

**LIFE EXPERIENCE AFTER BARIATRIC SURGERY
AMONG PATIENTS WITH MORBID OBESITY IN EAST
COAST PENINSULAR MALAYSIA:
A QUALITATIVE STUDY**

BY

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**DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENT FOR THE DEGREE MASTER OF MEDICINE
(FAMILY MEDICINE)**



**SCHOOL OF MEDICAL SCIENCES
UNIVERSITI SAINS MALAYSIA
2022**

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious, and the Most Merciful.

Alhamdulillah, all praise to Allah, for His blessings and for providing me with the strength along my journey of completing this dissertation. The experience was indeed challenging, filled with struggles, and often can make one feel lost in the path to reach the ultimate goal. But as I reached the endpoint, my heart was full of immense emotions of joy, relief, and gratitude that my team and I were finally able to bring this masterpiece to the eyes of the people.

First and foremost, I want to express my gratitude to Assoc. Prof. Dr Nani Draman, my main supervisor, whose competence, devotion, and generous assistance were crucial to me throughout the process. Her continuous support and patience gave me the confidence and strength to continue on the correct route until the endpoint. I'd also want to thank Dr Zainab Mat Yudin @ Badrin and Asst. Prof. Dr Rosediani Mohamad, my co-supervisor supervisor, for their excellent advice and encouragement throughout my writing. My sincere gratitude to Dr Razlina Abdul Rahman and Dr Mohd Nizam MD Hashim for their unwavering support during my quest to complete this dissertation. I'd want to express my gratitude to the participants for entrusting me with their stories, which I hope I've done justice to.

I dedicate this thesis to my husband, Dr Mohd Hafiz Bin Ismail, my pillar of strength. I wouldn't have finished writing if it were not for his constant love and prayers. I want to thank my parents, siblings, and law, who have physically and emotionally supported me. In addition, I want to thank my daughter, Hannah Safiyyah, for her happy distractions, allowing my mind some respite in between my writing. Finally, I would not have completed this thesis without the constant motivation and stimulating discussions from my friends and colleagues.

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LIST OF ABBREVIATIONS

APBSG	Asian-Pacific Bariatric Surgery Group
ASMBS	American Society for Metabolic and Bariatric Surgery
AGB	Adjustable gastric banding
BMI	Body mass index
ECG	Electrocardiogram
GERD	Gastroesophageal reflux disease
HUSM	Hospital Universiti Sains Malaysia
IFSO	International Federation for the Surgery of Obesity and Metabolic Disorders
LSG	Laparoscopic sleeve gastrectomy
LRYGB	Laparoscopic Roux-en-Y gastric bypass
LAGB	Laparoscopic adjustable gastric banding
MBSAQIP	Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program
NHANES	National Health and Nutrition Examination Survey
RYGB	Roux-en-Y gastric bypass
SG	Sleeve gastrectomy
T2DM	Type 2 Diabetes Mellitus
UMMC	University Malaya Medical Centre
UKMMC	University Kebangsaan Malaysia Medical Centre
VTE	Venous thromboembolism

WHO

World Health Organization

ABSTRAK

Pengenalan: Obesiti morbid adalah keadaan yang mencabar kerana ia memberi kesan kepada pelbagai dimensi kehidupan. Penurunan berat badan yang kekal melalui pembedahan bariatrik membantu pesakit yang mengalami obesiti morbid untuk menjalani kehidupan yang lebih sihat dan bermakna.

Matlamat: Kajian ini menyelami cabaran sebelum pembedahan bariatrik dan kesan pembedahan bariatrik terhadap kehidupan seseorang yang mengalami obesiti morbid.

Metodologi: Kajian ini menggunakan pendekatan fenomenologi dan temu bual secara mendalam yang melibatkan 21 pesakit. Hanya pesakit yang telah menjalani pembedahan bariatrik sekurang-kurangnya pada 6 bulan yang lalu diterima untuk menyertai kajian ini. Temu bual tersebut dirakamkan melalui audio, ditranskripsikan, dan dikodkan menggunakan perisian Nvivo12. Analisis tematik digunakan untuk mengkategorikan tema yang relevan dengan cabaran pesakit obesiti sebelum menjalani pembedahan and kesan pembedahan terhadap kehidupan mereka dengan menggunakan theory Maslow's Hierarchy of needs.

Keputusan: Lima tema ditemui: (1) Kekangan sosial; (2) Mengalami bias dan stigmatisasi sebelum pembedahan; (3) Membawa kehidupan baru; (4) Meningkatkan harga diri; dan (5) Kesan negatif pembedahan selepas pembedahan. Kesukaran pergerakan fizikal kerana berat badan mereka yang tidak normal mempunyai kesan negatif yang serius terhadap kehidupan sosial dan menyebabkan mereka mengalami bias serta stigmatisasi. Pembedahan baraitrik adalah pilihan terbaik bagi pesakit-pesakit ini untuk mencapai penurunan berat badan yang berterusan dan menjalani kehidupan baru. Walau bagaimanapun, beberapa pesakit menghadapi kesan sampingan pembedahan.

Kesimpulan: Kajian ini berperan sebagai platform untuk menyelami kesukaran yang dihadapi oleh pesakit yang mengalami obesiti morbid dan perubahan yang dialami oleh pesakit selepas pembedahan untuk intervensi pada masa depan untuk membendung peningkatan bilangan pesakit yang menghidap obesiti morbid.

Kata kunci: pengalaman hidup; pembedahan bariatrik; obesiti; obesiti morbid

ABSTRACTS

Background: Living with morbid obesity is challenging as it affects various dimensions of life. Sustainable weight loss via bariatric surgery helped people suffering from morbid obesity to lead a healthy and meaningful life.

Aim: This study highlights the challenges before bariatric surgery and the impact of the surgery on the patient's quality of life.

