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## **Challenges in Nutrition Education among Patients undergoing Bariatric Surgery: A narrative review**

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### **Abstract**

Bariatric surgery is one of the most effective therapies for achieving long-term weight loss in people with severe obesity. However, nutrition education can be very difficult due to various factors. This article aims to explore the challenges of nutrition education in patients undergoing bariatric surgery. A literature search was conducted using the terms 'bariatric surgery', 'nutrition education', 'nutrition challenges', 'healthcare providers', 'obesity' and 'patient education materials'. The evaluation showed that patients need longer follow-ups by healthcare professionals to support their motivation to change. Patients need more user-friendly and engaging resources with images, videos, and animations.

**Keywords:** Bariatric surgery, nutrition education, narrative review, patient education

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### **1.0 Introduction**

Overweight and obesity can be characterised as a state when there is an imbalance between energy consumption and expenditure, leading to the accumulation of excess fat and causing various negative health effects. The incidence of obesity is escalating significantly as a result of the amalgamation of both poor dietary habits and a lack of physical activity (Koo et al., 2023). The World Health Organisation (WHO) has acknowledged obesity as a global health concern. Malaysia has the greatest rate of obesity among the adult population compared to the other ten countries in Southeast Asia. Malaysia has had a significant increase in obesity rates over the past twenty years, with prevalence rising roughly five-fold from 4.4% in 1996 to 19.7% in 2019 (Koo et al., 2023). Based on current worldwide trends, it is projected that over 1 billion adults will be classified as obese, while 2.7 billion persons will be classified as overweight. Furthermore, it is estimated that by 2025, over 177 million adults will experience serious consequences due to obesity (Koo et al., 2023). Consequently, there has been a significant increase in the demand and necessity for bariatric procedures in the country. Bariatric surgery is widely recognised as a highly

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effective treatment for achieving sustained weight loss and reducing the impact of associated health conditions and mortality in individuals with severe obesity. Severe obesity is linked to a range of health morbidities, such as diabetes, hypertension, cardiovascular disease, and others. It can provide significant health benefits to those who have not been able to achieve weight loss through non-surgical methods (Tan et al., 2019). Nevertheless, educating patients on the management of bariatric surgery presents a significant obstacle due to the inability of many patients to maintain their weight and adhere to recommended lifestyle changes. This paper aims to investigate the challenges associated with providing nutrition education to patients undergoing bariatric surgery.

## 2.0 Literature review

### 2.1 Prevalence of Obesity

Obesity is categorised as having a body mass index (BMI) of 30 or higher. It poses a substantial risk for several chronic illnesses, such as cardiovascular diseases, cancer, and type 2 diabetes (Sherf-Dagan et al., 2021). As per the World Health Organisation (WHO), obesity is a worldwide epidemic that poses a significant threat to public health, affecting around 1.9 billion individuals who are overweight and around 600 million who are clinically obese (Koo et al., 2023). By 2025, it is projected that the worldwide obesity rate will be over 18% for men and over 21% for women (Tantengco, 2022). The National Health and Morbidity Survey (NHMS) 2022 has revealed a concerning deterioration in the general health and lifestyle behaviours of Malaysians. Based on the NHMS, Adolescent Health Survey 2022, almost 33% of Malaysian teenagers were categorised as overweight or obese in the previous year. Given that obesity is classified as a chronic disease, its therapy focuses on managing weight and addressing the specific characteristics and related disorders over an extended period of time. In order to account for the presence of several causes, obesity treatments may encompass, either individually or in conjunction, modifications to one's lifestyle, pharmaceutical interventions, and/or surgical procedures (Tzvetkov, 2023). Surgical surgery is the most highly recommended therapy for Morbid obesity (Body Mass Index - BMI  $\geq 35$  kg/m<sup>2</sup>) after lifestyle improvements or unsuccessful pharmaceutical attempts (Tzvetkov, 2023).

