INT'L. J. PSYCHIATRY IN MEDICINE, Vol. 47(1) 75-91, 2014

COPING STYLE AS A MEDIATOR BETWEEN ATTACHMENT AND MENTAL AND PHYSICAL HEALTH IN PATIENTS SUFFERING FROM MORBID OBESITY

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ABSTRACT

Objective: The presence of mental health problems and limitations in physical functioning is high in patients suffering from morbid obesity. The purpose of the current study was to examine the mediating role of coping style in the relationship between attachment representations and mental health and physical functioning in a morbidly obese population. *Method:* A total of 299 morbidly obese patients who were referred to the Slotervaart bariatric surgery unit in Amsterdam, the Netherlands, completed self-report questionnaires assessing adult attachment style (Experiences in Close Relationship–Revised Questionnaire), coping style (Utrecht Coping List), and patients physical

doi: http://dx.doi.org/10.2190/PM.47.1.g
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functioning and mental health (Short Form-36). *Results:* Attachment anxiety ($\beta = -.490$, $p < .001$) and attachment avoidance ($\beta = -.387$, $p < .001$) were both found to be related to mental health. In addition, attachment anxiety was also found to be related to physical functioning ($\beta = -.188$, $p < .001$). Coping style partly mediated these associations. *Conclusions:* Findings suggest that coping mediates the association between attachment anxiety and attachment avoidance on the one hand and mental health and physical functioning in patients with morbid obesity on the other hand.

(*Int'l. J. Psychiatry in Medicine* 2014;47:75-91)

Key Words: obesity, attachment, coping, mental health, physical functioning, bariatric surgery

INTRODUCTION

Morbid obesity has a negative impact on patients' mental health and physical functioning [1], and has been shown to be related to physical and psychiatric co-morbidities such as diabetes, hypertension, depression, and eating disorders [2-4]. Research shows that 35.6% of the morbidly obese patients applying for bariatric surgery have diabetes and the lifetime prevalence of Axis I (DSM-IV) clinical psychiatric diagnoses was 47.5% [5, 6]. Patients suffering from morbid obesity often report feelings of sadness and shame, lack of energy, and limitations in self-care and mobility, which are important reasons for people to consider bariatric surgery [7, 8]. Although patients' overweight may account for these higher levels of mental health problems and limitations in physical functioning, within the group of morbidly obese patients large differences exist which may in part be explained by patients' attachment style.

According to the attachment theory [9], internal working models of attachment are the mechanisms by which the continuity of childhood experiences is thought to be maintained over time and into adulthood. Bartholomew et al. (1991) & Brennan et al. [10] and Brennan et al. [11] demonstrated that these internal working models of attachment style can be categorized as either attachment anxiety or attachment avoidance. Individuals who score high on *attachment anxiety* exhibit fear of rejection and abandonment, have feelings of unworthiness, and tend to turn to others in an anxious, clingy manner. Individuals high in *attachment avoidance* are uncomfortable with intimacy and interdependence while maintaining a high sense of self-worth [10, 11]. Those low in attachment anxiety and attachment avoidance (i.e., secure attachment) have been found to show self-confidence coupled with confidence about the availability and responsiveness of others [12].

Compared to more insecure attachment representations, more secure attachment representations have been consistently found to be associated with better mental

and physical functioning in healthy people [13, 14], chronically ill patients [15], and in morbidly obese patients [16]. More securely attached patients may have a more realistic view of the stressors and threats they are facing and of their own resilience [17]. Consequently, physical symptoms and complaints tend to be "real" and connected to illness and injury [18]. In contrast, patients high in attachment anxiety tend to worry about health more than seems justified, are hypervigilant for threats and stressors, and report physical symptoms and complaints also when there is no indication for illness or injury [19, 20]. Moreover, patients high in attachment avoidance try their best to suppress symptoms of distress and may worry too little about their health [18].