Methods: A qualitative study utilising the phenomenology approach, using semi-structured in-depth interviews, was conducted among 21 participants. Only those patients who had undergone bariatric surgery at least six months ago were included in this study. The interview data were audio-recorded, transcribed verbatim, and managed in an analytic computer software NVivo12. The data were analysed thematically to identify themes and subthemes related to challenges before the surgery and the impact of the surgery by applying the humanistic theory using Maslow's Hierarchy of needs.

Results: Five themes were discovered: (1) Social restrain; (2) Experiencing bias and stigmatisation before the surgery; (3) Brings new life; (4) Boost self-esteem; and (5) Facing the negative side of surgery after the surgery. The physical limitation due to their abnormal body weight had a serious negative impact on their social life and made them targets of bias and stigmatisation. Bariatric surgery was the best option for them to attain sustainable weight loss and lead a new life. However, a few of the patients struggle with the side effects of surgery.

Conclusion: This study serves as a platform to explore the difficulties faced by people with morbid obesity and the changes that the participants experience after the surgery for future intervention to curb the rising number of people with morbid obesity.

Keywords: life experience; bariatric surgery; obesity; morbid obesity

CHAPTER 1
INTRODUCTION

1.1 World obesity burden

The world obesity burden has increased exponentially in recent decades as the value has tripled since 1975. In 2016 more than 1.9 billion adults, age 18 years and older, were overweight, and of these, over 650 million were obese (World Health Organization, 2021).

Overweight and obesity are defined by measuring body mass index (BMI). For adults, the World Health Organization (WHO) defines overweight, and obesity as follows: overweight is a BMI greater than or equal to 25 kg/m²; and obesity is a BMI greater than or equal to 30 kg/m² (World Health Organization, 2021).

1.2 Obesity in Asia and associated factors

Asian populations are lean when compared with the western population. The WHO has recommended that a BMI of 18.5 to <23 kg/m² is healthy for Asians (World Health Organization, 2000). A BMI larger than or equal to 23kg/m² is considered overweight, whereas a BMI greater than or equal to 27.5kg/m² is classified as obese. Obesity is further divided into three classes: class I has a BMI of ≥ 27.5 kg/m², class II has a BMI of ≥ 32.5 kg/m², and class III has a BMI of ≥ 37.5 kg/m², also known as morbid obesity (World Health Organization, 2000).

Like any other part of the world, obesity is a great public health threat to many other Asian countries as they are undergoing a transition in terms of socioeconomic and lifestyle due to rapid globalisation and urbanisation. Parallel with the rise in urbanisation, individual physical activity decreases, contributing to upper body adipose tissue deposit and BMI substantial rise (Ramachandran *et al.*, 2004). Considering that the onset of obesity-related complications in Asian people occurs at a much lower BMI compared with that in Western people, the indications for

bariatric surgery for Asian people were modified by the Asian-Pacific Bariatric Surgery Group (APBSG) in their first Asia-Pacific Bariatric Surgery Conference, consensus meeting in Taipei to be as follows: (1) obese patients with a BMI ≥ 37 kg/m² and (2) obese patients with a BMI ≥ 32 in the presence of diabetes or two significant obesity-related comorbidities (Ohta *et al.*, 2019).

1.3 Obesity and physical health complications

Being obese puts an individual at risk for many serious health conditions, including hypertension, sleep apnea, and cancer. With the rise in body weight, the risk of type 2 diabetes mellitus (T2DM) rises too. A study involving over 21 000 adults in the National Health and Nutrition Examination Survey (NHANES) found the increased risk of diabetes from 8% in the normal-weight population to 43% in individuals suffering from morbid obesity (Nguyen *et al.*, 2011). Obesity also influences lipid metabolism. Obesity-associated lipid changes include decreased high-density lipoprotein cholesterol, increased triglyceride levels and a shift in low-density lipoproteins to a more proatherogenic composition making an individual predisposed to high cardiovascular risk (Franssen *et al.*, 2011). Obstruction of the upper airway during sleep due to increased neck fat in obese people has led them to develop obstructive sleep apnea (Schwartz *et al.*, 2008). Besides that, obese individuals also suffer from osteoarthritis, a disabling degenerative joint disorder due to excessive joint loading and altered biomechanical patterns (King *et al.*, 2013).

1.4 Obesity impact on biopsychosocial

The detrimental effects of obesity are also seen in the biopsychosocial aspect of an individual life. This impact on the biopsychosocial aspect is attributed to the weight stigma and perceptions of weight discrimination they face in their daily life. They often face a pervasive social stigma due to their weight that subjects them to discrimination in employment, education and

healthcare. Even in a developed country like the United States, women are more likely to experience weight discrimination than males. About 20% of individuals who are overweight or obese experience weight stigma and may experience stigmatisation repeatedly over their lifetimes (Levy and Pilver, 2012). The incidence of perceptions of weight discrimination in individuals with more extreme obesity ($\text{BMI} \geq 35 \text{ kg m}^{-2}$) is more common (41.8%) compared to individuals with class I obesity (Spahllholz *et al.*, 2016). Often due to widespread negative stereotypes that overweight and obese persons are lazy, unmotivated, lacking in self-discipline, less competent, noncompliant, and sloppy, they are vulnerable to social injustice, unfair treatment, and impaired quality of life. Many overweight and obese individuals may experience psychological distress not because of their weight per se but due to stress associated with weight stigma and weight-based discrimination (Muennig, 2008). This state of distress mainly appears from feeling physically unattractive and living in a society that both stigmatises obesity and holds obese people responsible for their condition. Weight bias also mediates the relationship between obesity and self-esteem. It can result in low self-esteem and poor body image (Weinberger *et al.*, 2016).

