-0.04	-
Synthesis	0.03	0.057	-0.01	0.064	-0.07	0.061

*p<0.05, **p<0.01, ***p<0.001

Table 3b: Results of the stepwise regression analyses with the NVE scales (restraint, external and emotional eating) as dependent variables, gender and age as control variables and EPSI synthesis as predictor in prebariatric without binge eating (N=160).

In the sample of patients with binge eating (Table 3c), we found that identity synthesis was significantly positive related to restraint eating and negative to external eating. Restraint eating was also significantly related to being female.

	Restraint Eating		External Eating		Emotional Eating	
	Beta	R ²	Beta	R ²	Beta	R ²
Step 1						
Gender	-0.27*	-	0.09	-	-0.07	-
Age	-0.15	0.103	0.02	0.009	0.2	0.04
Step 2						
Gender	-0.30**	-	0.12	-	-0.05	-
Age	-0.18	-	0.04	-	0.22	-
Synthesis	0.24*	0.16	-0.23*	0.058	-0.19	0.074

*p<0.05, **p<0.01, ***p<0.001

Table 3c: Results of the stepwise regression analyses with the NVE scales (restraint, external and emotional eating) as dependent variables, gender and age as control variables and EPSI synthesis as predictor in prebariatric patients with binge eating (N = 80).

Discussion

In the present study, we investigated the relationship between binge-eating and identity confusion/synthesis in a sample of bariatric surgery candidates. Our results showed that patients who engage in binge eating have a more confused identity than patients without binge eating, whereas no significant difference was found for identity synthesis. These results are in line with the findings of Schupack Neuberger and Nemeroff [30], who reported higher levels of identity diffusion in university students with binge eating. These findings also confirm prior studies which link the presence of identity confusion to more maladaptive psychological functioning [27,28], and eating disorder-related behaviors in particular [41].

Furthermore, we also investigated the relation between the functions of eating behavior and identity confusion/synthesis, controlled for age and gender in our pre-bariatric sample. First, emotional eating, that is, eating driven by emotions, is positively associated with identity confusion in patients with binge eating, and positively related to being female in patients without binge eating. These results are in line with earlier studies [29-32, 37] which state that binge eating is a way to cope with the distress coming from identity-related decisions. This is also confirmed by the finding that we found no significant relation between identity synthesis and emotional eating for those patients who engage in binge eating, suggesting that binge eating is not a way to cope with negative emotions in general, but is specifically used to deal with identity-related distress among those with a more confused identity. In addition, in line with earlier research [42,

43], we found that emotional eating is more common among female patients in both the total sample and the sample without binge eating. In general, women have been reported to use more emotion-focused coping strategies than men [44-46]. Emotional eating can be seen as a form of emotion-focused regulation [47], trying to reduce or even suppress the arousal caused by negative emotions by distracting oneself by eating.

Second, external eating, that is, eating driven by external cues, is positively related to identity confusion and negative to identity synthesis in patients with binge eating. Having a more confused identity seems to make patients more vulnerable to overeat and even binge eating in response to external food-cues. This result is in line with the escape theory of Heatherton and Baumeister [29] suggesting that binge eaters shift their attention away from the self to food-related stimuli in the environment often resulting in disinhibition, whereby the distress coming from a binge is easier to bear than identity-related distress. Patients with a clear sense of who they are and what they want, described as identity synthesis by Erikson [25,26], seem to be protected against overeating in response to external cues. It seems plausible that they try to resist high-caloric and fattening foods, although tempting and highly present, to pursue their personal weight goals, often emotionally loaded and highly valued in a sample of pre-bariatric patients with a long history of being overweight and dieting. Furthermore, in the sample of patients without binge eating, external eating is significant related to a younger age. External eating is possibly linked to impulsivity ("being tempted by") and self-control ("not able to stop even though not hungry or even saturated"), of which we know that these personality traits further develop and mature throughout adolescence [48-52]. Inhibition, referring to resisting temptation and not acting impulsively, also continues to increase during adolescence [53-56]. These findings could offer an explanation why we found that younger patients are easier seduced to overeat in response to external food-cues. However, further research is necessary to investigate this suggested explanation.

