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Long-Term Experience of Undergoing Metabolic and Bariatric Surgery as an Adolescent

Malin Örn[1,2] | Kajsa Järvholm[3,4] | Eva Gronowitz[1] | Jovanna Dahlgren[1] | Torsten Olbers[4,5] | Lovisa Sjögren[1,2] | My Engström[6,7]

[1]Department of Pediatrics, Institute of Clinical Sciences, University of Gothenburg, Gothenburg, Sweden | [2]Region Västra Götaland, Pediatric Obesity Center, Sahlgrenska University Hospital, Gothenburg, Sweden | [3]Department of Psychology, Lund University, Lund, Sweden | [4]Childhood Obesity Unit, Skåne University Hospital, Malmö, Sweden | [5]Department of Biomedical and Clinical Sciences, Linköping University, Linköping, Sweden | [6]Region Västra Götaland, Sahlgrenska University Hospital, Department of Surgery Sahlgrenska, Gothenburg, Sweden | [7]Institute of Health and Care Sciences, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden

Correspondence: Malin Örn (malin.orn@gu.se; malin.orn@vgregion.se)

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ABSTRACT

Despite the well-documented effectiveness of metabolic and bariatric surgery (MBS) in treating severe obesity, significant gaps persist in understanding adolescents' lived experiences and perspectives. Addressing these gaps is essential for enhancing patient-centered care and supporting long-term outcomes.

Objective: To explore the long-term patient experiences of adolescents undergoing MBS.

Methods: A qualitative content analysis utilizing individual semi-structured interviews with 18 patients conducted a decade after MBS.

Results: The analysis identified three key categories: Enhanced daily life with the help of MBS, Support and routines, and Reflections on the decision to undergo MBS as an adolescent. Weight loss following MBS was described as pivotal in improving daily life due to enhanced physical, mental and social health. Participants emphasized the need for enhanced access to primary and specialist healthcare with appropriate knowledge of follow-up care. They also underscored the importance of identifying and treating concomitant neuropsychiatric and mental disorders prior to MBS. Additionally, informants highlighted the importance of psychosocial support to maintain the positive changes established post-surgery.

Conclusions: A high level of satisfaction was expressed among those who had undergone MBS as an adolescent. The treatment was considered to help improve daily life and overall well-being and the majority would recommend MBS to others in comparable situations. However, participants highlighted the need for ongoing multidisciplinary support and acknowledged the challenges associated with life after MBS. Notably, a significant proportion of individuals did not attend regular medical follow-ups, emphasizing the importance of structured strategies to ensure adherence to postoperative care.

1 | Introduction

Metabolic and bariatric surgery (MBS) is proven to be the most effective treatment for adolescents with severe obesity and leads to sustained weight loss, improvements in co-morbidities and quality of life [1–3]. Several qualitative studies in recent years have explored the experiences of adults undergoing MBS. A systematic review from 2017 included 33 articles and identified three overarching themes: control, normality and ambivalence [4]. However, knowledge gaps remain [5] as most studies involve small sample sizes and short follow-up periods. Moreover, findings from adult populations cannot be directly transferred to adolescents [6], highlighting the need for more research on pediatric health [7].

There is extensive quantitative research examining long-term outcomes regarding adolescents who have undergone MBS, including studies from large-scale cohorts such as Teen-LABS [8]; however, there is a noticeable lack of qualitative studies exploring the lived experiences. This gap underscores the need for qualitative research to complement existing findings, providing a deeper understanding of the personal and contextual factors that influence long-term outcomes. Such research is essential for humanizing healthcare and ensuring that treatments address the unique experiences and needs of adolescents undergoing MBS.

To the best of our knowledge, only two qualitative studies have explored adolescents' long-term experiences following MBS. These studies emphasize the importance of healthcare systems supporting adolescents in the transition from youth to adulthood with a focus on mental health care, medical surveillance and education. Additionally, the findings also showed that individualized support and education provided by a multidisciplinary team are beneficial in the first year post-surgery [9, 10]. Another quantitative study similarly emphasized the necessity of ongoing mental health follow-up for adolescents after surgery, extending into young adulthood [11].

