

# Predicting satisfaction with outcome and follow-up care 5 years after bariatric surgery: A prospective evaluation

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## Abstract

**Objective:** Patient satisfaction is viewed as essential for a successful outcome of bariatric surgery. Few studies have explored long-term satisfaction prospectively. This study aimed to examine pre- and post-surgery predictors for satisfaction with follow-up care, and change in outcome satisfaction from one to 5 years after bariatric surgery.

**Methods:** A sample of 210 participants was recruited from a single treatment center. Self-reported and medical record data regarding mental and somatic health, body image, follow-up attendance, and weight loss were obtained before, 1 year, and 5 years after surgery.

**Results:** Over 90% of the participants were satisfied with the results and treatment 1 year after surgery, while 69% had their outcome expectations fulfilled and 62% were satisfied with the follow-up 5 years after surgery. A shift from initial satisfaction to unfulfillment of expectations was predicted by baseline body dissatisfaction, greater percentage of weight regain after initial weight loss, and more discomfort from somatic symptoms 5 years after surgery. In addition to symptom discomfort, worry about surgery predicted satisfaction with follow-up care.

**Conclusion:** At 5 years, one-fifth of those initially satisfied reported that bariatric surgery had failed to meet their expectations. This suggests that outcome expectations related to weight loss, somatic symptoms, and body image need to be addressed both before and after bariatric surgery.

## KEYWORDS

bariatric surgery, follow-up, outcome satisfaction, prospective

## 1 | INTRODUCTION

Long-term weight loss and improvements in comorbidities after bariatric surgery are well documented.<sup>1,2</sup> Another measure of a successful outcome is patient satisfaction. Approximately 70%–90%

of patients are generally satisfied with the outcome after bariatric surgery, regarding how satisfied they are with their weight loss<sup>3–7</sup> and improvement in physical health.<sup>3,8,9</sup> The relative impact of a broader set of pre-surgery factors on long-term satisfaction with outcomes is less well explored. Furthermore, although follow-up

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care is viewed as essential for a successful outcome of bariatric surgery,<sup>10</sup> few studies have explored patient satisfaction with long-term follow-up.

The high degree of outcome satisfaction reported after bariatric surgery seems to be independent of when satisfaction is assessed<sup>6</sup> and how satisfaction is measured (e.g., satisfaction with having had bariatric surgery, if they would have surgery again, or if they would recommend surgery to someone else).<sup>4</sup> However, studies have indicated a minor but significant decrease in satisfaction over time.<sup>11,12</sup>

Most studies exploring group differences between satisfied and dissatisfied patients after bariatric surgery have found weight loss,<sup>13,14</sup> higher body mass index (BMI),<sup>3</sup> and weight regain after surgery to be related to dissatisfaction.<sup>6,15</sup> Though a study by Hotter et al.<sup>16</sup> did not find any difference in weight and weight changes between the two groups.

The main outcome for many patients is improvement in weight-related comorbidities and pain.<sup>8</sup> Still, some patients underestimate the importance of long-term side effects that may accompany bariatric surgery.<sup>17</sup> Patients who are dissatisfied may have more complications related to the treatment, and may experience more postoperative pain and other negative somatic symptoms than patients who are satisfied.<sup>5,16</sup> Reduced health-related quality of life (both physical and mental) and more obesity-related problems in the dissatisfied group have been reported 5,<sup>3</sup> 10,<sup>18</sup> and 12 years after surgery.<sup>19</sup> Some studies support the notion that unattainable or unrealistic expectations, such as the expected degree of weight loss and comorbidity improvement, may lead to lower satisfaction.<sup>13</sup> For example, a “disappointing” weight loss experienced by patients has often been viewed as a successful outcome by healthcare professionals,<sup>13,20,21</sup> and a study by Shai et al.<sup>22</sup> found that satisfaction was higher when the weight outcome was closer to the patients' ideal body weight.