In part, the association between attachment and mental and physical functioning may be explained by differences in coping skills between more securely and more insecurely attached patients [9, 21]. Kotler et al. [13] and Wei et al. [21] have found evidence for the mediating role of coping between attachment representations and physical and mental functioning in student samples. However, no published studies have examined the association between attachment style, various coping styles, and mental and physical functioning in morbidly obese patients seeking bariatric surgery. A complex patient population characterized by both physical as well as psychiatric co-morbidities.

Coping, defined as the thoughts and actions we use to deal with stress, is found to be strongly associated with mental health and physical functioning. Lazarus and Folkman classified two types of coping responses: emotion focused coping and problem focused coping [22]. The seven coping strategies used in this study are derived from the Utrecht Coping List (UCL) [23]. The coping strategies seeking social support, palliative reacting, avoiding, passive reacting, reassuring thoughts, and expression of emotions can be seen as emotion focused coping, whereas active tackling can be seen as problem focused coping. In general, problem focused coping has been found to be associated with better outcomes when dealing with situations where a high level of control is perceived, while emotion focused coping seems more appropriate when stressors are unalterable [24, 25]. Moreover, passive ways of coping and expressing emotions is found to be associated with lower mental and physical functioning, whereas a more active way of coping and seeking support is shown to positively influence patients' mental and physical functioning [26-28].

Furthermore, individuals with more secure attachment representations (i.e., low on attachment anxiety and attachment avoidance) who perceive others as available and responsive may not only be comfortable *seeking support* but may also have learned that their own actions (*active tackling* are often effective in reducing distress and in solving problems [29, 30]. On the other hand, less securely attached patients (i.e., those who believe others will not be readily available) may be more likely to feel overwhelmed and paralyzed (*passive reacting*) by problems and may possibly cope by adopting external regulatory mechanisms *(palliative reacting*), such as smoking and drinking [31, 32]. Specifically, those

people with more anxious attachment representations may tend to express their fears and worries in a profound and clingy way *(emotional expression)* in order to ensure support and care from others [33]. This tendency is consistent with developmental experiences where the primary caregiver was only helpful if the "signal" of neediness was strong enough [14]. As a consequence, these people learned to focus on and express negative emotions while waiting for reassurance as the ability to *sooth and distract oneself* is under-developed [30]. Instead, they have become hyper-vigilant to distress, which manifests itself through worrying and thinking about negative experiences and emotions in a repetitive and passive way (*passive reacting*). Furthermore, patients with more avoidant attachment representations have a habitual way of coping with negative experiences and emotions by *distancing, avoiding, and repressing* [34-37]. They have most likely received consistently unresponsive care giving [38], maintaining a high sense of self-worth by defensively denying the value of close relationships and stressing the importance of independence and self-reliance [39] and, therefore, may be reluctant to *seek support* [40, 41].

The purpose of the current study was to examine the relationships between attachment representations and coping styles on the one hand and mental health and physical functioning on the other, in a morbidly obese population. Based on the aforementioned literature three main hypotheses were formulated:

1. more attachment anxiety and attachment avoidance are associated with worse mental health and physical functioning;
2. lower attachment anxiety and lower attachment avoidance (i.e., attachment security) are associated with more support seeking and active tackling, whereas attachment anxiety and attachment avoidance are associated with more passive reacting and palliative reacting; and
3. the association between patients' attachment representations on the one hand and physical and mental functioning on the other are mediated by patients' coping style.

METHOD

Study Sample

This study took place in the Slotervaart bariatric surgery unit, Amsterdam, the Netherlands between February and August 2012. The total sample included 299 morbidly obese patients referred for bariatric surgery. Patients between the ages of 18 and 60 years are eligible for gastric bypass surgery if IFSO criteria are met: BMI above 40 or a BMI above 35 combined comorbidity such as hypertension, diabetes, obstructive sleep apnea syndrome, or arthrosis, and if they have made serious attempts at losing weight [42].