Finally, restraint eating (or dieting) was significantly related to being female and to identity synthesis in the group of pre-bariatric patients with binge eating. This finding confirms previous research, which shows that dieting is more common in women than in men [57-60]. The high prevalence of dieting behavior in females is also linked to the role of the media, which promotes the (unrealistic) thin body ideal for women, and the (unrealistic) athletic body for men, which may drive women to dieting (and binge eating, if they lose control) and men even to the use anabolic steroids to reach this body ideal [61,62]. Furthermore, the positive correlation between restraint eating and identity synthesis can be driven by the fact that identity synthesis is related to a higher level of conscientiousness. Conscientiousness represents self-discipline, thoroughness, and being hard-working [63,64], which is necessary to reach some level of restraint eating. Dietary restraint, however, makes people vulnerable to lose control eventually and engage in binge eating. Further, previous research indicates that females with an unclear or narrow sense of themselves (low levels of identity synthesis) are more vulnerable for social pressure and conformity to the thinness ideal, which often results in chronic dieting [65,66]. However, it is possible that in the specific sample of pre-bariatric patients, with a long-often emotional – history of being overweight and dieting, losing weight is became a personal held value instead of just the result of social pressure.

Limitations and suggestions for future research

This study is not without limitations. First, the use of a sample of pre-bariatric patients may inhibit the generalizability of the findings and can potentially increase the risk of socially desirable answers. Future research should include patients outside a bariatric surgery setting, even patients who are not seeking treatment, and also include patients with a lower degree of obesity to expand the range of obesity. Further, our sample consisted of 70.8% women and 29.2% men which also limit the generalizability of the results. Future studies, could therefore strive for a more equal distribution of male and female participants. A third limitation is that the data are mainly self-report (except weight and height which were measured by the research team), which makes them susceptible to reporting biases and inflated correlations. Fourth, our study assessed binge eating based on only one item of the EDE-Q. Future studies should include a more extensive battery of tests regarding binge eating, ideally supplemented with a structured diagnostic interview. Fifth, our study was cross-sectional in nature, which can limit our interpretation concerning the causal relationship between the investigated variables. Longitudinal research is needed to further clarify the relation between identity development and (disturbed) eating behavior in pre-bariatric obese patients. Finally, our study has not included the age of onset of obesity, which can be interesting to explore regarding the effect of age of onset of obesity on identity measurements.

Despite this limitation, our findings underline the importance of assessing binge eating in the screening procedure of bariatric surgery candidates and offer tailor-made treatment to enhance success of bariatric surgery. In this treatment of (pre) bariatric patients with binge eating, it is important to pay special attention to identity development as our study has shown that identity issues are strongly related to the functionality of (disturbed) eating behavior.

Conclusion

The present study gives us more insight into identity issues in bariatric surgery candidates. We found that identity issues are strongly related to the functionality of (disturbed) eating behaviours, especially among those patients who engage in binge eating. Our findings suggest that it is important to screen bariatric surgery candidates for binge eating and offer customized treatment with attention for identity-related issues, to enhance the success of bariatric surgery.

Acknowledgements

The authors thank the following colleagues for their help with the data collection: Dr. Bouckaert W., Dr. Houben B., Dr. Knol J. and Dr. Sergeant G. (Department of Abdominal Surgery, Jessa Hospital, Hasselt), the other members of the Obesity Centre Hasselt and the board of the Jessa Hospital.

References

1. The World Health Organization (2016) Obesity and overweight. Geraadpleegd op 11 augustus.
2. Andersen JR, Aasprang A, Karlsen TI, Natvig GK, Vage V, et al. (2015) Health-related quality of life after bariatric surgery: a systematic review of prospective long-term studies. *Surg Obes Relat Dis* 11: 466-473.
3. Collins J, Meng C, Eng A (2016) Psychological impact of severe obesity. *Current Obesity Reports* 5: 435-440.

