



# Fenugreek seed powder's effectiveness in reducing blood sugar level in type- 2 diabetes patients at E. T. C. M. Hospital, Kolar

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## ABSTRACT:

**Background:** Diabetes is a long-term disorder characterised by unusually high blood sugar levels (glucose). People with diabetes either don't make enough insulin, a hormone that converts sugar, carbohydrates, and other foods into energy, or can't utilise the insulin that their bodies do produce. Glucose gets up in the bloodstream as a result. Fenugreek, which originated in India and Northern Africa, is one of the oldest medicinal herbs. The leaves and seeds are used to make therapeutic extracts or powders.

**Method:** The study takes an evaluative approach, with data collected using a two-group pre- and post-test (quasi-experimental) design. Fenugreek seed powder is the independent variable, while fasting blood sugar levels are the dependent variable. The primary study was done at the ETCM Hospital Kolar OPDs, with a sample size of 50 type II diabetes patients (25 experimental and 25 control group) chosen by simple random selection, and the collected data analysed and interpreted using descriptive and inferential statistics.

**Findings:** The experimental group of Type 2 Diabetic Patients had a mean percentage of 2.04 with a standard deviation of 1.020 in the pre-test and a mean percentage of 1.32 with a standard deviation of 1.030 in the post-test. The mean percentage in the control group was 2.00 with a standard deviation of 1.118 in the pre-test and 2.06 with a standard deviation of 0.850 in the post-test; the resultant 't' value of 4.884 is larger than the table value at the (0.05) level of significance. As a result, 't' value is considerable, but the control group's blood sugar level does not alter. It indicates that fenugreek seed powder has an influence on type 2 diabetics' fasting blood sugar levels. This study shows that fenugreek seed powder is useful in lowering fasting blood sugar levels in type 2 diabetic patients.

**Key words:** Diabetes; Fenugreek; effectiveness; E. T. C. M. Hospital, Kolar; blood sugar level

## INTRODUCTION

Diabetes is a long-term disorder characterised by unusually high blood sugar levels (glucose). People with diabetes either don't make enough insulin, a hormone that converts sugar, carbohydrates, and other foods into energy, or can't utilise the insulin that their bodies do produce. Glucose gets up in the bloodstream as a result. Diabetes can cause blindness, kidney illness, nerve damage, heart disease, and stroke if left untreated.

According to World Health Organization predictions, diabetes would affect 380 million people globally by 2025. According to the American Diabetes Association, someone is diagnosed with diabetes every 21 seconds, and someone dies from diabetes-related causes every 10 seconds. Its prevalence is fast rising, with estimates that by 2030, the population would have nearly doubled.

India now has over 61 million diabetes patients, up from 50.8 million last year, according to the International Diabetes Federation (IDF). India's diabetes burden is predicted to reach 100 million people by 2030. With 983,000 fatalities attributable to diabetes this year, the country is also the highest contributor to regional mortality. The astonishing findings were presented as part of the IDF's fifth diabetes atlas. According to the IDF, diabetes affects 9.2% of Indians aged 20 to 79. India comes in second only to China, which had 90 million diabetes in 2011 and expects to reach 130 million by 2030. According to the International Diabetes Federation, "new estimates show that the number of people living with diabetes is likely to climb from 366 million this year to 552 million by 2030 if no action is done." This translates to almost three new instances every ten seconds, or over ten million every year." South Asia is home to 71.4 million diabetics this year. By 2030, this number is predicted to rise to 120.9 million. "Four out of every five diabetics is between the ages of 40 and 59," according to the Atlas.

In Karnataka, a cross-sectional community-based survey was done to assess the prevalence of type 2 diabetes and investigate its socio-demographic correlates. A two-stage stratified random selection procedure was used to choose 1,239 respondents over the age of 30 for the study. A personal, face-to-face interview was conducted, followed by blood sugar measurement using a glucometer. Diabetes was found to be prevalent in 16 percent of the population. Self-reported diabetes accounted for 11.2 percent of the population, whereas high fasting capillary blood glucose levels were discovered in 4.8 percent of previously healthy adults. The significant diabetes incidence in this coastal community necessitates more investigation.<sup>5</sup>