1.5 Obesity and sexual dysfunction

Obesity is associated with a lack of enjoyment of the sexual activity, lack of sexual desire, difficulties with sexual performance, and avoidance of sexual encounters. Sexual quality of life is most impaired for women and individuals with Class III obesity (Kolotkin *et al.*, 2006).

1.6 Bariatric surgery throughout different nations

Bariatric surgery is the most effective treatment option for a morbidly obese individual. It improves weight loss and emolliates obesity-related comorbidities compared with nonsurgical interventions, regardless of the surgical procedure used (Colquitt *et al.*, 2014; J. Picot, 2010).

According to the International Federation for the Surgery of Obesity and metabolic disorders (IFSO) Worldwide Survey 2014, about 634,897 bariatric operations were performed worldwide in 2016 (Angrisani *et al.*, 2017). Various surgical options are now available, and they are continuously evolving globally. In 2013, the most commonly performed procedures were Roux-en-Y gastric bypass (RYGB), 45 %, followed by SG, 37 %, and adjustable gastric banding (AGB), 10 %, while no other single procedure exceeded 2.5 % (Angrisani *et al.*, 2015). However, later on, the surgical options changed globally. IFSO Worldwide Survey 2014 reported that the most commonly performed procedure in the world was SG, which reached 45.9%, followed by RYGB (39.6%), and AGB (7.4%) (Angrisani *et al.*, 2017). In regions such as the USA, Canada, and the Asia Pacific, SG has become the most frequently performed procedure. It requires an easier surgical technique with promising outcomes than RYGB (Angrisani *et al.*, 2015).

1.7 Bariatric surgery in Malaysia

In Malaysia, the first bariatric surgery, an open vertical banded gastroplasty, was performed circa 1996, followed by a laparoscopic gastric bypass in 2001, laparoscopic adjustable gastric banding (LAGB) in 2005, and laparoscopic sleeve gastrectomy (LSG) in 2006 (Kosai and Rajan, 2018). There has been a steady increase in the number of bariatric cases performed per annum in Malaysia. About 222 bariatric procedures were done from 1996 to 2009, and 1787 cases were performed from 2010 to 2016 (Kosai and Rajan, 2018). The constant rise in popularity of bariatric surgery in Malaysia can be largely attributed to inclination in awareness among healthcare providers regarding the availability of surgical management of obesity both in the private and government sector, and obesity-related co-morbidities, rigorous public awareness campaigns by the Ministry of Health, and the proactive involvement of both print as well as electronic media in providing information on the deteriorating effect of obesity. Throughout the country, just like any

other part of the world, LSG was the most commonly performed bariatric procedure accounting for almost 57%, followed by laparoscopic Rou-y gastric bypass (LRYGB), with 29% of the total case volume done (Kosai and Rajan, 2018).

1.8 Complications post-bariatric surgery

Surgeries are not without complications; they can either occur immediately or later. Common surgical complications include bleeding, stomal stenosis, leak, vomiting, reflux, gastrointestinal symptoms, and nutritional and electrolyte abnormalities. Thanks to the American College of Surgeons and the American Society for Metabolic and Bariatric Surgery (ASMBS) for creating the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) to assure bariatric surgery quality and safety (American College of Surgeon, 1996-2022). The MBSAQIP 2015 participant use file data were gathered to review 30-day morbidity among 135,413 patients undergoing SG (67%), RYGB (29%), AGB (3%), and duodenal switch (1%). All the complications found was less than 1%, which were bleeding (0.7%), wound infection (0.5%), urinary tract infection (0.3%), VTE (0.3%), and leak (0.2%) (Daigle *et al.*, 2018). Nutritional deficiencies after bariatric surgery have also been reported, especially when involving malabsorptive intervention rather than a restrictive procedure. The RYGB, one of the famous malabsorptive interventions, is associated with a higher prevalence of nutritional deficiencies than sleeve gastrectomy and laparoscopic gastric banding, the restrictive type (Tack and Deloosse, 2014). As for gastroesophageal reflux disease (GERD), the disappearance of the acid pocket at the gastro-oesophageal junction following RYGB has been implicated in improving its related symptoms (Herbella *et al.*, 2011).

1.9 What is missing in the literature?

Looking at the rising prevalence of overweight and obesity in our country and the burden of medical illness caused by obesity, this surgery should be brought forward to light to our community, making them aware of this service, the benefits, changes and new hope that it could bring to one's life should be highlighted making our people more acceptance towards it. Therefore, this study is meant to share the struggle they faced when they were once obese and highlight the wonders that this powerful weapon can do in combating obesity. With that, this study is meant to make our people more accepting of it and help our clinicians curb this obesity in our nation with a better understanding of the barrier faced by the patients.

Many morbidly obese patients have failed to attain weight reduction following the conventional way to lose weight, predisposing them to ongoing health problems. True enough, this surgery can bring new hope to their life as it is one evidence-based treatment that can cure obesity. Yet, from expert communication of clinical practitioners, many of our Malaysian morbidly obese patients are still reluctant and refuse when offered bariatric surgery, despite their failure to attain weight reduction from their lifestyle modification afford and the disease that they suffer from as complications from their morbid obesity. Despite this surgery bringing miracles and new hope in one's life, in Malaysia, only three hospitals provide this service to the community: Hospital Universiti Sains Malaysia (HUSM), University Malaya Medical Centre (UMMC), and University Kebangsaan Malaysia Medical Centre (UKMMC), with 100 -150 cases per annum, respectively.

Many studies were done in the foreign country exploring the patient's journey from being obese and highlighting the benefits they gain after the surgery making their patients more open to it. However, in Malaysia, such studies are still lacking; perhaps the ultimate cause for refusal is yet to be discovered in our populations with different cultures, practices, and beliefs. The benefits

are less talked about, and their very own personal experience and the journey of being obese leading to surgery are yet to be explored in our nation. Therefore, this study is meant to fill in the gap and improve our health care system by providing the best treatment options for patients with morbid obesity.