With the increasing use of MBS in adolescents, there is a need for research capturing the patient perspective to improve care. This qualitative study aims to explore the long-term experiences of patients undergoing MBS for severe obesity during adolescence.

2 | Methods

This study employed a qualitative descriptive design, utilizing individual semi-structured interviews with patients conducted on a single occasion. To ensure methodological rigor, the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist by Tong et al. [12] was applied (see Supporting Information S1 for details).

2.1 | Participants

Nineteen patients from two university hospitals in Sweden who had undergone MBS between 2006 and 2009 within the Adolescent Morbid Obesity Surgery (AMOS) study [2] were invited to participate in interviews during their 10-year follow-up. No additional inclusion or exclusion criteria were applied beyond those used in the original study. Participants were recruited consecutively until data saturation was reached and eighteen participants agreed to take part. The sample consisted of 72% females, with a mean age at surgery of 16 years (range 14–18) and a mean age at interview of 28 years (range 24–31). The average BMI loss was 11.7 kg/m^2 ($\pm$ 8.2 SD).

2.2 | Data Collection

All data were collected between June 2019 and February 2020 by three of the authors (ME, KJ, and EG). The participants were allowed to choose whether they wanted to be interviewed in person at the hospital, in their own home, or by telephone. A semi-structured interview guide was developed, providing a framework to ensure that all participants were given the same set of questions [13]. Two pilot interviews were conducted to ensure that the interview guide addressed the objectives of the study. These interviews were also included in the analysis as they corresponded well to the study objectives, and the changes made to the interview guide were minor. All interviews were recorded and transcribed verbatim by one of the authors (MÖ) and lasted between 22 and 125 min (mean 53 min).

2.3 | Data Analysis

Content analysis was chosen as the method is sensitive to participants' narratives and therefore useful when a relatively unexplored topic is being studied [14]. All interview transcripts were read several times to become familiar with their content. One of the authors (MÖ) carried out the initial steps. Meaning units that captured the participants' experiences of undergoing MBS as adolescents were highlighted and reduced into condensed phrases that were labeled with codes. These codes were then grouped into subcategories before being abstracted and interpreted into overarching categories. Two authors (MÖ and ME) carried out this step of the analysis. An additional triangulation step was performed by another author (KJ) to strengthen the credibility of the results. To further enhance trustworthiness, all authors reflected on the subcategories and categories, which were revised until consensus was reached. Participant quotes are used to illustrate key findings. Each quote is followed by a number in parentheses, representing the unique identifier assigned to each participant to maintain confidentiality while distinguishing individual contributions.

2.4 | Ethical Consideration

All participants were provided with written and verbal information about the study and signed their informed consent. The study was approved by the Regional Ethical Review Board in Gothenburg (No. 2019–00769/1163–18).

3 | Results

The analysis identified three categories: Enhanced daily life with the help of MBS incorporating subcategories of physical perspective and psychosocial perspective, *Support and routines* including subcategories of support from healthcare and family and adherence to new routines and *Reflections on the decision to undergo* MBS *as an adolescent* with subcategories of right time in life and being prepared. These categories illustrate the participants' long-term experiences of undergoing MBS as adolescents.

3.1 | Category 1: Enhanced Daily Life With the Help of MBS

Participants described how severe obesity, before undergoing MBS, profoundly affected their physical and psychosocial well-being, making it difficult to live like their peers. They viewed MBS as a last resort following years of struggle, often beginning in early childhood, marked by repeated but unsuccessful weight loss attempts.

3.2 | Physical Perspective

Most participants expressed that obesity had contributed to physical limitations for many years as well as lack of energy and, for some, pain. Before undergoing MBS, participants had overall poor health and actively avoided physical activities.

> I didn't participate in any sports activities at school. I was always picked last in sports and wasn't really good at sports or any social activity like that.
>
> (0119)

Concern about their health was an incentive for undergoing MBS, with participants reporting that they saw no future without surgery and a substantial weight loss. They reflected on how the body weight would continue to increase if not taking radical action and envisioned how their overeating could contribute to a shortened life span.

