



Body mass index control program for obese patients in a primary healthcare setting

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ABSTRACT

Obesity is a major public health problem and an important risk factor for non-communicable diseases, including hypertension, diabetes mellitus, cardiovascular disease, and metabolic disorders. Body Mass Index (BMI) control is an essential strategy in obesity management, particularly in primary healthcare settings where preventive and promotive interventions can be implemented directly at the community level. This study aimed to analyze a BMI control program for obese patients in a primary healthcare setting. A descriptive observational approach was used through field surveys, direct observation, counseling, interviews, and anthropometric data collection at HTM V Primary Clinic, Natar District, Lampung Province, Indonesia. The program included nutrition education, dietary management, physical activity promotion, behavioral modification, body weight and BMI monitoring, waist circumference measurement, comorbidity management, and patient counseling. The findings indicate that the program helped improve patient understanding of the relationship between obesity, BMI, physical activity, vital signs, and the risk of non-communicable diseases. The use of interactive educational media and participatory counseling also supported patient engagement in adopting healthier lifestyle behaviors. Although measurable long-term BMI reduction was not fully evaluated in this study, the program demonstrated potential as a primary healthcare strategy to support obesity management through health education, lifestyle modification, regular monitoring, and continuous patient motivation. Strengthening follow-up evaluation and documenting changes in BMI, waist circumference, physical activity, and metabolic risk factors are recommended to improve future program effectiveness.

1. Introduction

Obesity is a growing public health problem that affects individuals across different age groups and communities. It is closely associated with lifestyle changes, low physical activity, unhealthy dietary patterns, sedentary behavior, and increasing

urbanization. Obesity is not only a condition of excess body weight but also a major risk factor for various non-communicable diseases, including hypertension, type 2 diabetes mellitus, cardiovascular disease, dyslipidemia, metabolic syndrome, and musculoskeletal disorders. These conditions can reduce quality of life, increase healthcare costs, and place a significant burden on public health systems [1, 2].

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Body Mass Index (BMI) is widely used as an initial screening tool to assess nutritional status and identify overweight or obesity. Although BMI does not directly measure body fat distribution, it remains useful in primary healthcare settings because it is simple, practical, inexpensive, and easy to apply in community-based screening. In addition to BMI, waist circumference measurement is also important because central obesity is strongly associated with metabolic and cardiovascular risk. Therefore, regular monitoring of body weight, BMI, waist circumference, and related health indicators is essential in obesity prevention and management [3–5].

Obesity control requires comprehensive and sustainable lifestyle modification. Dietary regulation, reduction of excessive calorie intake, limitation of high-sugar and high-fat foods, increased fruit and vegetable consumption, regular physical activity, adequate sleep, stress management, and behavioral modification are important components of obesity management. Physical activity plays a particularly important role because it helps increase energy expenditure, improve cardiovascular function, enhance insulin sensitivity, maintain blood pressure stability, and support gradual weight reduction. Regular exercise and active daily movement are therefore essential strategies for controlling BMI and reducing the risk of obesity-related complications [6, 7].

Primary healthcare facilities have a strategic role in obesity prevention and management. As the first level of healthcare service, primary clinics can provide health education, early screening, counseling, lifestyle intervention, regular monitoring, and referral when necessary. Primary clinics are also well positioned to support patients continuously because they are closer to the community and can provide repeated education and motivation. In this context, BMI control programs implemented in primary healthcare settings can contribute to improving patient awareness, promoting healthy behavior, and preventing non-communicable diseases [8–10].

The BMI control program at HTM V Primary Clinic, Natar District, Lampung Province, was implemented through field surveys, direct observation, counseling, interviews, and anthropometric measurements. The program included nutrition education, dietary management, physical activity promotion, behavioral modification, monitoring of body weight and BMI, waist circumference measurement, comorbidity management, psychological support, and health counseling. The program also used interactive educational media and participatory discussion to improve patient understanding and engagement [3, 11].

