# **Original Research Article**

# Perceived Barriers, Enablers, Beliefs and Level of Physical Activity and Awareness regarding Role of Physiotherapy in Patients posted for Bariatric Surgery: A Questionnaire Based Study

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# ABSTRACT

**Background:** Obesity is of huge concern worldwide. Bariatric surgery is effective in managing morbid obesity and its associated complications. Physiotherapy plays a crucial role in the pre-operative as well as postoperative phases of bariatric surgery. Lack of physical activity in patients who are obese, patients who are posted for bariatric surgery and those who have undergone bariatric surgery can be accounted to a lot of factors. Identifying their perceived level of physical activity along with the facilitators, barriers and beliefs will help in addressing these issues and thereby increasing adherence to physical activity.

**Objective:** To evaluate perceived level, along with barriers, enablers and beliefs of physical activity in patients posted for bariatric surgery. We also evaluated their awareness about the role of physiotherapy in pre and post-operative phases of bariatric surgery.

**Method:** A questionnaire was designed to gain an insight aboutfactors contributing as barriers and enablers, under the domains of physical, psychological, interpersonal and environmental. It also included perceived level and the existing level of physical activity in the study participants.Questions were also designed to understand their awareness about the role of physiotherapy in the pre and post bariatric surgery phase. It was administered to patients posted for bariatric surgery on an interview basis. Sample size was calculated to be 96. The data was then analysed and represented as descriptive statistics.

**Results:** All study participants failed to meet the recommended level of physical activity. The predominant barriers perceived by the study participants belonged to physical, psychological and interpersonal domains; whereas environmental barriers were found to be of least significance. 72.92% of the study participants lacked the knowledge about the role of physiotherapy in the pre-operative phase of bariatric surgery.

**Conclusions:** Interpersonal, physical and psychological being the predominant barriers faced by the study participants highlight the scope of physiotherapeutic intervention. Also these factors can be modified at an individual level, thereby improving the adherence. There is lack of awareness about the role of physiotherapy in the pre-operative phase of bariatric surgery. Thus there is need to increase awareness about the role of physiotherapy in therapy in managing obesity and related complications in pre and post op phases of bariatric surgery.

**KEY WORDS:** Facilitators, Barriers, Beliefs, Awareness, Bariatric Surgery, Physical Activity, Questionnaire based, Physiotherapy, Obesity.

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#### **INTRODUCTION**

World Health Organisation has defined physical activity as any bodily movement produced by skeletal muscles that requires

energy expenditure. It includes all the movements or activities done during leisure time, in order to get to and from places as well as part of individual's work. Moderate and vigorous intensity of physical activity has been shown to be associated with better health benefits [1]. Benefits of physical activity include betterment in brain health, improving the strength of bones and muscles, increasing and improving the ability to carry out activities of daily living, prevention of falls, improving the quality of life as well as in management of disabilities and chronic health conditions [2]. It has been proven that regular physical activity helps to reduce the risk of developing noncommunicable diseases like obesity, stroke, heart diseases, diabetes and cancer. Along with prevention, regular physical activity also has a crucial role in the management of these noncommunicable diseases. Physical activity also helps in promoting a feeling of improved psychological wellbeing, thereby improving the quality of life [1].

Physical inactivity has taken a form of pandemic over the last 4 decadesand is of huge concern worldwide [3]. It is associated with a lot of health problems and its associated complications. Physical inactivity is also responsible for the economic burden borne by the society, costing lot of money to the healthcare system, public and private sectors as well as to the household's worldwide [4].

The advantages of exercise and the adverse effects of inactivity are like flip sides of a coin. It is extremely essential to understand the hazards of physical inactivity and work towards being more physically active [5].