Procedures

All patients referred to the Slotervaart bariatric surgery unit received a pre-surgical multidisciplinary assessment. During this assessment patients received questionnaires to complete at home. These questionnaires assessed patients' attachment style, coping styles, physical functioning, and mental health. Patients were asked to bring the completed questionnaire to their next visit at the bariatric surgery unit.

After random allocation all completed and returned questionnaires received an identification number and information gathered was treated as strictly confidential. The study was approved by the Medical Ethical Committee. Research participants provided informed consent.

Measures

Attachment styles were assessed using the Experiences in Close Relationships–Revised scale (ECR-R). The ECR-R is a 36-item self-report measure of adult attachment style, which requires participants to reflect on their typical ways of relating in close/romantic relationships. Reviews of self-report measures of adult attachment suggest that the ECR-R has the best psychometric properties of the available measures [43]. The ECR consists of two subscales, attachment anxiety (e.g., I'm afraid that I will lose my partner's love) and attachment avoidance (e.g., I prefer not to show a partner how I feel deep down), and both dimensions are assessed with 18 items. Answers are on a 5-point scale ranging from "strongly disagree" (1) to "strongly agree" (5). The present data showed that Cronbach's alpha for subscale attachment anxiety was 0.88 and the Cronbach's alpha for subscale attachment avoidance was 0.90.

Coping styles were measured using the Utrecht Coping List (UCL), a 47-item, self-report questionnaire that measures 7 empirically derived subscales that assess "active tackling" (7 items; e.g., "putting things in a row," "seeking a way to solve a problem"), "seeking social support" (6 items; e.g., "discussing the problem with friends or family," and "asking somebody for help"), "palliative reacting" (8 items; e.g., "looking for distraction and looking for good company"), "avoiding" (8 items; e.g., "avoiding difficult situations" and "letting things go"), "passive reacting" (7 items; e.g., "being overwhelmed by problems"), "reassuring thoughts" (5 items; e.g., "imagining that things could be worse"), and "expression of emotions" (3 items; e.g.. "showing anger to the person who is responsible for the problem"). Answers are on a 4-point scale ranging from "seldom or never" to "very frequently." Prior research has shown that the UCL is a valid and reliable instrument for measuring coping strategies and that it has fairly good internal consistency . In the present data, the different coping scales showed good internal consistency—Cronbach's alpha for active tackling was .85, for seeking social support .89, for palliative reacting .63, for avoiding .74, for passive reacting .74, for reassuring thoughts .67—with the exception of the expression of

emotions scale, Cronbach's alpha = .57. This might be due to the small number of items in this scale, whereas most other scales consisted of at least five or six items [23].

Physical functioning and mental health were evaluated using the SF-36, a widely used Health Related Quality Of Life (HRQOL) measure. Its use in bariatric surgery patient populations is well-established. For the domains physical functioning and mental health, scores were coded, summed up, and transformed to a scale of 0 (worst health) to 100 (best health). The instrument has been translated into Dutch and validated for the Dutch population [44]. The physical functioning domain and the mental health domain were used as outcome variables in the present study. The physical functioning domain consists of 10 items (e.g., to what extent do you have limitations in lifting and carrying groceries?) and answers are on a 3-point scale ranging from "extremely limited" to "not limited at all." The mental health domain consists of 5 items (e.g., in the last 4 weeks, how often did you feel nervous?) and answers are on a 6-point scale ranging from "constantly" to "never." The present data showed that Cronbach's alpha for physical functioning (0.88) and mental health (0.84) showed good internal consistency.

Statistical Analyses

Statistical analyses were performed using SPSS 19.0. Independent *T*-tests and Pearson's correlations were used to explore possible confounding in the relationship between, on the one hand, demographics (i.e., age, gender), BMI, and education level, and, on the other hand, coping styles, physical functioning, and mental health. The mean scores on the SF-36 of physical functioning and mental health were compared to age-matched Dutch general population norms using *t*-tests [44].