However, obesity management programs should not only focus on short-term education but also require continuous monitoring and evaluation. To determine program effectiveness, changes in BMI, body weight, waist circumference, physical activity level, dietary behavior, blood pressure, blood glucose, and lipid profile should be documented over time. This is important because lifestyle modification requires long-term adherence and consistent patient motivation. Without proper follow-up, the impact of obesity control programs may be difficult to evaluate scientifically.

Based on this background, this study aimed to analyze the implementation of a Body Mass Index control program for obese patients in a primary healthcare setting. The study focused on program components, patient education, lifestyle modification strategies, monitoring activities, controlled risk factors, and the role of primary healthcare services in supporting obesity management and prevention of non-communicable diseases.

2. Materials and Methods

2.1. Study design and location

This study used a descriptive observational approach to analyze the implementation of a Body Mass Index control program for obese patients in a primary healthcare setting. This design was selected because the study focused on describing program activities, patient education, lifestyle modification strategies, anthropometric monitoring, and patient responses to the BMI control program.

The program was designed as a promotive and preventive health activity aimed at improving patient awareness of obesity, Body Mass Index, physical activity, dietary behavior, and the risk of non-communicable diseases. The study did not evaluate long-term clinical outcomes using a controlled experimental design; therefore, the analysis emphasized program implementation, observed patient responses, and health education outcomes [12, 13].

The study was conducted at HTM V Primary Clinic, Natar District, Lampung Province, Indonesia. The activity was carried out on May 13, 2026, starting at 09:00 AM until completion. The clinic was selected because it provides primary healthcare services to the surrounding community and has an important role in obesity screening, health education, and lifestyle-based disease prevention.

The participants were patients and community members attending the BMI control program at HTM V Primary Clinic. Participants were involved in health education, anthropometric measurement, observation, and interviews related to lifestyle habits, dietary patterns, physical activity, sleep patterns, and other factors associated with obesity management. The program focused particularly on individuals with excessive body weight or obesity risk.

2.2. Data collection

Data were collected through field surveys, direct observation, counseling activities, interviews, and anthropometric measurements. Field surveys were conducted to understand the implementation of the BMI control program in the primary healthcare setting. Direct observations were used to assess patient participation during counseling and educational activities.

Anthropometric data were collected by measuring body weight, height, and waist circumference. Body weight and height were used to calculate Body Mass Index, while waist circumference was used to assess central obesity and metabolic risk. Interviews were conducted to obtain information regarding patient lifestyle, eating habits, physical activity, sleep patterns, snacking habits, stress, family support, and motivation to control body weight.

2.3. BMI control program components

The BMI control program consisted of several intervention components, including nutrition education, dietary management, physical activity promotion, behavioral modification, body weight and BMI monitoring, waist circumference monitoring, comorbidity management, psychological support, and health counseling. Nutrition education focused on healthy eating patterns, reducing high-calorie foods, limiting sugary drinks, reducing saturated fat intake, and increasing healthier food choices.

Physical activity promotion emphasized the importance of regular exercise and active daily movement. Patients were encouraged to perform moderate-intensity physical activity, such as walking, cycling, or other light exercises suitable for their physical condition. Behavioral modification focused on improving meal schedules, reducing overeating, limiting fast food consumption, managing stress, improving sleep patterns, and

reducing sedentary behavior.

2.4. Educational method and program evaluation

Health education was delivered using interactive counseling and PowerPoint-based visual media. The educational session explained the relationship between obesity, BMI, physical activity, vital signs, and non-communicable disease risk. Participatory discussion was also used to encourage patient engagement, improve understanding, and motivate patients to adopt healthier lifestyle behaviors. This educational approach was consistent with the original program, which used counseling, interviews, direct observations, and interactive media to increase participant understanding of obesity, BMI control, physical activity, and vital signs.