Several studies report a reduction in the prevalence of depressive, and to some degree anxiety symptoms among many patients in the first few years after bariatric surgery.<sup>23,24</sup> This change, together with an improvement in body image, seems to correspond with changes in body weight. In the long-term, a relapse in psychological concerns, such as depressive symptoms and body image problems, has been documented, often in association with suboptimal weight loss.<sup>23,24</sup> For example, depressive symptoms have been associated with less outcome satisfaction at 2 years<sup>12</sup> and 4 years after surgery,<sup>6</sup> and body dissatisfaction has generally been related to lower satisfaction when assessed at the same time.<sup>6,13</sup> As post-surgical psychological factors are often interrelated with both weight loss and negative somatic symptoms,<sup>25,26</sup> it can be challenging to dissect the specific impact of mental health and body image on the degree of satisfaction with the outcome.

In addition to an association between excess body weight and poorer health-related quality of life, findings from review studies indicate that bariatric surgery candidates have increased psychiatric symptoms and diagnoses.<sup>23,24</sup> Patients' mental health and body image before surgery may thus influence satisfaction through expectations and worries that affect the experience and interpretation of

postsurgical outcomes.<sup>27,28</sup> For example, concerns about the procedure and possible side effects may increase the patient's awareness and duration of symptoms.<sup>27</sup> In one study, more baseline depressive and anxiety symptoms predicted less satisfaction with surgery after 1 year,<sup>13</sup> while another study showed that more pre-surgery depressive symptoms predicted less satisfaction both at one and 2 years after surgery.<sup>12</sup> To our knowledge, there are no prospective studies on whether baseline body image predicts satisfaction with surgery.

Patient-experience feedback related to post-surgical follow-up consultations is important, among other things, to ensure the best possible attendance at consultations. Attrition rates of follow-up, and dissatisfaction with the outcome (e.g., the degree of weight loss) or with the perceived quality of the consultation itself may all be indicators of patient dissatisfaction with the follow-up care provided by the healthcare system.<sup>29,30</sup>

The main aim of this study was to describe patient satisfaction with outcome and with the hospital treatment one- and 5-years after bariatric surgery. A secondary aim was to examine whether factors not previously prospectively assessed over the long-term, such as pre-surgery mental health, body image, and worries about surgery, predicted satisfaction with follow-up care and outcome 5 years after bariatric surgery. Finally, the hypotheses were that suboptimal weight outcome, somatic symptom discomfort, and less improvement in comorbidity will predict less satisfaction with follow-up care and outcome 5 years after bariatric surgery.

## 2 | MATERIAL AND METHODS

### 2.1 | Participants

The Oslo Bariatric Surgery Study is an ongoing prospective cohort study of individuals who have undergone bariatric surgery, and is a collaboration between the Department of Psychology, University of Oslo and the Center for Morbid Obesity in Oslo University Hospital. The participants were recruited by surgeons at the center between February 2011 and September 2013. The questionnaires were administered by the Department of Psychology. They were answered at home before the surgery, and 1, 3, and 5 years after the surgery. During the recruitment period, 728 patients underwent surgery; of these, 222 were excluded for being enrolled in other studies. Of the remaining 506 patients, 332 agreed to participate in the study, and 302 participants completed the pre-surgery questionnaire. Of the 332 participants, 16 were later excluded because they withdrew their consent or did not undergo surgery. A total of 258 of the 316 (82%) participants returned the questionnaire 1-year post-surgery, 200 (of 307; 65%) 3 years post-surgery, and 224 (of 302; 74%) 5 years post-surgery. The study sample consisted of patients with complete data from both pre-surgery and 5 years after surgery ( $N = 210$ ). Most of the participants (196) had a Roux-en-Y gastric bypass and 14 had gastric sleeve. The participants completed a mandatory 38-h course at the hospital in preparation for surgery.

Attrition from the study was analyzed using a multiple logistic regression analysis. The study variables at baseline were included as predictors of non-participation 5 years later. Participants who were single (odds ratio [OR] = 1.92; 95% confidence interval [CI] = 1.01–3.67,  $p = 0.049$ ) and not employed (OR = 2.33; 95% CI = 1.21–4.50,  $p = 0.012$ ) at baseline were more likely to have dropped out of the study.