4. de Wit L, Luppino F, van Straten A, Penninx B, Zitman F, et al. (2010) Depression and obesity: a meta-analysis of community-based studies. *Psychiatry Res* 178: 230-235.
5. McElroy SL, Kotwal R, Malhotra S, Nelson EB, Keck PE, et al. (2004) Are mood disorders and obesity related? A review for the mental health professional. *The J Clin Psychiatry* 65: 634-651.
6. de Zwaan M, Enderle J, Wagner S, Mühlhans B, Ditzgen B, et al. (2011) Anxiety and depression in bariatric surgery patients: a prospective, follow-up study using structured clinical interviews. *J Affect Disord* 133: 61-68.
7. Kalarchian MA, Marcus MD, Levine MD, Courcoulas AP, Pilkonis PA, et al. (2007) Psychiatric disorders among bariatric surgery candidates: relationship to obesity and functional health status. *Am J Psychiatry* 164: 328-334.
8. Mitchell JE, Selzer F, Kalarchian MA, Devlin MJ, Strain GW, et al. (2012) Psychopathology before surgery in the Longitudinal Assessment of Bariatric Surgery-3 (LABS-3) psychosocial study. *Surg Obes Relat Dis* 8: 533-541.
9. Hudson JL, Hiripi E, Pope HG, Kessler RC (2007) The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biol Psychiatry* 61: 348-358.
10. Marek RJ, BenPorath YS, Ashton K, Heinberg LJ (2014) Impact of using DSM5 criteria for diagnosing binge eating disorder in bariatric surgery candidates: Change in prevalence rate, demographic characteristics, and scores on the Minnesota Multiphasic Personality Inventory-2 Restructured Form (MMPI2RF). *Int J Eat Disord* 47: 553-557.
11. Niego SH, Kofman MD, Weiss JJ, Geliebter A (2007) Binge eating in the bariatric surgery population: a review of the literature. *Int J Eat Disord* 40: 349-359.
12. Wadden TA, Sarwer DB, Fabricatore AN, Jones L, Stack R, et al. (2007) Psychosocial and behavioral status of patients undergoing bariatric surgery: what to expect before and after surgery. *Med Clin North Am* 91: 451-469.
13. American Psychiatric Association (2013) Diagnostic and statistical manual of mental Disorders, 5th Edn, Arlington, VA: American Psychiatric Publishing.
14. de Zwaan M (2001) Binge eating disorder and obesity. *Int J Obes Relat Metab Disord* 25: 51-55.
15. Dingemans AE, Bruna MJ, Van Furth EF (2002) Binge eating disorder: a review. *Int J Obes Relat Metab Disord* 26: 299-307.
16. de Zwaan M, Bach M, Mitchell JE, Ackard D, Specker SM, et al. (1995) Alexithymia, obesity and binge eating disorder. *Int J Eat Disord* 17: 135-140.
17. Masheb RM, Grilo CM (2006) Emotional overeating and its associations with eating disorder psychopathology among overweight patients with binge eating disorder. *Int J Eat Disord* 39: 141-146.
18. Pinaquy S, Chabrol H, Simon C, Louvet JP, Barbe P (2003) Emotional eating, alexithymia, and binge eating disorder in obese women. *Obes Res* 11: 195-201.
19. Wadden TA, Foster GD, Letizia A, Wilk JE (1993) Metabolic, anthropometric and psychological characteristics of obese binge eaters. *Int J Eat Disord* 14: 17-25.
20. Marek RJ, BenPorath YS, Heinberg LJ (2016) Understanding the role of psycho-pathology in bariatric surgery outcomes. *Obes Rev* 17: 126-141.
21. Womble LG, Williamson DA, Martin CK, Zucker NL, Thaw JM, et al. (2001) Psychosocial variables associated with binge eating in obese males and females. *Int J Eat Disord* 30: 217-221.
22. Schafer MH, Ferraro KF (2011) The stigma of obesity does perceived weight discrimination affect identity and physical health? *Social Psychology Quarterly* 74: 76-97.
23. Verstuyf J, Van Petegem S, Vansteenkiste M, Soenens B, Boone L (2014) The body perfect ideal and eating regulation goals: investigating the role of adolescents identity styles. *J Youth Adolesc* 43: 284-297.
24. Shostovsky BJ (1983) Ego identity development and obesity in adolescent girls. *Adolescence* 18: 551.
