

# **PRE & POST-OPERATIVE CARE IN BARIATRIC SURGERY**

A LITERATURE REVIEW

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<p>Abstract:</p> <p>A huge percentage of the world's population suffers from obesity. This results in many other co-morbidities such as heart diseases, diabetes, sleep apnea, and depression due to low self-esteem resulting in the need for weight loss. Bariatric surgery is considered the ultimate and final procedure for weight loss. Note not all overweight individual require this surgery therefore, one must be eligible and chosen only if they meet up with criteria needed. Nurses/healthcare providers creates awareness to the patient's health and conditions to pave a way to the patients and counsel them on how to obtain and maintain new lifestyle.</p> <p>The purpose of the study was to find out benefits associated with bariatric surgery, to examine the risks and complications, to understand nursing role, to assess the extent of pre understanding needed by the client in achieving a positive lifestyle after bariatric surgery. As a guide to the aims, the following research questions were formed: 1) How important or valuable is patient education before and after obesity surgery? 2) What roles do nurses play in post-operative phase of a patient care?</p> <p>To answer these questions, a literature review approach was used. The search sources were CINAHL, EBSCO, PubMed, SpringerLink, YouTube channel and google scholar. Search words: bariatric surgery, obesity surgery, the importance of patient's education after surgery, and post-operative care after surgery. To add value to this work, a conceptual framework of the health belief model and change model which explains the stages of change by Kurt Lewins, was used. The induction and deduction approach were considered during search and the content of 20 articles chosen were analyzed and coded following the research questions.</p> <p>The authors concluded and recommended obesity surgery for patients with BMI not only above 35 kg/m<sup>2</sup>. Rather for 30-34.9 kg/m<sup>2</sup> who have tried out other weight loss program to prevent the occurrence of type 2 diabetes and other related morbidity. Also, a continues nutritional education.</p>	
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## Contents

<b>1</b>	<b>INTRODUCTION .....</b>	<b>8</b>
<b>2</b>	<b>BACKGROUND .....</b>	<b>9</b>
2.1	Bariatric procedures and types.....	9
2.2	Reason's people undergo bariatric surgery .....	10
2.2.1	<i>Obesity .....</i>	<i>10</i>
2.2.2	<i>Causes and Effects of Obesity .....</i>	<i>12</i>
2.2.3	<i>Biological factors and Psychological factors .....</i>	<i>12</i>
<b>3</b>	<b>THEORETICAL FRAMEWORK .....</b>	<b>14</b>
3.1	Change and health belief model.....	14
3.1.1	<i>Unfreeze (perceiving and recognizing needs for change).....</i>	<i>16</i>
3.1.2	<i>Change (making change happen).....</i>	<i>16</i>
3.1.3	<i>Refreeze (solidify and maintained the change achieved) .....</i>	<i>17</i>
3.2	Procedures of Eligibility .....	18
<b>4</b>	<b>AIMS AND RESEARCH QUESTION.....</b>	<b>20</b>
<b>5</b>	<b>methodology .....</b>	<b>21</b>
5.1	Data collection .....	21
5.1.1	<i>Choice of Eligible Articles .....</i>	<i>24</i>
5.1.2	<i>Lists of Selected Articles .....</i>	<i>24</i>
5.2	Data analysis .....	26
5.3	Coding Schematic .....	27
5.4	Ethical values in research study.....	29
<b>6</b>	<b>Findings.....</b>	<b>31</b>
6.1	Clinical care plan .....	31
6.1.1	<i>Nurses' roles after bariatric surgery .....</i>	<i>32</i>
6.1.2	<i>Nutritional education before and after obesity surgery.....</i>	<i>34</i>
6.1.3	<i>Physical activities before and after obesity surgery .....</i>	<i>35</i>
6.2	Earlier Education on Risks and Complication that may occur after Bariatric Surgery .....	36
6.2.1	<i>Smoking.....</i>	<i>37</i>
6.2.2	<i>Vitamin deficiency after Bariatric Surgery .....</i>	<i>37</i>
6.2.3	<i>Movement after surgery.....</i>	<i>38</i>
6.3	Benefits and the outcomes of bariatric surgery .....	38
6.4	Dietary guidelines after bariatric procedures.....	40
6.4.1	<i>Phase One.....</i>	<i>40</i>
6.4.2	<i>Phase Two.....</i>	<i>41</i>

6.4.3	<i>Recommendation on eating after Bariatric surgery</i> .....	42
<b>7</b>	<b>discussion</b> .....	<b>44</b>
<b>8</b>	<b>Conclusion</b> .....	<b>47</b>
8.1	Strength, Limitation, & Recommendation .....	47
<b>9</b>	<b>References</b> .....	<b>49</b>

## TABLES & FIGURES

Table 1: Classes of obesity .....	11
Table 2: Selected articles from Arcada data search.....	22
Table 3: Exclusion and inclusion .....	23
Table 4: Categorization of Data Analysis.....	29
Table 5:Meals for day 1-2 in post-operative care.....	41
Table 6: Changing from liquid to solid/normal meals.....	42
Figure 1: Uploaded by Brahmanaidu Parim explained the causes and effects of obesity. .....	12
Figure 2: Prezi Published with reusable license by Kaylee Hammon (2016) Concept of health belief model when struggling to overcome obesity .....	15
Figure 3:SliceSalad.com (2019) Lewins chande management model process.....	16
Figure 4: Kurt lewin change – Google Search (2019) Source by jennifers0556. summarizing of the change process .....	18
Figure 5: Process of content analysis .....	26
Figure 6: Coding method.....	28
Figure 7: Eras protocol:guideline caring for patient in the surgery day .....	33

# ACRONYMS

AT-III	Antithrombin III)
BMI	Body Mass Index
BS	Bariatric Surgery
ERAS	Enhance Recovery After Surgery
HQOL	Healthy Quality of Life.
HRQOL	Health-Related Quality of Life
ICU	Intensive Care Unit
OSAS	Obstructive Sleep Apnea Syndrome
PA	Physical Activity
PAI-1	Plasminogen Activators Inhibitors 1)
QOF	Quality of Life
WHO	World Health Organization

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# 1 INTRODUCTION

Globally, there has been a remarkable change in feeding habits and sedentary lifestyle in most countries due to improvements in living standards. Many people in work Class cohorts have shifted their consumption habits from traditional food to fast food services. Such a change in consumption habits has not gone without problems. However, the prevalence of overweight and obesity are higher in developed countries like the United States of America, and the increase in weight gain diseases, including obesity is objectively the risk factor for coronary artery disease, aside from the increased prevalence of hypertension, hypercholesterolemia, and type II diabetes mellitus associated with obesity. WHO (World Health Organization) (2020). Stated that the rate of obesity and overweight continue to grow in adults and children, causing the death of over 4 million citizens each year, according to the 2017 global burden of disease. Of these, 1.9 billion adults are overweight, and over 650 million obese, 340 million children aged 5–19, and 38 million children under the age of 5 were either overweight or obese. 39% of adults are overweight, 13% being obese, and 47.1% of children, for over 2.1 billion individuals are either overweight or obese. Nevertheless, bariatric surgery started over 60 years ago, approximately in 1954, at a slow pace but eventually became prominent in the 1990s (Mandy 2012). The demand for bariatric surgery has multiplied in recent times due to its efficiency in fighting obesity. It is currently acknowledged as the gut and metabolism's best modifier to restore good health (Laffin & Karmali, 2014).

The authors did their surgical practical training in an abdominal surgical ward where clients were operated upon to reduce weight. This stirred up the motivation to carry out research to get a full understanding of some aspects in bariatric surgery. The authors hope that this research work serves as an inspiration, and a tool to impact knowledge on the reader as intended. Even though the authors experienced taking care of bariatric patients, endeavors are made not to be biased during this study by using personal experience.



## **2 BACKGROUND**

The use of surgery in treating health problems can be traced back to 3500 years ago, and it is used to solve specific clinical health problems after non-surgical procedures were explored. Surgery ranges from minor to major; major surgery is an invasive surgical process that requires penetration into the body cavity tissues that result in a permanent impairment, while minor surgeries are noninvasive, requiring only tampering of mucus membrane and connecting tissues (Ann, 2016). Therefore, bariatric surgery is considered a major surgery because it tampers with a body organ (for instance, stomach, duodenum, intestine,).

Bariatric surgery is a popular approach for people with morbid obesity who find it difficult to lose weight. The procedures are known for their efficacy of changing both metabolic and hormonal states associated with obesity co-morbidities. Patients must follow-up recommended treatments to decrease related co-commodity disease and increase health conditions before bariatric surgery. It is the final step of losing weight, where other medical and non-medical procedures have failed (Avanell A. et al, 2004). (Laffin & Karmali, 2014). Bariatric surgery is an effective treatment that brings changes for patients with type 2 diabetes in morbid obesity and other obesity-related complications (e.g., high blood pressure, obstructive sleep apnea syndrome (OSASI), and heart disease). However, most of the trials have been done observationally or retrospectively. Bariatric surgery is further classified into sleeve gastrectomy, Roux-en-Y (gastric bypass), adjustable gastric band and biliopancreatic diversion.

### **2.1 Bariatric procedures and types**

Bariatric surgery is a general surgical intervention with a significant risk of morbidity and pre-operative mortality. The type of bariatric surgery chosen will only be performed after a successful pre-operative evaluation improves and restores better health for overweight and morbid obesity patients. The scope of metabolic bariatric surgery has been demanding and progressing. There are distinct kinds of bariatric surgery, but they are commonly performed using less invasive laparoscopic procedures. Mandal A (2019) explains them as follow:

Sleeve Gastrectomy: a procedure performed laparoscopically, by removing part of the stomach to limit food intake and lower hormonal level.