> At the time my biggest fear was that I wouldn't live, I would either eat myself to death or kill myself and the operation contributed to the fact that I haven't done any of that.
>
> (0104)

Following MBS, numerous positive physical outcomes of the surgery persisted for a decade. For example, several participants highlighted the fact that they continued to have more energy and were thus more active than before MBS.

> ...I'm so much more energetic than I was, then I barely managed to walk the dog. Now we're out walking 10 km a day in the forest and we're out jogging together and we're out all the time. I think it's fun to be active now, so it's such a difference.
>
> (0140)

Participants also described improved and sustained appetite regulation with less hunger and increased satiety. After surgery, they described that food intake became more regular and healthier and comprised smaller portions and eating habits that were perceived as healthier compared to before MBS. However, some participants experienced that pre-surgical eating habits persisted in the long-term, giving rise to an increase in worries and concerns about their weight.

> Or maybe I imagine it. But now I feel as if I can eat as much as I could before. Which is worrying and tough.
>
> (0119)

Dumping was still experienced by several participants a decade after MBS and was perceived as unpleasant but helpful as it limited food intake. One participant described it as the best signal to stop eating.

Most participants maintained their weight loss over time, while some continued struggling with weight regain by means of various types of diet program. Gaining weight caused fear and stress; hence, the participants emphasized the importance of receiving the right type of support and information from healthcare providers when their weight started to increase. However, such care was not always available.

> I was probably around 20–21 when I started gaining weight and I felt like a big failure because I didn't know why, I didn't know why it was ... so, what I had done wrong and, as I said, I didn't get any support either.
>
> (0107)

3.3 | Psychosocial Perspective

Many adolescents expressed a strong desire to be like everyone else and fit in before undergoing MBS. Being able to buy clothes in the same shops as others was often mentioned as an example. They expressed that emotions, such as depression, anxiety, boredom and restlessness, had contributed to the development of their obesity. About half of the participants reported engaging in emotional eating before MBS to improve their mood and alleviate feelings of anxiety or sadness. For some, emotional eating persisted after surgery, but they were unable to consume the same quantity of food as before.

> ... I think that when I was younger, I also used food as some kind of comfort when I felt bad.
>
> (0133)

Before MBS, obesity treatment was perceived as psychologically demanding and stressful, with many participants acknowledging its lack of lasting effects. They emphasized that treatment should address broader psychosocial and emotional aspects, not just physical health and eating behaviors. Participants highlighted the importance of external support in fostering self-acceptance and stressed the need for psychological treatment both before and after MBS.

> Well, of course you need weighing and measuring and taking blood samples and everything, but you also need someone to talk to who doesn't just look at the numbers but also looks at the brain instead.
>
> (0112)

Several participants reported being regularly exposed to severe bullying due to their obesity while growing up, usually at school. Experiencing bullying led to feelings of loneliness and exclusion from social activities and contributed to social withdrawal. Feelings of shame, guilt and stigma were expressed, often based on societal beliefs that obesity is self-inflicted, and many called for a broader understanding of obesity as a disease.

> ...when I walked along the corridor, people would say that the whole school was shaking because of me, and that's not something you want to hear. And then instead, I always had a headache or a slight temperature or something else made up to avoid going to school.
>
> (0104)

Undergoing MBS had a large impact on participants' psychosocial situation. For example, they described now being seen as a person and not just as a person living with obesity. After MBS, they transitioned into a more typical adolescent life where their emotional well-being improved due to having higher self-esteem and better self-confidence. At the same time, participants stated that MBS did not solve all their problems.

> ...you went into this with the idea that now I'm going to be thin, now I'm going to feel good, now life is going to be easy, everything is going to work out, milk and honey, and then it's not like that...all the problems you've had because of your obesity before being operated on aren't going to go away because you've had surgery.
>
> (0306)

Some participants described increased sensitivity to alcohol after MBS, resulting in drinking less alcohol or not at all, which could limit their social lives. One participant developed alcohol abuse disorder postoperatively and particularly emphasized the importance of being well-informed before surgery about the risks associated with alcohol consumption after MBS.

3.4 | Category 2: Support and Routines

Participants described MBS as a life-long project and underlined the necessity of ensuring that patients understand what it implies, including the need for support and adherence to new routines.