1.10 Theoretical framework

It is essential to delve into any applicable theoretical foundations that may aid me in comprehending these participants' life experiences. Based on my literature review, I opted to use the humanistic theory using Maslow's Hierarchy of needs.

1.10.1 Maslow's Hierarchy of needs

The humanistic theory using Maslow's Hierarchy of needs was adopted in this research to explore the changes that the participant experienced after going through bariatric surgery. Abraham Harold Maslow was an American Psychologist who first introduced his hierarchy of needs in a 1943 paper entitled "A Theory of Human Motivation" (Maslow, 1943). This five-stage model includes physiological needs, safety needs, love and belongingness needs, esteem needs, and self-actualisation needs. Maslow extended his theory over several decades, arguing that the order of requirements can be changeable depending on external conditions or individual differences and does not have to follow the hierarchy orders. When these growth needs have been reasonably met, this paradigm helps us realise that everyone is capable of and aspires to rise the ladder toward a level of self-actualisation. It revealed the changes that the participants went through at each level of the hierarchy after this procedure met their life-saving weight-loss needs.

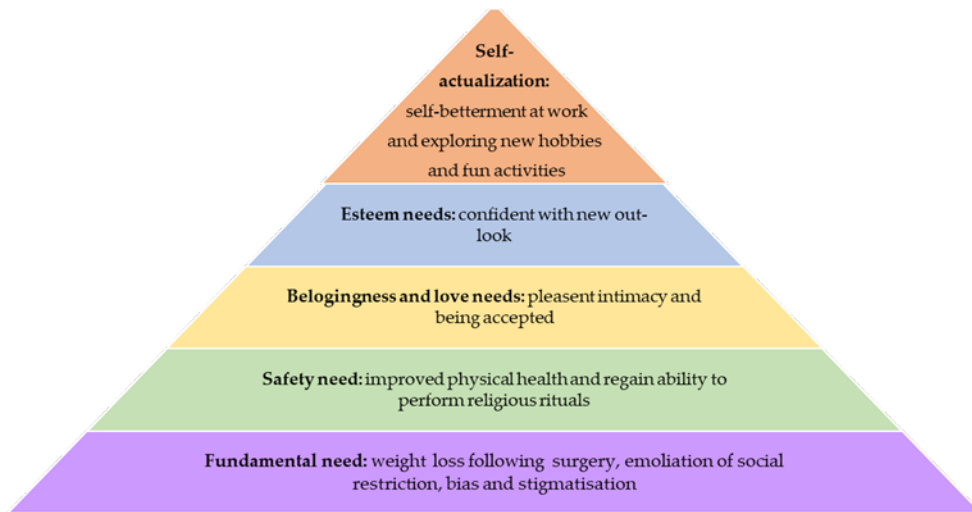


Figure 1.1 Adapted theoretical framework from Maslow's Hierarchy of needs

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CHAPTER 2
OBJECTIVES OF THE STUDY

2.1 General Objectives

To explore the experiences of patients with morbid obesity who have undergone bariatric surgery.

2.2 Specific Objectives

1. To explore the challenges faced by the patients before the surgery.
2. To explore the impact of the surgery on the patient's quality of life.

CHAPTER 3
MANUSCRIPT

3.1 Manuscript article

Article

Life Experience after Bariatric Surgery among Patients with Morbid Obesity in East Coast Peninsular Malaysia: A Qualitative Study

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Citation: Gullaam Rasul, S.F.

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Draman, S. Title. *Int. J. Environ. Res.*

Public Health **2022**, *19*, x.

<https://doi.org/10.3390/xxxxx>

Academic Editor: Firstname
Lastname

Received: date

Accepted: date

Published: date

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Abstract: Living with morbid obesity is challenging as it affects various dimensions of life. Sustainable weight loss via bariatric surgery helped people suffering from morbid obesity to lead a healthy and meaningful life. This study highlights the challenges before bariatric surgery and the impact on one's life. We employed a phenomenological approach using in-depth interviews with twenty-one participants 15 females and 6 males who had undergone surgery at least six months ago with the mean age of 42.6. The physical limitation due to their abnormal body weight had a serious negative impact on their social life and made them targets of bias and stigmatisation. Surgery was the best option for them to attain sustainable weight loss and lead a new life. However, a few of the participants struggle with the side effects of surgery. Five themes were discovered: (1) Social restrain; (2) Experiencing bias and stigmatisation; (3) Brings new life; (4) Boost self-esteem; and (5) Facing the negative side of surgery. This study serves as a platform to explore the difficulties faced by people with morbid obesity and the changes that the participants experience after the surgery for future intervention to curb the rising number of people with morbid obesity.

Keywords: life experience; bariatric surgery; obesity; morbid obesity

1. Introduction

Obesity has become a global threat affecting people from various continents of the world. Worldwide over six hundred fifty million adults, amounting to 11% of men and 15% of women, live with obesity [1]. Likewise, many Asian countries face this rising obesity trend as they

undergo socio-economic and lifestyle transitions due to rapid globalisation and urbanisation. Unfortunately, with the rise in urbanisation, individual physical activity has decreased, contributing to upper body adipose tissue deposit and substantial body mass index (BMI) rise [2].

Asian populations are lean when compared with the western population. The World Health Organization (WHO) has recommended that a BMI of $18.5 - <23\text{kg/m}^2$ as being healthy for Asians [3]. Overweight is a BMI greater than or equal to 23kg/m^2 , and obesity is a BMI greater than or equal to 27.5kg/m^2 . Obesity is further classified into three classes, class I means a BMI of ≥ 27.5 , obesity class II ≥ 32.5 , and obesity class III ≥ 37.5 , which is also known as morbid obesity [3].