Roux-en-Y or Gastric bypass: whereby a pouch is, so that food that passes the stomach is absorbed in the small intestine with the intension of limiting the level of food absorption.

Laparoscopic Adjustable Gastric Banding: a band is fitted at the top of the stomach to reduce the client's quantity of food intake.

The duodenal switch or Biliopancreatic diversion: is the removal of a more significant part of the stomach. Allowing the client to become full after eating a small amount of food.

## **2.2 Reason's people undergo bariatric surgery**

Obesity has proven to be a globally leading health disturbance. The world health organization (WHO 2014) has elaborated on some pertinent statistics of the prevalence of obesity. Following worldwide demography, the occurrence of obesity has: Increase in the geometrical rate since 1975, more than 38 million children under the age of 5 were overweight or obese in 2019, more than 340 million children between 5–19-year-old were obese in 2016. Between 1975-2016 the number rose from 4% -18%, which was almost similar in all genders (18% girls and 19% boys), 1.9 billion adults were overweight worldwide in 2016. Over 650 million were obese, 39% of adults in 2016 were overweight, with a proportion of 13% being obese. Yearly, the death rate is estimated to be 2.6 million. Thus, obesity is preventable and can be cured. There is no doubt, that being overweight has its proportion of the mortality rate. However, it is consolable that there are preventable measures as well as cured. One of the most effective ways of solving this health problem is the use of Bariatric surgery.

### **2.2.1 Obesity**

WHO (2020) defines obesity and overweight as “abnormal or excessive fat accumulation that is dangerous to the health. A body mass index (BMI) over 25 is considered overweight, and over 30 is obese”. Sheryl (2020) says that obesity can affect all aspects

of human's health. It is associated with high cholesterol, high blood pressure, type 2 diabetes, sleep apnea, heart attack, stroke, osteoarthritis, and some cancers, among other conditions. Morbid obesity is BMI  $\geq 40$  and its considered extreme or excessive weight (morbidly obese) if a person is 45kg/m<sup>2</sup> above the ideal weight.

Laffin & Karmali, (2014) define obesity as body mass index (BMI  $\geq 30$ ) greater than 30 and morbidly obese  $\geq 35$ .

Caroline (2016) described class 1 obese patient who could not achieve adequate weight loss after a reasonable period of non-surgical therapy, should not be denied access to bariatric surgery. Surgery should be highly considered for patients with BMI 30-34.9 kg/m<sup>2</sup> to prevent type 2 diabetes and other related morbidity.

*Table 1: Classes of obesity*

Class 1 obesity BMI 30-34.9.	Weight loss surgery should be considered as a possibility for patients in this category to prevent type 2 diabetes. Because diet and exercise programs are often ineffective at achieving major, long-term weight reduction and resolution of weight-related medical issues.
Class 2 BMI 35-39.9 and type 2 diabetes	Weight loss surgery should be recommended option for patients with poorly controlled type 2 diabetes.
Class 3 Extreme Morbid obesity BMI $\geq 40$ kg/m <sup>2</sup> and 45kg above idea weight	Bariatric surgery should be highly recommended as the only solution for a healthier lifestyle for patients with type 2 diabetes and related co-comorbidities regardless of the level of blood sugar control.

Body Mass Index (BMI) measured by height and weight and expressed in kilograms per square meter (kg/m<sup>2</sup>) to calculate if a person is overweight or obese. According to Sheryl (2020) BMI should not only be measured using height and weight. Other body composition should be considered like muscles. Several studies show that black people have lower body fat and higher lean muscle mass than whites at the same BMI, which

means that they may have a lower risk of developing obesity-related diseases. Although BMI is the right starting tool, it is considered an imperfect measurement for obesity.

### 2.2.2 Causes and Effects of Obesity

Weight gain is not mainly caused by poor nutrition. Although, unhealthy eating habits and lifestyle play a significant role. The more calories people consume and the fewer calories a person loses will contribute to weight gain. Thereby slowing down the body's metabolism; thus, weight gain becomes inevitable (Sheryl 2020). Furthermore, some aspects of obesity are caused by voluntary control. Hypothalamus regulates body weight and is responsible for receiving signals sent by the periphery indicating the end of a meal, both in the short and long term. These signals help individual integrates and determines when next to eat.

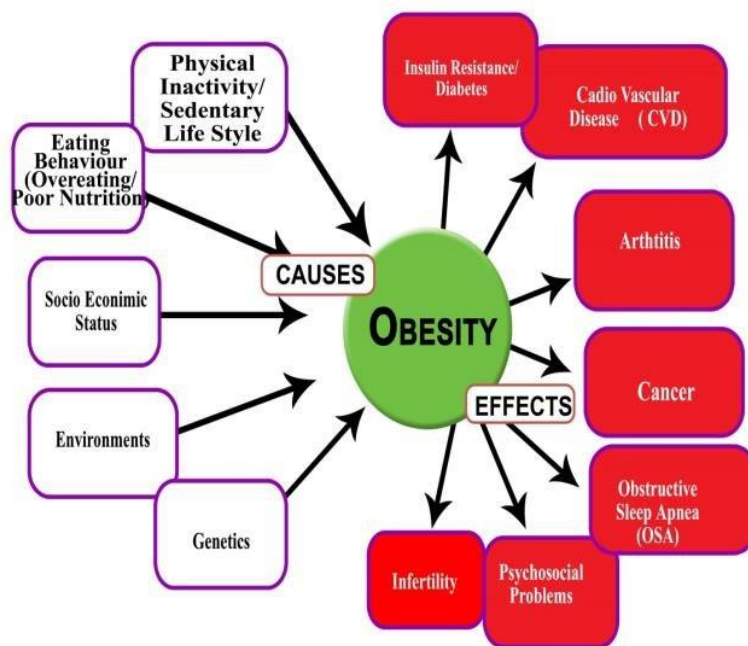


Figure 1: Uploaded by [Brahmanaidu Parim](#) explained the causes and effects of obesity.

### 2.2.3 Biological factors and Psychological factors

Stress and depression can contribute to eating disorders, and several other dysfunction can cause weight gain, as shown in the diagram above. Genetics, environment, culture,

medication, socio-economical status (finances), eating behavior (overeating, poor nutrition, and binge disorder), lifestyle sedentary (less physical activity PA).

Note that people who have inactive thyroid disorders can be obese, even with a high physical activity level (Sheryl 2020).

Using medications like steroids and some antidepressants can cause weight gain, Race/ethnicity, genetic disorders like gene mutation, leptin LEP, and leptin receptor (LEPR) hormone produced by fat cells that affect appetite (Sheryl 2020) and (Caroline 2016). According to the diagram above, obesity affects Insulin Resistance Diabetes, Cardiovascular Diseases (CVD), Arthritis, Obstructive Sleep Apnea (OSA), Psychosocial Problems, Cancer, and Infertility.

### 3 THEORETICAL FRAMEWORK

This chapter examines the change model by Kurt Lewin and other aspects of the literature of prominent researchers. The authors also choose the health belief model by Godfrey et al. Kurt Lewin's change model as a suitable framework for this research study. Combining the change model and the health belief model poses a significant benefit to this research study. These models are often referred to and applicable to health care settings when psychological change and understanding the need for change is needed. For example, before or after surgery. In this study the authors focus on obesity surgery and the needs for losing weight from the health care provider and the patient's willingness to improve their own health.

#### 3.1 Change and health belief model

Lewis said, *"If you truly want to understand something, try to change it"* He developed a change model involving three steps, unfreezing, moving to a new level or changing and freezing concepts. This model stands out and represents a useful and straightforward way of understanding Change. The fact that Lewis generates this practice is based on the belief that, when a person acknowledges that a change is needed, it allows him to have a different view of evolution. Thus, desires and behaviors occur when the individual work toward their new goal, setting this new attitude to a daily standard.

Health belief model by Godfrey, Stephen, and Irwin. Irwin explained that to predict the change in a person, one must perceive exposure, severity, benefits, and barriers. They consider the recommended preventative health act that understands a person's motivation and choice about seeking aid. *"People will respond best to ideas that will promote and prevent diseases from their health"*. To accomplish these changes, the person needs to follow four conditions so that differences can exist. Teaching and learning are a daily phenomenon. So, the person must perceive danger to seek help, more education is provided regarding their health and their willing to implement learning from the best of their knowledge.

