The long-term psychological impact of disclosing (or not) laparoscopic adjustable gastric banding surgery

Abstract

Objective: Individuals opting for bariatric surgery to assist with weight loss face stigma from a variety of sources. This stigma influences individuals decisions for disclosing (or not) their surgical intentions. To date, the psychological impact on disclosure or non-disclosure has not been explored.

Method: As part of a longitudinal study exploring the impact of laparoscopic adjustable gastric banding [LAGB], 31 participants (aged between 32 and 60 years) completed three validated psychometric scales (Hospital Anxiety and Depression Scale, Derriford Appearance Scale, and World Health Organisation Quality of Life scale) seven times over a five year period.

Results: Significant positive differences were found on all the psychometric measures across time compared to the preoperative scores, however, no differences between disclosure groups were present. Relationships between psychometric measures and weight were only found in the disclosure group.

Conclusion: LAGB surgery is likely to have a positive impact on psychological health, and the decision to disclose (or not) surgery is an individual's choice which does not seem to affect mental health outcomes.

Introduction

Overweight individuals are those classified as having a Body Mass Index [BMI] between 25 and 30 kg/m^2, when BMI is ≥ 30 individuals are then classed as obese, if BMI goes above 40 individuals are then classified as morbidly obese.[1] An individual who is overweight or obese faces social stigma,[2] poor long-term health,[3] and challenges undertaking activities of daily living.[4] Overweight individuals are often able to use behavioural modification such as changing diet and/or physical activity levels to reduce BMI into a healthy range (18.5 to 25 kg/m^2),[5] but for individuals who are obese, medical intervention such as bariatric surgery may be required to assist with weight loss. [1,6]

Individuals who have bariatric surgery may experience stigma from social networks and/or health care professional for opting for this type of medical intervention.[7-9] Due to the stigma associated with bariatric surgery, some individuals opt not to disclose they are having this procedure. [10-14] Potentially, this non-disclosure could have a negative impact on psychological outcomes following surgery; not telling others limits opportunities for support, e.g. discussing challenges and successes, which is known to be of benefit during behaviour change.[15,16]

There has been a steady increase in recognition of the importance of considering psychological health outcomes alongside biometric outcomes,[17-22] demonstrating acknowledgement of the psychological challenges encountered by obese individuals.[7,23] Psychological health typically improves following bariatric surgery,[24] but can also deteriorate.[25] Improvements in psychological health have been linked to enhanced physical health and the ability to be more active,[26] decreased depression,[24] and increased confidence in social interactions.[17] Whereas deterioration may be due to difficulties with social interactions involving eating out due to changed diet following surgery, [17] decreased body confidence due

to loose skin from weight loss,[27] or increased depression in those who experience weight regain following an initial weight loss.[25]

The choice to disclose (or not) having bariatric surgery has the potential to impact on psychological outcomes with both decisions associated with psychological stress. Individuals who are obese may be ashamed of their inability to maintain a healthy weight.[28] Shame and guilt are the emotions individuals are least likely to disclose,[29] and are therefore possibly associated with the non-disclosure of the decision to undergo weight loss surgery. Similarly, talking about intentions to undergo bariatric surgery may have resulted in past negative reactions from others,[13] therefore non-disclosure may be seen as a way to protect oneself from potential negativity. [10,30] Disclosure may result in others monitoring behaviour, which may be both helpful through encouragement of behaviour, and unhelpful through judgement of behaviour.[31] Furthermore, disclosure allows an individual to talk about the emotions they are experiencing on their weight loss journey, which although may gain respect from others,[32] might also cause stress for an individual, as reflecting on experiences, including failures and weaknesses, can lead to embarrassment and/or anxiety about rejection. [30,33]

It is currently unknown whether there is a difference in psychological outcomes following surgery in individuals who chose to disclose (or not) their surgery. Previous research in sample of adults in the United Kingdom [UK] showed that non-disclosure did not negatively impact on weight loss following laparoscopic adjustable gastric banding [LAGB].[10] Both disclosers and non-disclosers in the previous study lost a significant amount of weight over a five year period, regardless of their decision to disclose (or not).[10] The aim of the current study was to explore whether non-disclosure negatively impacted on psychological outcomes following LAGB surgery.