The growing number of people living with morbid obesity has led to serious health consequences and caused significant obesity-related health care expenditure [4]. Besides poor physical health, an individual living with obesity also suffers from poor mental health due to weight stigma [5]. They face perceived weight discrimination in various angles of life like employment, health care, and interpersonal relationships [6]. Therefore, this surgery stands as a tool to solve one's weight problems and as a weapon to combat all comorbidities, including physical and biopsychosocial problems attributed to excessive weight. In the midst of overcoming this muddle, bariatric surgery stands not only as - strongly established but also as one of the most effective and safe treatments for severe obesity [7]. Bariatric surgery, which includes gastric bypass, sleeve gastrectomy (SG), and laparoscopic gastric banding, often helps excess weight loss within one year of surgery for a prolonged duration [8]. In addition to the substantial and sustained effects on weight, this surgery significantly ameliorates obesity-attributable comorbidities such as type 2 diabetes mellitus, cardiovascular disease, hypertension, dyslipidemia, and sleep apnea in most patients [8].

According to the International Federation for the Surgery of Obesity and Metabolic disorders (IFSO) Worldwide Survey 2014, about 634,897 bariatric operations were performed worldwide in 2016[9]. Various surgical options are now available, and they are continuously evolving globally.

In Malaysia, the first bariatric surgery, an open vertical banded gastroplasty, was performed circa 1996, followed by a laparoscopic gastric bypass in 2001, laparoscopic adjustable gastric banding in 2005, and laparoscopic sleeve gastrectomy (LSG) in 2006[10]. There has been a steady increase in the number of bariatric cases performed per annum in Malaysia. About 222 bariatric procedures were done from 1996 to 2009, and 1787 cases were performed from 2010 to 2016, respectively [10]. The constant rise in popularity of bariatric surgery in Malaysia can be largely attributed to inclination in awareness among healthcare providers regarding the availability of surgical management of obesity both in the private and government sector, and obesity-related comorbidities, rigorous public awareness campaigns by the Ministry of Health, and the proactive involvement of both print as well as electronic media in providing information on the deteriorating effect of obesity. Throughout the country, just like any other part of the world, laparoscopic sleeve gastrectomy (LSG) was the most commonly performed bariatric procedure accounting for almost 57%, followed by laparoscopic Roux-en-Y gastric bypass (LRYGB), with 29% of total case volume done [10].

Various studies were done globally to explore the changes that the participants' experienced in their life after the surgery. Previous studies describe the positive consequences of this surgery in many domains of life, such as physical health, sexual life, and recovery of self-esteem [11-13]. Yet, such studies are still lacking among the Asian population as many studies done were focused on specific disease resolution and cardiovascular risk reduction [14, 15]. Data on the biopsychosocial aspect of life, spiritual health, and self-esteem are still unexplored among Asian populations with different cultures and ethnicities.

The humanistic theory using Maslow's Hierarchy of needs was adopted in this research to explore the changes that the participant experienced after going through bariatric surgery. Abraham Harold Maslow was an American Psychologist who first introduced his hierarchy of needs in a 1943 paper entitled "A Theory of Human Motivation" [16]. This five-stage modal includes physiological needs, safety needs, love and belongingness needs, esteem needs, and self-actualisation needs. Over several decades, Maslow refined his theory that the order of needs might be flexible based on external circumstances or individual differences and not necessarily follow the hierarchy orders. This framework helps us understand that every person is capable and desires to move up the hierarchy toward a level of self-actualisation when these growth needs have been reasonably satisfied.

Understanding participants' experiences and views about this life-saving surgery is essential for the health care worker to reach more patients in need of this intervention. This study aims to explore the challenges faced by the patients before the surgery and the impact of the surgery on the patient's quality of life.

2. Materials and Methods

This qualitative study was conducted with a phenomenological approach by exploring post-bariatric patients' stories, empowering them to share their very personal life experiences and challenges before and after the surgery. This phenomenological approach sets aside biases and preconceived assumptions about feelings, human experiences, and responses to a certain scenario. This enables us to delve into the viewpoints and perceptions, as well as the feelings and understanding of those who have been in this position. Aside from that, this study design provides insight into individuals' subjective "live" experiences without providing a larger explanation, i.e., it focuses solely on producing research accounts for individuals' specific settings. Considering the importance of participants' actual words as essential sources of information, the qualitative model serves as a platform for these patients to fully provide meaning to an internal experience in answer to the questions asked by allowing them to freely unfold their stories in their own words [17]. This research only involved post-bariatric surgery patients proficient in Malay and English and it was approved by The Human Research Ethics Committee of USM (USM/JEPeM/19100567).

2.1. Setting

This research was conducted at Hospital Universiti Sains Malaysia (Hospital USM) in Kelantan, a state located in Northeast Malaysia, with 94% of the population being Malay Muslims [18]. The hospital also

receives referrals from other tertiary hospitals on the east coast of Malaysia.

2.2. Participant

Participants who met the inclusion criteria, who had done the surgery at least six months ago, were contacted by sharing posters and messages via a short messaging application (WhatsApp) to the specific WhatsApp group of bariatric patients who had undergone the surgery. Participants aged less than 18 years old were excluded from this study. Participants were recruited from those who contacted the researcher to participate in this study based on the details shared via WhatsApp. The researcher will arrange an appointment to have an interview session with the patients. Snowballing technique was also used to increase the number of participants recruited. Recruitment of patients was ceased once recurrent patterns had emerged during the interview, and theoretical saturation was achieved from 21 interviews [19].