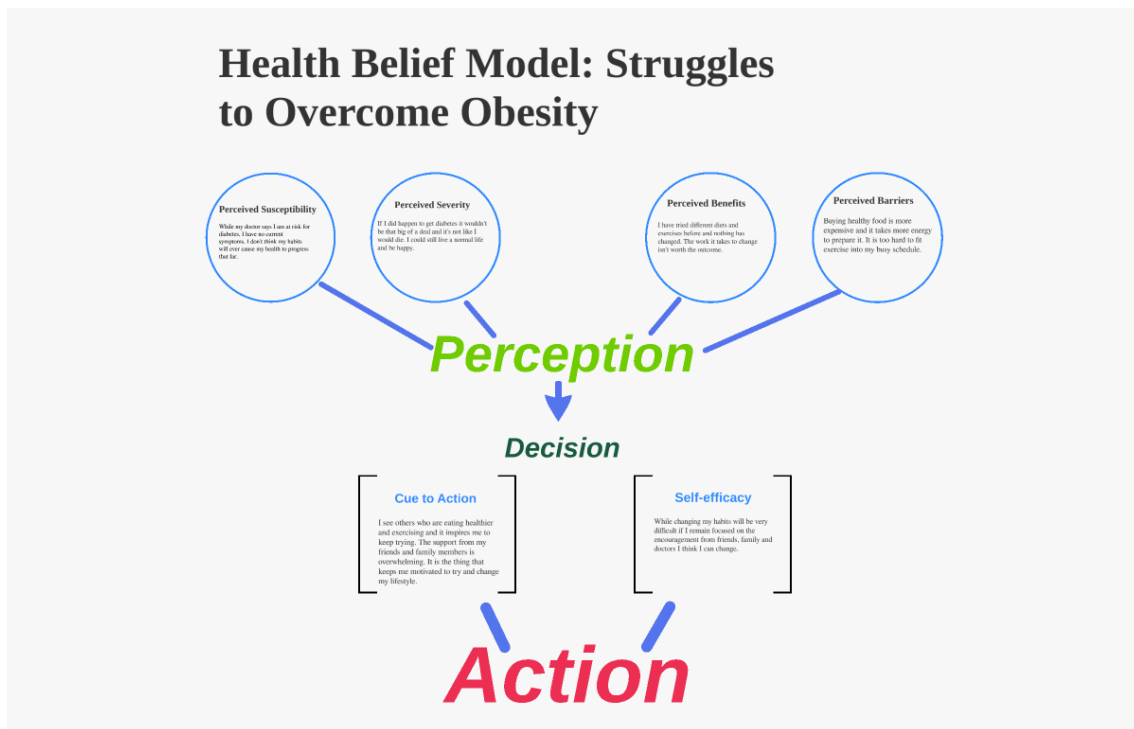


Figure 2: Prezi Published with reusable license by [Kaylee Hammon](#) (2016) Concept of health belief model when struggling to overcome obesity

1. The individual must believe that they are at risk of developing a specific condition. They must perceive danger in their health.
2. The person believes that the risk is severe, and the effects of developing diseases are adverse.
3. The person acts with the belief that change will reduce risk in specific parts of their life.
4. The person believes that any obstacle made toward change in habits can be managed and overcome.

Whenever a change is needed, the health belief model and change theory is widely recommended to promote health.

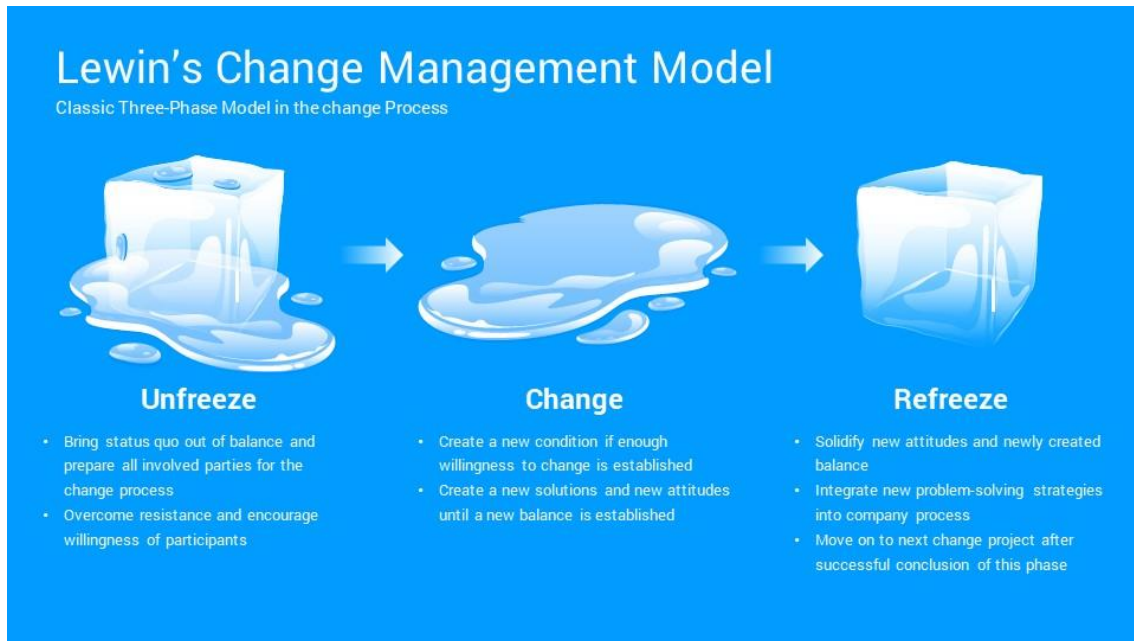


Figure 3: SliceSalad.com (2019) Lewin's change management model process

### 3.1.1 Unfreeze (perceiving and recognizing needs for change)

Unfreezing process is adopted in obesity health when moving a step towards change, the person must first be defrosted or unfreeze (Lewin's model). It applies to a personal realization that their health is at substantial risk of developing different conditions. They seek further help and solutions toward their beliefs. It can only happen after the person recognizes their situation. The unfreezing face allows Professional to elaborate more on adverse conditions, risk, and effect of a problem without changing certain behaviors. To move towards change, the person must acknowledge the risk and dangers involved and willing to change. Consequently, to start change, plans are developed by the professional and the client on how to work toward the change and keep it going (Kurt Lewis cited by study.com 2012) and (Brooke Jacques. 2016).

### 3.1.2 Change (making change happen)

The person is aware and decides that the risks involved reduced by the changes they are making, and the barriers can be overcome and managed to achieve the desired behaviors. Now that the person is willing to change (un-



freeze), the change should be carefully planned and executed. Lewins recognized the changing process as the part where the organization plays the most significant role in moving into the new stage and being the one to implement the change. This process is known as a transition stage. The transitioning part is where the change process becomes real, and people find it exceedingly difficult and struggle more with the new reality. It is hard to overcome this time because of fear and uncertainty (Kurt Lewis cited by study.com 2012).

For this reason, communication, patient education, their support/family, and time (how long the change will be) is crucial. So, professionals must always remind the person why change is needed and its benefits. Changes allow the person to learn and think positively about new behavior. The more prepared and informed individuals are for this stage, the easier the process is completed, and goal is achieved (Kurt Lewis cited by study.com 2012).

### **3.1.3 Refreeze (solidify and maintained the change achieved)**

According to Kurt Lewis theory cited by study.com (2012), the frozen state is the most vital and challenging phase of obesity. Because it occurs after a change by the organization process (after surgery), goals, structures, contributions, and the personal acceptance of the existing change. To safely guide the earlier implementation of change or to ensure not to fallback to former habits, the person must strengthen, stabilize, solidify, and maintain the new state/habits as their new pattern or routine (as their newfound way of thinking and doing). Developing positive thoughts and recognizing individual efforts is often used when reinforcing new habits (Diet and Physical Activity (PA)). Refreezing can be possible only if the patient accepts the changes made by the organization process, goal, structures, offerings, or people are accepted. There have been arguments that the refreezing step is outdated due to the continuous need for change. However, without the refreezing effort, there are possibilities that the patient may not be capable of maintaining the new lifestyle initially planned. Neither can it be kept permanent (without the refreezing stage, it is impossible to accomplish the planned goal or sustain the recent change). According to Lewin's model, it is vital to understand that change is a gradual process requiring taking one step at a time (Kurt

Lewis, cited by study.com 2012). Below is a diagram that summarizes the key activities of the change model.

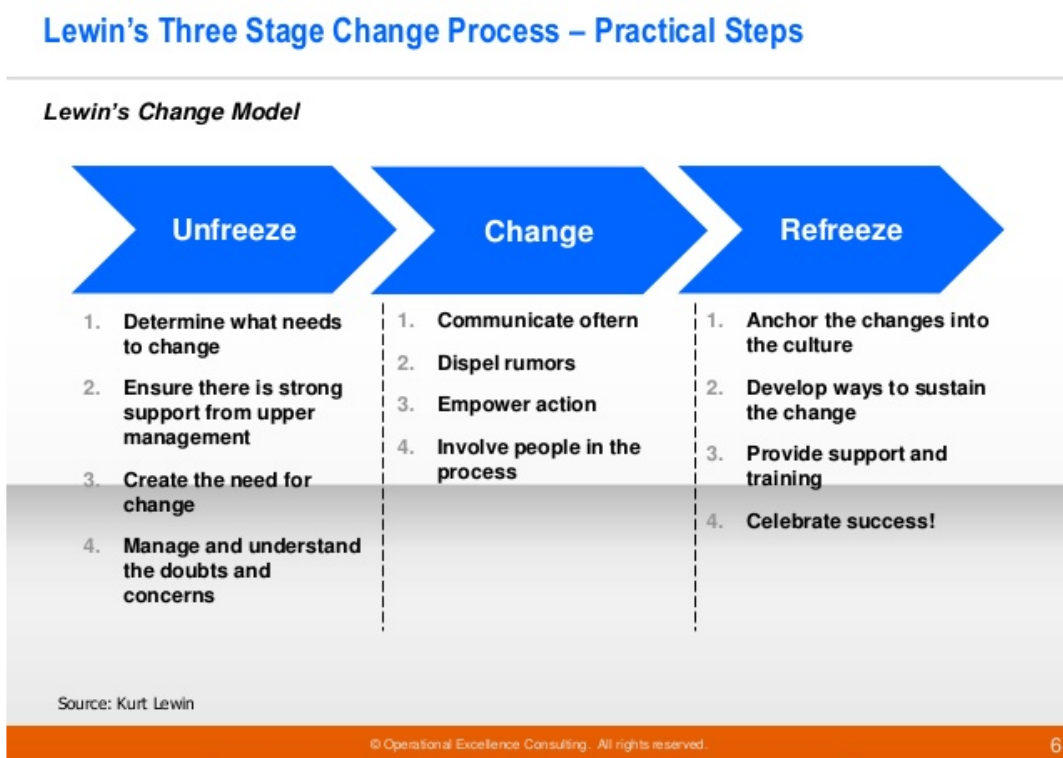


Figure 4: Kurt lewin change – Google Search (2019) Source by jennifers0556. summarizing of the change process

### 3.2 Procedures of Eligibility

In Obesity, BMI is used as a diagnostic tool to measure or calculate body fat. Stacy et al, (2006) explained that while selecting a candidate's suitability, it must be evaluated with several methods to decrease surgical risks. The patient must be selected carefully after accomplishing a multidisciplinary pre-operative evaluation. The evaluation process is designed to find co-comorbid conditions closely before surgery and show any contra-indications.