Materials and methods

Participants and procedures

Participant eligibility, study timelines and setting has been described in detail elsewhere.[10,34,35] Briefly, participants needed to meet the NICE eligibility criteria for LAGB surgery,[6] and for this study were required to either have type II diabetes or, in the absence of diabetes, have other comorbidities due to obesity (e.g., high blood pressure). From the sample of 35 individuals who spoke about reasons for disclosure (or not) of their LAGB surgery, 31 were included in this sub-study (n = 23 disclosers; n = 8 non-disclosers). Reasons for exclusion were as follows; did not complete the questionnaires (n = 2), only completed a pre-surgery questionnaire (n = 1), and had type I diabetes (n = 1). The 31 participants were aged between 32 and 60 years old (mean ± standard deviation [SD]; 45.9 ± 7.2); one participant stated their ethnicity as Indian, the others identified themselves as White. This longitudinal mixed methods study collected data at seven time points: pre-operatively, six months post-operatively, then annually until five years post-LAGB. Prior to data collection commencing ethical approval for this study was given by National Health COREC (REC Ref: 06/Q2002/38). Written informed consent was gathered for all study participants. Typically, each data collection point coincided with the participant's routine visit with the weight loss service [WLS], and they completed the study measures as part of this visit. If a participant did not attend, questionnaires were posted with a pre-paid envelope to return these to the WLS.

Measures

Hospital Anxiety and Depression Scale [HADS]. This questionnaire comprises two subscales that measure general anxiety (seven items) and depression (seven items).[36] Respondents are asked to respond to questions based on how they have been feeling in the past week rated on a 4-point Likert scale ranging from 0 to 3. Response anchors vary between questions (e.g., "I can sit at ease and feel relaxed" anchored definitely to not at all; and "I get sudden feelings of panic" anchored not at all to very much indeed). Higher scores on the HADS indicate greater distress. The questionnaire authors suggest that scores are grouped to act as signifiers of

distress. In its current form, the HADS is now divided into four ranges: normal (0-7), mild (8-10), moderate (11-15), and severe (16-21).

Derriford Appearance Scale [DAS-24]. This scale assesses emotional and behavioural difficulties experienced by individuals with problems of appearance and consists of 24 items.[37] Response options to the questionnaire items are on a 4-point Likert scale ranging from 1 to 4. Response anchors vary between questions (e.g., "I avoid communal changing rooms" anchored almost always to never/almost never; and "How rejected do you feel?" anchored not at all to extremely), with 11 items having a 'not applicable' [N/A] option scored as 0. Higher scores on the scale indicate more problems associated with social avoidance as a result of appearance concerns. There are no suggested clinical cut-offs for this questionnaire.

World Health Organization Quality of Life Brief [WHOQoL-BREF]. This scale assesses quality of life within four domains (physical, psychological, social relationships, and environment).[38,39] In addition, there are two items assessing overall quality of life and general health. In total the scale has 28 items. Response options are on a 5-point Likert scale ranging from 1 to 5. Response anchors vary between domains (e.g., "Do you have enough energy for everyday life" anchored almost not at all to completely; and "How satisfied are you with yourself?" anchored very dissatisfied to very satisfied). Higher scores in each domain and on the two separate items indicate better quality of life. The WHO recommends WHO-BREF scores are transformed to WHO-100 scores in order to make normative comparisons.[38]

Statistical analysis

Participants were assigned to one of two groups based on their pre-LAGB decision to disclose their surgery or not, the categorisation process has been described elsewhere. [10] Scoring guidelines for the WHOQoL-BREF were used to calculate each domain, and convert scores to the WHOQoL-100.[38] Questionnaire author instructions on how to handle missing item responses were followed. Descriptive statistics (mean and standard deviation) were

calculated for each measure at each data collection point. Where it was not possible to calculate score totals for a measure, the last observation carried forward [LOCF] method was applied to the missing data.[40] A series of individual repeated measures ANOVAs were undertaken on each of the measures to explore change over time and between groups (e.g., a 7 (HADS anxiety score at each time point) x 2 (disclosers vs non-disclosers). Effect sizes between the discloser and non-discloser groups were quantified using Hedges' *g*.[41,42] Differences between pre-LAGB and five years post scores within groups were exploring using paired-sample *t*-tests.[43] Pearson correlations between the psychometric measures and weight at each time point for each disclosure group were conducted to explore relationships.[43]

Results

Missing data – Last Observation Carried Forward [LOCF]. Table 1 shows the number of LOCF for each measure at every post-surgery data collection point. As is common with longitudinal studies the number of times LOCF was used grew as time since the study commenced increased.

