

Role of Intermittent Fasting in the Management of the Diabetes Mellitus Type 2 Patients in Karachi

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ABSTRACT

To determine the role of intermittent fasting in managing Diabetes Mellitus Type 2 patients in Karachi.

Methodology: It was a cross-sectional study conducted at Bahria University Health Sciences Campus, Karachi with total duration of three months from February 2022 to May-2022. After IRB approval random sampling technique was used to recruit subjects. 156 patients with DM type II were part of the study out of which 102 were in fasting among them 75 patients found intermittent fasting beneficial in managing blood glucose and symptoms, remaining 27 did not find it beneficial. Data Analysis was conducted by using SPSS version 25.

Results: A total of 156 patients with DM type II were part of the study out of which 102 were fasting among them 75 patients found intermittent fasting beneficial in managing blood glucose and symptoms, remaining 27 did not find it beneficial thus 73.5 % patients were better able to manage DM II with intermittent fasting. There was no association between the beneficial effects of intermittent fasting with a specific type.

Conclusion: Intermittent Fasting is beneficial for diabetes mellitus type II patients which proves our alternate hypothesis, but there is no specific type of intermittent fasting associated with it being beneficial. As long as a patient of DM II was observing periods of intermittent fasting, it has been show a clear evident that intermittent fasting plays a key role in the management of diabetes mellitus type II patients.

Keywords: Diabetes Mellitus, DM, Intermittent Fasting, Control of DM, Fasting

INTRODUCTION

Diabetes mellitus is the most prevalent metabolic diseases characterized mainly by hyperglycemia and insulin resistant that causes many complications with significant long-term morbidity and mortality worldwide (1). There are two main types of diabetes mellitus type I and type II. Unfortunately, due to the growing urbanization and financial crisis many people go undiagnosed making the disease Diabetes mellitus type II more complicated every passing year (2). According to the latest International Diabetes Federation (IDF), the global prevalence of T2DM in adults between (20-79 years was 536.6 million (10.5%). This figure is expected to increase to 643 million by 2030, and 783 million by 2045. Approximately 3 in 4 individuals with diabetes mellitus live in low- and middle-income countries, where it is accountable for 6.7 million fatalities every 5 seconds (3); the incidence in the United Kingdom is 4%, but it jumps to 9% in China, 10% in India, 11% in Sri Lanka, and a staggering 20% in Pakistan. Diabetes mellitus affects 26.7% of people in Pakistan, bringing the aggregate amount of sufferers to almost 33,000,000 (4).

In fact, a research found that when type 2 diabetics were given extensive insulin treatment to attain precise control of their glucose levels, all of the patients had hyperinsulinemia and added pounds during a 6-month period (5), many surgeries are present like gastric bypass; cutting the stomach size so the calorie intake will be lowered.

Intermittent fasting is becoming increasingly prominent as a way to improve the physique and metabolism (6). Intermittent fasting relates to eating routines that revolve upon the concept of ingesting extremely few to no nutrients for time intervals that vary from 12 hours to many days in a row. Intermittent fasting can be done in a variety of ways. Alternate day fasting is one such programme (7). There are several different regimens of intermittent fasting. Alternate day fasting is one such programme. (8). A different strategy is periodic fasting, in which people fast one or two days each week (also known as 5:2 or 6:1 fasting). Lastly, the most prevalent strategy is time-restricted eating, which restricts dietary intake to a specific period of time each day, often with 16-20 hour daily fasts. This is one of the most popular intermittent fasting regimens. Intermittent fasting's main function is to cut down the caloric intake in the body. The term intermittent fasting connotes reduced caloric intake on an intermittent basis. This can vary from several hours during the day such as 6-8 hours, 8-10

hours, 10-12 hours, 12-14 hours, and 14-16 hours. People with prolonged intermittent fasting can go in serious condition like unconsciousness by severe hypoglycemia (9).