## 2.2 | Measures

The participants' weight was measured at the hospital on the day of surgery and at all follow-up consultations, and BMI and %Total Weight Loss (TWL) were calculated. The %weight regain was based on the lowest weight measured after surgery (nadir), where weight regain was calculated as the percentage of the maximum weight lost:  $(100 * [\text{post-nadir weight} - \text{nadir weight}] / [\text{pre-surgery weight} - \text{nadir weight}])$ .<sup>31</sup>

Change in comorbidities was categorized from the medical record entries as present (1) or absent (0) for *type II diabetes*, *sleep apnea*, *dyslipidemia*, *pain—muscles/back/joints*, and *abdominal pain*, and then summarized. The difference between the sum at baseline and 5 years after surgery was calculated, where a positive score indicated a reduction.

Attendance at the Center for Morbid Obesity for routine follow-up consultations was registered in the medical records at 8 weeks, 6 months, 1, 2, 3-, and 5-years post-surgery.

Satisfaction 1 year after bariatric surgery was assessed with the following questions: "Are you satisfied with the result of the surgery?" and "Were you satisfied with the treatment you received at the hospital?" Both questions elicited response options ranging from "very dissatisfied"<sup>1</sup> to "very satisfied".<sup>5</sup> Satisfaction with follow-up 5 years after surgery was measured with: "What do you think about the follow-up/help you received at the hospital after the surgery?" The response categories ranged from "very dissatisfied"<sup>1</sup> to "very satisfied".<sup>5</sup> Meeting of expectations 5 years after surgery was measured with the question: "To what extent were your expectations for the obesity surgery met?" The response categories ranged from "not at all"<sup>1</sup> to "completely",<sup>5</sup> and were re-categorized as *expectations not met* versus *expectations met*. A new variable, Change in satisfaction, was constructed based on the group that reported being *satisfied* or *very satisfied* with the result 1 year after surgery. This group was further divided into two groups depending on their response 5 years after surgery: *No change* (0) (Satisfied at 1 year + Expectations met at 5 years) versus *Change* (1) (Satisfied at 1 year + Expectations not met at 5 years).

Preoperative desire for weight loss was measured with the statement: "Your dream weight (A weight you would choose if you could weigh whatever you wanted)",<sup>14</sup> where %Dream weight loss was calculated using the formula  $(100 * [\text{pre-surgery weight} - \text{dream weight}] / \text{pre-surgery weight})$ .

Symptom discomfort was measured with the patients' perceptions ("How much are you bothered by...") of nine different somatic

symptoms: *dumping*, *stomach pain*, *muscle/back/joint pain*, *headache*, *fatigue*, *dizziness*, *vomiting*, *diarrhea*, and *constipation*. These were measured 5 years after surgery, with response categories ranging from "nothing"<sup>1</sup> to "very much".<sup>6</sup>

Anxiety and depressive symptoms before surgery were measured using the Hospital Anxiety and Depression Scale.<sup>32</sup> This scale comprises 2 subscales which measure symptoms of anxiety and depression, each with 7 items scored 0–3 (sum scores range from 0 to 21, with a higher sum score reflecting higher levels of anxiety and depressive symptoms).

Body satisfaction before surgery was assessed using the Body Areas Satisfaction Scale,<sup>33</sup> which consists of nine items. A high mean score indicated satisfaction with body and weight.

Preoperative worry for bariatric surgery was based on two questions: "To what extent are you worried that the outcome of the surgery will not be successful?" and "To what extent are you worried that complications will arise in connection with the surgery?" A higher mean score represented more worry.

## 2.3 | Ethics

The study was approved by the Regional Research Ethics Committee (2009/1248a) and the local data protection officer at the Oslo University Hospital (19-2010 OUS-A). All participants received written and oral information about the study before they submitted a signed consent form to the Department of Psychology at the University of Oslo.