Table 2 shows the descriptive data from the HADS and DAS-24 scales. These data suggest there was a change in scores over the five year period following LAGB in individuals who chose to disclose and not disclose their surgery, although the disclosers tend to be showing signs of more significant distress.

HADS. Repeated-measures ANOVA for anxiety showed significant changes in scores over time, $F(6, 24) = 4.2$, $p = .005$, but no differences between disclosers and non-disclosers, $F(6, 24) = 1.0$, $p = .42$. Calculation of the effect size of the mean difference between the two groups' anxiety scores showed a medium effect size at baseline ($g = .55$), with non-disclosers scoring 2.3 points less than the disclosers. By five years post-LAGB a small to medium effect size ($g = .43$) was present, with non-disclosers scoring 2.2 points less than the disclosers. Exploring change in anxiety pre-LAGB to five years post within groups, *t*-test results showed

a significant change for the disclosers, $t(22) = 2.3$, $p = .03$, but not the non-disclosure group, $t(7) = 1.5$, $p = .19$. Correlation results are shown in Table 4. No significant relationships were present between weight and anxiety scores at any time point for the non-disclosers group, however, in the disclosers group from two to five years significant positive correlations were present, r = .54, .62, .57 and .60, respectively.

There was a change in depression scores over time, $F(6, 24) = 5.7$, $p = .001$, but, as before, no difference between the groups, $F(6, 24) = 0.5$, $p = .81$. The effect size of the mean difference between the two groups' scores showed a medium effect size at baseline (g =.58), with non-disclosers scoring 2.5 points less than the disclosers. By five years post-LAGB a small effect size (g =.34) was present, with non-disclosers scoring 1.9 points less than the disclosers. Exploring change in depression pre-LAGB to five years post within groups, results showed a significant change for the disclosers, $t(22) = 2.7$, $p = .01$, but not the non-disclosure group, $t(7) = 1.5$, $p = .18$. Table 4 shows no significant relationships were present between weight and depression scores at any time point for the non-disclosers group, however, in the disclosers group from one to five years significant positive correlations were present, r = .58, .62, .69, .66 and .64, respectively.

DAS-24. Repeated-measures ANOVA showed a significant change in scores over time, $F(6, 24) = 5.1$, $p = .002$, but no difference was observed between disclosers and non-disclosers, $F(6, 24) = 1.2$, $p = .33$. So both groups were experiencing less social anxiety and using less avoidant coping by the end of the five years. Effect size calculations showed a medium effect size at baseline (g =.65), with non-disclosers scoring 10.7 points less than the disclosers. By five years post-LAGB a small effect size (g =.35) was present, with non-disclosers scoring 7.3 points less than the disclosers. Within group analysis (t-test) showed significant changes for the discloser, $t(22) = 4.6$, $p < .001$, but not the non-disclosure group, $t(7) = 2.0$, $p = .08$. Correlation results indicated no significant relationships were present between weight and

DAS-24 scores at any time point for the non-disclosers group, however, in the disclosers group from one to five years significant positive correlations were present, r = .47, .55, .55, .43 and .54, respectively.

WHOQoL. Table 3 shows the descriptive data from the WHOQoL sub-scales. These data suggest that quality of life follows an arc with improvements showing mid-term with a trend for a reduction towards the end of the five year period. Repeated-measures ANOVA for WHOQoL question one (general rating of quality of life) showed there was no change in scores over time, $F(6, 24) = 2.0$, $p = .10$, and no difference was observed between disclosers and non-disclosers, $F(6, 24) = 0.6$, $p = .74$. Effect size calculation showed a medium effect at baseline ($g = .67$), with non-disclosers scoring 0.7 points more than the disclosers. By five years post-LAGB a small effect size ($g = .29$) was present, with non-disclosers scoring 0.3 points more than the disclosers. Within group analysis (t-test) showed a significant change for the disclosers, $t(22) = -3.5$, $p = 0.02$, but not the non-disclosure group, $t(7) = -1.4$, $p = 0.20$. Correlation results indicated no significant relationships were present between weight and question one scores at any time point for the non-disclosers group, however, in the disclosers group pre-LAGB, then two to five years significant negative correlations were present, r = -.43, -.73, -.63, -.68 and -.60, respectively, with a positive correlation found at year one, r = .64.