The patient must know the significant lifestyle changes needed after surgery and follow the post-operative diet, vitamin supplementation, and follow-up. Applicant selections should include the following criteria.; age 18-60, the patient must have a higher body mass index (BMI) of 40 kg/m<sup>2</sup> or BMI 35 kg/m<sup>2</sup> with significant obesity-

related diseases, acceptable operative risk, documented failure of non-surgical weight-loss programs: prior attempts to lose weight by non-surgical means have failed, A well-informed and motivated patient, psychologically stable with realistic expectations, supportive family/social environment. Absence of uncontrolled psychotic or depressive disorder and no active alcohol or substance abuse.

## **4 AIMS AND RESEARCH QUESTION**

According to some of the statistics stated above and based on bariatric surgery literature reviews, this study aims to achieve the following.

1. To find out the benefits associated with bariatric surgery and the benefit associated with patient's education before and after bariatric surgery.
2. To understand nursing roles in post-operative bariatric units.
3. To assess the extent and level of preunderstanding needed by the candidates to achieve a positive lifestyle change after the surgery.

### **Research questions**

For the investigation process and to answer the complexity of this study, the researchers decided to ask the following question as a guideline detecting to answer the results of the investigation.

1. How important or valuable is a patient education before and after obesity surgery?
2. What roles does nurses play in post-operative phase of the patient care?

## **5 METHODOLOGY**

This chapter outlines a qualitative research method whereby details collected from other associated articles to the paper's topic were reviewed. The researchers chose the qualitative method as a convenient and suitable method for a small sample, critically giving an overview to meet the study's aims. Data was collected from Google scholars, YouTube and database. A search method was done according to the Arcada thesis Guide. Inclusion and exclusion criteria were implemented in the study.

### **5.1 Data collection**

Articles were searched and collected scientifically from google scholar and database sources such as CINAHL, EBSCO Host Academic search complete, PubMed, and SpringerLink. ResearchGate was used to open articles that could not open in SpringerLink due to payment restrictions. This was performed simply by copy pasting the title of the article in ResearchGate. YouTube channel was used to gain more knowledge as feedback from bariatric patients views and healthcare provider. The search where use as a function for finding Academic scholarly articles related to bariatric surgery. A search method was done according to the Arcada thesis guard. The authors selected 20 academic articles related to the research subjects and examines the articles. The articles were selected based on its relevance to the subject aims and purpose of the study. Which was to investigate the importance of patient education before and after bariatric surgery and the role of nurses. The articles aimed and question were included in the search criteria. Search was limited by Peer-reviewed, full text, including citations and free access, pdf text, articles not less than 10 years (2010-2020) and English language.

In database search: CINAHL, EBSCO, PubMed and SpringerLink was used to perform search words "Bariatric surgery or obesity surgery" bariatric surgery and patient education, "the important of patient education in bariatric surgery" and "post-operative care after bariatric surgery." Filters were applied such as linked Full text, full pdf text, publish year 2010-2020, peer reviewed, academic journals, language English and articles

relevance to the research questions were selected. The search resulted to 17 potential articles that were used in the study.

Table 2: Selected articles from libguides database search

No.	Boolean search words	EBSCO	CINAHL	PUBMED	Springerlink/researchgate
1	“Bariatric surgery” or “obesity surgery	Hits 1 964 articles. 6 chosen.	Hits 226 articles. 2 chosen.	Hits 2 096 2 chosen.	
2	bariatric surgery and patient education	Hit 18 1 chosen.	Hits 11 1 chosen.	Hits 7 article. 1 chosen.	
3	“The important of patient education in bariatric surgery”			Hits 10 articles 1 chosen.	
4	Post-operative care after bariatric surgery				Hit 8 817 articles. 3 chosen. Thorell et al. 2016. Both Pieracci et al. 2016 & Maghrabi et al. 2019. was opened from research gate.
Chosen articles		7	3	4	3

Excluded criteria: Include articles not English, not peer reviewed, older than 10years, not nursing related, not full-free access, irrelevant articles related to bariatric surgery. Therefore, it was necessary to look and read the articles titles, abstract, introduction and conclusion before choosing suitable articles for the research aims and questions.

Table 3: Exclusion and inclusion

Inclusion	Exclusion/ deduction
<p>Relevant to.</p> <ul style="list-style-type: none"> <li>❖ Relevant to the research topic, aims (such as the benefits and nursing role) and research questions.</li> <li>❖ Not less than 10years and randomly controlled studies.</li> <li>❖ Reviewed articles were eligible.</li> <li>❖ Peer review.</li> <li>❖ English language.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Systematic reviewed articles that were not eligible.</li> <li>❖ irrelevant articles related to bariatric surgery.</li> <li>❖ Other than 2010, not peer-reviewed, not full free text and not relevant to the research questions.</li> <li>❖ Other languages</li> <li>❖ Articles that needed payments were also excluded.</li> </ul>

In Google scholar: data was searched by using keyword such as “bariatric surgery” or “obesity surgery,” “bariatric and obesity surgery,” “patient education before and after bariatric surgery.” Thousands of articles were found using these keywords mentioned above. Filters was applied using time range customized from 2010-2020, sort by relevance, include citations and patents. “Bariatric surgery” 82 500 results in 0.06secs., “Obesity surgery” 17 400 results in 0.12secs, "Bariatric" and "obesity surgery" 16 400 results in 0,06secs., “Bariatric” or “obesity surgery” 17 500 results in 0,03secs, “Patient education before and after bariatric surgery” 18 100 results in 0.11secs., “post-operative care in bariatric surgery” 17 900 results in 0.12secs. Furthermore, the authors included “Pre- and Post-operative patient education in bariatric surgery” 16 500 results in 0.03secs.

Most of the articles found were already chosen by the researchers from database search such as (CINAHL, EBSCO, PubMed) except with the Keyword: “bariatric surgery or obesity surgery” with 17 500 results and 2 articles selected were Manuel mayo, et al. (2014) and Gerber, Anderin & Thorell (2015).

The authors found an interesting YouTube channel by Dr Matthew Weiner. (2013) and use the video by translating their understanding from Dr Matthew Weiner regarding meals bariatric surgery patients should eat.

### **5.1.1 Choice of Eligible Articles**

The researchers applied and used the following inclusion and exclusion criteria in choosing the 20 articles. The articles were selected and included. Articles were selected randomly from google scholars and database searches.

Research gate: was used to open articles that were relevant to the subject that could not opened from database search. The authors copy pastes the title of the article and search through research gate and then choose the articles.

YouTube: A video was watched in YouTube related to meal on first day in post-operative bariatric surgery was also added to the collection.

### **5.1.2 Lists of Selected Articles**

1. Al-Rubeaan Khalid, et al. (2020). Enhance Recovery Program Versus Conventional Care in Bariatric Surgery: A Systematic Literature Review and Meta-Analysis.
2. Aleeya & Leah (2016). Quality of Life Outcomes of Bariatric Surgery: A Systematic Review.
3. Areej Alkhalid, et al (2019). General and Postbariatric Nutritional Knowledge Among Patients Undergoing Bariatric Surgery.
4. Cassie I. Story. (2019). Hematological Consideration after Bariatric Surgery
5. C. E. Owers, et al. (2012). Perioperative Optimization of Patients Undergoing Bariatric Surgery.
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## 5.2 Data analysis

Content analysis as a technical tool that focus on both identifying manifest content as well as latent content. To conduct a content analysis, data is firstly converted in textual form if it is in other forms (like video or audio clips). Based on the study objective, the textual data is coded into various categories at a variety of levels – word, word sense, phrase, sentence, paragraph, or theme. The coding categories represent distinctive characteristics of interest based on the research objective and they are collectively known as coding scheme. Coding scheme is applicable to the entire body of text, for the purpose of obtaining uniform and quality information. The information collected can be used to draw conclusion or combined with other data for conducting further statistical analysis. In case of quantitative content analysis is used in a deductive way by using theory, to develop coding scheme. In contrast, qualitative content analysis may involve inductive evolution of coding scheme through analysis of collected data (Gaur & Kumar 2017).