## 2.4 | Statistical analyses

Descriptive statistics were used to describe the sample and the distribution of the study variables. A simple regression analysis was performed to analyze the contributions of each independent variable separately. All statistically significant variables ( $p < 0.05$ ) from the simple regression analysis were then entered into a multiple regression analysis to assess the unique contribution on satisfaction with follow-up care (multiple linear regression) and change in satisfaction as a dichotomous dependent variable (multiple logistic regression). The effect size was measured as confidence intervals (95% CI) for the regression analysis.

## 3 | RESULTS

Of the study sample ( $N = 210$ ), 78.2% were women. Before surgery, the participants' mean age was 44.4 years ( $SD = 9.3$ ), 68.4% were married/had a partner, 31.6% were single, 31.4% had a higher (>12 years) and 68.6% had a lower ( $\leq 12$  years) education level. Most participants (74.3%) were employed, 18.3% were unemployed/on disability welfare, and 7.4% were students/in the military/stay-at-home parents.

BMI varied between 34.0 and 64.3 kg/m<sup>2</sup> before surgery, %TWL after 5 years was 24%, and weight regain was 25% (Table 1). Of the participants, 52% (84 out of 160) had gained at least 20% of the lowest postoperative weight by 5 years after surgery. Before surgery, 106 (out of 200; 54%) participants dreamed of reaching a normal weight (BMI < 25); however, only 11 (7%) had achieved this after 5 years. The majority, 129 (61%) participants, had attended all 6 routine follow-up consultations, while 44 (21%) had attended 5 consultations, and 37 (17%) had attended a maximum of 4 follow-up consultations.

Of the participants, 92% were slightly to very satisfied with the results 1 year after surgery, and 93% were slightly to very satisfied with the treatment they had received at the hospital (Table 2). Five years after surgery, 145 participants (69%) reported that the surgery had largely or completely met their expectations, and 127 (62%) were satisfied with the follow-up care they had received from the hospital after the surgery. There were no sociodemographic differences in degree of expectations met or satisfaction with follow-up 5 years after surgery.

The study variables in the simple linear regression analysis of satisfaction with follow-up as the outcome variable are shown in Table 3. Participants who were more *dissatisfied* reported more pre-surgery anxiety symptoms and more worry about surgery outcomes and complications, had attended fewer check-ups, reported more discomfort from somatic symptoms, and had lower %TWL, and higher BMI 5-years after surgery. In the multiple regression model, only less worry pre-surgery and less discomfort from somatic symptoms

5 years after surgery remained significant predictors of satisfaction with follow-up (Table 3).

### 3.1 | Changes in satisfaction

From among the 184 participants who were *satisfied* at 1 year, 116 (64%) responded that their *expectations had been met* 5 years after bariatric surgery, while 64 (36%) changed their view from being *satisfied* to their *expectations not being met*. Of the 14 participants who were initially *dissatisfied* with the result 1 year after surgery, 6 participants (43%) stated at 5 years that *their expectations from the surgery were met*.

All weight variables predicted a change in satisfaction when they were entered as single predictors (Table 4). Participants who had changed their response to indicate that their *expectations had not been met* 5 years after surgery were more likely to have a higher baseline and 5-year post-surgery BMI, lower %TWL, and higher % weight regain. The multiple regression analysis showed that participants who reported that the expectations for bariatric surgery *had not been met* 5 years after surgery were more dissatisfied with their body before surgery, had regained more weight after maximal weight loss, and reported more discomfort from somatic symptoms than those who were satisfied with the outcome throughout the post-operative period (Table 4).