Program evaluation was conducted descriptively based on observation results, interview findings, and patient responses during the activity. The evaluation focused on several aspects, including patient understanding of BMI and obesity, awareness of physical activity benefits, recognition of healthy eating patterns, willingness to monitor body weight and BMI, and motivation to adopt lifestyle changes. The program also considered several control parameters, including body weight, BMI, waist circumference, blood pressure, blood glucose, and lipid profile. However, because the study was mainly descriptive and conducted as a program analysis, long-term changes in these parameters should be interpreted carefully unless follow-up measurements are available.

2.5. Data analysis

The collected data were analyzed descriptively. Information obtained from observations, interviews, and counseling activities was organized into themes related to BMI control, dietary behavior, physical activity, sedentary habits, sleep patterns, stress management, monitoring behavior, family support, and comorbidity control.

This study maintained participant confidentiality by not presenting personal identities or individual medical data. Information obtained from interviews and observations was used only for descriptive analysis of the BMI control program. Participants were involved in educational and counseling activities as part of primary healthcare-based obesity prevention and management. The analysis aimed to describe how the BMI control program was implemented and how it contributed to patient awareness and lifestyle modification. The findings were then interpreted in relation to obesity management in primary healthcare, particularly the role of education, regular monitoring, behavioral change, and continuous motivation.

3. Results and discussion

3.1. Implementation of the BMI control program

The BMI control program at HTM V Primary Clinic was implemented as a promotive and preventive health activity for obese patients and community members at risk of obesity. The program focused on improving patient understanding of obesity, Body Mass Index, physical activity, dietary behavior, waist circumference, vital signs, and the risk of non-communicable diseases. The activity was conducted through field surveys, direct observation, counseling, interviews, and anthropometric measurements, including body weight, height, and waist circumference [6, 14, 15].

The findings showed that the program consisted of several main components, including nutrition education, dietary management, physical activity promotion, behavioral modification, weight and BMI monitoring, waist circumference monitoring, comorbidity management, psychological support, and health counseling. These components are important because obesity is influenced by multiple factors, such as excessive calorie intake, low physical activity, sedentary behavior, poor sleep patterns, stress, unhealthy eating habits, and lack of regular monitoring [4, 16].

The use of interactive educational media and participatory discussion helped participants understand the relationship between

obesity, BMI, physical activity, vital signs, and the risk of chronic diseases. Participants were encouraged to adopt healthier behaviors, such as reducing portion sizes, limiting sugary drinks and fast food, increasing fruit and vegetable intake, increasing daily physical activity, and monitoring body weight regularly. This is consistent with the manuscript's original focus, which emphasized counseling, observation, interviews, physical activity education, BMI monitoring, and lifestyle modification for obese patients at HTM V Primary Clinic [17, 18].

3.2. Components of the BMI control program

The BMI control program was designed to address both individual behavior and clinical risk factors related to obesity. The main program components are summarized in **Table 1**. The table shows that BMI control requires a comprehensive approach. Nutrition education and dietary management help reduce excessive calorie intake, while physical activity promotion increases calorie expenditure and improves cardiometabolic health. Behavioral modification is also important because obesity is often associated with long-term habits, including irregular eating patterns, emotional eating, sedentary behavior, and low motivation [3, 6, 16].