In order to determine whether coping styles are a mediator of attachment style, and physical functioning and mental health, three regression equations were carried out: we first regressed the mediator (coping style) on the independent variable (attachment style); second, we regressed the dependent variable (physical functioning and mental health) on the independent variable (attachment style); and third we regressed the dependent variable (physical functioning and mental health) on both the independent variable (attachment style) and on the mediator (coping styles). To establish mediation, we tested the three regression equations following the criteria of Baron and Kenny [45]. All relationships that were found insignificant were excluded from further analyses. Finally, we used unstandardized regression coefficients (B) and standard errors for the approximate significance test of Sobel [46] to test for the indirect effect of the independent variable on the dependent variable via the mediator [45, 46]. Standardized regression coefficients (β) are presented in the text. The level of significance was set at $p < .05$. All tests were two-tailed.

RESULTS

Descriptive Statistics

A total of 299 patients seeking bariatric surgery were included in the study. Mean age of the study population was 44 (*SD* = 11.0), and 85 % of test subjects were women. Mean BMI was 44.1 (*SD* = 6.2) and only a small part of the patients had followed a higher education (20.5%).

Pearson's correlations showed that age was not associated with most of the coping styles except for palliative reacting ($r = –.162$, $p = .006$). Women ($M = 2.47$, $SD = .62$) reported to seek more social support than men ($M = 2.15$, $SD = .66$), $t(291) = 3.06$, ($p = .002$), 95% CI: .11-.51. Women ($M = 2.54$, $SD = .49$) were also found to use more reassuring thoughts than men ($M = 2.30$, $SD = .45$), $t(292) = 3.11$, ($p = .002$), 95% CI: .09-.40. Patients with a higher education used more active tackling, $t(285) = –3.51$, ($p = .001$), 95% CI: –.41-.11, and sought more social support, $t(289) = –2.16$, ($p = .032$), 95% CI: –.38-.02, than patients with a lower education. Furthermore, patients' BMI was not associated with one of the different coping styles.

Independent *T*-test showed gender differences for physical functioning, $t(297) = –1.981$, ($p = .048$). Similarly, significant differences in physical functioning, $t(295) = –2.820$, ($p = .005$), 95% CI: –15.69-2.79, were found between patients with a higher and a lower education level. Pearson correlation showed that both age ($r = –.125$, $p = .030$) and BMI ($r = –.132$, $p = .023$) were associated with physical functioning. In other words, women, patients with a lower education, older patients, and patients with a higher BMI scored lower on physical functioning than men, patients with a higher education, younger patients and patients with a lower BMI. Table 1 shows the correlations between the main study variables. No correlations between demographics and mental health were found.

Mean scores for physical functioning (present study $M = 55.0$, norm $M = 83.0$, $P < .001$) and for mental health (present study $M = 71.3$, norm $M = 76.8$, $P = .001$) were significantly lower compared to those of persons of comparable age in the general Dutch population [44].

Attachment, Coping, and Health

We tested whether coping was a potential mediator for the effect of adult attachment and mental and physical health (Figure 1). The *first criterion* that should be met for a coping style to mediate the association between attachment anxiety and attachment avoidance on the one hand and mental health and physical functioning on the other stipulates that attachment should be significantly associated with mental health and physical functioning. The unmediated effect in Table 2 shows that, after controlling for age, gender, education, and BMI, a significant negative association was found between attachment anxiety and physical functioning ($\beta = –.188$, $p < .001$) and between attachment anxiety and

Table 1. Correlation Matrix of the Main Study Variables

	2	3	4	5	6	7	8	9	10	11
1. Attachment anxiety	.586**	−.406**	.121*	.221**	−.275**	.532**	.120*	−.005	−.495**	−.210**
2. Attachment avoidance	1	−.293**	.115	.262**	−.570**	.457**	.027	−.084	−.379**	−.065
3. Active tackling		1	.110	−.387**	.327**	−.480**	−.100	.310**	.397**	.181**
4. Palliative reacting			1	.189**	.216**	.219**	.110	.411**	−.103	−.021
5. Avoiding				1	−.220**	.463**	.023	.096	−.224**	−.071
6. Seeking social support					1	−.211**	.183**	.257**	.210	.093
7. Passive reacting						1	.256**	.004	−.657**	−.216**
8. Expression of emotions							1	.031	−.123**	.042
9. Reassuring thoughts								1	.023	−.040
10. Mental health									1	.340**
11. Physical functioning										1

*Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

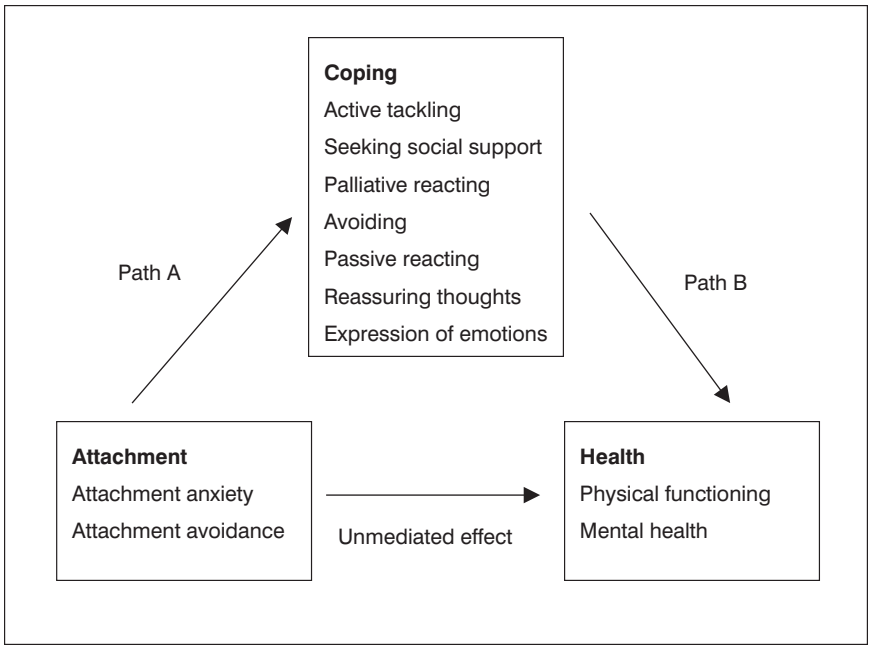

Figure 1. Coping as mediator of the effect of adult attachment on health outcomes. Pathway values are reported in Table 2.

mental health ($\beta = -.490$, $p < .001$). Furthermore, we also found a strong relation between attachment avoidance and mental health ($\beta = -.387$, $p < .001$). These results show that the first criterion for mediation was met for all the associations, except for attachment avoidance and physical functioning.

The *second criterion* stipulates that attachment representations should be significantly associated with coping style. Path A in table 2 shows that a lower score on attachment anxiety and attachment avoidance are found to be associated with more active tackling and social support seeking. A higher score on attachment anxiety and/or attachment avoidance are found to be associated with more avoidance, passive reacting and palliative coping. Moreover, a higher score on attachment anxiety is found to be associated with more emotional expression. The coping style reassuring thoughts was not associated with any attachment style and, therefore, excluded from further analyses.

Next, in accordance with the *third criterion*, we investigated whether the different coping styles were significantly associated with mental health and physical functioning. Regression analyses showed that active tackling was positively and passive reacting negatively associated with both physical functioning and mental health (see Path B Table 2). Moreover, social support was positively

Table 2. Coping Style as Mediator between Attachment Style and the Dependent Variables Mental Health and Physical Functioning, Adjusted for Age, Gender, Education, and BMI