Intermittent fasting can make 75% less calorie intake. We need to be aware of the health risks of diabetes mellitus type 2 and its management. Intermittent fasting could be beneficial in managing it as it would put a check on excess gain of weight in diabetes mellitus type 2 patients. We know that 80-85% of obese people are more likely to develop diabetes mellitus 2. Intermittent fasting is a method in which participants are asked to eat during specific hours of the day and fast for the rest (8). Loss of body weight is typically the goal of intermittent fasting. In Pakistan, religious communities such as Muslims fast from dawn until dusk during the Islamic month of Ramadan. Many studies have shown the beneficial effects of Ramadan fasting on various health indices (10). Intermittent fasting offers low effective, less-risk for type 2 diabetes mellitus management (11). We have designed this current study to find out the role of intermittent fasting in the management of Diabetes mellitus type 2

METHODOLOGY

It was a descriptive cross-sectional study. The study was conducted in Karachi, Pakistan, and it spanned over three months from 15th February 2022 to 15th May 2022. The sampling technique used was Non-Probability Convenient Sampling as participants were selected based on availability and willingness to participate. Participants volunteered through the online questionnaire distributed among the population in Karachi. The sample Size was calculated using Epi-Info Software. The prevalence of Diabetes Mellitus Type 2 in Pakistan is 11.7%. [6]

Using Epi-Info with Confidence Level 95% we were required to have a sample size of n=159 with the margin of error set at 5%. In the Inclusion criteria, people older than 15 were included in our study along with people having Diabetes Mellitus Type 2. In the exclusion criteria people with Diabetes Mellitus Type 1 and people with Gestational Diabetes were added. As the setting of our study was in Karachi people outside of Karachi were also in the exclusion criteria. People aged less than 15 were also excluded from the study.

Data was collected through an online questionnaire including demographic profile, Knowledge section, and practices section. The questionnaire was distributed among the general public in

Karachi through online means, and people voluntarily took part in this research study after giving their consent. In the demographic profile section, people were asked about their gender, age, marital status, qualification, and general health. Moving on to the knowledge section, participants were questioned regarding their knowledge of Diabetes Mellitus Type 2 and Intermittent fasting. They were also asked if they had a family history of Diabetes Mellitus Type 2 and whether they have diabetes mellitus Type 2 or not. They were also asked about the ideal blood glucose level in the knowledge section.

Further on in the practice section, participants were asked about the medication they took to control their diabetes and did they use any other methods for its control. People were also asked about having a glucose meter and using it to monitor their glucose levels. Then questions regarding Intermittent Fasting were asked such as time duration of intermittent fasting, time period of them trying intermittent fasting and participants monitoring glucose levels while intermittent fasting. In the end they were asked if they faced any problems while intermittent fasting and did it prove beneficial to them practicing Intermittent Fasting.

For the data analysis, we used SPSS Version 25. First and foremost, we started with demographic characteristics of data, for which we used descriptive analysis to analyze frequencies and percentages of our data. Then, moving towards our main hypothesis, we applied the Pearson Chi-Square test to check for the association between two categorical variables (have you ever tried intermittent fasting, yes or no – has intermittent fasting proven beneficial in controlling your blood glucose levels). For our second objective we applied chi-square test to check for any association between the time period of intermittent fasting and has it proven beneficial or not. The ethical endorsement was obtained from the ethical review board of Bahria University Health Sciences. Each participant was informed about the research's purpose and benefits, and a confidentiality guarantee was provided before data collection.

RESULTS

A total of 156 patients with DM type II were part of the study. Around 66% were males, with majority in the group of 25 to 55 years old category and equal distribution of married and single patients. Family history of DM was positive in around 55% patients.

Table 1: Basic details of the patients enrolled in the study

Demographics	Frequency	Percentage
Age	15-25	9 5.8%
	25-35	64 41%
	35-45	28 17.9%
	45-55	49 31.4%
	55+	6 3.8%
Duration of DM	< 5 years	71 45.5%
	5-10 years	36 23.1%
	10-15years	32 20.5%
	15-20year	12 7.7%
	>20 years	5 3.2%
Have you ever tried intermittent fasting?	Yes	102 65.4%
	No	54 34.6%
Type of intermittent fasting	Not trying intermittent fasting	54 34.6%
	6-8 hours	33 21.2%
	8-10 hours	30 19.2%
	10-12 hours	29 18.6%
	12-14 hours	7 4.5%
	14-16 hours	3 1.9%

It was noted that there was no association between the beneficial effects of intermittent fasting with gender and age of a patient, while association was found between the marital status, qualification and family history of a patient with the beneficial effects of intermittent fasting. As seen in table 2 ,p- value > significance = 0.05 for age and gender while p-value < significance = 0.05 for marital status qualification and family history.