**TABLE 1** Distribution of psychological characteristics and weight-related parameters before and 5 years after bariatric surgery

	Score	N	Mean	SD	Min-Max
Before surgery					
Anxiety symptoms	0–21	207	6.98	4.36	0–20
Depressive symptoms	0–21	207	5.44	3.67	0–9
Body satisfaction	1–5	210	2.46	0.56	1.1–4.1
Worry	1–5	208	2.53	1.00	1–5
BMI	-	210	44.5	5.74	34.0–64.3
%Dream weight loss	-	202	40.3	8.12	19.4–60.4
5 years after surgery					
Follow-up attendance	1–6	210	5.34	1.03	1–6
Symptoms - discomfort	0–6	199	1.47	0.87	0–4.5
Change in comorbidity	-	199	0.71	1.00	–1.0 to 3.0
BMI	-	163	36.7	6.04	20.5–52.4
%TWL	-	159	23.2	10.5	–2.3 to 52.0
%Weight regain	-	160	26.0	23.4	0–117.3

Abbreviations: BMI, Body Mass Index; SD, Standard deviation; %TWL, % Total Weight Loss; %Weight regain, % Weight regain after maximum weight loss.

## 4 | DISCUSSION

This study showed that 90% of the participants were satisfied with both the results of the surgery and treatment at the hospital 1 year after surgery. Five years after surgery, 69% of the participants reported that their expectations from bariatric surgery had been met, and 62% were satisfied with the follow-up from the hospital. A decrease in satisfaction has also been reported in other prospective studies,<sup>11,12</sup> and may be explained by the fact that weight outcome and physical health vary more over time than what many patients are aware of and prepared for. The proportion of participants who were satisfied 5 years after bariatric surgery was lower in this study than the 70%–90% reported in previous studies. Whether expectations for surgery have been met plays a central role in the degree of outcome satisfaction; however, the concepts are not identical.<sup>34</sup> Therefore, the findings of this study cannot be compared directly with those of studies that have analyzed general satisfaction with the result. Like Hegland et al.<sup>3</sup> there were no sociodemographic variations, but that BMI and weight change 5 years after surgery were central for degree of satisfaction.

Of particular interest was the finding that being worried about the outcome and possible side effects before surgery, in addition to perceived discomfort from somatic symptoms after surgery, predicted dissatisfaction with the follow-up care from the hospital, while weight loss was not a significant predictor in the multiple regression model. Satisfaction, in this context, is a measure of the participants'

**TABLE 2** Satisfaction with the result of obesity surgery and hospital treatment 1 year after surgery, and satisfaction with follow-up from the hospital and fulfilled expectations to surgery outcome 5 years after obesity surgery (N = 210)

Satisfaction with the result 1 year after surgery			Fulfilled expectations 5 years after surgery		
	n	%		n	%
Very satisfied	115	57.8	Completely	58	27.8
Satisfied/Slightly satisfied	69	34.7	To a large extent	87	41.6
Neither nor	1	0.5	Neither nor	53	25.4
Slightly dissatisfied/Dissatisfied	12	6.0	To some extent	5	2.4
Very dissatisfied	2	1.0	Not at all	6	2.8
Satisfaction with treatment at the hospital 1 year after surgery			Satisfaction with hospital follow-up 5 years after surgery		
	n	%		n	%
Very satisfied	127	64.1	Very satisfied	66	32.0
Satisfied/Slightly satisfied	57	28.8	Slightly satisfied	61	29.6
Neither nor	2	1.0	Neither nor	42	20.4
Slightly dissatisfied/Dissatisfied	12	5.8	Slightly dissatisfied	28	13.6
Very dissatisfied	0	0	Very dissatisfied	9	4.4