One of the major consequences of physical inactivity is obesity. Obesity is a major health condition associated with notable comorbidities as well as decline in quality of life. Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health [6]. Obesity Medicine Association has defined obesity as a chronic, relapsing, multifactorial, neurobehavioral disease, wherein an increase in body fat promotes adipose tissue dysfunction and abnormal fat mass physical forces, resulting in adverse metabolic, biomechanical and psychosocial health consequence [7]. A body mass index (BMI) between 25 and 29.9kg/m<sup>2</sup> is considered overweight, BMI between 30 and 34.9 is obesity class 1, between 35 and 39.9 is obesity class 2 and BMI greater than or equal to 40kg/m<sup>2</sup> is categorised as obesity class 3 [8].

The issue of obesity has grown to epidemic proportions. Many studies show that obesity is rapidly increasing in India. A study also shows that abdominal obesity is more prevalent than generalised obesity in the northern, southern, eastern and western regions of India [9]. Management of obesity includes conservative, medical or a surgical approach. Conservative management for Class 1 obesity mainly includes lifestyle modifications, dietary changes and regular physical activity. According to American College of Sports Medicine, exercise guidelines for adults with chronic health conditions and disabilities are at least 150 to 300 minutes a week of moderate intensity or 75 to 150 minutes a week of vigorous intensity aerobic physical activity and muscle strengthening activities of moderate or greater intensity involving all major muscle groups on 2 or more days a week [10].

Bariatric surgery is a very effectual treatment option for morbid obesity. Along with weight loss, bariatric surgery also helps in managing problems associated with obesity. There is also evidence which suggests that there is a decrease in or complete recovery of associated comorbidities like Type 2 Diabetes. Along with this there is also improvement in quality of life [11]. Different types of Bariatric surgery approved by American Society for Metabolic and Bariatric Surgery are Sleeve Gastrectomy, Rouxen-Y Gastric Bypass, Adjustable Gastric Band, and Biliopancreatic Diversion with Duodenal Switch and Single Anastomosis Duodeno-Ileal Bypass with Sleeve Gastrectomy [12]. Indications include a BMI of more than 40 kg/m<sup>2</sup> or weight more than 100 pounds, patients having BMI more than or equal to 35 and at least one or more obesity-related co-morbidities such as Type II diabetes, hypertension, sleep apnoea & other respiratory disorders, non-alcoholic fatty

liver disease, osteoarthritis, lipid abnormalities, gastrointestinal disorders, or heart disease or inability to achieve a healthy weight loss sustained for a period of time with prior weight loss efforts [13].

Even though bariatric surgery is effective in causing significant weight loss in obese, it alone isn't enough. It needs to be supplemented with regular physical activity, proper nutrition, good dietary habits and appropriate lifestyle modification. Physical activity is important not only in patients prior to bariatric surgery where they try to lose weight but also, after the surgery for further weight loss, maintenance and toning. There is a lot of evidence which states that physical activity can aid weight loss and also help in alleviating comorbidities associated with obesity [2].But the main problem is that most of the pre-operative patients are not physically active even before considering surgery or have not succeeded in adhering to good physical activity due a lot of factors [14].

A barrier is defined as a problem that makes something difficult or impossible [15]. Some of the barriers to physical activity in general are lack of time, motivation, social support, aches and pains, fear of injury and so on [16].

If identified appropriately, physiotherapists can help address the different barriers faced by patients to perform physical activity, thereby improving their participationin physical activity.

A facilitator is defined as a thing that helps a process take place [17]. Different facilitators for physical activity are weight loss, weight maintenance, feeling of improved psychological wellbeing and so on [18, 19].

It has been found that even after surgery a lot of patients are not able to adhere to the physical activity levels or are not able to increase their physical activity level to meet therecommended guidelines [20].

Physiotherapists do have a role in the weight loss journey both preoperatively as well as postoperatively. They are trained in tailoring exercises according to the patient's needs and health condition, and also implementing and monitoring these programmes effectively. Along with the expertise in the weight loss program, they also have a role in managing associated comorbidities like diabetes and hypertension. They play a very important role in promoting sound and safe participation in exercise program to achieve both the goals of weight loss and weight maintenance.

