

# Exercise in patients with Type 2 diabetes: Facilitators and barriers - A qualitative study

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## ABSTRACT

**Introduction:** Diabetes is a major noncommunicable disease affecting more than 65 million Indians. Although treatment algorithms suggest lifestyle measures (diet and exercise) along with medications data regarding adherence to exercise as well as facilitators and barriers to the practice of physical activity in such patients are limited. Hence, this qualitative study was conducted. **Objectives:** The objective of this study is to describe the factors which (1) Facilitated and (2) hindered the practice of regular exercise in patients with Type 2 diabetes. **Methodology:** The study was conducted on 13 diabetic patients admitted to a tertiary care center in Bengaluru - St. John's Medical College Hospital, to explore factors that acted as facilitators and barriers to physical activity. Data saturation with the coded themes was achieved on interviewing 13 patients, after which, thematic analysis was done, and final themes reported. **Results:** The age of the study participants (7 males, 6 females) ranged from 40 to 80 years. Among those who did exercise, factors such as awareness regarding the benefits of exercise and complications linked with diabetes, positive family support, and emphasis by nursing staff emerged as facilitators. Lack of time, obligations to others, inability to link exercise with blood sugar control, lack of perception of obesity as a health issue, inadequate emphasis by physicians, social/cultural issues, lack of infrastructure, and physical restriction were the factors that acted as barriers to physical activity. In addition to the above, a clear lack of adherence to standard guidelines, while advising patients by physicians was also noted. **Conclusion:** A comprehensive approach by both doctors and nurses, based on standard guidelines, could help in implementing adherence to exercise in patients with diabetes.

**Keywords:** Compliance, diabetes, exercise

## Introduction

Diabetes mellitus is a predominant noncommunicable disease estimated to affect approximately 65.1 million in India alone.<sup>[1]</sup> Diabetes and its complications have now become a major cause of mortality and morbidity in the modern world. As per the American Diabetes Association (ADA), a glycated hemoglobin (HbA1c) of 7% or below is the treatment goal recommended to prevent long-term complications, and the treatment includes diet, exercise, and medications.<sup>[2]</sup>

Physical activity improves glycemic control and insulin action, reduces cardiovascular risk and also helps weight loss and general

well-being. In a systematic review and meta-analysis on the effects of structured exercise interventions in clinical trials of 8 weeks, it was observed that post intervention HbA1c was significantly lower in exercise group.<sup>[3]</sup>

According to the recommendations of the ADA, adults with diabetes should be advised to perform at least 150 min/week of moderate-intensity aerobic physical activity (50%–70% of maximum heart rate), spread over at least 3 days/week with no more than 2 consecutive days without exercise along with weight training exercises.<sup>[2]</sup> Despite this, it is noticed that most diabetics fail to include exercise in their daily schedules. It is further known that even in those who exercise the intensity of physical activity is low.<sup>[4]</sup>

There is very limited knowledge on factors that facilitate or hinder the practice of physical activity in diabetics, especially

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in India. A qualitative study was thus conducted on diabetic patients to explore their views regarding the practice of exercise as a part of their diabetes self-care, and the results are reported in this paper.

## Methodology

An emergent study design was used based on constructivist grounded theory where data are obtained from an interaction between the subject and researcher, with the researcher's perspective being a part of the process. In-depth interviews were conducted using a flexible, open-ended approach.<sup>[5]</sup> The study commenced following approval from the Institutional Ethics Committee, St. John's Medical College.

### Recruitment and sampling

Subjects were recruited from among inpatients admitted to St. John's Medical College Hospital, Bengaluru, by face-to-face recruitment; the criteria for inclusion being patients above the age of 40 who have been suffering from Type 2 diabetes for more than 1 year (as it may take some time for the patient to get used to a new routine which includes exercise or to realize the barriers that do not permit them to exercise). Patients <40 years of age and those who were deemed mentally or physically unfit to be interviewed by the treating physician were excluded from the study. Triangulation was practiced by recruiting subjects from different groups of people. The recruitment of new subjects continued till data saturation was attained.

### Data collection

Once recruited the coinvestigator met the subjects, during which time their consent was taken to conduct and tape record the interview. Interviews of 30–40 min were conducted in a language that the patient is comfortable with. An interview guide was used to streamline the process, which was initially based on topics obtained from a thorough literature review. Themes that emerged in the initial interviews were incorporated in the guide in subsequent interviews.

The final list of topics that were incorporated into the interview guide included general questions regarding whether exercise is/was a part of the subject's routine, perceived importance of exercise, and its impact on health and the impact of diabetes on health. On the other hand, if the subject did not exercise, the interview was focused on eliciting the reasons for not doing so and unmet needs. The recorded interviews were then copied into writing using manual word-by-word transcription and back translation.