Out of these, 102 were performing intermittent fasting while 54 were not. To find whether the patients performing intermittent fasting were able to manage DM type 2, they answered whether intermittent fasting was beneficial for them or not, this was also checked with whether their blood glucose was in check and also if their symptoms were controlled. Among them 75 patients found intermittent fasting beneficial in managing blood glucose and symptoms, remaining 27 did not find it beneficial. Marital status, level of education and family history of DM were the variables showing significant difference when stratified for the main outcome variable (p values of < 0.01).

Pearson Chi-square test statistics were used to examine the association between these two categorical variables (have you ever tried intermittent fasting, yes or no – has intermittent fasting proven beneficial in controlling your blood glucose levels). There is a significant association between the two variables at significance level of 5%,(p-value = 0.00) Hence Alternative Hypothesis was supported (p-value < significance =0.05). The test results are seen in table 2

Table 2:

Have you ever tried intermittent fasting?	Has intermittent fasting proved beneficial in controlling your blood glucose levels?			P 0.001
	YES	NO		
	YES	75	27	
NO	0	54	54	
	75	81	156	

To find whether the beneficial effects were linked to a specific type of intermittent fasting we first tested for an association between the types of intermittent fasting and beneficial effects of intermittent fasting , for which we used pearson chi square test, as seen in table 4 , there was no association between the two categorical values. For which we did not had to go through the 2nd part of finding the most beneficial type.

DISCUSSION

Similar researches close to our topic found similar results. Several types of research did utilize diet and other factors as good factors for maintaining hypoglycemic state. A randomized control trial study established that for individuals with Type 2 diabetes on hypoglycemic medications, fasting of any type increased the rate of hypoglycemia. With education and medication reduction, fewer than expected hypoglycemic events occurred (12).

Living in a Muslim country, we have a beautiful example of how intermittent fasting doesn't only put us in high merit before our Allah almighty but also has proven beneficial via numerous types of research. Participants of one of such researches reported optimism towards fasting during Ramadan, as they believed that fasting was beneficial to their overall well-being, and a time for family bonding (13).

On the other hand, this poses many potential risks for those with diabetes who wish to observe Ramadan which may include hypoglycemia. Guidelines are being generated and researched on for how to tackle this complication (14). This can be further supported by another research in which participants made attempts to discuss with their doctors on the decision to fast and self-adjusted their medication based on experience and symptoms during this period. They also reported difficulty in managing their diet, due to fear of hypoglycemia and the collective social aspect of fasting (13).

In our research we came find that intermittent fasting was beneficial for managing diabetes mellitus Type 2. However we did not find an association between Type of Intermittent Fasting and it being beneficial which is in accordance with some studies (15). Intermittent Fasting also carried risk of hypoglycemic episodes leading to unconsciousness, vertigo and trembling heartbeat etc. We also found that beneficial effects of intermittent fasting was associated with the marital status, qualification and family history of the patients, while no association was found with gender and

age and it is also shown by some other published literature (16, 17).

Our research was limited by the pandemic that struck the world with surprise, which set boundaries to many things, first starting with our data collection, which could only be done online. Due to SOPs the diabetic patient clinics and hospitals were hesitant to let us conduct our questionnaire in person. Summing up, research proved our alternative hypothesis. Intermittent fasting has a role in management of diabetes mellitus type 2 in patients.

CONCLUSION

This research could be further approved by doing this research in person as response rate would be increased and results will be more accurate. To improve this research, we can also purposively select patients doing intermittent fasting with diabetes mellitus type 2. The results should be tabulated on an objective approach not depending on the patient's response to avoid any information bias provided by the participant. Focusing on specific objectives, they can be improved by relating intermittent fasting with Caloric Intake and type of intermittent fasting. We should relate Lifestyle betterment of diabetic mellitus patient practicing Intermittent Fasting.

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