For WHOQoL question two (rating of satisfaction with health), results showed a significant change in scores over time, $F(6, 24) = 8.7$, $p < .001$, but no group differences, $F(6, 24) = 0.4$, $p = .85$. There was a small effect size at baseline ($g = .32$), with non-disclosers scoring 0.3 points more than the disclosers. By five years post-LAGB no effect size ($g = .08$) was present, as the two groups differed by only 0.1 point. Within group analysis showed significant changes for both the discloser and non-disclosure groups, $t(22) = -5.9$, $p < .001$ and $t(7) = -2.6$, $p = .03$ respectively. Correlation results indicated no significant relationships

were present between weight and question two scores at any time point for the non-disclosers group, however, in the disclosers group from two to five years significant negative correlations were present, r = -.59, -.54, -.66, and -.57, respectively, with a positive correlation found at year one, r = .64.

For the psychological domain there was a significant change over time, $F(6, 24) = 3.2$, $p = .02$, but no difference was observed between disclosers and non-disclosers, $F(6, 24) = 0.7$, $p = .64$. There was a small to medium effect size at baseline (g =.41), with non-disclosers scoring 8.4 points more than the disclosers. By five years post-LAGB a very small effect size (g =.15) was present, with non-disclosers scoring 4.2 points more than the disclosers. Within groups, results showed a significant change for the disclosers, $t(22) = -2.6$, $p = .02$, but not the non-disclosure group, $t(7) = -0.6$, $p = .60$. Correlation results indicated no significant relationships were present between weight and psychological domain scores at any time point for the non-disclosers group, however, in the disclosers group from six months to five years significant negative correlations were present, r = -.45, -.55, -.54, -.62, -.50, and -.52, respectively.

For the physical domain there was a significant change in scores over time, $F(6, 24) = 7.5$, $p < .001$, but no between group differences, $F(6, 24) = 0.8$, $p = .60$. There was a medium effect size at baseline (g =.49), with non-disclosers scoring 10.7 points more than the disclosers. By five years post-LAGB a very small effect size (g =.13) was present, with non-disclosers scoring 4.1 points more than the disclosers. Within group analysis showed a significant change for the disclosers, $t(22) = -4.5$, $p < .001$, but not the non-disclosure group, $t(7) = -1.9$, $p = .10$. Correlation results indicated no significant relationships were present between weight and physical domain scores at any time point for the non-disclosers group, however, in the disclosers group from one to five years significant negative correlations were present, r = -.52, -.58, -.56, -.63, and -.53, respectively.

The social relationships domain showed no change in scores over time, $F(6, 22) = 1.1$, $p = .42$, and no differences between groups, $F(6, 22) = 0.6$, $p = .75$. There was a large effect size at baseline ($g = .87$), with non-disclosers scoring 19.2 points more than the disclosers. By five years post-LAGB a medium effect size ($g = .65$) was present, with non-disclosers scoring 16.5 points more than the disclosers. Exploring change in social scale scores pre-LAGB to five years post within groups showed no significant changes for either the discloser or non-disclosure groups, $t(21) = -1.1$, $p = .31$ and $t(6) = -0.9$, $p = .38$ respectively. Correlation results indicated no significant relationships were present between weight and social domain scores at any time point for the non-disclosers group, however, in the disclosers group from six months to five years significant negative correlations were present, r = -.48, -.52, -.59, -.57, -.42, and -.36, respectively.