### 2.2 Bariatric Surgery as Management of Obesity

Bariatric surgery (BS) is largely acknowledged as the most efficacious intervention for extreme obesity with minimally invasive and less risk procedures are offered to patients which significantly enduring weight reduction, enhancements in obesity-associated health issues, and ultimately enhanced quality of life (Aderinto et al., 2023). Despite Bariatric Surgery can be advantageous in reducing the burden of obesity and comorbidities, it considered as expensive intervention which require long term commitment of care from careful preoperative evaluation to thorough postoperative care to sustain positive long term health effects as patient might have high risk to develop nutrient deficiencies and challenge in weight loss. (Aderinto et al., 2023). In order for a Bariatric Surgery operation to be deemed effective, there must be a minimum of 50% reduction in excess weight (EWL), which must be maintained for a duration of at least five years (Tzvetkov, 2023). The long-term preservation of surgical success has been recognised as a serious challenge between 18 and 24 months after the surgery (Billing-Bullen et al., 2022). Following Bariatric Surgery, several factors are commonly observed, including the development of eating disorders, the absence of healthy habits, a lack of physical activity, excessive alcohol consumption, smoking, and the body's physiological adjustments to anatomical changes in the stomach, intestines, and hormones, which vary depending on the type of surgery performed (Billing-Bullen et al., 2022). Therefore, psychological support is crucial to help patients navigate these challenges successfully. Ensuring access to long-term dietary and psychological support is a key responsibility of bariatric surgery services. These services should be readily available to patients to help them maintain their health and well-being throughout their post-operative journey. Healthcare providers play a crucial role in delivering this support and helping patients navigate the complexities of life post-surgery (Sherf-Dagan et al., 2021).

### 2.3 Nutrition Education

Nutrition education plays a vital role in ensuring that individuals are aware of and utilize proper dietary sources of nutrients. It also helps people make effective use of available health services and interventions provided by government agencies or other organizations. Nutrition education encompasses a range of factors, including beliefs, attitudes, environmental influences, and understanding about food (Ab Hamid et al., 2021). It aims to lead individuals to adopt practical and healthy dietary practices that align with their unique needs and available food resources. Education is a catalyst for behaviour change, taking individuals from a lack of interest in nutrition to a state of appreciation for knowledge and motivation to take action for better health. Nutrition education can be delivered through various methods, including fact sheets, pamphlets, brochures, audiovisual

messages, and digital platforms (Ab Hamid et al., 2021). The choice of approach should ideally be customized to the specific needs and goals of the target audience (Ab Hamid et al., 2021).

### 3.0 Methodology

A comprehensive literature review was conducted utilising four prominent databases, namely PubMed, ScienceDirect, Google Scholar, and ClinicalKey. This review utilised publications written in the English language published between 2019 and 2023. The search criteria employed to get the relevant papers were 'bariatric surgery', 'nutrition education', 'nutrition difficulties', 'healthcare providers', 'obesity', and 'patient education material'. The complete publications were acquired if their abstracts elucidated the difficulties of bariatric surgery pertaining to nutrition education, the determinants, and consequences of unintelligible instructional materials. On the contrary, this study excluded papers that were published more than five years ago, written other than English language and the intervention focus on the non-surgical approaches.

### 4.0 Results

According to the literature analysis, there are numerous difficulties associated with providing nutrition instruction to patients who are undergoing bariatric surgery. The findings are summarized and presented in Table 1.

Table 1. Challenges of Nutrition Education

Challenges	Themes	Description
Long-term support	Patients feel unsupported by the Bariatric team. Feelings of loneliness	Patients express a need for ongoing support because it is challenging to change eating behaviour and they are struggling with their eating mindset.
Barriers to practicing healthy lifestyles	Financial concerns Lack of time and motivation to make a change Low health literacy level Easily influenced by advertisements.	Patients reported that healthy foods are always expensive and are time-consuming to prepare. Patients reported to have lack of knowledge in healthy food choices.
Online resources/Digital educational tools	They are shared ideas/recommendations between patients and health professionals. A need for reliable online resources. Patients worried about false information on the Internet	Patients express a need for accessible resources and reliable platforms to share journeys or seek information.

### 5.0 Discussion

The success of nutrition education programs relies on effective implementation strategies and should be tailored to the specific needs and characteristics of the target community. However, a researcher noted multiple challenges for nutrition education among Bariatric Surgery patients, primarily most perceived nutrition education as short term, less suitable in the aspects of contents, structure and design, not meeting the patient's needs and use of printed educational methods.