The results of the first phase of a nationwide research to evaluate the prevalence of diabetes and pre diabetes (impaired fasting glucose and/or impaired glucose tolerance) in India were studied using a stratified multistage sample approach. A total of 363 primary sampling units (188 urban, 175 rural) were sampled in three Indian states (Tamilnadu, Maharashtra, and Jharkhand), as

well as one union territory (Chandigarh). Fasting and two-hour post-glucose-load capillary blood glucose levels were used to determine the prevalence of diabetes and pre-diabetes. 14,277 (86 percent) of the 16,607 people who were chosen for the research took part, with 13,055 of them giving blood samples. Tamilnadu had a weighted prevalence of 10.4 percent diabetes (both known and newly diagnosed), Maharashtra had 8.4 percent, Jharkhand had 5.3 percent, and Chandigarh had 13.6 percent. Prediabetes was found in 8.3%, 12.8 percent, 8.1 percent, and 14.6 percent of the population, respectively. According to the estimates, Maharashtra will have 6 million diabetics and 9.2 million pre-diabetics in 2011, Tamilnadu will have 4.8 million diabetics and 3.9 million pre-diabetics in 2011, Jharkhand will have 0.96 million diabetics and 1.5 million pre-diabetics in 2011, and Chandigarh will have 0.12 million diabetics and 0.13 million pre-diabetics in 2011. According to projections, India would have 62.4 million diabetics and 77.2 million persons with prediabetes.

Fenugreek, which originated in India and Northern Africa, is one of the oldest medicinal herbs. The leaves and seeds are used to make therapeutic extracts or powders. Fenugreek was employed as incense and to embalm corpses in ancient Egypt, according to records. Fenugreek was said to help in labour and delivery in ancient Rome. Fenugreek seeds are used as a tonic and a therapy for leg weakness and edoema in traditional Chinese medicine. Fenugreek is a popular spice in India, and it's also utilised as a lactation stimulant. Fenugreek has a long history of traditional applications, including the treatment of dyspepsia and baldness. The findings of experimental animal and human experiments have revealed that oral fenugreek seed powder may have hypoglycemic and anti hyperlipidemic characteristics.

Diabetes is the most common metabolic disorder, affecting almost every organ and system in the human body. It is the most serious disease, and it affects practically every country. Diabetes affects more than 50 million people in India, making it the world's diabetic capital. It's simple to keep under control by altering one's lifestyle. The seed powder of fenugreek has a blood sugar-lowering effect. It's been used as a spice and a medicinal for centuries. Fenugreek has been revealed to have insulin-like qualities, allowing it to lower blood glucose, triglycerides, and cholesterol levels, all of which are crucial for type 2 diabetes patients. Patients can regulate their blood sugar at a low cost by taking fenugreek. The greatest prevalence of type 2 diabetes mellitus is found among the Indian community. My study on this subject will assist people in learning more about their illness and the effects of fenugreek on diabetes mellitus. Because fenugreek is readily available in our community, I believe that by conducting this research, I will be able to help people who are suffering from diabetes mellitus. As a result, I created a problem statement Fenugreek seed powder's effectiveness in lowering blood sugar levels in type 2 diabetes patients at E. T. C. M. Hospital, Kolar, with the following goals. 1. Determine the pre-fenugreek blood sugar level in type II diabetes patients in the experimental and control groups before administering fenugreek. 2. Give the fenugreek to the experimental group. 3. To compare the blood sugar levels of type 2 diabetes patients in the experimental and control groups after the test.

## **MATERIALS AND METHODS**

At E. T. C. M. Hospital in Kolar, an evaluative research technique was used to determine the efficacy of Fenugreek seed powder in lowering blood sugar levels in type 2 diabetic patients. A two-group pre- and post-test was conducted. The current study's goals were met through the use of a Quasi Experimental design. The research was carried out in the E.T.C.M hospital's OPD in Kolar. Fenugreek seed powder is the independent variable, while blood sugar levels of type II diabetes patients are the dependent variable. Diabetic patients (40-60 years) who frequent the E.T.C.M. hospital Kolar's OPD are the study's target demographic. By using a purposive sampling strategy, 50 type 2 diabetes patients were enrolled in the research.

### **Sampling criteria**

The samples were selected with the following predetermined set of criteria.