The environmental domain showed a significant change in scores over time, $F(6, 24) = 2.6$, $p = .04$, but no difference was observed between disclosers and non-disclosers, $F(6, 24) = 1.0$, $p = .45$. There was a very small effect size at baseline ($g = .17$), with non-disclosers scoring 3.5 points more than the disclosers. By five years post-LAGB a small effect size ($g = .25$) was present, with non-disclosers scoring 5.7 points more than the disclosers. Exploring change in environmental scale scores pre-LAGB to five years post within groups, results showed no significant changes for either the discloser or non-disclosure groups, $t(22) = -1.3$, $p = .19$ and $t(7) = -0.8$, $p = .45$ respectively. Correlation results indicated no significant relationships were present between weight and question one scores at any time point for the non-disclosers group, however, in the disclosers group pre-LAGB, then two to five years significant negative correlations were present, r = -.44, -.55, -.57, -.62 and -.63, respectively.

Discussion

In this sample, data indicates individuals who decide to disclose (or not) having LAGB surgery may differ psychologically at baseline, but these differences do not necessarily

remain at five years post-LAGB surgery. Prior to LAGB surgery non-disclosers appear to have less problems with appearance and social avoidance as measured by the DAS-24, and be less anxious and depressed as measured by the HADS compared to disclosers. By five years post-LAGB surgery the difference between the groups regarding problems with appearance and social avoidance, anxiety and depression between the two groups seemed to have reduced. Quality of life in three domains, psychological, physical and environmental appears to improve long-term, but there is no difference between the decision to disclose (or not).

The finding that prior to surgery non-disclosers appeared less anxious, depressed and had less problems with social avoidance than non-disclosers may indicate that non-disclosure helps with self-preservation prior to change.[44] Individuals who choose to keep their decision largely private may feel they are accountable to only a small select group (e.g., spouse, children and clinical team), and therefore do not risk being judged more widely on choosing bariatric surgery in order to lose weight.[13] But as time since surgery increases, disclosers appear to adjust so they are more psychologically aligned with non-disclosers than they were prior to surgery. However, in terms of problems with social avoidance due to appearance (DAS-24) although findings indicate the disclosure group reported less problems five years post-LAGB than pre-surgery, the presence of a small effect size between disclosers and non-disclosers on the DAS-24 at five years post-LAGB may be suggestive of continuing difficulties with being obese in society. [2,7] This is supported by the significant positive correlations found between weight and DAS-24 score in the disclosers group between one and five years post-LAGB surgery, which indicates as weight increases more problems with social avoidance as a result of appearance concerns are reported. Disclosers may be more aware of being judged about their appearance and food choices by others given that they have told people about their surgery and hence may have experienced others passing remarks. Individuals following bariatric surgery have reported comments from others to the effect that

they thought the individual would have been smaller six months following surgery than they were, but this is also linked at times to an individual's unrealistic expectations of bariatric surgery.[45,46] This type of feedback from others can hinder motivation to change maladaptive behaviours,[47-49] and can be a reason non-disclosure is chosen.[10,12,13]

It is worth exploring how the current samples HADS scores compare to the clinical cut-off points of this scale. The HADS scoring states a scale score < 8 is considered in the normal range, a score of 8–10 indicates a possible case and a score > 10 indicates a probable case of mood disorder.[36] Throughout the five year period of the current study the non-disclosure group were all in the normal range for both anxiety and depression, whereas for the anxiety measure, the disclosers were in the possible mood disorder range prior to LAGB and in the first year, and remained close to the possible range throughout the five year period. The disclosers depression scores pre-LAGB were in the possible mood disorder range, but following surgery these returned to normal over the next five years of monitoring. Despite the HADS scores reducing over the five year period, significant positive correlations remained between weight, anxiety and depression measures between two and five years, and one and five years respectively in the disclosure group. This indicates that as weight increases so do reported anxiety and depression feelings, a finding commonly reported in the wider obesity literature.[50] These findings are consistent with the wider literature on the impact of bariatric surgery which shows many candidates are in the clinically non-healthy range prior to surgery, but have sustained improvement in HADS scores after surgery,[51,52] with change predominantly occurring within the first year of surgery,[53] which is when weight loss tends to be quickest.[54] Even with weight loss over time there appears to be a continuing relationship between higher self-reported levels of anxiety and depression.