### Analysis

Data analysis and data collection were conducted simultaneously, with analysis being started as soon as the interviews began. The transcripts obtained were manually coded (using open, axial, and selective coding) independently by all the investigators, and new

themes were identified and explored in subsequent interviews. Data saturation with the coded themes was achieved after interviewing 13 patients. Following this, thematic analysis was done and final themes reported.

## Results

Interviews were taken from 13 subjects, of which 7 were males, and 6 were females. The age distribution of the subjects is outlined in Table 1.

Out of the 13 subjects who were interviewed, only 5 were engaging in physical activity/exercise on a regular basis and 3 used to exercise regularly in the past but could not continue to do so for various reasons. The themes and subthemes identified are summarized in Figure 1.

### Facilitators

#### Patient's knowledge

Irrespective of whether they exercised or not patients knew that exercising could only have a positive impact on their health. The following are the components of this subtheme:

##### 1. Perceived benefits:

- Reduction in blood sugar - 4 out of 13 subjects said that they knew exercising helps in controlling sugars. Some of the responses backing this theme were:
  - “I feel healthier and I also feel my sugar is under control when I exercise.”
  - “I know that sugar is controlled with regular exercise.”
- Reduction in weight - Almost all patients said that exercising helped them in lose weight and improve health. A response that was received was:
  - “I know that it (exercise) helps in losing weight and improving the general health condition of the body”
- Feel good factor - Many subjects felt that exercising regularly helped them perform their activities of daily living much better when compared to the days when they could not exercise. Some responses suggesting this were:
  - “I feel active if I go for a walk in the morning.”
  - “I feel active after I exercise otherwise I feel drowsy and lazy.”

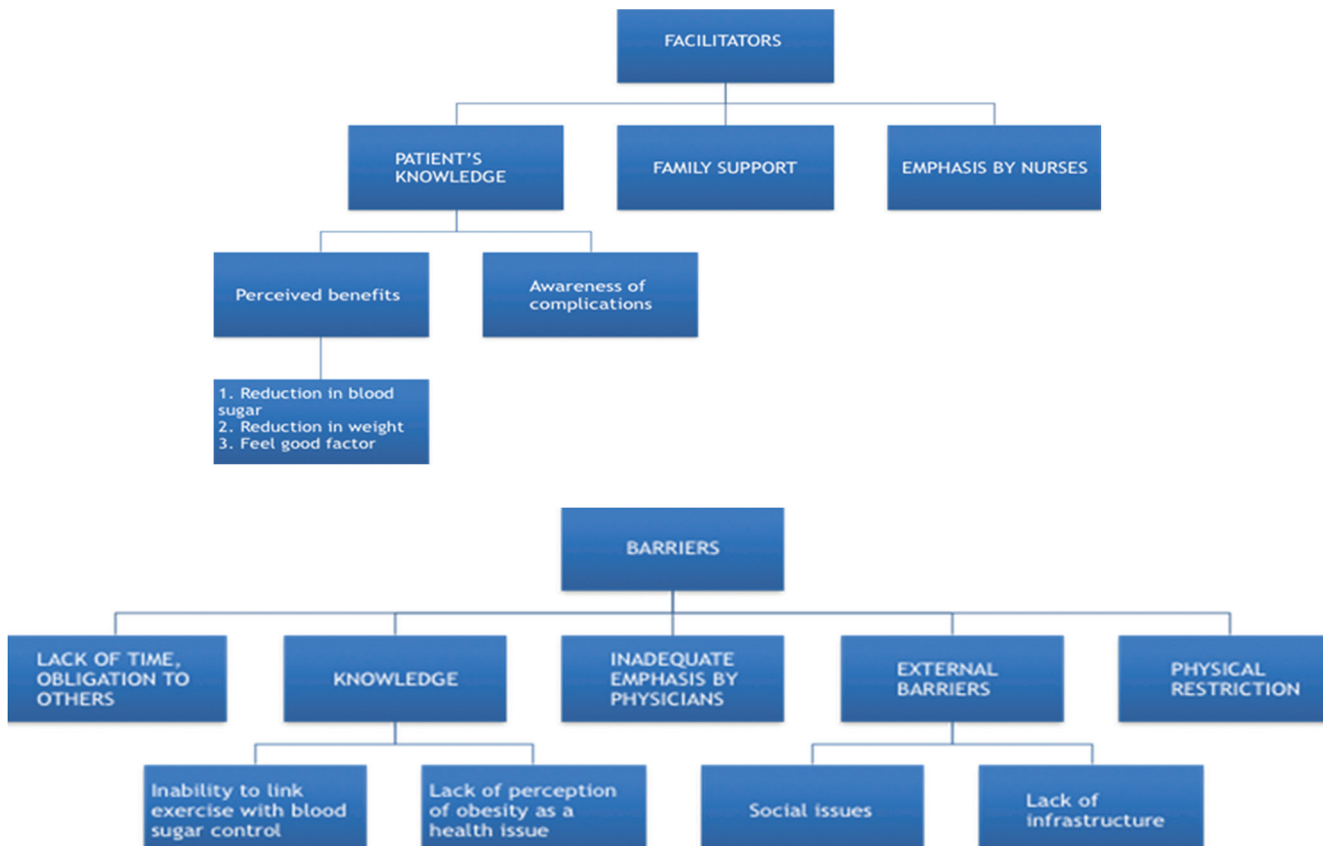
##### 2. Awareness of complications:

Patients were aware that exercising regularly could help in preventing the occurrence of such complications apart from controlling blood sugar levels. One of the subjects remarked:
 

- “I know that it is essential to control sugar levels else

**Table 1: Age distribution of subjects**

Age (in years)	Frequency (male/female)
40-50	4 (4, 0)
50-60	6 (3, 3)
60-70	2 (0, 2)
70-80	1 (0, 1)



**Figure 1:** Facilitators and barriers to physical activity in patients with Type 2 diabetes

I can have kidney, eye problems. This is what I have been told. I know that all organs can be affected by diabetes/high sugar levels.”

**Family support**

The collective beliefs of the family members and support given to the patient to enable them to exercise regularly are an important facilitating factor. This was expressed by one of our subjects, who spoke:

“When my children leave for work in the car, they drop me off a little away from home where there is less traffic. They ask me to walk on roads with less traffic because they are apprehensive that I may meet with an accident or something of the sort.”

**Emphasis by nurses**

Nursing staff spend much more time with patients than doctors do and so advice given to patients by nurses tends to have a deeper impact. It is also seen that nurses interact a lot more with patients than doctors can and establish a much better rapport. This was brought out as one of the facilitators in compliance to physical activity. The above sentiment was expressed by a subject, through the following remark:

“The nurses told me more about it (exercise) than the doctor did. The nurses are much closer to patients than doctors are and we tend to listen to them more.”

**Barriers**

**Lack of time**

Constraint for time due to work schedule and other responsibilities and obligations was found to be a reason why many diabetic patients could not incorporate physical activity into their daily regimes. Some responses pointing this out are:

“Time restriction. I have children, I have to take them to school, spend time with them. My wife is also working so I have to make time for my children and then I have no time left to exercise.”

“I don’t really get the time to exercise. I leave for work at 7 in the morning and come back at around 6 or 7. I’m really tired when I come back so I cannot exercise.”

**Lack of awareness/knowledge**

1. Inability to link exercise with blood sugar control: A minority of the patients interviewed were not aware of the beneficial effects of physical activity on blood sugar control. First, their treating physicians sometimes failed to mention how exercising can be an important modality for controlling blood sugar levels, and second, they did not know whether to associate their blood sugar control to the medications they received or to their habit of exercising; because of which they eventually stopped exercising.

“I do blood tests every month but I don’t know whether they are controlled because of exercise or because of the medicine”

“He (treating physician) told me to exercise to lose weight. But they (treating physicians) don’t explain the reasons and I don’t ask for an explanation either.”

2. Lack of perception of obesity as a health issue:

A few patients felt that obesity was normal because they have a strong family history. For the same reason, they felt that exercising even to reduce weight was not required for them. One of the responses that makes this apparent is:

“Everyone in my family is well built as I am. It is not like I gained weight in the middle I have always been on the heavier side from when I was young.”

**Lack of infrastructure**

A lot of subjects brought up the issue of lack of infrastructure as an impediment to exercise. There were only few parks, or other recreational spots where citizens can walk, jog, or exercise in a safe, healthy, and pollution free environment. The main roads were a threat to their safety by itself because of vehicular traffic. In addition, the poor walkability on Indian roads due to a lack of pavements for pedestrians and potholes on the roads where pedestrians are forced to walk were impediments. Some responses that brought this out are mentioned below:

“It would be great to spend some time looking at greenery, maybe in a park or somewhere. It would be a motivation to exercise. Now I go for walk on the main road and traffic poses a problem and this stresses me out and worries my children.”

“I am scared that I will fall down if I walk on the roads near my house because they are maintained so poorly, there are no footpaths and there are so many potholes.”

**Social issues**

An interesting and often neglected thought that emerged as a barrier to exercising regularly was the fact that some subjects, especially women, felt uncomfortable or rather felt judged by those around them when they exercised in public,

One subject remarked:

“At my relatives’ place, people look upon me weirdly when I go on walks so I avoid exercising when I go out of station.”