Table 1

Components of the BMI control program for obese patients

No	Program Component	Activity	Objective	Evaluation Indicator
1	Nutrition education	Counseling on balanced diet, reducing high-calorie foods, sugar, saturated fat, and fast food	To improve patient knowledge of healthy eating patterns	Improved understanding of healthy food choices
2	Dietary management	Portion control and calorie reduction based on individual needs	To reduce excess energy intake	Gradual weight reduction
3	Physical activity promotion	Encouraging moderate-intensity exercise such as walking, cycling, or light aerobic activity	To increase energy expenditure and improve fitness	Increased physical activity duration
4	Behavioral modification	Managing meal schedules, reducing overeating, improving sleep, and managing stress	To support long-term healthy lifestyle habits	Improved daily routine and reduced unhealthy habits
5	Body weight and BMI monitoring	Regular measurement of body weight and BMI	To monitor obesity status and program progress	Gradual BMI reduction
6	Waist circumference monitoring	Regular abdominal circumference measurement	To assess central obesity and metabolic risk	Decreased waist circumference
7	Comorbidity management	Monitoring blood pressure, blood glucose, and lipid profile when available	To reduce obesity-related complications	Controlled metabolic risk factors
8	Health counseling	Individual or group counseling with healthcare providers	To increase motivation and adherence	Improved patient compliance
9	Family support	Encouraging family involvement in lifestyle changes	To strengthen patient motivation and social support	Improved program adherence
10	Follow-up evaluation	Periodic assessment of lifestyle changes and health indicators	To support continuity of obesity management	Sustained healthy behavior

3.3. Controlled factors in obese patients

The program also identified several lifestyle and behavioral factors that need to be controlled in obese patients. These factors include overeating, sugary drink consumption, snacking habits, lack of physical

activity, sedentary lifestyle, lack of sleep, stress, low motivation, and limited social support. The controlled factors and recommended actions are summarized in **Table 2**. The results indicate that obesity management should not focus only on body weight reduction, but also on improving daily lifestyle behaviors. Controlling eating habits, increasing physical activity, improving sleep patterns, managing stress, and strengthening family support are essential to support long-term BMI control [24].

Table 2
Controlled factors and recommended actions in obese patients

No	Controlled Factor	Recommended Action	Expected Outcome
1	Overeating	Reduce portion size gradually and arrange regular meal schedules	Reduced daily calorie intake
2	Sugary drink consumption	Replace sweetened drinks with water	Reduced sugar and calorie intake
3	Unhealthy snacking	Choose fruits, vegetables, or low-calorie snacks	Improved eating habits
4	Lack of physical activity	Increase daily movement and regular exercise	Increased calorie expenditure
5	Sedentary lifestyle	Reduce prolonged sitting and take active breaks	Increased daily activity
6	Lack of sleep	Maintain 7–9 hours of sleep per night	Improved appetite and metabolic regulation
7	Stress and emotional eating	Apply stress management and counseling	Reduced emotional eating
8	Lack of monitoring	Measure body weight, BMI, and waist circumference regularly	Improved self-monitoring
9	Lack of nutritional knowledge	Provide health education and nutrition counseling	Improved diet compliance
10	Low social support	Involve family in lifestyle modification	Improved motivation and adherence
11	Comorbid metabolic diseases	Conduct regular health checks and medication adherence when needed	Better control of blood pressure, glucose, and lipids
12	Low motivation	Set realistic targets and provide progress feedback	Improved commitment to weight control

3.4. Monitoring parameters and targets

Monitoring is an important component of obesity management because it allows healthcare providers and patients to evaluate progress over time. In this program, several parameters were considered important, including body weight, BMI, waist circumference, blood pressure, blood glucose, and lipid profile. These parameters are presented in **Table 3**.

Table 3
Controlled factors and recommended actions in obese patients

Parameter	Recommended monitoring frequency	Target or expected change
Body weight	Weekly or monthly	Gradual reduction of 0.5–1 kg per week when appropriate
BMI	Monthly	Gradual decrease toward overweight or normal range
Waist circumference	Monthly	Gradual reduction, especially in patients with central obesity
Blood pressure	Monthly or according to clinical condition	Controlled blood pressure
Blood glucose	Every 3–6 months or according to clinical indication	Within normal or controlled range
Lipid profile	Every 6–12 months or according to clinical indication	Improved lipid profile
Physical activity	Weekly self-monitoring	At least 150 minutes of moderate-intensity activity per week

Regular monitoring can help patients recognize their progress and maintain motivation. However, in the present study, long-term changes in BMI, waist circumference, blood pressure, blood glucose, and lipid

profile were not fully evaluated. Therefore, the program outcomes should be interpreted mainly as improvements in awareness, education, and behavioral intention rather than confirmed long-term clinical effectiveness [14, 22, 23].