25. Erikson EH (1950) *Childhood and society*. New York: Norton
26. Erikson E (1968) *Identity: Youth and crisis*. New York: Norton.
27. Luyckx K, Soenens B, Goossens L, Beckx K, Wouters S (2008) Identity exploration and commitment in late adolescence: Correlates of perfectionism and mediating mechanisms on the pathway to well-being. *J Social Clin Psychol* 27: 336.
28. Schwartz SJ, Zamboanga BL, Wang W, Olthuis JV (2009) Measuring identity from an Eriksonian perspective: Two sides of the same coin? *J Pers Assess* 91: 143-154.
29. Heatherton TF, Baumeister RF (1991) Binge eating as escape from self-awareness. *Psychol Bull* 110: 86.
30. Schupak-Neuberg E, Nemeroff CJ (1993) Disturbances in identity and self? Regulation in bulimia nervosa: Implications for a metaphorical perspective of body as self? *Int J Eat Disord* 13: 335-347.
31. Polivy J, Herman CP (2002) Causes of eating disorders. *Ann Rev Psychol* 53: 187-213.
32. O Neil S, Adams GR (2017) Exploring the relation between identity style and bulimic behavior.
33. Laghi F, Baiocco R, Liga F, Lonigro A, Baumgartner E (2014) Binge eating and binge drinking behaviors: Individual differences in adolescent's identity styles. *J Health Psychol* 19: 333-343.
34. Wheeler HA, Adams GR, Keating L (2001) Binge eating as a means for evading identity issues: The association between an avoidance identity style and bulimic behavior. *Identity: An Int J Theory Res* 1: 161-178.
35. Berzonsky MD (2008) Identity formation: The role of identity processing style and cognitive processes. *Personality Ind Diff* 44: 643-653.
36. Berzonsky MD, Adams G (1999) Reevaluating the identity status paradigm: Still useful after 35 years. *Developmental Rev* 19: 557-590.
37. Polivy J, Herman CP, McFarlane T (1994) Effects of anxiety on eating: Does palatability moderate distress-induced overeating in dieters? *J Abnorm Psychol* 103: 505.
38. Fairburn CG, Beglin SJ (1994) Assessment of eating disorders: Interview or self-report questionnaire? *Int J Eat Disord* 16: 363-370.
39. Rosenthal DA, Gurney RM, Moore SM (1981) From trust to intimacy: A new inventory for examining Erikson's stages of psychosocial development. *J Youth Adolesc* 10: 525-537.
40. Van Strien T, Frijters JER, Bergers GPA, Defares PB (1986) The Dutch Eating Behavior Questionnaire for assessment of restrained, emotional and external eating behavior. *Int J Eat Disord* 5: 295-315.
41. Verschueren M, Luyckx K, Kaufman E, Vansteenkiste M, Moons P, et al. (2017) Identity Processes and Statuses in Patients with and without Eating Disorders. *Eur Eat Disord Rev* 25: 26-35.
42. Spoor ST, Bekker MH, Van Strien T, van Heck GL (2007) Relations between negative affect, coping, and emotional eating. *Appetite* 48: 368-376.
43. Van Strien T (2005) *Nederlandse Vragenlijst voor Eetgedrag 2005*. Handleiding en Verantwoording, Amsterdam.
44. Larsen JK, van Strien T, Eisinga R, Engels RC (2006) Gender differences in the association between alexithymia and emotional eating in obese individuals. *J Psychosom Res* 60: 237-243.
45. Nolen-Hoeksema S (2012) Emotion regulation and psychopathology: The role of gender. *Annu Rev Clin Psychol* 8: 161-187.
46. Nolen-Hoeksema S, Aldao A (2011) Gender and age differences in emotion regulation strategies and their relationship to depressive symptoms. *Personality Ind Diff* 51: 704-708.
47. Folkman S, Lazarus RS (1990) Coping and emotion. *Psychol Biol Approach Emo* 13: 313-332.
48. Casey BJ, Jones RM, Hare TA (2008) The adolescent brain. *Ann N Y Acad Sci* 1124: 111-126.
49. Harden KP, Tucker-Drob EM (2011) Individual differences in the development of sensation seeking and impulsivity during adolescence: further evidence for a dual systems model. *Dev Psychol* 47: 739.