	Unmediated effect β (*p*)
Attachment anxiety → Active tackling →	
Physical functioning	–5.422 ($p < .001$)
Mental health	–10.696 ($p < .001$)
Attachment avoidance → Active tackling →	
Mental health	–8.632 ($p < .001$)
Attachment anxiety → Avoiding →	
Mental health	–10.696 ($p < .001$)
Attachment avoidance → Avoiding	
Mental health	–8.632 ($p < .001$)
Attachment anxiety → Seeking social support →	
Mental health	–10.696 ($p < .001$)
Attachment avoidance → Seeking social support →	
Mental health	–8.632 ($p < .001$)
Attachment anxiety → Passive reacting →	
Physical functioning	–5.422 ($p < .001$)
Mental health	–10.696 ($p < .001$)
Attachment avoidance → Passive reacting →	
Mental health	–8.632 ($p < .001$)
Attachment anxiety → Expression of emotions	
Mental health	–10.696 ($p < .001$)

Path A β (*p*)	Path B β (*p*)	Mediated effect β (*p*)	Sobel's *Z* (*p* value) β (*p*)
–.266 ($p < .001$)	5.642 ($p < .05$)	–4.857 ($p < .05$)	–2.096 ($p < .05$)
–.266 ($p < .001$)	12.663 ($p < .001$)	–8.523 ($p < .001$)	–4.954 ($p < .001$)
–.197 ($p < .001$)	12.663 ($p < .001$)	–6.694 ($p < .001$)	–4.063 ($p < .001$)
–.122 ($p < .001$)	–7.994 ($p = .001$)	–10.348 ($p < .001$)	–2.511 ($p < .05$)
–.148 ($p < .001$)	–7.994 ($p = .001$)	–7.951 ($p < .001$)	–3.089 ($p < .05$)
–.218 ($p < .001$)	6.465 ($p < .001$)	–10.122 ($p < .001$)	–2.902 ($p < .05$)
–.460 ($p < .001$)	6.465 ($p < .001$)	–8.764 ($p < .001$)	–3.840 ($p < .001$)
–.315 ($p < .001$)	–9.637 ($p = .001$)	–2.945 ($p = .130$)	–3.311 ($p < .001$)
–.315 ($p < .001$)	–23.901 ($p < .001$)	–4.265 ($p < .001$)	–8.343 ($p < .001$)
–.274 ($p < .001$)	–23.901 ($p < .001$)	–2.562 ($p < .05$)	–7.219 ($p < .001$)
–.076 ($p < .001$)	–4.645 ($p < .05$)	–10.439 ($p < .001$)	–1.512 ($p = .129$)

associated with mental health, while avoidance and expression of emotions were both negatively associated. Thus, the third criterion was also met.

Finally, *the fourth criterion* for coping style to be a mediator, requires the association between attachment style and physical functioning or mental health to be reduced or to no longer be significant after controlling for a specific coping style. The mediated effect in Table 2 shows that this final criterion was also met. The strength of the association between attachment anxiety or attachment avoidance and mental health and physical functioning decreased when the specific coping style was taken into account as a mediator. The Sobel test confirmed these findings and showed that the decrease in all beta coefficients was significant (Table 2). The beta coefficients of attachment anxiety and attachment avoidance in all relations decreased, but remained in almost all mediating analyses significant when coping style was controlled for. This indicates that the association between attachment style and mental health or physical functioning was *partly* mediated by the mentioned coping styles. In contrast, a full mediation model was found to describe the association between attachment anxiety and physical functioning, and the beta coefficient was no longer significant when controlling for passive reacting.

DISCUSSION

Although previous studies identified relations between attachment and mental health and physical functioning [13, 15], our results extend these findings by suggesting that attachment representations influences mental health and physical functioning through various coping styles in morbidly obese patients seeking bariatric surgery. A population who constantly has to cope with the different aspects of morbid obesity, a chronic life threatening and limiting disease often combined with complex psychological and medical problems (e.g., diabetes).

Our results suggest that more securely attached morbidly obese patients (i.e., those with lower levels of attachment anxiety and attachment avoidance) reported more active problem solving strategies as well as a willingness to seek support when needed. These findings confirm our expectations and may reflect an adequate balance between two sides of a continuum as described by Maunder and colleagues [14, 47]. This continuum stretches from autonomy and confidence in one's own ability to solve problems to dependency and the need to trust others for support and care. While more securely attached patients are able to integrate both sides, more insecurely attached patients (i.e., those with higher levels of attachment anxiety and attachment avoidance) discard one side of the continuum (either autonomy in the case of attachment anxiety or dependency in the case of attachment avoidance) in favor of the other side. This is reflected by their coping style, which, in this and other studies [30], was found to be characterized by not knowing what to do and by feeling overwhelmed in stressful situations (i.e., avoidance and passive coping).