3.5 | Support From Healthcare and Family

Some participants wished for more frequent and individual support after undergoing MBS, while others were satisfied with the care provided. The need for improved support for managing emotional changes and new routines was highlighted by several participants. A more supportive approach to weight regain and chronic or recurrent pain was also mentioned as essential after MBS.

> ... maybe I didn't think I needed it then, but I think I would have needed to talk to someone, especially during the first two years because so much happens at that stage.
>
> (0108)

Participants emphasized the importance of receiving information about the risks associated with MBS and strategies for managing potential complications. While some patients did not experience discomfort or complications after surgery, others reported a range of issues, including constipation, dumping syndrome, fatigue, hair loss, excess skin, gallstones, body dissatisfaction due to weight loss, anxiety, pain, lactose intolerance, and hypoglycemia.

Female participants who had given birth after MBS highlighted the importance of appropriate support during pregnancy, noting variability in healthcare providers' knowledge. While some patients received additional care due to their MBS history, others did not. Support from a midwife knowledgeable about pregnancy after MBS was viewed as highly beneficial. After giving birth, participants reported returning to their pre-pregnancy weight.

About a third of the participants had undergone surgery for the removal of excess skin, primarily abdominoplasty, while others were denied due to insufficient excess skin or inadequate weight loss. Some participants reported that excess skin negatively impacted their self-image.

Additionally, they expressed a desire for primary healthcare providers to receive written information about long-term follow-up care after MBS. Participants noted conflicting recommendations between primary care providers and surgical clinics, particularly concerning blood tests and prescribed supplements. This perceived lack of knowledge led participants to seek primary care services only when necessary.

> ....it was a period when I was so damn tired and then the doctor said, we will take a Hb [Haemoglobin] and iron and I was down to 70-something on Hb and I had no iron deposits so then I received a drip [intravenous infusion]
>
> (0311)

Receiving support from family after MBS was viewed as invaluable in preventing feelings of isolation. Consequently, it was considered important that relatives also receive information and support. In some cases, relatives and parents were more involved in healthcare decisions and needs than the patients themselves.

> ...I think it's very important that you have parents who care and are involved and want to help. Just because it's still a responsibility with the tablets and immediately after you may not be able to eat in the same way and it will be a very big adjustment in the beginning ...
>
> (0133)

3.6 | Adherence to New Routines

Most participants did not attend the recommended annual follow-up visits within the primary care setting. An important reason was that they were expected to book the visits themselves. Another reason was a perceived lack of knowledge on the part of primary care providers about MBS and nutritional supplements.

Despite the importance of having a routine for taking nutritional supplements throughout life to avoid deficiencies, participants found this difficult to achieve. Most participants had not taken prescribed supplements over the years, and only a few did so daily. Some highlighted that their adherence to supplements improved over time, but they still found it challenging to remember to take them, particularly when they were feeling well.

> ... That it's a lifelong decision, you always have to take your tablets because otherwise it can lead to problems because I think I honestly didn't realize how important it is to take them.
>
> (0108)

There were several suggestions about improving care during follow-up after MBS. Some participants expressed a desire to interact with other adolescents to share experiences, while others wanted a more detailed care plan during the postoperative period to facilitate the establishment of new routines. Additional suggestions included follow-ups closer to home, conducting an annual follow-up by phone after the initial period and ensuring the continuity in the care relationship with the specialist team.

3.7 | Category 3: Reflections on the Decision to Undergo MBS as an Adolescent

With the exception of one who had experienced several complications after surgery, all participants were positive about having undergone MBS as adolescents. The vast majority of participants would recommend MBS to others in a similar situation. They described MBS as a tool in the battle against obesity and not as a simple solution. Participants consistently stressed the importance of understanding and being prepared for the challenges involved in undergoing MBS as an adolescent. Before the surgery, they felt they had exhausted all other available obesity treatments.

3.8 | Right Time in Life

When reflecting on the timing of MBS, most participants concluded that adolescence was an appropriate time for the procedure. Some wished they had undergone MBS even earlier, believing it would have further improved their confidence and social situation. Others felt that waiting until they were a bit older, around 18–28 years, might have allowed them to be more mature and better equipped to maximize the benefits of the treatment. Participants also noted the lack of fixed routines and habits during adolescence, highlighting it as both a strength and a weakness.