2.3. Procedure

Data were collected through, face-to-face, in-depth interviews using a semi-structured questionnaire consisting of several key questions that will assist the researcher in defining the areas to be explored in more detail. The interviews were arranged at a time and place convenient to the participants and were conducted by the same researcher, a Family Medicine Trainee who had undergone training to conduct a qualitative study. Most of the interviews were conducted in a private room at the Department of Family Medicine, School of Medical Science Health campus USM while three interviews were conducted at the patients' office. All the researchers have no prior relationship with the patients. Before conducting the interview, consent for an audio recording of their interviews was taken. Then, patients were requested to complete a sociodemographic questionnaire. Interviews were conducted in English and Malay depending on the patient's preference. The session was started by asking open-ended questions such as: 'What do you know about obesity?', 'How does obesity affect your life?' and 'What is the impact of bariatric surgery on your life' before exploring the details about patients' experiences. This questionnaire was piloted on three patients before the real interview to evaluate the questionnaire's appropriateness, acceptance, and validity. The total interview time per patient ranged from 60 to 90 minutes. All interviews were audiotaped, kept secure, and transcribed verbatim into text before being analysed.

2.4. Data analysis

The transcription were coded using the NVivo 12 (Qualitative Research Computer Analysis Package) software. Relevant themes were extracted from the transcribed data by using the inductive method according to Braun and Clarke's thematic analysis approach [20]. In the beginning, all the researchers (SF, RM, ND, ZMY and RAR) thoroughly reviewed the first five transcripts to familiarise themselves with the patients' general views and perspectives. Later, the main researcher created an initial list of codes in NVivo® (Microsoft Corporation, Redmond, WA, USA), and we coded the transcripts precisely. A rereading of each participant's transcript was done until all the researchers made sense of each word and sentence, discovered repeated patterns of meaning, and later made sense of the participant's stories as

a group. Each transcript was examined in detail before collecting the identified themes and organising them into an interconnected framework (themes, subthemes, and axial coding). To ensure proper coding, validity and reliability, the research supervisor (ND and ZMY) collaborated with the main researcher to check the transcript's codes again. A co-researcher (RAR) with a background in obesity further examined and discussed the coding and themes for all transcripts to generate helpful ideas. All conceptual differences in the thematic analysis were addressed and revised. Subsequently, other preliminary themes were developed. Finally, a mutual consensus was reached among the researchers on the final codes, including all the themes, subthemes, and axial coding. The transcribed material was sent to the participants to verify the content of the results. None of the participants had a contrary view.

3. Results

3.1. Characteristics of the Participants

This study involved twenty-one adults participants, 15 females and 6 males. All of them are Malay Muslim with the mean age of 42.6. Most of them were married and working in education sector. Twenty of them had comorbidities before the surgery. The mean pre operation BMI is 51.4kg/m² and the mean post-operation BMI is 38.6kg/m². The detailed characteristic of the patients who took part in this study is summarised in Table 1.

Table 1. Characteristics of the morbidly obese people with bariatric surgery (n=21).

ID	Age	Gender	Comorbidities	Year of operation	Type of operation	Pre-operation BMI (kg/m ²)	Post-operation BMI (kg/m ²)
ID 1	36	F	HPT, DM	2019	SG	53	41.8
ID 2	60	F	HPT	2017	MGB	49.3	35.4
ID 3	45	F	Knee OA, OSA	2019	RYGB	37.2	27.3
ID 4	45	F	ASTHMA	2019	SG	70.1	50.6
ID 5	39	M	HPT	2020	SG	67.2	55.7
ID 6	34	F	HPT	2017	SG	45.8	32.5
ID 7	41	M	DM, HPT	2018	SG	52	41.6
ID 8	59	M	Knee OA	2017	SG	41.9	29.0
ID 9	43	F	Nil	2019	SG	42.5	30.1
ID 10	47	F	DM, HPT, OSA	2019	SG	50.9	36.6
ID 11	43	F	HPT, OSA	2019	SG	57	45.0
ID 12	61	F	HPT	2019	RYGB	42.3	30.0
ID 13	35	F	HPT, DM	2017	RYGB	40.3	28.9
ID 14	29	M	OSA	2018	SG	45.8	36.3
ID 15	40	M	HPT	2018	SG	57.7	40.0
ID 16	35	M	OSA, IFG, Cystic acne	2018	SG	41.8	31.9
ID 17	42	F	HPT, OSA	2020	SG	54.5	40.3
ID 18	41	F	Knee OA	2018	SG	65.6	48.5
ID 19	28	F	Acne vulgaris	2017	SG	91.4	72.5
ID 20	47	F	HPT, OSA	2019	RYGB	37.2	27.7
ID 21	45	F	DM, HPT, HPL	2018	RYGB	37.1	28.7

DM, Diabetes mellitus; HPT, Hypertension; HPL, Hyperlipidemia; ID, identification; IFG, Impaired fasting glucose; MGB, Mini gastric bypass; OA, Osteoarthritis; OSA, Obstructive sleep apnea; SG, Sleeve gastrectomy; RYGB, Roux-en-Y gastric bypass

3.2. Themes

Five main themes were identified: (1) Social restrain, (2) Experiencing bias and stigmatisation before the surgery and (3) Brings new life (4) Boost self-esteem, and (5) Facing negative side of surgery after the surgery. (Table 2).

Table 2. Life experiences of the morbidly obese person with bariatric surgery, (n=21).