This study therefore aimed to evaluate the barriers, beliefs and facilitators of physical activity in the patients who are posted for bariatric surgery. The study also intended to assess the level of perceived physical activity in these patients, and if they met the recommended guidelines for physical activity. We also aimed to assess their perception about the role of physiotherapy in pre as well as post bariatric surgery phases.

# METHODOLOGY

This cross sectional study was conducted at obesity centres in Pune, India fromwith patients posted for bariatric surgery being the study participants. Clearance was sought from the Institutional Ethics Committee, before conducting this study. The inclusion criteria was patients primarily undergoing bariatric surgery for obesity and the exclusion criteria was patients undergoing bariatric surgery owing to other serious health issues like heart disease, carcinomas etc. It was a questionnaire based study. A questionnaire was designed to gain an insight about their perceived level and the existing level of physical activity. It also included factors contributing as barriers and enablers designated under the domains of physical, psychological, interpersonal and environmental.

Questions were also designed to understand their awareness about the role of physiotherapy in pre and post bariatric surgery phases. To understand the perspective of the study population about various barriers and facilitators, a focus group discussion was scheduled which assisted us in laying out the framework of the questionnaire. The responses obtained from patients helped us to categorize barriers and facilitators under specific domains. Physical domain had factors like potential weight loss, improvement in current health issues, and prevention of health problems as facilitators and pain, fatigue,

excessive weight, breathlessness as barriers to exercise. Psychological domain had factors like sense of self efficacy, motivation, enhanced psychological wellbeing as facilitators and feeling of intimidation or embarrassment, lack of hope, motivation and confidence as some of the barriers. Environmental domain had facilitators such as, even walking surfaces, availability of equipment at home, pleasant weather and barriers included were lack of accessible facilities, bad weather, busy roads and so on.

All questions were close ended and framed in simple English language.Face validation of the questionnaire was done.Post validation, data was collected on an interview basis. Sample size was calculated using the formula n=z<sup>2</sup>pq/ E<sup>2</sup> (where z=1.96, p=50%, E which is absolute precision was taken as 10) and it was found to be 96. Participants were included after screening the inclusion and exclusion criteria. The procedure was explained in detail to the study participants. Subject information sheet was provided and written informed consent was taken from the participants. After obtaining informed consent from the study participants, they were administered the questionnaire on an interview basis. The data collection was done over a period of 6 months. Their responses were then analysed using appropriate statistics. The data was analysed using Microsoft Excel 2010 version and represented as descriptive statistics.

#### RESULTS

Data from 96 study participants was collected over a period of 6 months. Out of the total study participants 59(61.45%) were females and 37(38.54%) were males. The average age of the study participants was 42 ± 11 years and the median age was 41 years. 56(58.33%) participants were graduates, 12(12.5%) participants had completed their postgraduation, 12(12.5%) participants were 12<sup>th</sup> standard pass, 7(7.29%) had completed their 10<sup>th</sup> standard and 9(9.37%) participants fell in the category of below 10<sup>th</sup> standard pass. The study participants were asked about their co-morbidities, 48(50%) participants didn't suffer from any co-morbidities, 28(29.1%) suffered from hypertension, 19(19.7%) people had Type 2 Diabetes, 19(19.7%) participants had hypothyroidism and 2(2.08%) participants suffered from asthma. Many of the participants had more than one co-morbidity.

The study participants were asked about their job profile and the intensity of occupational demands was further categorised as Low Intensity, Moderate Intensity or High Intensity using the 2011 Compendium of Physical Activities [21].