#### 5.1 Short-term support

Around 35% of individuals undergo weight regain starting from two years after the surgery. This weight regain can have both physiological and psychological consequences, potentially compromising the overall success of the Bariatric Surgery (Billing-Bullen et al., 2022). One suggested reason for weight regain is the continuation or reemergence of maladaptive eating behaviours. The risk of weight regain tends to increase over time post-surgery. Following significant physiological and metabolic adjustments, the process of substantial weight loss reaches a plateau after approximately 12 months, and there is a heightened likelihood of weight rebound. The study by Billing-Bullen et al. (2022) focused on a specific time frame between 18 and 21 months post-surgery. During this period, a significant proportion of participants (67%) experienced weight gain. Additionally, a subset of participants (10.7%) gained a substantial amount ( $\geq 5$  kg), indicating a noteworthy increase. All individuals experienced challenging eating patterns, including emotional and binge eating, excessive snacking, overeating, and unconscious night snacking (Tzvetkov, 2023). Hence, participants expressed a desire for extended follow-up with healthcare providers to ensure continued progress in their weight loss journey. Nevertheless, a majority of patients expressed a sense of inadequate support from the bariatric team, particularly during the period of discharge when the task of sustaining weight loss became more difficult. This lack of support was particularly evident as most appointments were primarily scheduled within the initial year following the surgery, when weight loss was at its highest (Billing-Bullen et al., 2022). Even though physiological changes reduced the ability to eat or binge on large volumes of food, the mindset associated with binge eating persisted. This resulted in overeating, particularly on foods perceived as less conducive to weight management, such as biscuits or chips. This reflects a recognition of the ongoing challenges and the need for sustained support beyond the initial post-surgery period.

#### 5.2 Suitability of Educational Materials

Patient education plays a crucial role in healthcare. Research has established that patients who get education exhibit reduced anxiety levels, possess enhanced readiness for health professional consultations, actively participate in decision-making processes, and achieve more favourable patient outcomes (Kwame & Petrucka, 2021). Patient education in Bariatric Surgery is typically delivered in two main forms which are written and verbal. These methods are employed to convey essential information such as basic care instructions, dietary regulations, and treatment positives (Kwame & Petrucka, 2021). While verbal education is a common practice in Bariatric Surgery clinics, it has some limitations. Verbal instructions may be easily forgotten, and the core message may not be fully understood, as patients tend to retain only 20% of what they hear (Schubbe et al., 2020). Alternatively, patients prefer to use written educational materials as it has been shown to have several advantages. Patients who receive written information, in addition to verbal communication, experience decreased anxiety, less nausea and vomiting, fewer postoperative complications, reduced medication use, and shorter hospital stays (Schubbe et al., 2020). Moreover, written materials also facilitate patients' ability to cope with their situations. Rather than relying solely on verbal communication or written materials, a comprehensive approach involves combining both methods (Schubbe et al., 2020). It is emphasized that written educational materials should be used as an adjunct to verbal education rather than a substitute. Providing written educational materials after verbal communication in Bariatric Surgery clinics ensures that patients have a permanent and recallable source of information. This approach is considered more effective in enhancing patient understanding and engagement (Schubbe et al., 2020).

Thus, for written materials to be valuable, they should meet certain criteria. Patients must be able to read and understand the content. Apart from this, the information should be based on scientific foundations, realistic, and current (Mbanda et al., 2021) to ensure that the materials are reliable and contribute to the patient's overall understanding. Despite the increasing demand for written educational materials, there is a significant concern about the suitability of many materials. Mbanda et al. (2021) noted that when the written educational material is evaluated, a substantial portion of written materials lacks appropriateness in terms of content, structure, design, composition, and language. A common issue identified is that written materials are often written at an inappropriate level, without considering the age and health literacy of the reader. This can make it challenging for patients to comprehend the information and limit the overall value of the educational material. Patients may find educational materials complicated due to more complex wording and fewer illustrations (Schubbe et al., 2020). The use of overly technical language and a lack of visual aids can hinder understanding. Hence, using plain language is crucial in written materials for patient education and it is recommended to avoid medical jargon. For instance, using terms like "Bariatric Surgery" instead of "Metabolic Surgery" or "Bad cholesterol" instead of "Low Density Lipoprotein" (Mohd Salim et al., 2023) can easily be understood by the target audience. Additionally, a researcher also should consider the effective design which includes word choice, image use, and the overall visual appeal of the materials. Mbanda et al. (2021) suggest using colours that are appealing to the target audience because patients have reported that readily available educational materials are often in black and white, which may not be as attractive to them (Mbanda et al., 2021).