Active problem solving coping as well as support seeking were in the present study, as well as in previous studies [28] found to be associated with better mental health. Hence, these coping strategies seem to help more securely attached patients maintain a positive outlook despite their overweight. In contrast, avoidance coping, passive coping, and expression of emotions were found to be associated with worse mental health. This may help explain why more insecurely attached patients may experience more mental problems than more securely attached patients. Although we did not find any association between attachment avoidance and palliative reacting, we did find an association for attachment anxiety.

Moreover, in the present study we also found that more anxiously attached patients (i.e., those scoring higher on attachment anxiety) reported worse physical functioning. This was not true for more avoidant attached patients (i.e., those scoring higher on attachment avoidance). This finding is in accordance with the idea that more anxiously attached patients may respond to a stressor in a hypervigilant way, that they focus on physical complaints, and that they may express their fears and worries more eagerly in an attempt to guarantee the availability and responsiveness of those needed as much as possible [14]. More anxiously attached patients have been found to report more (un)explained physical symptoms and to use the healthcare system more regularly [48].

In the present study, active as well as passive coping were not only found to be associated with mental functioning but also with physical functioning. That is, more active coping and less passive coping were found to be associated with better physical functioning. These findings are in line with other studies [27]. An explanation for these findings might be that due to their passive way of coping, patients develop more stress-related physical symptoms (e.g., back pain), which in turn may lead to worse physical functioning [48]. Moreover, patients with a less active coping style may tend to focus more on bodily sensations, which in turn may also result in more physical complaints. Alternatively, patients with more physical problems may be forced to use more passive coping strategies, due to their physical complaints.

Furthermore, patients with morbid obesity were found to report more impaired physical functioning and mental health compared to the general Dutch population [49, 50]. We found that more securely attached patients exhibited better mental health and physical functioning than more insecurely attached patients. While the physical functioning scores of the more securely attached patients were still lower than those of the general population, the scores for mental health of more securely attached patients were comparable to those of the general population. These results indicate that more secure attachment representations may serve as a buffer for mental health of morbidly obese patients. In contrast, more insecure attachment representations may exacerbate the impact of obesity on mental health and physical functioning.

These results should be interpreted in the context of limitations. As we only included patients from the Slotervaart bariatric surgery unit, the results may not

be generalizable to all patients seeking bariatric surgery and the general population as a whole. In addition, all data is gathered through self-reported measurements. Determining the mediating role of coping styles in the relation between attachment representations and mental health and physical functioning could therefore benefit from the inclusion of clinical interviews. Furthermore, this study has a cross-sectional design which prevents us from drawing conclusions about causality. Therefore, longitudinal studies are needed to evaluate our findings.

Despite these limitations, the value of our study lies in that it is the first to investigate the relationship between attachment representations and mental health and physical functioning in patients seeking bariatric surgery and how this is mediated by patients' coping styles. In considering bariatric surgery for patients, specialists currently use patients' quality of life as an important criterion, as they expect that patients' quality of life will improve after the operation. Although post-operative improvements in quality of life (including physical functioning and mental health) are expected, our findings suggest that BMI predicts only a small part of the differences in physical functioning and mental health. Therefore, our study argues in favor of a greater consideration of patients' attachment representations and coping behaviors when considering physical functioning and mental health. Findings suggest not only that it is important to consider attachment anxiety or attachment avoidance in understanding mental health and physical functioning in patients with morbid obesity, but also that coping style plays an important role in these relationships. Future studies are needed to investigate whether patients attachment representations and coping behaviors can predict physical functioning and mental health after the surgery.

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