Table 1 represents the percentage of participants involved in Low, Moderate or High Intensity Occupation.Anthropometric measurements such as height, weight, Body Mass Index, waist circumference of each study participant were assessed. The mean height was 161.8 ± 10.11 cm and mean weight was 114.68 ± 27.22 kg. Body Mass Index was calculated using the data. Table 2 highlights Body Mass Index of the study participants. Waist circumference was used to assess abdominal obesity. The reference value for female study participants was considered as > 80cm and  $\geq$  90cm for male study participants [22]. The data collected depicted that all 96(100%) participants had central obesity.

Study participants were asked to grade their perceived physical activity level in Poor, Fair, Good and Excellent category. **Table 3** shows categorisation of their responses. Participants were further asked to describe their existing level of physical activity or if they were exercising in any form, results of which are demonstrated in **Table 4**.In order to evaluate their sedentary behaviour, all the participants were asked the amount of time they spent in sitting or reclining on a typical day excluding the time that they slept. The average amount of time spent in sitting was found to be  $8 \pm 3$  hours.

#### Domain wise analysis:

**Physical Domain:** The responses of study participants to various physical facilitators and barriers faced by them while exercising are illustrated in **Figure 1** and **Figure 2** respectively.

**Psychological Domain:** The analysis of facilitators and barriers under psychological domain is illustrated in **Figure 3** and **Figure 4**.

**Interpersonal Domain:** Facilitators and Barriers under Interpersonal domain are listed below in **Table 5.** 

**Environmental Domain:** Only 1(1.04%) study participant felt the presence of even walking surfaces as a facilitator for exercise. None of the study participants perceived pleasant weather, need of exploring alternative option to exercise or availability of equipment at home as a facilitator. Bad weather was reported as a barrier by 5(5.20%) participants whereas presence of stairs, uneven surfaces, lack of accessible facilities was a barrier to 2(2.08%) participants respectively. Only 1(1.04%) participant felt busy road to be a barrier for exercise.

**Beliefs:** Various beliefs that the study participants had which either helped them to exercise or kept them from exercising are illustrated in **Table 6.** 

Awareness regarding Physiotherapy: The study participants were also evaluated for their perception regarding the role of Physiotherapy in pre-operative as well as post-operative phases. Figure 5 represents awareness regarding physiotherapy in pre and post op phase among the study participants.

**Table 1:** Intensity based distribution of occupation inthe study participants.

<b>Occupational Demand</b>	n (%)
Low Intensity	83 (86.45)
Moderate Intensity	13 (13.54)
High Intensity	0 (0)

 Table 2: Distribution of body mass index in study participants.

Body Mass Index	n (%)	
Overweight	2 (2.08)	
Obesity Class 1	11 (11.46)	
Obesity Class 2	20 (20.83)	
Obesity Class 3	63 (65.62)	

**Table 3:** Distribution of perceived physical activitylevels in study participants.

Perceived Physical Activity Levels	n (%)
Poor	29 (30.20)
Fair	46 (47.91)
Good	20 (20.83)
Excellent	1 (1.04)

**Table 4:** Distribution of current level of physical activityin study participants.

Not exercising         51 (53.12)           Walking         39 (40.62)	Current Level of Physical Activity	n (%)	
Walking         39 (40.62)	Not oversising	E1 (E2 12)	
waiking 39 (40.62)	Malking	31 (33.12)	
	vvaiking	39 (40.62)	

**Table 5:** Distribution of responses under theinterpersonal domain.

Domain: Interpersonal		
Facilitator	Yes	No
Support of family/Friends	96 (100%)	0 (0%)
Help from specific support groups	13 (13.54%)	83 (86.46%)
Encouragement from team members	1 (1.04%)	95 (98.96%)
Good professional guidance	33 (34.37%)	63 (65.62%)
Being part of good social group	0 (0%)	96 (100%)
Barrier		
Lack of guidance: Correct way to exercise	13 (13.54%)	83 (86.46%)
Lack of guidance: Benefits of exercise	11 (11.46%)	85 (88.54%)
Lack of guidance: Correct duration of exercise	11 (11.46%)	85 (88.54%)
Lack of motivation from team members	0 (0%)	96 (100%)
Lack of motivation from family and friends	0 (0%)	96 (1005)
Lack of individual attention	1 (1.04%)	95 (98.96%)
Presence of others was intimidating	3 (3.12%)	93 (96.87%)
Felt being pushed too hard	2 (2.08%)	94 (97.92%)