Themes	Subtheme	Axial Coding
Social restraint	Burdensome to carry out activities of daily living	Tired to go for shopping
	Difficult to perform the spiritual act	- Feel embarrassed for occupying a lot of space in the prayer line - Breathless to walk to the mosque
	Struggle at workplace	- Difficult to climb up to the classes at a higher level at school - Exhausted to walk around the class to monitor the students
	Unpleasant travelling	- Lack of attractive attire options - Inadequate public facilities - Embarrassing life event
Experiencing bias and stigmatisation	Body-shaming by their family members	Labelling linked to an animal
	Discrimination	- Discriminating gestures by the surrounding people in public places - Judgmental remarks on work quality by bosses
Brings new life	Improved physical health	- Resolution of diabetes, hypertension and high cholesterol - OSA symptoms subsided - Disappearance of skin pigmentation and acne - Vanishing debilitating knee pain
	Regain the ability to perform religious rituals	- Reciting Al-quran at ease - Able to perform spiritual acts unhindered
	Pleasant intimacy	- Increased sexual drive - Can have sex longer - Improved couple satisfaction
	Exploring new hobbies and fun activities	- Confident to travel alone - Fun long drive with family - Sports as new hobbies - Enjoying sandy beach and exciting games at a theme park
Boost self-esteem	Being accepted	- Felt valued by family and friends - No more discrimination
	Confident with new out-look	- Increased self-esteem - Excited wearing trendy clothing
	Self-betterment at work	- Improved working quality - Enthusiastic about expanding knowledge on new work scope
Facing the negative side of surgery	Facing side effects after surgery	- Suffering from GERD - Getting bald after surgery
	Regain weight	Failure to be mindful of diet choices

3.3. Theme 1: Social restraint

Daily life activities were challenging for all the patients when they were once living with morbid obesity. Their excessive weight had so many negative influences in multiple domains of their life, and the health-related issues were the most striking of all. Excessive weight has a negative impact on human biomechanics. Multiple joint pain and poor physical fitness had made their daily life difficult. Moreover, the heavyweight made them easily tired and breathless because of high energy expenditure. These have led many people with morbid obesity to restrain themselves from social life. For example, one male participant, P5, remarked:

“For everything that we do, all our movements are restricted. Before the surgery, I will drive my wife to the shopping complex; I’m honestly tired. I will just let her get into the mall alone to do the shopping. I will wait in the car because I’m easily tired”.

The extreme weight also brought a negative impact on their spiritual life. For Muslims, physical health is essential for executing the spiritual act, which entails standing, bending down, and prostration. Men are urged to perform the five daily prayers at a mosque, particularly the Friday prayer, which must be performed in the mosque.

Many men with obesity feel reluctant to go to the mosque as walking to the mosque will leave them breathless with unpleasant body odour due to excessive sweating. P16 shared his experience, *"I will leave to the mosque early on every Friday to get the nearest parking spot as possible...so I don't have to walk far away to reach the mosque because...I will sweat a lot and that makes me uncomfortable"*. Moreover, their restricted limb movements made it difficult for them to perform the spiritual act with perfection. For example, P16 further said that his big physical appearance affects his ability to perform the prayer.

"Taraweeh during Ramadhan, Friday prayers... I will always feel embarrassed because I will take a lot of space in the prayer line, and Tahayat akhir will always be a problem because I have to bend my legs. [...] It was quite problematic. Because I might push the person next to me when I tried to bend my leg, but yeah, it was uncomfortable for me".

Even at the workplace, many struggles to carry out tasks assigned to them. Working in the education sector requires most participants to monitor the students, and social connection with them is critical to maintain a strong bond with them. Unfortunately, being obese and physically unfit had kept them tired and less interactive with their students. P21, a teacher, expressed her difficulties.

"I can't start teaching for the first 10-15 minutes because I will be breathless, gasping for air, especially if I had to attend classes at higher levels. I have to rest for about 10 minutes before starting the class, and when I sweat... I feel uncomfortable to walk beside my students to check on their work".

Asides from the physical limitation, the participants were socially restrained due to a lack of attractive attire options. There are many clothing designs for average sized people, but there are few options for obese individuals. They believe fashion is not meant for them. P8 said,

"The saddest part was the clothing. Other people look smart. When I was at my maximum weight, about 140kg, I had to wear size 4XL. Everything I wore was tight. It was uncomfortable for me. I prefer to be at home. [...] I had to buy my clothes at a bundle shop. If I go to the mall, the clothes were very expensive, and there weren't many choices".

Furthermore, inadequate public facilities have caused many people who are morbidly obese to refuse to travel. Public transportation, particularly aeroplanes, are frequently small. From the stairs till the washrooms in the aeroplanes are all catered for people with regular weight. P8 further shared his experience,

"Previously, when I had to travel by flight, I had to have extra belts, which means they had to join two belts for me; I can't go for Haj. I can't be sitting on the flight like that. Can you imagine, the belts were tight, and the space was small. I can't even unfold the table in front of me. I was suffering".

Social restraint among people with obesity is also attributed to embracing life events they face. Their large stature made them walk with an unsteady gait, making them prone to fall. Moreover, their heavyweight also made them vulnerable to falling from a broken chair,

as most public places in Malaysia provide people with plastic chairs that cannot handle heavyweight. P10 said,

"Sometimes I became sad thinking that I need to pray, especially when travelling. Because there won't always be chair prepared. Even if there were chairs available...those were plastic chairs with the mosaics the chair legs tent to spread. I've fallen about two to three times. I felt so embarrassed with the people around me. I fell on my buttocks while praying, sitting on a plastic chair. Because the plastic chair can't support my heavy weight. The chair legs started to spread and break".

3.4. Theme 2: Experiencing bias and stigmatisation

People who are overweight and obese always vulnerable to discrimination and body shaming. The labelling thrown to them, even worse by their loved ones, had caused psychological stress among them. P10 shared her bitter experience when she was once a victim of body shaming by her children.

"My children always say that 'Mommy, you walk like a penguin' because I can't walk... it was till that extend... Limited. It was all limited".

Facing people in daily life has become torture. The discriminating gesture by the public due to their heavyweight was indeed soul breaking for many of the participants. They were often left feeling embarrassed in public places when people acknowledged them for their huge physical appearance. P18 had expressed feeling stressed due to the discriminating gesture by the public toward her.

"The worst was mental torture. Because people looked at me like a monster walking. I felt sad. Some people pulled people next to them as I walked to look at me. There was once a person who burst into laughter looking at me. Truly I felt myself like a monster walking... really mental torture".