3.5. Patient understanding and lifestyle awareness

The educational component of the program helped improve patient understanding of the relationship between obesity, BMI, physical activity, and non-communicable disease risk. Participants became more aware that obesity is not only related to body appearance, but also to health risks such as hypertension, diabetes mellitus, cardiovascular disease, metabolic disorders, and reduced quality of life. The participatory counseling method encouraged patients to ask questions and discuss their daily habits. This method was useful because many obese patients may already understand that weight loss is important but may not know how to apply practical lifestyle changes in daily life. Through counseling, patients were encouraged to reduce excessive food portions, limit sugary drinks, reduce fast food consumption, increase physical activity, and monitor body weight regularly [20, 21, 25].

Visual media such as PowerPoint presentations also supported patient understanding. Visual explanations can help simplify complex health information, especially the relationship between obesity, BMI, vital signs, and chronic disease risk. This approach can increase patient interest and make health education more interactive.

3.6. Role of physical activity in BMI control

Physical activity was one of the main components of the BMI control program. Regular physical activity can help reduce body fat, increase energy expenditure, improve cardiovascular function, enhance insulin sensitivity, support blood pressure control, and improve overall quality of life. In the primary healthcare setting, physical activity promotion should be practical and adapted to the patient's condition [16, 26, 27].

Patients were encouraged to perform moderate-intensity physical activity such as walking, cycling, light aerobic exercise, or other activities that can be performed consistently. The recommendation of at least 150 minutes of moderate-intensity physical activity per week can be used as a practical target for obese patients. However, the activity plan should consider age, comorbidities, physical capacity, and patient preference. Physical activity counseling is particularly important because some patients may have sedentary habits or believe that exercise is only needed when symptoms appear. Therefore, the program emphasized that physical activity should be performed regularly as a preventive and therapeutic lifestyle habit [14, 22, 23].

3.7. Dietary management and behavioral modification

Nutrition education and dietary management were important components of the program. Patients were encouraged to reduce high-calorie foods, sugary drinks, saturated fat, and fast food. Portion control was also emphasized because excessive calorie intake is one of the main contributors to weight gain [28, 29].

Behavioral modification was also needed to support dietary control. Patients were encouraged to manage meal schedules, avoid overeating, choose healthier snacks, improve sleep patterns, and manage stress. These behavioral factors are important because obesity is often influenced by emotional eating, irregular eating habits, lack of sleep, and low motivation. Family support can also improve patient adherence. When family members support healthier food choices and physical activity, patients may find it easier to maintain lifestyle changes at home. Therefore, obesity management in primary healthcare should involve not only the patient but also the surrounding family and social environment [19–21].

3.8. Comorbidity management and health risk reduction

Obesity is closely associated with several comorbid conditions, including hypertension, type 2 diabetes mellitus, dyslipidemia, cardiovascular disease, and musculoskeletal disorders. Therefore, BMI control programs should include screening and management of comorbidities. Monitoring blood pressure, blood glucose, and lipid profile is important to detect metabolic risk factors and guide further intervention [14, 22, 23].

In obese patients, even modest weight loss can provide health benefits. A gradual weight reduction of 5–10% of initial body weight within six months is often considered clinically meaningful because it

can improve blood pressure, glucose metabolism, lipid profile, and cardiovascular risk. However, such outcomes require continuous follow-up and proper documentation.

In this study, the program helped improve awareness of obesity-related disease risks. Nevertheless, future evaluation should include measurable clinical indicators to determine whether the program leads to actual improvements in BMI, waist circumference, blood pressure, blood glucose, and lipid profile.

3.9. Role of primary healthcare in obesity management

Primary healthcare facilities have a strategic role in obesity control because they are accessible to the community and can provide continuous health promotion, early screening, counseling, monitoring, and referral. Primary clinics can support patients through regular education, lifestyle counseling, anthropometric measurement, and follow-up evaluation.