**TABLE 3** Satisfaction with hospital follow-up 5 years after bariatric surgery as criterion

	Simple regression				Multiple regression		
	Satisfaction with follow-up				Satisfaction with follow-up (n = 139) R <sup>2</sup> = 0.17		
	n	β	p	95% CI	β	p	95% CI
<b>Before surgery</b>							
Anxiety symptoms	201	-0.15	0.03	-0.08, -0.00	0.03	0.76	-0.04, 0.06
Depressive symptoms	201	-0.12	0.08	-0.09, -0.00	-	-	-
Body satisfaction	204	0.04	0.54	-0.20, 0.38	-	-	-
Worry	203	-0.22	0.002	-0.41, -0.09	-0.18	0.03	-0.39, -0.02
%Dream weight loss	197	-0.04	0.55	-0.26, 0.14	-	-	-
<b>5 years after surgery</b>							
Follow-up attendance	204	0.26	<0.001	0.14, 0.45	0.05	0.50	-0.21, 0.42
Change comorbidity	155	0.08	0.32	-0.09, 0.26	-	-	-
Symptom discomfort	195	-0.33	<0.001	-0.62, -0.27	-0.34	<0.001	-0.69, -0.21
%TWL <sup>a</sup>	153	0.18	0.03	0.00, 0.04	0.09	0.26	-0.01, 0.03
%Weight regain <sup>a</sup>	154	-0.16	0.053	-0.02, 0.00			
BMI 5 years <sup>a</sup>	157	-0.21	0.01	-0.06, -0.01			
BMI pre-surgery <sup>a</sup>	204	-0.06	0.41	-0.04, 0.02			

Note: Simple and multiple linear regression analysis.

Abbreviations: BMI, Body Mass Index; 95% CI, 95% Confidence interval; β, standardized beta coefficient; p, p-value; R<sup>2</sup>, R-squared: explained variance; %TWL, % Total Weight Loss; %Weight regain, % Weight regain after maximum weight lost.

<sup>a</sup>In order to avoid multicollinearity, only one of the weight variables (%Weight regain) was included in the multiple linear regression analysis.

assessment of the actual help they received after surgery compared to the follow-up care they believed they deserved. The fact that one-third of the participants were dissatisfied with the follow-up care

may partly be explained by the discrepancy between how patients and healthcare professionals assess the need for, and type of help regarding expectations and distress from somatic symptoms, or by

TABLE 4 Simple and multiple logistic regression analysis

	Simple regression No change (0) versus Change (1) in satisfaction				Multiple regression No change (0) versus Change (1) in satisfaction (n = 131)		
	n	OR	p	95% CI	OR	p	95% CI
Before surgery							
Anxiety symptoms	181	1.08	0.06	0.99, 1.16	-	-	-
Depressive symptoms	180	1.05	0.29	0.96, 1.14	-	-	-
Body satisfaction	183	0.35	0.002	0.18, 0.68	0.25	0.010	0.09, 0.72
Worry	181	1.50	0.013	1.09, 2.06	1.05	0.84	0.66, 1.67
%Dream weight loss	175	1.05	0.03	1.01, 1.09	1.04	0.13	0.99, 1.10
5 years after surgery							
Follow-up attendance	183	1.18	0.37	0.82, 1.73	-	-	-
Change comorbidity	141	0.70	0.07	0.48, 1.03	-	-	-
Symptom discomfort	174	2.04	0.001	1.34, 3.12	2.24	0.006	1.26, 3.98
%Weight regain <sup>a</sup>	141	1.03	<0.001	1.01, 1.05	1.04	<0.001	1.02, 1.06
%TWL <sup>a</sup>	140	0.90	<0.001	0.86, 0.94			
BMI 5 years <sup>a</sup>	144	1.19	<0.001	1.10, 1.28			
BMI pre <sup>a</sup>	183	1.06	0.038	1.01, 1.12			

Note: Change in satisfaction with bariatric surgery outcome: satisfied at 1 year + having expectations met at 5 years (0) versus satisfied at 1 year + having expectations *not* met at 5 years (1).

Abbreviations: BMI, Body Mass Index; 95% CI, 95% Confidence interval; OR, odds ratio; p, p-value; % TWL, % Total Weight Loss; %Weight regain, % Weight regain after maximum weight lost.