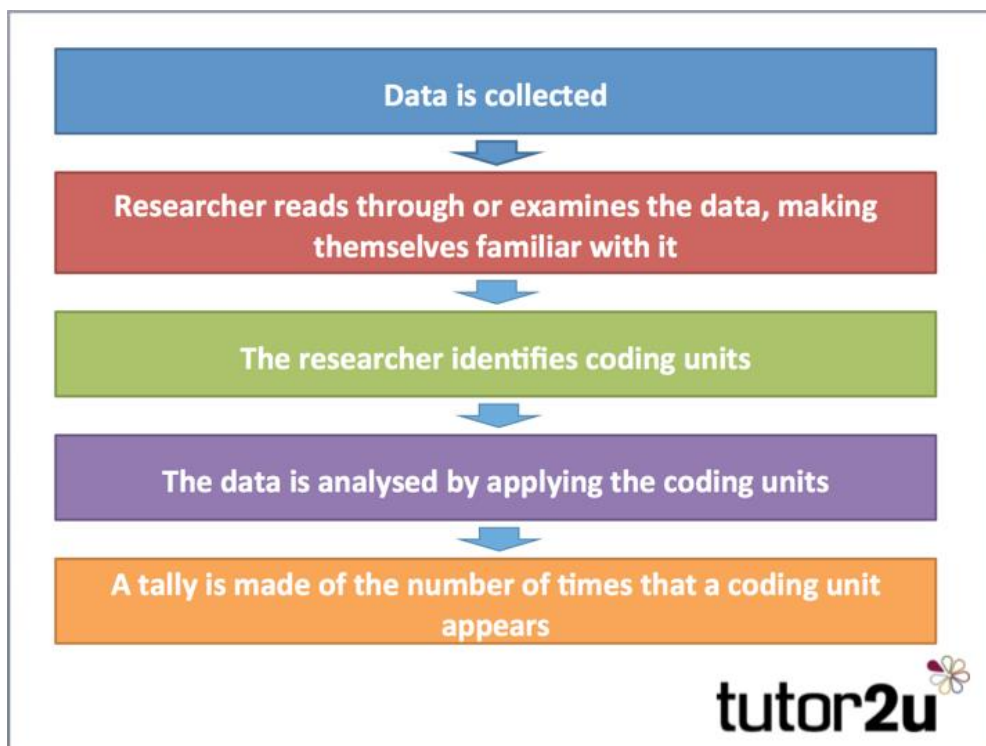


Figure 5: Process of content analysis

For the motive of this research, related articles, video, theory, and model were collected. A literature review is made to understand the meaning, reasons, pre and post bariatric surgery, benefits, complications, and nurses' role. The research was conducted using a deductive approach as a suitable means to emphasize the importance of care and patient's education in bariatric surgery. The researchers understood that when conducting a deductive approach, theories, and articles like the research should be put in place to answer the research questions and to meet the aims of the study. In this way, they are deductively comprehended and tested (Raimo, 2019).

Data will be analyzed in an open-ended manner following the research questions and the theories. Literature reviews are used as a tool to analyze the data collected from other authors. Sashi (2010) stipulated that a qualitative approach focus on preliminary explanations and interpretation of what is in a context. Therefore, it is vital to acknowledge that the data will be accentuated by the meaning and purpose of the participants which, in this case, the participants are the researchers. A search method was done according to the Arcada Thesis Guard, 20 academic articles related to the research topic were selected by the authors. The articles were selected based on its relevance to the topic (post-operative care in bariatric surgery) The articles aimed and question (patient education before and after the surgery) were included in the search criteria.

### **5.3 Coding Schematic**

Coding is part of methodology that analysis data by identifying themes or codes that appear in literature.

## Choosing Appropriate Coding Methods (Type of Qualitative Research Question)

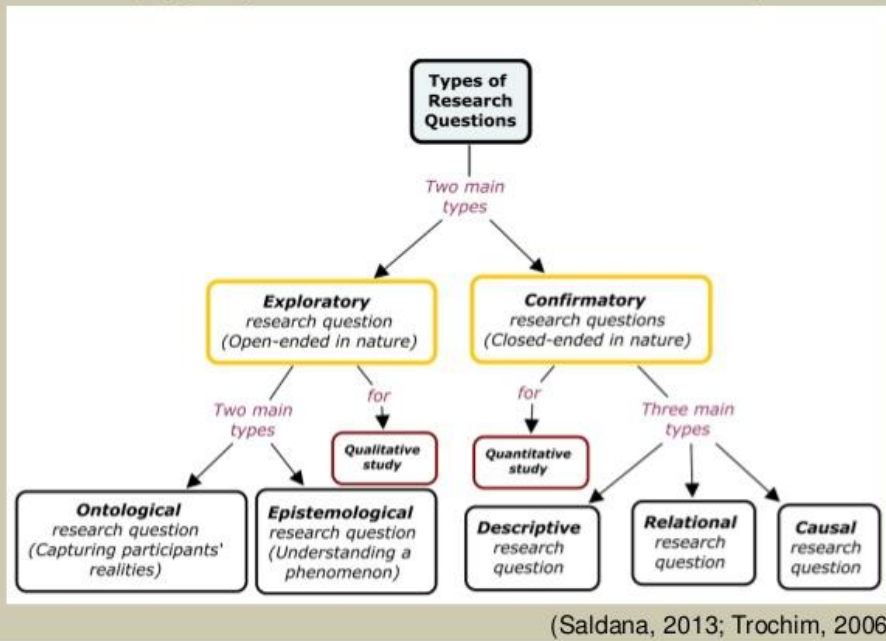


Figure 6: Coding method

The coding methods provide the researchers with top choice and maximum flexibility. Coding is widely used in research explaining all the work in a study. Emphasizing the way data was divided and the way it was classified and interpreted. Coding works as a vital component of multiple methodologies for interpreting data. Coding may be employed to describe verbal and textual studies. To text, categorize, and make sense of literature reviewed. In coding, the researcher can produce their own coding scheme based on the literature review's objectives. During this process, it is acceptable if the researchers decide to add or remove some of the coding categories if the changes are not too extensive and if done towards the end of the coding process (Gaur & Kumar, 2017).

After understanding the above, the authors carefully read and reviewed all articles collected and transcribed the video into a text. While reading, the authors wrote out and highlighted important notes and point with a pen and paper. Similarities and differences were stated through information articles and categorized.

Table 4: Categorization of Data Analysis

<b>Theme</b>	<b>Importance of patient education in bariatric surgery</b>		
<b>Sub theme</b>	<b>Pre-operative</b>	<b>Post-operative</b>	
<b>Categories</b>	patient centered approach	Development	nurse centered approach
<b>Sub-categories</b>	change Consistency in new behaviors Dependency	Challenges Benefits steady attitude risks complications	Assistance Counseling encouragements
<b>units</b>	18 14 12 8 10 9 11 2 6 3	18 11 14 12 8 10 9 13 20 2 5 6 15 17	14 11 13 12 19 10 11 5 1 4 15 3 6 17

## 5.4 Ethical values in research study

While preparing this thesis, Arcada's guidelines on good scientific practices in studies were read, followed, and understood by the authors. The guideline helped the authors to provide truthful information, knowledge, and prevent fabrication, falsification, plagiarism, and misappropriation of data not failing to acknowledge others work and contribute innovative ideas to the body of nursing science. The works and writing of authors and students were respected, given references and appropriation credits. According to The Finnish Advisory Board on Research Integrity TENK, (2012) Recognitions and respect were given to other researcher publications cited appropriately in this research. Appreciations were given to their work and achievements. These guidelines' objective

is to promote the responsible conduct of research and prevent misconduct in research in all organizations involved in research work, such as universities and research institutes. Before carrying out this study, lectures were taught by thesis supervisors on ethical considerations and research methodology were properly understood. This ethical rule was put into studying to achieve all the criteria required and scientific knowledge standards. The authors planned, conducted, and reported in detail on the research process.

## **6 FINDINGS**

Findings are formed logically from the problem, research question, and design. Results or evidence of research, whether quantitative or qualitative. Explaining the outcomes of all data collected is descriptive statistics, inferential statistics, or coding and themes, for example, in qualitative research. The analysis presents the findings in a research topic, questions, objectives, theoretical framework. (Bloomberg and Volpe, 2016). Also, findings show clarity on how research problems and research questions are addressed and present a clear and narrative pattern using verbatim quotes that is relevant and thick description. Narrative data are connected and synthesized through substantive explanatory text and visual display, when applicable some tables and figure may be deferred to the appendices.

Therefore, this chapter's content is based on all findings the authors collected from 1 video transcripts and 19 articles. It is the overall outcomes that answer the questions and meet the aims of the study. The findings were categorized into Theme: important of Patient education prior and after bariatric surgeries. Sub theme pre-operative education and post-operative education. These were categorized into their main findings in both pre and post as Nutritional dietary, physical activity, weight loss, how BS. patients are selected, awareness of risk and complications that may occur after BS. Like vitamin deficiency and the benefits of creating new habits after surgery.

Patients' needs to be aware before BS what causes obesity and facts of what might happens to their health if measures are not taken, what they need to do, how they can change their behavior to promote own health, health care plan is drawn and the benefits of how their knowledge will prevent further morbidity diseases related to obesity. Hence, surgery is carried out. Although it has been stated severally that Laparoscopic surgery has superseded open surgery in bariatric surgery meaning open surgery is rarely performed (Thorell, et al. 2016).

### **6.1 Clinical care plan**

Laparoscopic is used in performing bariatric surgery in Roux-en-y gastric bypass (LRYGB), sleeve gastrectomy (LSG) and one anastomosis gastric bypass (OAGB) and

they are the most performed BS (Al-Rubean, et al. 2020). Also, enhanced recovery programmes is use as a tool of care guideline that support the patient before and after laparoscopic surgery. It helps reduce hospital stay, monitor the patient intake, allow the patients to make use of all available resource provided by the hospital and its focuses on reducing physiological stress response to surgery. Finally, it helps and reduce complications that may occur.