### **Inclusion criteria:**

- 1] Patients with type 2 diabetes who are willing to take part in the research.
- 2] Patients with type 2 diabetes who are available at the time of data collection.
- 3] Patients with type 2 diabetes whose FBS is more than 120 mg/dl.

### **Exclusion criteria:**

- 1] Patients with type 2 diabetes who decline to take part in the trial.
- 2] Patients with type 2 diabetes who are currently using fenugreek seed powder.

### **Selection and development of the tool**

The diabetes rating scale was used to obtain data. It is divided into two part. Section I includes demographic characteristics such as Age, gender, occupation, education, income of the family, Religion, Type of Family, Marital Status, Working time and Nature of work, Duration of diabetes mellitus, family history of DM, bad habits, and medications used treatment for DM, blood sugar level, diabetic diet, dietary habits, sleeping hours, exercise, home remedies and mental stress. Section II: Consists of rating scale in assessing the blood sugar level of type II diabetic patient which ranges from  $\leq 126$  –  $\geq 161$  and above mg/dl. The subjects were promised that the information they submitted would be kept anonymous and confidential, and formal informed permission was acquired. The pre-test consisted of checking blood sugar levels, then giving the experimental group fenugreek seed powder and instructing them to take it daily for the next 21 days. The post-test was done using the same instrument.

## **RESULT AND DISCUSSION**

The data were analyzed on the basis of the study objectives, using both descriptive and inferential statistics. Findings are organized in the following headings

Table – 1: frequency and percentage distribution of Demographic profile of type II diabetes patients

Sl. no.	Demographic variables	Experimental group		Control group	
		(N=25)		(N=25)	
1	Age in years	Frequency	Percentage	Frequency	percentage
a	40-45 years	6	24.0	3	12.0
b	46-50 years	7	28.0	6	24.0
c	51-55 years	3	12.0	1	4.0
d	56-60 years	9	36.0	15	60.0
<b>2</b>	<b>Gender</b>				
a	Male	10	40.0	13	52.0
b	Female	15	60.0	12	48.0
<b>3</b>	<b>Occupation</b>				
a	Private employee	4	16.0	6	24.0
b	Business	7	28.0	7	28.0
c	Government employee	7	28.0	6	24.0
d	Agriculture	7	28.0	6	24.0
<b>4</b>	<b>Education</b>				
a	Illiterate	5	20.0	4	16.0
b	primary school	4	16.0	3	12.0
c	secondary school	5	20.0	5	20.0
d	Higher secondary school	5	20.0	4	16.0
e	Intermediate	3	12.0	3	12.0
	Graduation	3	12.0	6	24.0
<b>5</b>	<b>Monthly Family Income</b>				
a	Rs. 6750-13499	13	52.0	12	48.0
b	Rs. 5050-6749	11	44.0	8	32.0
c	Rs. 3375-5049	1	4.0	5	20.0
<b>6</b>	<b>Family type</b>				
a	Nuclear family	22	88.0	21	84.0
b	Joint Family	3	12.0	4	16.0
<b>7</b>	<b>Marital status</b>				
a	Married	25	100.0	25	100.0
b	Unmarried	0	0.0	0	0.0

<b>8</b>	<b>Working times</b>				
a	Morning Shift	13	52.0	15	60.0
b	After Noon shift	8	32.0	8	32.0
c	Night Shift	4	16.0	2	8.0
<b>9</b>	<b>Duration of Diabetes Mellitus</b>				
a	One Year	5	20.0	8	32.0
b	Two years	3	12.0	3	12.0
C	Three Years	7	28.0	6	24.0
d	More than 4 Years	10	40.0	8	32.0
<b>10</b>	<b>Family history of diabetes</b>				
a	Yes	11	44.0	14	56.0
b	No	14	56.0	11	44.0
<b>11</b>	<b>Personal Habits</b>				
a	Smoking	12	48.0	12	48.0
b	Alcohol	4	16.0	4	16.0
c	Betel Nut	9	36.0	9	36.0
<b>12</b>	<b>Treatment measures</b>				
a	Insulin	13	52.0	14	56.0
b	Oral Hypoglycemic agents	12	48.0	11	44.0
<b>13</b>	<b>Dietary habits</b>				
a	Vegetarian	3	12.0	3	12.0
b	Mixed	22	88.0	22	88.0
<b>14</b>	<b>Sleeping hours</b>				
a	Less than 6 hours	4	16.0	8	32.0
b	More than 6 hours	21	84.0	17	68.0
<b>15</b>	<b>Awareness about fenugreek seed powder</b>				
a	Yes	5	20.0	8	32.0
b	No	20	80.0	17	68.0
<b>16</b>	<b>Taking any Medications</b>				
a	No	25	100.0	25	100.0
<b>Total</b>		<b>25</b>	<b>100%</b>	<b>25</b>	<b>100%</b>