### *5.3 Patient's Educational Needs*

Before choosing educational materials, a researcher must conduct a professional assessment of the patient's educational needs. This involves listening carefully to the patients' perceptions and understanding what information they want to know about bariatric surgery (Schubbe et al., 2020). After identifying the patient's educational needs, a researcher should consider demographic, social, and financial factors when developing materials. Factors such as financial situation, price of food, availability, beliefs, and habits can significantly influence individuals' eating habits (Billing-Bullen et al., 2022). Financial stress is reported as a common barrier, and researchers should be aware that promoting expensive healthy food choices may not be practical for everyone (Billing-Bullen et al., 2022). Other barriers include a lack of knowledge about making healthy food choices, influenced by food product advertisements, and time limitations in making good food decisions (Billing-Bullen et al., 2022). In addition, researchers should consider developing quick and easy menu plans to help patients prepare healthy meals because patients may express concerns about the cost and time associated with preparing healthy meals. While health recommendations promote nutritious choices, individuals may find it cheaper and more convenient to opt for fast food. This is particularly relevant for individuals with long working hours, as they may face challenges associated with lower fruit and vegetable consumption and a higher intake of fast food or convenience foods (Billing-Bullen et al., 2022). Such that, understanding these perspectives is crucial for developing practical and realistic educational materials for patients with Bariatric Surgery (Billing-Bullen et al., 2022).

### *5.4 Digital Health Education*

Patient education can be disseminated through diverse modalities, such as individual consultations, interactive classroom sessions, telephonic assistance, video presentations, online platforms, slide presentations, and printed resources (Sherf-Dagan et al., 2021). This variety allows for tailoring educational approaches to the preferences and needs of individual patients. While printed formats like infographics or leaflets are considered reliable, they may have limited accessibility (Sherf-Dagan et al., 2021). Patients reported that relying solely on printed materials can be restrictive, especially when they need information on the go (Sherf-Dagan et al., 2021). Participants often turn to the Internet for information about healthy choices or dietary options during various situations such as what to eat during family gatherings. However, there are mixed views on the benefits of online information (Wang et al., 2023). While it is easily accessible, there are concerns about the accuracy of medical information available online (Wang et al., 2023). The increasing demand for reliable digital educational materials is driven by

patients becoming more proactive in seeking health information regarding Bariatric Surgery. Digital materials offer unlimited access to resources and facilitate patient engagement (Mbanda et al., 2021). Despite the potential benefits, digital communication tools in pre-bariatric surgery education have received modest attention. For this reason, there is a need for increased exploration and utilization of digital tools in educating patients before and after bariatric surgery. Several studies have demonstrated favourable patterns in behavioural modifications and weight reduction when employing mobile technologies, such as motivational messages and video-based educational modules, to equip patients for bariatric surgery (Sherf-Dagan et al., 2021). In a nutshell, patients express a desire for healthcare providers to use digital education tools, as they provide flexibility and operate outside the constraints of place and time (Haleem et al., 2021). This aligns with the changing preferences of patients who seek information at their convenience.

## 6.0 Conclusion and Recommendation

Our results demonstrate that lack of ongoing support from healthcare professionals, less suitability of educational materials in aspects of content, design and language are the challenges in nutrition education. In short, addressing the issues related to the appropriateness of content, readability, and design is crucial for the effectiveness of written materials in patient education. Striving for simplicity, clarity, and patient-friendly language, along with visually appealing design elements, can enhance the understanding and engagement of patients with educational materials. In addition, factors such as financial constraints, work commitment and low health literacy level also contribute to the barriers to healthy eating habits among patients undergoing Bariatric Surgery. So, future research should know that different strategies should be tailored to a patient's educational needs to reduce the barriers to adopting a healthy lifestyle. Moreover, health professionals can develop reliable educational materials that are promising, powerful and effective tools for presenting data, explaining concepts and providing basic insights into the information towards providing better support and improving the long-term health and well-being of Bariatric Surgery patients. However, the limitations in this review include the inability to perform a more in-depth analysis of the challenges of nutrition education due to lack of publications that emphasize education among patients undergoing Bariatric Surgery. Secondly, this review also has insufficient access to all educational materials related to Bariatric Surgery because it is only available to patients but not to the public.

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## Paper Contribution to Related Field of Study

This study offers insights into the obstacles encountered in nutrition education, which can aid in formulating more effective strategies for creating instructional resources for patients following Bariatric Surgery. In the long run, this study has the potential to decrease weight regain in patients who have undergone Bariatric Surgery and enhance their adherence to dietary guidelines.

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