The BMI control program at HTM V Primary Clinic demonstrates that primary healthcare can serve as an important platform for obesity prevention and management. However, program sustainability is essential. A single educational activity may improve awareness, but long-term BMI control requires repeated counseling, periodic monitoring, patient motivation, and follow-up visits.

Therefore, the clinic should strengthen a structured follow-up system. Patients with obesity should be monitored periodically, and progress should be documented using measurable indicators such as body weight, BMI, waist circumference, dietary behavior, physical activity level, blood pressure, and metabolic parameters [30].

3.10. Program limitations and areas for improvement

Although the BMI control program provided useful education and encouraged healthy lifestyle changes, several limitations should be noted. First, the study did not clearly present the number of participants, participant characteristics, or obesity classification. Second, long-term changes in BMI, waist circumference, or metabolic indicators were not fully reported. Third, some program components, such as pharmacological therapy and bariatric surgery, should be clarified as general recommendations rather than actual interventions conducted at the primary clinic [31].

Future programs should include pre- and post-intervention measurements to evaluate effectiveness more objectively. The clinic should document baseline body weight, BMI, waist circumference, blood pressure, blood glucose, physical activity level, and dietary behavior, then compare them with follow-up results after several weeks or months. This would allow the program to demonstrate measurable health outcomes [32].

Overall, the BMI control program has potential to support obesity management in a primary healthcare setting through education, lifestyle modification, and regular monitoring. However, to confirm its effectiveness in reducing BMI and obesity-related risks, future evaluation should include structured follow-up and quantitative outcome data.

4. Conclusion

This study shows that the Body Mass Index control program for obese patients in a primary healthcare setting can support obesity management through health education, lifestyle modification, anthropometric monitoring, and patient counseling. The program implemented at HTM V Primary Clinic included nutrition education, dietary management, physical activity promotion, behavioral modification, body weight and BMI monitoring, waist circumference measurement, comorbidity management, and health counseling.

The findings indicate that the program helped improve patient awareness of the relationship between obesity, Body Mass Index, physical activity, vital signs, and the risk of non-communicable diseases. Interactive education and participatory counseling encouraged patients to better understand the importance of reducing excessive calorie intake, limiting sugary drinks and fast food, increasing physical activity, improving sleep patterns, managing stress, and regularly monitoring body weight and BMI.

Overall, the BMI control program has potential as a promotive and preventive strategy for obesity management at the

primary healthcare level. However, the effectiveness of the program in reducing BMI, waist circumference, and metabolic risk factors should be evaluated through long-term follow-up and measurable clinical indicators. Future programs should include structured documentation of baseline and follow-up data, including body weight, BMI, waist circumference, blood pressure, blood glucose, lipid profile, dietary behavior, and physical activity level. Continuous monitoring and patient motivation are essential to support sustainable lifestyle changes and reduce the risk of obesity-related non-communicable diseases.

CRedit authorship contribution statement

Mira Aprilika: Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Rahmania:** Writing – review & editing, Supervision, Validation, Resources, Conceptualization. **Mutiara Utami Maulida:** Writing – original draft, Methodology, Investigation, Formal analysis, Data curation. **Natalia Sri Rahayu:** Investigation, Data curation, Formal analysis, Writing – original draft. **Putra Maulana Zuanda:** Investigation, Data curation, Formal analysis. **Raihan Fadhel Muhammad:** Investigation, Data curation, Formal analysis. **Rega Hidayatussyhab:** Investigation, Data curation, Formal analysis. **Riby Aurellia Roche:** Investigation, Data curation, Formal analysis. **Rifqah Salsabil Rovany:** Investigation, Data curation, Formal analysis. **Ringga Aryadila:** Investigation, Data curation, Formal analysis. **Sabrina Marjiani:** Investigation, Data curation, Formal analysis, Writing – review & editing. **Salma Zalika Namira:** Investigation, Data curation, Formal analysis, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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