### **6.1.1 Nurses' roles after bariatric surgery**

Bariatric surgery is among the most performed gastrointestinal surgeries due to obesity in types 2 diabetes (Pieracci et al.2010). According to Mahawar 2018, the planning of patients care in bariatric surgery needs various professionals like bariatric physicians, endocrinologists, dieticians, psychologists, specialist nurses, anesthetists, and chest physicians are needed. So, nurses must be aware of the anatomical and physiological changes associated with bariatric surgery, routine care, identity, and to manage complications (Mahawar 2018). Bariatric Patients are at risks of several early and late complication related to major abdominal surgery, so nurses need to be conscious of early complications such as Bleeding, Gastrointestinal leaks, Chest infection and pulmonary embolisms (with or without thrombosis). Also, nurses must be alert of urgent medical review after bariatric procedure if there is a persistent heartbeat greater than 120 beats/min (tachypnoea and tachycardia) (Mahawar 2018).

To monitor patients in post-operative units after bariatric procedures, ERAS- protocol is designed to use as care guidelines to address the unique care requirements of the morbidly obese in the acute care setting. Nurse's care includes early removal of drains and tubes, stop iv fluids, give opioids to control pain post-operative antibiotics, and Early mobilization, early oral intake of fluids and creating awareness to the patients on symptoms, risks, and complications that may occur after surgery, assessment, and intervention addressing wound care, medications for pain management, early ambulation, deep vein thromboembolism prophylaxis heparin to prevent blood clot, fluid management and nurses discontinue urinary catheter with 48 hours (Fencl et al 2015). The illustration below explains details of ERAS protocol that helps nurses provide better care and education to obesity patients.



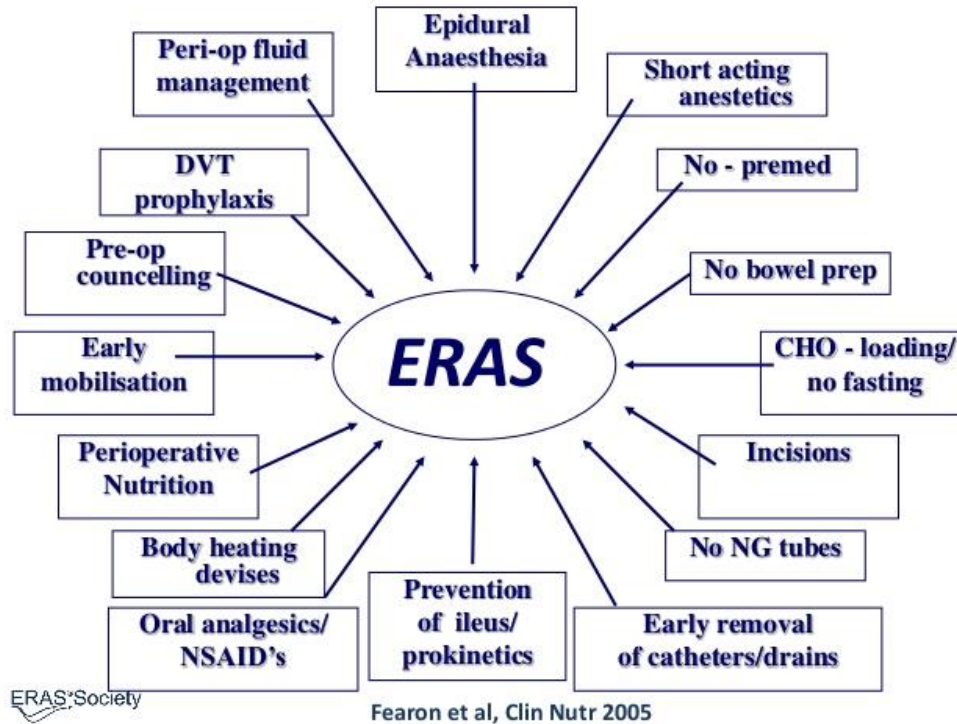


Figure 7: Eras protocol: guideline caring for patient in the surgery day

Educating patients: ERAS protocol helps caregivers to provide appropriate education and safety to patients during their stay at the hospital.

Wound care & infection: informing the patient how wound care is managed and when to seek help and providing valuable information.

Nutritional intake: measuring and observing patient intake and output.

Medication: medication hematology after bariatric surgery such as pain medication & vitamins (vitamins deficiency and anticoagulant use).

Instructions During discharge: Follow up & Maintenance of the new lifestyle:

The nurse must teach the patient vocally and provide a writing guide that can help if they forget the new lifestyle instructions. The nurse and the patient should review and discuss any new medication dosing time and arrange a follow-up. The nurse must discuss the incision site on how to care and help ensure that the patient understands any indication of signs and symptoms that needs urgent help (Fencil et al 2015).

The use of Enhanced recovery after surgery (ERAS) protocols have been introduced to reduce surgical stress and facilitate post-operative recovery. By reducing complications

and limit hospital stay (2.5 days) by application of ERAS pathways. Thus, ERAS programs constitute comprehensive and evidence-based best care. Modified ERAS protocols are successfully used in peri- and post-operative care of BS. Nurses should be aware during education that there are several factors known to affect understanding when teaching a patient, which also depends on the outcome of continuous weight loss. Such as also Age, Gender, Culture/ Ethnicity/ religion, Education, Environment (the location where the person lives).

### **6.1.2 Nutritional education before and after obesity surgery**

Reports show that knowledge in nutritional education on pre- and post- bariatric surgery increases patient adherence effectively (Maghrabi, et al. 2019) and (Lier, et al. 2012). The candidates' understanding of the importance of nutritional intake is the most focused subject of bariatric surgery. According to Lier, et al. (2012), attending dietary pre-operative group counseling offered by individual healthcare settings is mandatory in tackling nutritional-related problems like Binge disorder. There is excellent improvement following nutritional education because the patient understands the importance of changing bad eating habits to healthy eating and that weight loss is attached to healthy life quality. Both authors above agreed in their studies that not all patients retained pre-operative education, and the patient must pass the pre-operative test of their bariatric procedure knowledge and the lifestyle change that is necessary before the surgery. 17% of the patients thought weight loss is guarantee regardless of what food they ate after surgery or what they did (Lier, et al. 2012). According to Maghrabi, et al. 2019, the retention of nutritional education on weight loss is vital prior to obesity surgery to prevent regaining weight after surgery and the patient knowledge must be evaluated on lifestyle changes before the surgery to figure out their level of understanding and find out ways that may help to minimize risks and complication after the surgery. Also, it is crucial for the healthcare professional to know the patient dietary progress and food behavioral relationships of the patients, like the consumption of proteins and micronutrient supplements and nutritional therapy for primary gastrointestinal symptoms. To prepare the patient to refreeze long term lifestyle change, dietary changes are essential, and it requires the patient's attendance in nutritional education and counseling. Poor understanding of nutrition from an obese patient will lead to adverse risks of taking less protein than the

required amount needed to help heal, recover after surgery, and prevent lean body mass (Maghrabi, et al. 2019).

Nutritional education affects all changing aspects of bariatric surgery from pre, post and follow-up. Due to the long wait for the bariatric patients, it is more beneficial that the learning process continues until the operation. Lier, et al. (2012). Also, from the beginning of pre-operative counseling to the end of the treatments, the clinicians must provide the following initiatives. Introduced the candidates to a diary recording of all their activities and educated them on their food (nutritional) intake, planned and executed exercises, practiced mindfulness, and watched their eating behavior.

The patients learn to practice and develop skills like problem solving and cognitive behavior methods.

Stress reduction skills (yoga and food consumption) mindfulness.

The dietician recommended all the participants to eat 3-4 meals and two snacks and documents about their eating.

The patients must continue communication with a specialist and regular attendance of pre- post-operative and follow-up will support weight loss. Almost all the participants were contented with the pre-education and they agreed that it creates a better understanding on surgical procedures and lifestyle changes (Lier, et al. 2012). The knowledge on nutrition's decreases because of the prolonged period between pre- and post-operation (Maghrabi, et al. 2019). Overall, there are positive relationship between patient attendance to post-operative support groups and counselling groups and degree of weight loss after bariatric surgery (Lier, et al. 2012).

### **6.1.3 Physical activities before and after obesity surgery**

Initiating Physical activities PA counselling from the onset of pre-operative care contributes to improving the patients' health. It helps them lose weight, maintain a long-term surgery outcome, and reduce complications (king & bond 2013) and (Owers, et al. 2012). However, regardless of PA's contribution and vital role in weight loss operation, there is no specific evidence showing pre- and post-operative educational guidelines in bariatric surgery. According to King and Bound 2013, there are different PA recommendations from different organizations. Like the American Society for Metabolic and

Bariatric Surgery (ASMBS) suggested, mild exercise like aerobic and light resistance training 20mins/day 3-4 days a week before surgery improves cardiorespiratory fitness and reduces risks of surgical complication. Also, it facilitates healing and enhances post-operative recovery. The American Heart Association (AHA) also suggested similar activity like “mild” pre-operative exercise regimen of low-moderate-intensity PA at least 20mins/day 3-4 weeks/week.

Although numbers of studies have evaluated pre-operative weight loss’s potential to reduce post-operative complication rate, the studies address the possible connection between pre-operative weight loss and post-operative weight growth over time. Unfortunately, there were no reduction in the complication rate after the operation for patients who accomplished 10% weight loss before bariatric surgery (Gerber, et al. 2014). Nevertheless, all bariatric patients should be encouraged to lose weight before surgery (Owens, et al. 2012). PA counselling should begin with a patient interview. The five A’s is a useful tool for structuring PA therapy (Assess, Advice, Agree, Assists, Arrange) for all adults with chronic conditions. the motivated patients can increase their PA, leading to important health’s benefits and the guideline provided can assist in reaching PA goal and a justify routine PA counselling is safe when patients follow guideline (king & bond 2013). Also, stated that.