> I definitely think so, because I'm glad that I had the operation when I was sixteen, [...] because it gave me self-confidence, better self-esteem, I dared to take on more things in life, if it [the obesity] had continued until now at the age of 29, I don't think I would have had a job or anything, I would have stayed at home because I would have wanted to hide all the time.
>
> (0108)

3.9 | Being Prepared

Another perspective that emerged regarding the timing of surgery was the need for mental and neuropsychiatric disorders to be recognized and adequately treated preoperatively. Participants believed that if this had been addressed, MBS could have led to even better outcomes.

> ... and sort of check the mental health both before and after... I think it's incredibly important to solve the mental health issue beforehand, it impacts so many other things...
>
> (0125)

Adolescents also reflected on the importance of being aware that behaviors and problems related to obesity may persist after MBS. They emphasized the need for realistic expectations regarding weight loss, recognizing the essential role of new routines, and understanding that the surgery itself would not "fix everything" in their lives.

4 | Discussion

To our knowledge, this is one of the few long-term follow-up qualitative studies conducted on individuals who had undergone MBS for severe obesity as an adolescent. Over a decade after surgery, participants had a high level of satisfaction with the decision to undergo MBS related to maintaining physical and emotional well-being. The positive effects and experiences after surgery mentioned in the interviews included better self-image, self-esteem, vitality, healthier eating behaviors and better appetite regulation, as well as the ability to become a parent.

Most participants had encountered serious harassment during their childhood, which affected school attendance. Previous studies also report high levels of weight-based bullying in the school setting for children and adolescents with obesity [15]. Weight-related harassment has been demonstrated to have a profound negative impact on adolescent mental health [16], academic achievements and lead to social isolation, highlighting the need to address weight stigma and bias when providing care for adolescents with obesity [17]. Addressing weight stigma in schools to foster a supportive and inclusive school environment is also of great importance. For adolescents with a supportive family, care should focus on strengthening these relationships.

Those who perceive a lack of family support would benefit from family-based interventions to address dysfunction for improved long-term well-being [18]. Psychosocial support for adolescents who have undergone MBS can further be facilitated by support groups [19, 20] to address psychological and social difficulties. For example, patient advocacy groups could organize support groups and develop support materials tailored to adolescents and their families in collaboration with healthcare providers.

Adolescents undergoing MBS represent a vulnerable population with a high prevalence of psychiatric diagnoses and elevated rates of psychiatric medication prescriptions, both prior to and up to 10 years following surgery [21]. In the present study, several participants described experiences of mental disorders such as depression and anxiety before MBS and suggested that these conditions should be identified and treated prior to surgery to improve the transition to life post-surgery. The need to investigate which additional support is required and should be offered in order to manage mental health problems after MBS has also been stressed in previous studies [22, 23]. Zeller et al.'s findings indicate that bariatric surgery does not significantly alter suicide risk among adolescents within the first 4 years post-surgery, regardless of weight change trajectories, thus highlighting the complexity of mental health outcomes in this population. This study underscores the need for proactive psychological interventions both pre- and post-surgery. Our results emphasize the critical importance of integrating comprehensive psychological assessments and targeted support into the care of adolescents undergoing MBS. Addressing underlying neuropsychiatric disorders, such as Autism Spectrum Disorders (ASD) and Attention Deficit Hyperactivity Disorder (ADHD), often underdiagnosed in adolescents with severe obesity, can significantly enhance outcomes. Treating these conditions before surgery and maintaining long-term mental health follow-up may mitigate risks and improve patients' overall psychosocial well-being. This study underscores the necessity of making psychological support a routine component of multidisciplinary bariatric care. To the best of our knowledge, the lack of assessment for neuropsychiatric diagnoses has not been previously addressed in qualitative research on adolescents in the context of MBS. Recent data indicate a high prevalence of neuropsychiatric disorders among children with obesity and, in particular, among adolescents seeking MBS. For example, in a subsequent study (AMOS2), more than half of the participants screened positive for ADHD, autism spectrum disorder, or both. However, this high prevalence was not yet recognized when the participants in the present study underwent MBS. Ending an era of intense physical and psychosocial struggles, as well as stigmatization, and the hope for weight loss were very strong motivators for participants to undergo MBS as adolescents. The desire to improve their daily quality of life aligns with studies on adults and adolescents living with obesity [4, 5, 9, 24], as well as research on self-management in adolescents with other chronic conditions, such as renal, inflammatory bowel and rheumatologic diseases [25]. This study found that most participants were satisfied with undergoing MBS during adolescence, with some wishing they had done the surgery earlier to improve opportunities and social life. Most participants avoided weight regain after MBS, consistent with findings from qualitative research in adults [26]. However, some experienced shame and frustration when weight was regained, often attributing it to personal failure, with some reporting insufficient support from healthcare providers. These findings emphasize the importance of providing psychosocial support to address these challenges. Furthermore, educating patients about the role of individual physiological responses in determining weight outcomes post-surgery could help alleviate self-blame and enhance long-term satisfaction.