- In the experimental group, the majority of type II diabetes mellitus patients (28%) are between the ages of 46 and 50, whereas in the control group, the majority of type II diabetic mellitus patients (60%) are between the ages of 56 and 60.
- In the experimental group, the majority of type II diabetes mellitus patients (60%) were female, whereas in the control group, the majority of type II diabetic mellitus patients (52%) were male.
- In terms of occupation, the majority of type II diabetes mellitus patients (28%) in the experimental group were government employees, business owners, and farmers, whereas the majority of type II diabetic mellitus patients (28%) in the control group were in the business.
- In terms of education, the majority of type II diabetic mellitus patients (20%) in the experimental group were illiterate in secondary school and higher education, respectively, whereas the majority of type II diabetic mellitus patients (24%) in the control group had finished graduation.
- Participants' family income revealed that in the experimental group, the majority of type II diabetes mellitus patients (52%) had a family income of Rs. 6750-13499, whereas in the control group, the majority of type II diabetic mellitus patients (48%) had a family income of Rs. 6750-13499.
- In the experimental group, the majority of type II diabetes mellitus patients (88%) belong to a nuclear family, whereas in the control group, the majority of type II diabetic mellitus patients (84%) belong to a nuclear family.
- In the experimental group, the majority of type II diabetic mellitus patients (100%) were married, whereas in the control group, the majority of type II diabetic mellitus patients (100%) were likewise married.
- In the experimental group, the majority of type II diabetes mellitus patients (52%) worked in the morning shift, but in the control group, the majority of type II diabetic mellitus patients (60%) worked in the morning shift exclusively.
- In the experimental group, the majority of type II diabetes mellitus patients (40%) had a history of more than 4 years, whereas in the control group, the majority of type II diabetic mellitus patients (32%) had a history of more than 4 years.
- In the experimental group, the majority of type II diabetic mellitus patients (56%) had no family history of diabetes, whereas in the control group, the majority of type II diabetic mellitus patients (56%) had a family history of diabetes.
- In terms of personal habits, the majority of type II diabetic mellitus patients (48%) in the experimental group smoked, whereas the majority of type II diabetic mellitus patients (48%) in the control group smoked.
- In the experimental group, the majority of type II diabetic mellitus patients (52%) were using insulin as their diabetes therapy, whereas in the control group, the majority of type II diabetic mellitus patients (56%) were also taking insulin as their diabetes treatment.
- In terms of dietary habits, the majority of type II diabetic mellitus patients (88%) in the experimental group ate a mixed diet, whereas the majority of type II diabetic mellitus patients (88%) in the control group ate a mixed diet.
- In terms of sleeping hours, the majority of type II diabetes mellitus patients (84%) in the experimental group slept more than 6 hours, whereas the majority of type II diabetic mellitus patients (68%) slept more than 6 hours in the control group.
- In the experimental group, the majority of type II diabetes mellitus patients (80%) had no knowledge of fenugreek seed powder, whereas in the control group, the majority of type II diabetic mellitus patients (68%) likewise had no knowledge of fenugreek seed powder.
- In the experimental group, the majority of type II diabetes mellitus patients (100%) did not take medication, whereas the majority of type II diabetic mellitus patients (100%) did not take medication in the control group.