All bariatric patients should be educated on the benefits of regular PA and develop a reality view on the outcome expectation. For instance, teaching the patient that when PA increases its better cardiorespiratory and maintains weight loss. Nevertheless, PA does not eliminate the saggy skin.

## **6.2 Earlier Education on Risks and Complication that may occur after Bariatric Surgery**

Surgeries are sometimes associated with complications; therefore, bariatric surgery is no exception. Laparoscopy is used to carry out bariatric surgery unless there are some adverse circumstances due to preceding abdominal surgeries. Therefore, patients need to be aware before the surgery on possible risks and complications that may occur during and after bariatric surgery.

### **6.2.1 Smoking**

Smoking increases the risk of post-operative morbidity and mortality. it attributes to reduce tissue oxygenation (resulting in wound infection), pulmonary contribution, and thromboembolism. Therefore, all bariatric patients must stop using tobacco at least 4 weeks before surgery (Thorell, et al. 2016).

Most complications that usually occur after bariatric surgery is perceived to be caused by an increase in the concentration of Thromboembolic, Antithrombin III, and both Fibrinogen and Plasminogen Activators Inhibitors produced adiposities (Pieracci, et al. 2010). Context to post-operative setup, clients are put in the intensive unit, especially if they suffer from sleep apnea, asthma, and other illnesses. Moreover, post-operative obese patients who are critically ill, required 24 hours monitoring in the ICU (Intensive Care Unit) (Mahawar 2018). Patients should be taught or be aware of post-surgical anastomotic leaks and hematomas that may occur because of technical errors or bleeding sutures or staples, resulting in sepsis (Owers, et al. 2012). Also, Bariatric surgery patients are susceptible to inadequacy of vitamins and nutrients due to changes in eating habits and less absorption of nutrients due to surgery.

### **6.2.2 Vitamin deficiency after Bariatric Surgery**

All obese patients should be screened for nutritional deficiency before weight loss surgery, and if any nutritional deficiency is identified it should be treated before obesity surgery (Story 2019). Patients are educated to continue to take nutritional supplements as prescribed. The extent of nutritional inadequacy after the operation relies on what type of bariatric surgeries is carried out. For instance, after gastric bypass, patients are prone to deficiencies of the fat-soluble vitamins (A, D, E, and K), calcium, and increased vulnerability of getting anemia; hence, deficiencies in iron, vitamin B12 and other micronutrients (Areej Alkhalidy et al. 2019). The malabsorption of calcium and vitamins due to bariatric surgery leads to increased parathyroid hormone, causing bone calcium release, which eventually causes bone density and danger to osteoporosis (Owers, et al. 2012). Story (2019) explains that there are extensive impact of micro nutritional deficiencies on hematological disorder before and after BS. Because obesity is known as a risk factors related to deficiency of micro-

nutrient, and iron, anemia, or both, which are common in obesity. During the post-operative follow-up, patients are checked on iron absorption. Because obese patients are prone to iron deficiency, insufficient intake of iron increases hepcidin production and if not treated, it impairs the synthesis of hemoglobin which could lead to anemia. Normally iron is absorbed in the duodenum and upper jejunum, where it is transported or stored in the bone marrow. Anemia is connected to insufficient intake of main nutrients (protein, iron, folate, and vitamins).

### **6.2.3 Movement after surgery**

Sitting or lying down without any exercise after the surgery, increases Venous stasis and pulmonary hypertension. Also, increases the risk of endothelial dysfunction resulting from surgical injury can cause the blood to clot, resulting in thromboembolism complications (Pieracci et al. 2010). Furthermore, (Wolfe et al 2017) explain factors that pose as patients' major complications can be predicted by extreme BMI, obstructive sleep apnea, inability to walk 200 steps, and history of DVT. Also, other related comorbidities, smoking and age.

The combination of mechanical compression stockings or intermittent compression devices and prophylaxis with low molecular weight heparin are used to prevent deep vein thrombosis (DVT) because most obese patients' legs are too big for surgical compression stockings. Therefore, fabricated foot pumps are made to decrease venous thromboembolism risks. Pieracci et al. 2010 says that the patient positioned should be at a reverse Trendelenburg posture at 45° such that the pelvis is higher than the head. Though this posture limits full breathing but, it lessens thrombosis.

## **6.3 Benefits and the outcomes of bariatric surgery**

Presently, there are recommendations after investigations that neither pharmacological nor dietary management can keep up long-term weight reduction as bariatric surgery (Nazer Waleed et al. 2017). Medically or non-medically, the paramount aim of bariatric surgery is to achieve significant weight loss (Wolfe et al. 2016). The focus of eliminating and improving co-morbidities related to obesity like diabetes type 2, car-

diovascular risk hypertension, gastro-esophageal reflux disease, urinary incontinence, venous stasis, and fat reduction around the neck. which relieves sleep apnea, and stress (weight-bearing stress), improves insulin sensitivity and glucose level, enhances life quality, and decreases mortality. It is vital to assess the risks involved (Wolfe et al. 2016). Guidelines have been taken to bypass them, surgery for weight loss has proven efficient as the only remission of weight loss (Nazer Waleed et al. 2017).

Laparoscopic bariatric surgery has clearly and rapidly superseded open surgery, the use of laparoscopic providing the patients significant reduction in post-operative complication and the benefits of not staying longer time at the hospital, reduces the rates of incision hernial, reduces intraoperative blood loss, less post-operative pain as well as earlier recovery (Thorell, et all 2016). Bariatric surgery is among the most performed gastrointestinal surgeries due to obesity in types 2 diabetes (Pieracci. Et al.2010). It also promotes and improves psychological factors such as self-esteem, body awareness, depression and general well-being, and life quality (Aleeya & Leah 2016). Numerous studies show that individuals who have undergone bariatric procedures have achieved incredible weight loss, both short and longer-term (Wolfe et al. 2016). This achievement is considered successful when a person loses 50% of weight and failure was described as weight loss less than 30% at a year after surgery (Fencl et al, 2015). Manuel mayo et al. (2014) said that not all people could reach 50% of the excess weight loss. Sometimes, because they fail to maintain excess weight loss, resulting in a fall back in weight, physical exercise will become useful for the individual. Also, some factors should not be neglected as benefits before the procedure. Like age, gender, diabetes, physical activities, eating behaviors, and BMI before surgery can determine more weight loss (Wolf et al. 2016).

Owers et al. (2012), explains that for post-operative bariatric surgery to become more effective, taking other vital majors to reduce risk should be considered as early in the application period or during the first visit before selecting eligible clients for such operation such as:

Observe the patient's mindset to a healthy lifestyle and willingness to change the earlier lifestyle, encourage the patient to adopt new and healthy behaviors. In this way, the success rate of the operation will increase continuously, even after the procedures. For instance, quit smoking, maintaining regular physical exercise of at least 30minutes every day promotes cardiac functions as well as insulin control, educates the patient

on nutritional intakes like low fat dietary, low salt and vegetable diets will decrease atherosclerosis (formation of plaques in the arteries) in the long-term. Most centres often provide counselling and recommend patients attend all seminars with a bariatric specialist dietician who recommends them on pre-and post-operative nourishment and they also, assesses patient's general knowledge on bariatric surgery before the surgery and losing weight after surgery, if the patient know exactly what to eat and when to eat and how important is counselling.

## **6.4 Dietary guidelines after bariatric procedures**

The patient's protein intake, iron, vitamin B12, and calcium supplementation is mandatory. It should be monitored as early as post-operative (Thorell et al. 2016), and the patient is expected to follow the eating guideline provided by the dieticians. All the patients undergoing bariatric surgery will receive a nutritional education intervention and complete the eating after bariatric surgery questionnaires to evaluate their understanding before the intervention (Maghrabi, et al 2019). After bariatric surgery, two dieting phases are recommended: Phase One and Phase Two. These recommendations are based on eating and what to eat, and when to change a meal.

### **6.4.1 Phase One**

Fencl et al., 2015. Explained that this phase1 begins from discharge to the first post-operative follow-up, which is at least 3 weeks from the discharge date, and the patient must be educated verbally or in writing upon discharge on certain criteria. The education should be about the initial dietary progress from clear liquids to adding high-protein liquid meals. The nurse should reinforce the appropriate meal selection that can be provided in a liquid form. The type of food the patient must eat high protein meal will help the patient heal, promote hydration, and provide the initial behavioral change. The patient should have the ability to tolerate clear liquids, drink three (3) liquid meal supplements daily without nausea or vomiting, ambulate independently, and void without difficulty. Following Weiner 2013, the phase 1 instructions' goal is done so that the patient



can focus on protein and hydration. So, patients drink about 1,182.9ml of fluid every day (no juice).

*Table 5:Meals for day 1-2 in post-operative care*

Clear liquid diet of protein and hydration day 1-3 after surgery
Chicken or vegetable broth. Water Herbal tea Regular green tea and coffee Sugar-free popsicle Crystal light and other calories-free flavored drinks. 15 grams of protein. Eat less than 200 calories 200g or less. And High concentration protein.

#### 6.4.2 Phase Two

This phase includes early post-operative follow-up in weeks three to eight. This visit aims to assess diet status, identify maladaptive eating behavior, evaluate potential problems like internal hernia, and monitor co-morbidities status. Also, encourage regular PA, discuss weight-loss progress, and check the laboratory test for vitamin B1, B12, magnesium, phosphorous, blood cell count, albumin a metabolic profile. According to Weiner (2013), the patient should slowly advance meal every 2-5days and eat low-fat food containing rich protein on each step below:

Soft diary: Yogurt. Plain, low fat (organic), blended fruits, cottage cheese, and apple.

Well cooked vegetables: Should be soft and mushy Carrots, sweet potatoes, asparagus, broccoli, cauliflower.