<sup>a</sup>In order to avoid multicollinearity, only one of the weight variables (%Weight regain) was included in the multiple logistic regression analysis.

the responsibility for follow-up care not being adequately defined between the hospital and general practitioners. A relatively large proportion of bariatric surgery patients experience abdominal discomfort and symptoms 5 years after gastric bypass, which should be given greater importance in follow-up care.<sup>35</sup>

As hypothesized, suboptimal weight change was a central predictor of outcome satisfaction. In addition, discomfort from somatic symptoms emerged as equally important for those who were satisfied with the result at 1 year, but later reported that the outcome had failed to meet their expectations at 5 years. The fact that neither the preoperative expectations of greater weight loss nor concern regarding the side effects significantly predicted the degree of fulfilled expectations in the final model is in accordance with Mannion et al.,<sup>36</sup> who suggested that it is the final physical function, rather than preoperative expectations, that is primary to postoperative outcome satisfaction. Many patients have high expectations for weight loss and improved physical health.<sup>8,9</sup> If, for example, pain and fatigue persist regardless of weight development, it can be experienced as unexpected, and thus, especially disappointing.

That pre-surgery body dissatisfaction predicted failure to meet expectations 5 years after surgery, irrespective of weight outcome and symptom distress, is a novel finding. Although a review study found a general improvement in body image after bariatric surgery, it

also noted that findings on a specific association between body satisfaction and weight loss were still mixed.<sup>37</sup> Body dissatisfaction related to other aspects, such as excess skin, eating problems, or low self-esteem, may remain after surgery,<sup>23</sup> thereby influencing outcome evaluation. Unrealistic expectations of weight loss before bariatric surgery are common, and it is conceivable that unrealistic expectations regarding the degree to which surgery may change the appearance and body shape beyond weight loss also exist.

More realistic goals for long-term weight results and symptom burden could lead to more people achieving their expectations, and thus, becoming more satisfied with the results of bariatric surgery. All participants in this study were informed about the possibility of weight regain, expected results, and late symptoms through the mandatory course before surgery. The findings underscore that expected results should be elaborated upon, and that information is not necessarily thoroughly processed during the phase when motivation to undergo surgery is the highest. Only 62% of the patients were satisfied with the follow-up care from the hospital. Hence, contact points with general health services may be strengthened, and the structure of follow-up care may be adjusted. The fact that the patients who were dissatisfied with the follow-up attended fewer consultations indicates that the content of and expectations from follow-up should also be clarified.



Both treatment and follow-up was at the same center, which decreased variations in relation to procedures or settings between participants. The prospective design and long follow-up time with several study measurement points made it possible to analyze both preoperative predictors and changes in satisfaction, which is rare in the research literature. Study participation rate (74%) was relatively high at 5 years.

Potential study limitations include response biases due to the relationship with the health personnel at the center, even though the participants were reminded that the study was organized from outside the hospital and that their responses would be anonymized. However, administering the questionnaires from the Department of Psychology, rather than from the bariatric surgery program, may have decreased the response rate. Another limitation is that ethnicity was not registered as part of the study. Though at the time of study participant recruitment from the center, 18% of the population in Oslo was from non-European countries of origin<sup>38</sup> and patients with different ethnicities were referred to the center.

The question format and response categories on outcome satisfaction were not completely identical at 1 year and 5 years post-surgery, which may have hampered the comparison over time. The dichotomous categorization of comorbidities may have resulted in the variation being too small to detect any significant changes over time.

## 4.1 | Conclusion

Most participants were satisfied with the outcome and hospital treatment 1 year after bariatric surgery. At 5 years, one-fifth of those initially satisfied reported that bariatric surgery had failed to meet their expectations. The change in outcome satisfaction was associated with pre-surgery body dissatisfaction, poorer weight loss, and greater perceived somatic symptom burden. Conveying realistic expectations for treatment outcome both before and after bariatric surgery is important.

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## AUTHOR CONTRIBUTIONS

Ingela Lundin Kvale, Jon A. Kristinsson, Inger Eribe, and Tom Mala conceived the study design and collected the data, Ingela Lundin Kvale and Louise Gabrielsen did the literature research, analyzed, and interpreted the data. All authors were involved in writing the paper and had final approval of the submitted and published versions.

## CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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