Anxiety and depression are common traits in obese individuals, and for those who are undergoing LAGB there is an awareness of potential failure to successfully lose weight

following surgery either through malfunctioning of the LAGB,[55] or one's own inability to change behaviour.[27,56,57] Results from the current study are encouraging, as they indicate levels of anxiety and depression reduce regardless of an individual's decision to disclose (or not) their surgical intentions. In our previous work we noted there was a need to breakdown myths about LAGB being an easy weight loss option, [10] as individuals are required to make lifelong behavioural changes following surgery for successful weight loss.[48,58] Changing attitudes toward LAGB (and bariatric surgery in general) could psychologically benefit individuals as they may feel more supported in their choice and therefore less anxious and depressed.

Results from the WHOQoL indicating improvements in the physical and environmental domain are likely linked to weight loss. As an individual loses weight movement, pain, ability to do activities of daily living and exercise, and interacting with public spaces such as seating typically improve. [4,10,59] The capacity to do more activities for oneself, and be able to choose whether to do these activities or not, is a factor which enhances psychological health.[59,60,61] Self-perceived improvements in quality of life due to LAGB can assist an individual feel less stigmatised by society.[62] Results indicated no difference between disclosers and non-disclosers overall suggesting that improvements are not linked to decision to disclose (or not) surgical intentions. Similar to other studies improvements in quality of life appeared to be sustained compared to baseline scores.[63] However, for the current sample, data suggests there is a peak around two years which is likely linked to peak in weight loss before plateau. [10,54] In addition, the significant negative relationships found between all the WHOQoL domains and weight are indicative of reducing weight being associated with improved quality of life for those who chose to disclose, i.e., individuals who weigh less have higher WHOQoL domain scores.

Comparing scores at five years post-LAGB on the transformed scores that WHO recommend are used to make normative comparisons[38], against the suggested clinical cut-off of 69 (i.e., 15 on the WHO-BREF), where individuals scoring less than this are believed to be experiencing significantly reduced levels of quality of life.,[64] the results indicate the disclosure group continue to experience significantly reduced levels of quality of life in all the WHOQoL domains, whereas for the non-disclosure group reductions in quality of life remain present in two domains (psychological and physical), but are within the normal range for the social and environmental domains. Although encouraging, it is worth noting that the non-disclosure group were already close to the clinical cut-off at baseline for these two domains, nevertheless the social and environmental improvements in quality of life following LAGB surgery for this group is positive.

Study strengths and weaknesses

As far as the authors are aware, this is the first exploration of the long-term psychological impact in individuals who decide to disclose (or not) having LAGB in the UK using validated scales (HADS, DAS-24, and WHOQoL-BREF) used in other studies exploring psychological outcomes following LAGB.

A major limitation of this study was that the sample of non-disclosers comprised only eight individuals, however, the paired sample *t*-test was designed to detect changes in small sample sizes,[65] therefore the changes detected within the non-disclosure group from pre-surgery to five years post are likely to be existent. Similarly, some statisticians argue Pearson correlations are likely to be valid with small samples,[66] where other statisticians advise caution when the sample is less than 10. [67] It is possible we have accepted there were no relationships between weight and psychometric measure for non-disclosers, when in a larger sample these relationships may be present. Other limitations, including the underrepresentation of individuals from Black and Ethnic Minority [BAME] groups, and only

focussing on individuals undergoing LAGB surgery have been discussed previously.[10] In the current sample there were a number of individuals who chose not to complete the question "how satisfied are you with your sex life" within the WHOQoL social relationships domain, meaning less data was available for analysis. However, despite there being a smaller sample for analysis, the descriptive results still show improvement from pre-LAGB to five year post surgery. Finally, the use of the LOCF method has meant that findings reported may be conservative compared to a more complete data set as by five years post-LAGB 25% of the non-disclosures and roughly 48% of the disclosers data had assumed no change by using this method.[40,68]

Conclusion

Whether an individual chooses to disclose (or not) having LAGB surgery does not appear to negatively impact on long-term psychological changes. Individuals presenting for surgery, regardless of their decision to disclose appear to have significant improvements in anxiety, depression, quality of life, and less emotional and behavioural difficulties due to problems with appearance five years after having a LAGB. As we have previously stated the decision to disclose (or not) is a personal choice which clinicians should respect,[10] these and previous data reported indicate disclosure choice is not related to long-term outcomes.

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