Nutritional deficiencies are common long-term after MBS [27], with many participants admitting poor adherence to prescribed supplements, often due to the absence of symptoms [25]. In the AMOS study, non-adherence at 5 years post-surgery was linked to higher rates of micronutrient deficiencies [28]. This behavior, which could be tied to adolescent concrete thinking, highlights the need for effective strategies to improve adherence to supplementation in this group [25].

Steffen et al. [29] reported an increased risk of new-onset Alcohol Use Disorders (AUD) following MBS. While White et al. [30] highlight the need to integrate AUD evaluation and treatment into the long-term follow-up for adolescents undergoing MBS, this study underscores the importance of providing pre-surgery education about the potential risks associated with alcohol consumption after MBS.

One participant in this study who developed AUD expressed a desire for more pre-surgery information about alcohol-related risks, echoing concerns raised in previous research [21, 31]; Svensson et al. [32] specifically noted that gastric bypass surgery increases the risk of alcohol misuse and addiction. Participants in our study emphasized the need for strategies to avoid alcohol without hindering social interactions.

Improved follow-up care after transitioning from specialist pediatric care to primary care has been suggested by Järvholm, Olbers, and Engström [26] Similarly, Memarian et al. [33] highlighted the need for improved education and knowledge about obesity and MBS among primary care providers. While follow-up appointments in the child obesity centers were scheduled, participants now had to arrange their own appointments, similar to the findings in adults by Coulman, MacKichan, Blazeby, Donovan et al., [34] Digital solutions described by Müssener et al. [35] could improve pre- and postoperative support and accessibility.

All participants in the present study underwent Roux-en-Y gastric bypass surgery (RYGB). As a result, we do not know the extent to which these experiences differ from those of young patients who have undergone sleeve gastrectomy.

5 | Conclusion

Participants generally expressed satisfaction with undergoing MBS during adolescence, and the treatment improved their daily quality of life. But there were also challenges, including poor adherence to vitamin and mineral supplements and absence of annual follow-ups. Addressing mental health issues such as neuropsychiatric disorders, depression and anxiety before MBS was perceived as important to facilitate adjustment to life after surgery. Strengthening support networks through

pre-MBS interventions, peer group support and improved transitions to adult healthcare can better support the needs of adolescents in a comprehensive manner.

Author Contributions

M.E., E.G., and K.J. designed the study and conducted the data collection. M.Ö., M.E., & K.J. performed the data analysis. M.Ö. and M.E. drafted the initial version of the manuscript. All authors (M.Ö., K.J., E. G., J.D., T.O., and M.E.) contributed to the final manuscript and approved its content.

Conflicts of Interest

K.J. reports educational activities for Novo Nordisk; all reimbursement was directed to her clinical institution (Region Skåne). T.O. has received reimbursement unrelated to the submitted article from Johnson & Johnson (advisory board, educational activities), Novo Nordisk (advisory board, educational activities) and Sandoz (education) with all reimbursement directed to his institution. M.Ö. and L.S. report educational activities for Novo Nordisk, all reimbursement was directed to their clinical institution (Region Västra Götaland).

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.