Beans and eggs: eggs poached, fried, scrambled, or hard-boiled. Beans: soup is the best for BS patients (high proteins)

Fish and nuts: Fish flakey or baked (tilapia, cod, perch) patient should avoid sea food first. Nuts: raw or natural are excellent source of protein.

Chicken and others: Chicken: patient should try dark meat first, if the patient can tolerate chicken, then almost all meal can be tolerated.

*Table 6: Changing from liquid to solid/normal meals*

Groups	Diet	duration
Phase 1	Clear liquid	2-4 days
	Full liquid	Day 4 to 3 weeks
Phase 2	puree	2 weeks to 1 month
	soft	1 month to 6-8 weeks
	Normal meal	Begins at week 8 after the surgery and this is a continuous guideline that will help maintain weight loss and prevent regaining weight.

### **6.4.3 Recommendation on eating after Bariatric surgery.**

According to Gagan et al 2015 and Fencel et al 2015. After bariatric surgery, the patient are recommended on the following

The patients are advice to drink liquids 30 mins before and after eating (no drinking during meal), the minimum consumption of protein should be 50g daily, eating enough protein helps the body to heal, supply nutrition and prevents loss of lean muscle mass. Eat lots of balance diet. These include meals like vegetables, fruits, and whole grain because they are higher in fiber and can prevent constipation and help keep full or satisfied. Vegetables and fruits are low energy but high in water and fibre. Thus, helps in maintaining body weight (Tariq Aldawqiez et al 2017). Eating more regularly five to 6 small meals (portion sizes). Avoid fried foods high in fat sugar content. However, if

sugar is consumed, it should not be more than 10g of sugar per serving and 3g of fat or less. Eat slowly for 20-30 minutes and Chew very well and take small bites each time. Food that are not properly chewed may cause nausea or vomiting. Stop eating when satisfied. Drink minimum of 6-8 cups of non- calorie liquids between meals. Drinking lots of water can promote weight loss either through changes in metabolism or decreasing the intake of calories (Tariq Aldawqiez et al 2017). Few months after bariatric surgery the rule of nutrition is same as trying to maintain a healthy lifestyle. Weiner (2013) recommends that, the patient focus their energies on work, hobbies, friends, and families. To monitor intake before and after bariatric surgery, bariatric patients are educated during counselling and advice by the dietician to documents daily intake.

## 7 DISCUSSION

The study was performed to examine how important is patient knowledge before and after bariatric surgery. Therefore, the information presented from this literature review is an important step in understanding the status of patients undergoing obesity or bariatric surgery and their learning. The results show a model for evaluating patient nutritional knowledge prior to surgery and post-surgery, needs for planning, the target of the educational sessions is to improve patient adherence to post-operative dietary recommendations and making a lifetime dietary change to maintain weight loss by eating proper proteins and nutritional supplements.

In the literature review, the researchers found out that, obesity is a global epidemic on both medical and social problem, causing high morbidity and mortality rates. Globally, in 2016 it was recorded that 1.9 billion adults were overweight, among them 650 million were obese and more than 340 million children between ages 5–19 was also obese with an estimated death rate of 2.6 million every year. Therefore, the impact of obesity to health and life is considered severe, carrying alongside major risk factors with a variety of disorders associated with type 2 diabetes mellitus includes hypertension, coronary heart disease, stroke, sleep apnea syndrome, gallbladder disease, dyslipidemia, osteoarthritis, gout, and certain types of cancer. According to findings, many beliefs that obesity is only caused by excessive eating. However, obesity is a complex, multifunctional chronic disease influenced by several factors, like genetics, endocrine, metabolic, behavioral, environmental (social and cultural), and psychological components. This mechanism involves energy intake that exceeds energy output. There are several methods of treatment used to prevent and address this epidemic. However, bariatric surgery has been acknowledged as the only technique that provides effective long-term treatment for morbid obesity (obese class 3 with BMI above 40kg/m<sup>2</sup>). Laparoscopic is used in performing bariatric surgery in Roux-en-y gastric bypass (LRYGB), sleeve gastrectomy (LSG) and one anastomosis gastric bypass (OAGB) and they are the most performed obesity surgery. Also, enhanced recovery after surgery (ERAS) and enhanced recovery programs (ERPs) are used as a protocol for guideline care, improving and supporting patient care before and after laparoscopic surgery. It helps reduce hospital stay, monitor the patient intake, allow the patients to use all available resources provided by

the hospital, and focus on reducing physiological stress response to surgery. Thus, it helps and reduces complications that may occur.

Recently, an increased number of organisations performing bariatric and metabolic surgery laparoscopically, enhanced awareness of quality measures, and perioperative outcomes have become hospital administration's focus. Improvement of surgical techniques and the management of perioperative protocols have led to continuous safety in bariatric surgery. Therefore, B.S is considered safe and effective when reducing weight, particularly for high-risk obesity-related health diseases. Complications were few and controllable in laparoscopic surgeries, and the benefits associated with health after bariatric surgery are enormous. If lifestyle-change interventions are successful, it provides a significant sustainable weight loss for morbidly obese patients and improves obesity-related co-morbidities. Meaning, the patients experience a reduction in numbers of cardiovascular deaths, lower frequency of heart attack, stroke, and long-term, reducing the prevalence of specific cancer in women, particularly endometrial cancer.

The study reveals the importance of the nursing role in BS, particularly in educating the patient's pre and most operatively. The preparation of BS requires all the various health personnel such as the nurse, dietitian, physiotherapist (Pieracci et al. 1,2016). It is vital to check the patient's awareness of the underlying health conditions, risks, and complications. The nurse preoperatively makes the patient understand and see the need for a weight loss; guidelines are put forward, followed by the patient with supervision and encouragement from the nurse. They educate the patients on wound care, risks, and interventions to complications after BS. The healthcare personnel also hold multiple evaluation and counseling sessions to prevent patients from falling back to their old habits, thereby motivating them to seek continuous support and encouragement from health personnel, friends, and family members. This enables the patient to stay on steady, healthy behavior as planned, known as the refreezing stage according to Kurt's change and health belief model.

The benefit of BS is overwhelming. Though BS is to fight against weight loss, its process eliminates other health risk disease such as diabetes, hypertension, gastric refluxes,

insulin insensitivities, sleep apnea, and many others. Nazer waleed et al. 2017 imply that BS is the absolute remission to weight loss. Even though there are over types of BS, the laparoscopic procedure is outstanding because it ensures low risks and enables the patient to have a quick recovery and shorter stay in the hospital, resulting in less cost and burden to the patient and the hospital. Aleeya & Leah 2016 also implies that BS helps to boost patients' body awareness, general well-being and even alleviate depression. Wolfe et al claims that success is considered if a patient drops 50% of weight and failure if the loss is 30% after surgery within a year. therefore, the result of BS is incredible both in long and short term.

## **8 CONCLUSION**

Analysis gotten from the literature review and findings on how valuable patient education before and after obesity surgery and what role nurses play in post-operative phase of a patient care after bariatric surgery shows in this research work that bariatric surgery is an ultimate method to solve the problem of being obese with co-morbidities after other medical and non-medical procedures have been tried-out. The precise cause of obesity is unknown, but it is visible that there is multiple connection between biological, psychosocial, and behavioral factors, which include genetic foundation, socio-economic status, and cultural influences. Also, this condition may result from disease or pharmacologic treatment and a risk factor for the development of comorbid conditions (Nazer Waleed et al. 2017).

Not all overweight people need surgery; therefore, one must be eligible with certain criteria, as stated in the text above. Nevertheless, such surgery has risks but can be overcome by carefully examining what bariatric surgery type is suitable for a client. According to Kurt's theory of change, the client must be fully aware of the guidelines of risks and benefits accompanied by change. Therefore, to stay on a particular behavior, there must be a constant reminder of benefits, encouragement, and ways to maintain the desired outcome. In this case, the nurse's role in guiding and educating the client cannot be overly emphasized. However, the understanding of the patients regarding nutritional intake before and after the procedure is vital.

### **8.1 Strength, Limitation, & Recommendation**

The researchers encountered the following strengths that led to the completion of this research work:

There was weekly supervision of the research work by the supervising teachers.

The authors were able to register as a student to search sites in order to access some articles, there were many good articles, theories, and models during the search, which gave the authors a wider range to determine suitable ones. Finally, the authors find strength in one another.

Certainly, no project or research study can be carried out without some constraints. With literature review (qualitative research), there is a slide tendency to be biased in analysis.,

Time was limited. If not a questionnaire or an interview would have been carried out to find out statistics on how frequent bariatric surgery is carried out in a particular hospital setting and evaluate the level of education the patient received.

Some relevant articles suitable for this research paper were found but require payments to be accessed.

Also, the prevalence of covid-19 prevented the authors from meeting regularly during this research.

How to overcome future limitations: The authors limitations could be overcome in the future if all articles are accessible to students and if undergraduate's thesis time expand to 1 year period, perhaps start thesis class in second year of a study then there will be enough time to carry out a quantitative research by sending questionnaires following ethics of gaining approval of the participants. Also, if there is no restriction on gathering or meeting (no covid-19).

Recommendation: Obesity surgery should be strongly considered/recommended for patients with BMI 30 to 34.9 kg/m<sup>2</sup> to prevent the occurrence of type 2 diabetes and other related morbidity. Patients should be well educated, and the counselling process should continue until the surgery. Health education is recommended to assist obese patients to stay on a positive lifestyle and intend to do away with co-morbidities. A further research may be carried out to examine the motivating factors that can influence a consistency on the new lifestyle after bariatric surgery.



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