**Physical restriction**

Some participants had a plethora of comorbidities that restricted them from pursuing physical activity, starting from joint problems to tiredness, and a lack of stamina. Some remarks by patients that bring forth this point are:

“I developed joint problems and since then I walk at a slow speed and avoid exercising because otherwise I develop pain.”

“I feel ‘weak’ and I have giddiness if I exercise.”

**Inadequate emphasis by physicians**

Physicians sometimes forget to stress on the importance and the undeniable need to exercise to maintain blood glucose levels under control, in addition to compliance to pharmacological therapy.

“My doctor has not told me if blood sugar can be controlled with exercise”

**Lack of adherence to standard guidelines**

There was a clear lack of uniformity in the advice given by physicians regarding the amount and type of physical activity to be performed but their patients. Some of the varied responses that we received, to support this theme were:

“My doctor told me that if I walk for 2 h daily I will not have diabetes or any other such problem”

“They said I should walk for a minimum of ½ h”

“He asked me to walk a lot”

“He told me to walk as much as I could”

“He told me to go for yoga classes”

“He asked me to go for a brisk walk for 45 min.”

**Discussion**

The key feature in the success to any therapeutic regimen is the adherence to the prescription. Despite advancements in therapeutics, the control of glucose to desired levels remains elusive to many patients worldwide. Exercise is a quintessential part of diabetes regimen, and this qualitative study explored the barriers and facilitators to exercise in a cohort of diabetic patients from South India.

There are some previous qualitative studies which have probed into regimen compliance and health behavior of diabetic patients.<sup>[6-8]</sup> One such study from Michigan identified perceived susceptibility, severity, benefits, and barriers (among patients) as components of the basic health belief model for diabetes, thereby defining psychological variables that influence patient compliance to any regimen for disease control.<sup>[7]</sup> They concluded that a large gap exists between health behavior and the motivational components affecting it and identified areas that educational interventions for the same could focus on.

Our study looked into facilitators and barriers to exercise as part of the treatment protocol of diabetic patients. The facilitating factors were awareness regarding the benefits of exercise and complications linked with diabetes, positive family support, and emphasis by nursing staff. Lack of time, obligations to others, inability to link exercise with blood sugar control, lack of perception of obesity as a health issue, inadequate emphasis by physicians, social/cultural issues, lack of infrastructure, and physical restriction were the factors that acted as barriers to physical activity. In addition to the above, a clear lack of adherence to standard guidelines while advising patients by physicians was also noted.

A similar qualitative study from Edinburgh published in 2006 investigated the barriers to physical activity among 32 people of Indian and Pakistani origins residing in Scotland.<sup>[6]</sup> It was found that although patients were aware of the causes and impact of diabetes, there were several barriers that prevented them from adhering to the diabetic regimen such as lack of time, responsibilities, cultural norms, fear and shame, comorbid items, perception that diabetes triggers an irreversible decline, perception that they do enough work already, and lack of culturally sensitive facilities.

Another study by Beverly and Wray establishes the role of spousal support in compliance to the diabetic regimen threw light on three core themes - collective support, collective motivation, and collective responsibility.<sup>[7]</sup> In our study, we have confirmed the role that a family can play in helping a patient be compliant to their exercise regimen, by motivating and facilitating them to exercise.

In a review of adherence to physical activity in patients with diabetes mellitus, Qiu *et al.* have summarized the barriers to physical activity and put forth suggestions on strategies to improve adherence.<sup>[9]</sup> As observed in our study, they have pointed out internal barriers such as physical or mental well-being and external barriers such as climate or culture related. Their education, empowerment, and counseling by healthcare professionals may aid adherence. From the current study also, it is surmised that treating physicians must not only urge their patients to exercise but also give them standard advice regarding the type and duration of exercise. Physicians must reiterate during every visit the need for exercise and the role that it can play in improving the patient's health. In large general hospitals, this may be a major contributory factor to the motivation instilled into patients. General practitioners and nurse practitioners who are more closely associate with patients should bear in mind the importance of their role in empowerment of patients. A good physician-patient relationship with individualized exercise recommendations may change patients' perceptions of exercise thereby augmenting adherence.<sup>[10,11]</sup>

## Conclusion

The identified barriers and facilitators should serve as a framework for improving knowledge about and adherence to exercise of diabetic patients. The diabetic educators need to be trained appropriately to identify and tackle each patient's exercise habits at a personal level. The standard guidelines for physical activity in diabetes must be used by all doctors. A comprehensive approach by both doctors and nurses could help in implementing and monitoring adherence to exercise in diabetics as well as in educating the patient regarding the benefits of exercise. Further

qualitative studies focusing of physicians' perceptions of exercise and education of patients would help identify the barriers which exist in consultation rooms.

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## Conflicts of interest

There are no conflicts of interest.

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