50. Hou R, Mogg K, Bradley BP, Moss-Morris R, Peveler R, et al. (2011) External eating, impulsivity and attentional bias to food cues. *Appetite* 56: 424-427.
51. Luna B (2009) The maturation of cognitive control and the adolescent brain. In *From Attention to Goal-Directed Behavior* Springer Berlin Heidelberg, pp: 249-274.
52. Yurgelun-Tod D (2007) Emotional and cognitive changes during adolescence. *Curr Opin Neurobiol* 17: 251-257.
53. Best JR, Miller PH (2010) A developmental perspective on executive function. *Child Dev* 81:1641-1660.
54. Diamond A (2013) Executive functions. *Ann rev psychol* 64: 135-168.
55. Luna B (2009) Developmental changes in cognitive control through adolescence. *Adv Child Dev Behav* 37: 233-278.
56. Luna B, Garver KE, Urban TA, Lazar NA, Sweeney JA (2004) Maturation of cognitive processes from late childhood to adulthood. *Child Dev* 75: 1357-1372.
57. Dittmar H (2005) Introduction to the special issue: Body image—vulnerability factors and processes linking sociocultural pressures and body dissatisfaction. *J Social Clin Psychol* 24: 1081-1087.
58. Neumark-Sztainer D, Shenvood NE, French SA, Jefsery RW (1999) Weight control behaviors among adult men and women: cause for concern? *Obes Res* 7: 179-188.
59. Rolls BJ, Fedoroff IC, Gurthrie JF (1991) Gender differences in eating behavior and body weight regulation. *Health Psychol* 10: 133-142.
60. Polivy J, Herman CP (2004) Sociocultural idealization of thin female body shapes: An introduction to the special issue on body image and eating disorders. *J Social Clin Psycho* 23: 1-6.
61. Dietrich A, Federbusch M, Grellmann C, Villringer A, Horstmann A (2014) Body weight status, eating behavior, sensitivity to reward/punishment and gender: relationships and interdependencies.
62. Yean C, Benau E, Dakanalis A, Hormes JM, Perone J, et al. (2013) The relationship of sex and sexual orientation to self-esteem, body shape satisfaction, and eating disorder symptomatology. *Front Psychol* 4: 887.
63. Klimstra TA, Luyckx K, Goossens L, Teppers E, De Fruyt F (2013) Associations of identity dimensions with Big Five personality domains and facets. *Eur J Personality* 27: 213-221.
64. Luyckx K, Teppers E, Klimstra TA, Rassart J (2014) Identity processes and personality traits and types in adolescence: Directionality of effects and developmental trajectories. *Dev Psychol* 50: 2144.
65. Pelletier LG, Dion S, Lévesque C (2004) Can self-determination help protect women against sociocultural influences about body image and reduce their risk of experiencing bulimic symptoms. *J Social Clin Psychol* 23: 61-88.
66. Vartanian LR (2009) When the body defines the self: Self-concept clarity, internalization, and body image. *J Soc Clin Psychol* 28: 94-126.