**Table 6:** Distribution of various beliefs regardingphysical activity among study participants.

Beliefs		
Beliefs which helped to exercise	Yes	No
Feeling of enjoyment while doing physical activity	38 (39.58%)	58 (60.42%)
Fear of guilt on missing physical activity	11 (11.46%)	85 (88.54%)
Being aware of positive effects of physical activity	55 (57.29%)	41 (42.70%)
Felt the need of exploring alternative options	1 (1.04%)	95 (98.96)
Beliefs which interfered with exercise		
Disliked going to gym or doing any outdoor physical activity	27 (28.12%)	69 (71.88%)
Dislikes doing exercise at home	52 (54.17%)	44 (45.83%)
Unsure of correct way of doing physical activity	8 (8.33%)	88 (91.67%)
Lack of time	45 (46.87%)	51 (53.12%)



**Fig. 1:** Distribution of facilitators of Physical domain identified by study participants.





Fig. 2: Distribution of barriers of Physical domain according to study participants.



Fig. 3: Distribution of facilitators of Psychological domain according to study participants.





**Fig. 5:** Distribution of perception about the Role of Physiotherapy in pre-op and post-op phase among study participants.

#### DISCUSSION

Obesity is a serious health condition that can cause significant reduction in the quality of life. Physiotherapists play a vital role in prevention as well as management of obesity. Studies have highlighted that physiotherapy plays an essential role in managing obesity by introducing structured aerobic exercises which are properly tailored according to the patient's health condition and are monitored and modified on a regular basis [23, 24].

A study conducted by King WC and Bond DS showed that by increasing the physical activity levels pre-operatively to post-operatively and higher post-operative physical activity level are associated with greater weight loss, improved body composition and improved fitness following bariatric surgery. Thus the role of physiotherapy in preoperative as well as postoperative phase of surgery is well established [20, 23].

Results of our study helped in assessing wide range of perceived physical, psychological, interpersonal and environmental facilitators, barriers and beliefs regarding physical activity among patients posted for bariatric surgery. This study also threw light on the disparity between the perceived level and actual participation level of physical activity in the study participants. The study revealed that none of the study participants met the criteria of being physically active which requires, exercising at moderate intensity for 150 minutes per week or high intensity for 75 minutes per week and including at least 2 days of strengthening activities per week [10].

On the contrary, 47.91% of the study participants actually thought that they had fair levels of physical activity. Only 29% of study participants graded themselves to have poor levels of physical activity whereas 20% perceived to have good levels of physical activity and 1 participant graded himself to have excellent physical activity level. This was also not reflected in their Body Mass Index values wherein, almost 65% of participants belonged to Obesity Class 3, 20% were in ObesityClass 2, 11% belonged to Obesity Class 1 and only 2% of study participants were

# overweight.

Occupational demands in terms of intensity of the required physical activity was also found to be less in these study participants, wherein almost 86% of the study participants were involved in work forms requiring low intensity, 13% being engaged in moderate intensity activities at work and none of the study participants had a high intensity job profile. The average amount of time that the study participants spent in siting or reclining throughout the day was found out to be  $8 \pm 3$ hours reflecting their sedentary behaviour. Bond DS and Unick JL also concluded in their study that bariatric surgery candidates spent 80% of their time in sedentary behaviour via objective assessment using accelerometer [25]. There is a lot of scope to alter physical activity levels in domains of occupation, travel to and from places, recreational activities as well as by having a check on sedentary behaviour.