**Table 2: Frequency and Percentage Distribution of Blood Sugar Level of Type2 Diabetic Patients in Both Experimental and Control Group** N = 50

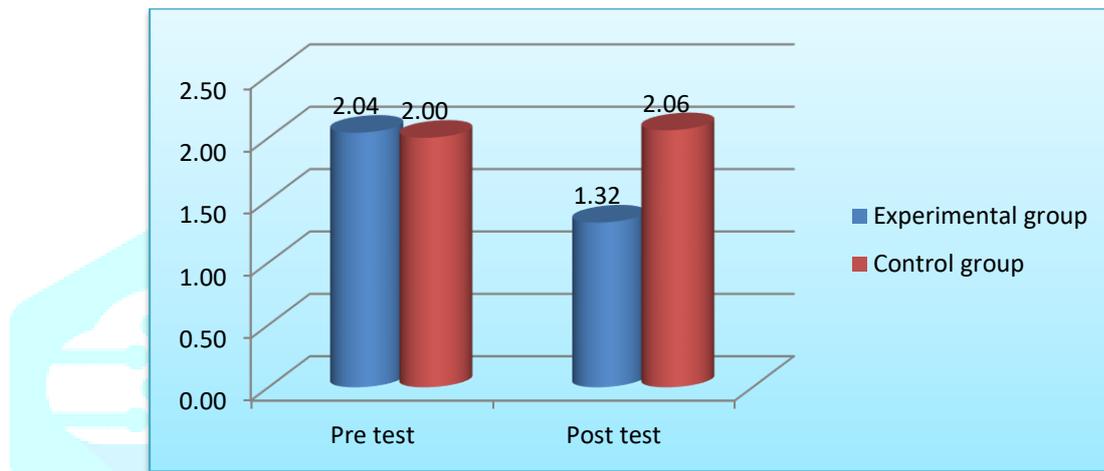
Sl. No	Blood sugar level	Experimental group				Control group			
		Pre Test		Post Test		Pre Test		Post Test	
		f	p	F	p	f	p	f	p
1.	Normal Blood Glucose level $\leq 126$	3	12.0	6	24.0	4	16.0	0.0	0.0
2.	Mild Hyperglycemia 127-140	3	12.0	9	36.0	3	12.0	7	28.0
3.	Moderate hyperglycemia 141-160	9	36.0	6	24.0	7	28.0	7	28.0
4.	Severe Hyperglycemia $\geq 161$	10	40.0	4	16.0	11	44.0	11	44.0
	<b>Total</b>	<b>25</b>	<b>100.0</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>100.0</b>	<b>25</b>	<b>100</b>

In the experimental group, the highest percentage of type 2 diabetes mellitus patients (40%) had severe hyperglycemia in the pre-test, whereas the majority of type 2 diabetes mellitus patients (36%) had moderate hyperglycemia in the post-test. This shows that patients with type 2 diabetes mellitus had lower blood sugar levels after taking fenugreek powder. In the control group, the most type II diabetes mellitus patients (44%) had severe hyperglycemia in the pre-test, and the majority of type II diabetes mellitus patients (44%) had severe hyperglycemia in the post-test. This demonstrates that the pre- and post-blood sugar levels of type 2 diabetes mellitus patients do not differ.

**Table 3: Mean, mean percentage and standard deviation of the pre and post blood sugar level of Type2 Diabetic Patients. N = 25**

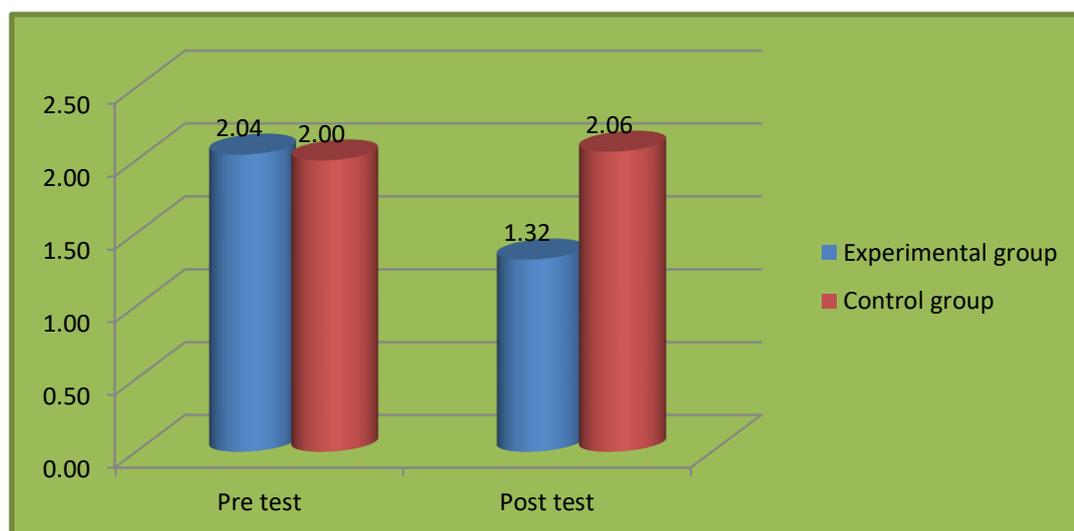
Sr. no	Blood sugar level of Type2 Diabetic Patients	Experimental group		Control group	
		Mean	S D	Mean	S D
1	Pre test	2.04	1.020	2.00	1.118
2.	Post test	1.32	1.030	2.06	0.850