At times, it was not about the surrounding people, but self-perceived body image that they look imperfect had kept them timid. Their thought of being imperfect has taken away their self-confidence. Such internalised stigmatisation could help explain the low self-esteem and poor body image among adults with obesity, which led them to self-stigmatization. P16 expressed concern about being judged by his students.

"Because I teach, I'm a lecturer. I feel low self-esteem with my students and whenever I go into the lecture. I will set up my computer connected to the PowerPoint projector; I will sit and talk and press the button for the slides and wouldn't even round in the classroom. Because I'm so scared and embarrassed about being judged on my big tummy back then".

Even at the workplace, many patients experience discrimination. Judgemental comments on their work quality left them unappreciated. Their efforts were unrecognised, parallel to the popular belief that people with obesity are lazy. P13 said,

"Before the surgery, my weight was about more than 100kg. [...] My supervisor frequently remarks on how slow I work. Only a small amount of

work was completed. I sit more compared to working. "I'm too lazy to attend to the customer."

3.5. Theme 3: Brings new life

The struggles and humiliation they faced became strong reasons for them to opt for surgery. The determination to end their misery was stronger than their apprehension of undergoing a major surgery. Once they met the doctor at the surgical outpatient department (SOPD), all participants agreed to surgery due to their strong willpower and family support. Indeed, the surgery was a great turning point for almost all the patients. They gained significant advantages in various scopes of life, including physical health, spiritual ritual capacity, and sexual life. It also gave them confidence to venture into new hobbies and activities. They believe that the surgery has given them a second chance to live and taste the beautiful life they always dreamed of.

3.5.1. Improved physical health

Most of the patients suffer from multiple diseases due to morbid obesity. Diabetes, hypertension, hyperlipidemia, obstructive sleep apnea (OSA), osteoarthritis and other diseases are not uncommon among people with morbid obesity. P21, a lecturer, was diagnosed with diabetes, hypertension and hyperlipidemia about three years before the surgery. Her dietary habits made her blood sugar level uncontrolled. The busy schedule kept her physically inactive, making it difficult to control her high blood pressure, and rising cholesterol levels made her more vulnerable to cardiovascular complications. She experienced great improvement and recovery from the diseases she suffered for years following the surgery. P21 expressed that she was glad that she had the surgery that brought tremendous health benefits.

"...felt as if I was given a new life. Diabetes, high blood pressure, high cholesterol, are all gone".

P16, a lecturer, suffered from obstructive sleep apnea. He had a severe snoring habit. His snoring was so loud that it could be heard outside his house. His mother once said that he snores like a motorboat. At times, he also had night awakening, as he felt the sensation of choking due to his excessive neck fat. Poor quality of sleep made him tired and less productive. With the help of surgery and adopting a healthy lifestyle, he recovered from OSA.

"So after treatments of Bariatric surgery, my OSA reduces. I have no more snoring issues anymore. Just after three months of surgery."

P16 further added that he had pigmentations at his armpit and neck due to insulin resistance when battling morbid obesity. He even suffered from severe acne conditions. He sought medical advice multiple times from many skin specialists, yet his cystic acne didn't resolve. He also spent a lot of money buying expensive supplements and skincare products to help him attain healthy skin. Unfortunately, not much improvement was seen. About five months after the surgery, he noticed the resolution of the acne and the disappearance of all the pigmentation that he had.

"No cystic acne anymore. Back then, it was huge cystic acne. [...] About five to six months after the surgery, all the pigmentation at the armpit and neck cleared out; my armpit looks brighter now. My neck as well".

Many of the participants also suffered from osteoarthritis. The incapacitating knee pain has caused many detrimental consequences in their daily lives. Standing or walking for a long time exacerbated the pain, and for women activities such as cooking and cleaning the house were challenging. P18, a teacher, shared that she was diagnosed with bilateral knee osteoarthritis at 40-year-old. She was suffering from debilitating knee pain at home and work, making it difficult for her to do her tasks. It was difficult for her to climb up the staircase to the second or third floor to attend her classes. Moreover, standing for long hours conducting the class often exacerbates her knee pain. The pain was so excruciating that she needed to be on an oral pain killer frequently, and at times she required intraarticular injections to elevate the pain. After the surgery, the knee pain reduced significantly, and she barely required a pain killer.

"Now I still have knee pain. Knee pain is still one of my problems [...] but better now than before surgery".

3.5.2. Regain the ability to perform religious rituals

With the extreme weight loss through the help of surgery, many participants had improvement in their freedom to perform spiritual acts. Performing prayers had been pleasant without struggling to lift an extremely heavy bodyweight. The surgery lifted the physical limitation, making them capable of performing all the spiritual acts they wanted. Reciting Al-Quran, which requires one to manipulate their breathing, has become easier. They need not struggle or feel breathless to complete one surah in the Quran. P3 shared she could perform her prayer longer and complete reciting the surah that she preferred.

"Now ok. If I want to perform Salat ul Hajat. I can recite Ayatul Kursi seven times...I can stand longer. Now everything is ok".

Similarly, P1 values her spiritual act more as she feels more connected to her religion. She can now perform her spiritual acts unhindered after her weight reduction surgery.

"I always get up early to perform Salat ul Tahajjud because I feel the movement has been lighter, there are so many things we can do now. Because we feel relaxed. That's precious for me... because I can do sujood. It feels different. We can perform prayers as often while sitting on a chair, and it's easy. But once we do it properly, the sujood the rukuk, we can feel the difference. That's the best feeling for me."

3.5.3. Pleasant Intimacy

Obesity affects sexual health. Many factors related to obesity contribute to unpleasant sexual intimacy. Their unattractive look, low self-esteem, and physical limitations with multiple comorbidities stand as barriers to healthy sexual life. P21 felt it was such misery to have sexual intimacy due to her heavyweight restricting her physical movement.