Physical activity level can also be accentuated by overcoming the identified barriers and enhancing the facilitators. Various facilitators and barriers for physical activity in the patients posted for bariatric surgery were identified through this study. Obesity related problems were potential barriers to exercise, however the benefits of exercise and regular physical activity that were experienced by the study participants acted as a facilitator for many of them.

70% of the study participants thought of potential weight loss as a big facilitator to exercise, whereas in order to improve their current health issues was the driving force for more than 45% of the participants and only 20% of them were exercising to prevent the advent of health problems. Thus there is scope for primary and secondary prevention by creating awareness about the hazards of physical inactivity or sedentary behaviour during early stages. Different physical barriers were also identified through this study, the most prominent being fatigue which was reported by almost 68% of the study participants where as 54% of participants complained of pain related to musculoskeletal origin being as a barrier to exercise. Over the past 2 years, owing to the covid 19 pandemic, the

various restrictions that were imposed including lockdown restrictions also interfered in the exercise regimen of almost 30% of study participants.

Positive emotional effects of physical activity like sense of self efficacy and enhanced psychological wellbeing were the main psychological facilitators for more than 50% of study participants. Improvement in the level of confidence and motivation served as a facilitator for 34% of participants to adhere to their exercise regimen. The barriers which were predominantly highlighted during the study were lack of confidence, motivation and hope which was reported by more than 70% of the study participants. Sense of depression was reported as a barrier by 63% of the study participants and it was mainly attributed to being on a heavier side, not being successful in reducing their weight and in general taboo of being obese in the society. Over 80% of the study participants discontinued physical activity because of lack of positive results over period of time. A consultation of a physiotherapist during the early stages of weight loss journey can help in either eliminating or decreasing these fears thereby tackling the barriers to physical activity.

Various interpersonal and environmental facilitators and barriers were also identified during this study. All of the 96 participants had full support from their family and friends which helped them to exercise. However only 1.35% of the study participants were able to receive help and encouragement from specific support groups. This points out that there is need for more obesity support groups, community programmes and facilities to tackle the burden of obesity since the prevalence of obesity has increased worldwide.

Thus the major inference that was drawn from this study was that interpersonal, physical and psychological domain had the most predominant barriers faced by the study participants, which are possible to be targeted at an individual level with appropriate physiotherapeutic intervention. On the other hand, environmental barriers which are difficult to tackle at an individual level were found to be of least significance. Beliefs which helped the study participants to exercise and the ones which interfered in their exercise regimen were also explored during this study. Almost 40% of the study participants felt enjoyment while doing physical activity and more than 50% of them were aware of the positive effects of physical activity which helped them to exercise. Almost 30% of the study participants reported that they disliked going to gym or participate in outdoor physical activity options which kept them from exercising. 54.17% of study participants attributed exercising by themselves at home as a barrier for regular physical activity, highlighting the need for intervention, may be in the form of structured group therapy.

Awareness regarding the role of physiotherapy for weight loss and weight maintenance was also assessed as a part of this study. 72.92% of the study participants felt that physiotherapy is not essential during the pre-operative phase. Whereas, 62% of the study participants were of the opinion that physiotherapy is essential and a crucial part of post bariatric surgery journey, and more than 55% of the study participants perceived that involvement of a physiotherapist for weight loss and maintenance is also essential. Thus, the awareness regarding the role physiotherapy in the post operative phase of bariatric surgery, among the study participants was fair, but their awareness about the role of physiotherapy in the pre operative stage is poor, highlighting the need of creating awareness about this aspect of physiotherapy.

# CONCLUSION

All study participants failed to meet the recommended level of physical activity.Most of the barriers enlisted by the study participants are modifiable at an individual level.There is lack of awareness about the role of physiotherapy in the pre-operative phase of bariatric surgery.

#### **Conflicts of interest: None**

# **AUTHORS CONTRIBUTION**

Both the authors have contributed in the conception and design of the study, analysis and interpretation of data and preparing of manuscript. First author has additionally contributed towards collecting the data.

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