In the pre-test, the mean percentage of Type 2 Diabetic Patients was 2.04 with a standard deviation of 1.020, and in the post-test, the mean percentage was 1.32 with a standard deviation of 1.030. The mean percentage in the control group of Type 2 Diabetic Patients on blood sugar levels was 2.00 with a standard deviation of 1.118 in the pre-test and 2.06 with a standard deviation of 0.850 in the post-test.

**Figure 1: Representing mean pre test and post test blood sugar level of Type2 Diabetic Patients in experimental and control group****Table 4: Effectiveness of fenugreek seed powder on lowering blood sugar level among experimental and control group type 2 diabetic patients**

Blood sugar level of Type2 Diabetic Patients	Pretest		Posttest		PAIRED T - TEST	Inference
	Mean	S D	Mean	S D		
Experimental group (N-25)	2.04	1.020	1.32	1.030	4.884	S
Control Group (N-25)	2.00	1.1418	2.06	0.850	1.38	NS

The obtained 't' value 4.884 in the experimental group is bigger than the table value at the (0.05) level of significance. As a result, the value of 't' is determined to be important. It indicates that fenugreek seed powder has an influence on type 2 diabetes patients' fasting blood sugar levels. The results of this study show that fenugreek seed powder is beneficial in lowering fasting blood sugar levels in type 2 diabetes patients; the acquired 't' value of 1.38 is lower than the table value at the 0.01 (12.94) level of significance in the control group. As a result, the value of 't' is determined to be insignificant.

**Figure 2: Representing mean blood sugar level of Type2 Diabetic Patients in experimental and control group****CONCLUSION**

The following conclusions were drawn from the data analysis: The goal of this study was to examine how successful Fenugreek seed powder was at lowering blood sugar levels in type 2 diabetic patients at E. T. C. M. Hospital in Kolar. In the pre-test, the mean percentage of Type 2 Diabetic Patients was 2.04 with a standard deviation of 1.020, and in the post-test, the mean percentage was 1.32 with a standard deviation of 1.030. The mean percentage in the control group of Type 2 Diabetic Patients on blood sugar levels was 2.00 with a standard deviation of 1.118 in the pre-test and 2.06 with a standard deviation of 0.850 in the post-test. The obtained 't' value 4.884 in the experimental group is bigger than the table value at the (0.05) level of significance. As a result, the value of 't' is determined to be important. It indicates that fenugreek seed powder has an influence on type 2 diabetes patients' fasting blood sugar levels. This study shows that fenugreek seed powder is useful in lowering fasting blood sugar levels in type 2 diabetic patients.

**Implications of the Study**

1. As a nurse counsellor, she must advise type 2 diabetes patients to use fenugreek seed powder on a regular basis to keep blood sugar levels in check.
2. She must tell patients about fenugreek seed powder and aid them in using it, as well as give information on fenugreek seed powder to patients.
3. The study underlines the relevance of short-term in-service teaching programmes for nurses and other peripheral health professionals on the importance of fenugreek seed powder in reducing blood sugar levels in type 2 diabetic patients.
4. Nurses must improve their ability to prepare health education materials at the level of patients' comprehension in a variety of specialist areas.
5. The nurse administrator should tap into their potential and stimulate creative thinking in the development of appropriate educational materials and manpower use.
6. Researchers will be inspired to undertake comparable studies on a larger scale and in diverse settings as a result of this work.

**CONFLICT OF INTEREST:**

The authors have no conflicts of interest regarding this investigation.

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