

# THE EFFECTIVENESS OF BUTTERFLY PEA FLOWER TEA ON BLOOD SUGAR LEVEL AMONG PATIENTS WITH TYPE-2 DIABETES MELLITUS SMCH'

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## Abstract

**AIM:** The purpose of this study was to ascertain how butterfly pea flower tea affected each patient's type-2 Diabetes mellitus condition. The study's aims are to evaluate blood glucose levels on the pretest and posttest in patients with type-2 diabetes mellitus. **METHODOLOGY:** Fifty patients with diabetes mellitus participated in an experimental study with a pre-test and post-test design utilizing basic random sampling techniques. Structured questionnaires were utilized to collect data. Throughout the entire procedure, confidentiality was upheld. A combination of inferential and descriptive statistics were used to analyze the data. **RESULTS:** Fifty people in all finished the study. When sucrose was combined with 1 g and 2 g of butterfly pea flower powder, the postprandial plasma glucose and insulin levels were decreased after 3 hours of intake. There was a group correlation for these outcomes. **CONCLUSION:** The analysis revealed that butterfly pea flower tea administered among the patients with type-2 diabetes mellitus was found to be effective in reducing the level of blood sugar among the patients with type-2 diabetes mellitus.

**Keywords:** Butterfly Pea Flower, Blood Sugar Level, Type-2 Diabetes Mellitus.

## INTRODUCTION

Traditional medicine has traditionally employed Clitoriaternatea, mostly as a supplement to enhance cognitive performance and alleviate symptoms of many ailments as fever, inflammation, discomfort, and diabetes (1). There are two flower colors for Clitoriaternatea: white and blue. The native term for Clitoria ternatea Linn(2) is Shankh pushpi. In addition to being a natural source of food-grade organic colors and antioxidants, it may find applications in contemporary agriculture and health. Clitoriaternatea has been used extensively as a sedative, antidepressant, memory booster, and stress reliever. Four (4) In recent years, a number of novel bioactive compounds derived from hypoglycemic plants have demonstrated greater efficacy in antidiabetic activity when compared to oral hypoglycemic medicines utilized in clinical therapy.(4) In vitro, it was recently discovered that aqueous Clitoriaternatea flower extract blocked digestive enzymes that break down carbohydrates, including pancreatic  $\alpha$ -amylase and intestine  $\alpha$ -glucosidase. After simulating gastrointestinal digestion, Clitoriaternatea flower extract was microencapsulated to boost its bioaccessibility and inhibit pancreatic  $\alpha$ -amylase and antioxidant activities.[8] Clitoriaternatea is a plant species that is unique to the Indonesian island of Ternate. It is an endemic member of the Fabaceae family and is also known by the names Asian pigeonwings, bluebellvine, blue pea, butterfly pea, cordofan pea, and Darwin pea.(14).

In India, the percentage of people with diabetes increased from 7.1% in 2009 to 8.9% in 2019. It is projected that 25.2 million adults today have IGT, and by 2045, that number will rise to 35.7 million.<sup>(10)</sup> According to data from Tamil Nadu, 21% (37/179) of adults over 40 had diabetes. In the 55–64 age range, the highest prevalence (41%; 7/17) was seen. Nine out of the fifteen participants with impaired glucose tolerance and sixteen of the 34 subjects with diabetes had a family history of the condition."<sup>(11)</sup> In Chennai, the prevalence rate was 779 people with known diabetes, of which 99.4% had type 2 diabetes, among 26,066 people of all ages. For both sexes combined, the prevalence of known diabetes was 2.9% of the population. For those over 20, the crude and age-standardized prevalence was 4.9% (95% CI 4.6-5.2). In individuals 40 years of age or older, the standardized prevalence was 10.5% (95% CI 9.8-11.2). In females, the prevalence was substantially high ( $P < 0.05$ ).<sup>(12)</sup>

## METHODOLOGY

After obtaining an ethical clearance from the institutional ethical committee of Saveetha Institute of Medical and Technical Science and formal permission letter obtained from the head of the SMCH, the present study was conducted. An experimental study with pre-test and post-test design using simple random sampling techniques was used to conduct a study of 50 patients with Diabetes mellitus. The data was collected with the help of structured questionnaires. Confidentiality was maintained throughout the process. The data collected was analysed using descriptive and inference statistics. The inclusion criteria were all the diabetes mellitus patients, new case of diabetes, patient with diabetes for more than 2 years. The purpose and the aim of the study was explained by the investigator to each of the participants and consent was obtained from them. The demographic variable was collected from the sample using semi structured questionnaire method. The sample characteristics were described using frequency and percentage. Chi square was used to associate the level of blood glucose with their selected demographic variables.

## RESULT AND DISCUSSION

### Section A: Description of The Demographic Variables of The Type - 2 Diabetes Mellitus Patients

In the experimental group, in regard to the demographic and clinical characteristics most of the age 40-60 is 18(36%), sex is female 50% and male is 50%, religion is Hindu 41(82%), resident is rural 26(52%), monthly income 5000-10000 25(50%), BMI moderate 23 (46%), dietary habit both 48(96%), lifestyle 42(84%), family history 31(62%), daily exercise 24(48%), physical activity 38(76%), anti-diabetic drug 16(32%), how many years 16(32%), age at diabetes 33(66%), recent test 20(40%), complications 36(72%), kidney related disease 48(96%), time for wound healing 23(46%), regularly monitoring 19(38%), home medicine 34(68%), more sugar in diet 17(34%), other medications for other conditions 46(92%), medications taken by 35(70%), frequent urination 43(86%), forget to take medicine 27(54%), anti-diabetic prescribed 50(100%), any amputation 46(92%), types of foot wear 33(66%).

### Section B: Assessment of Level of Blood Sugar Level Among Patients With Type-2 Diabetes Mellitus

Frequency and percentage distribution of pretest and posttest level of blood sugar level among patients with type-2 diabetes mellitus

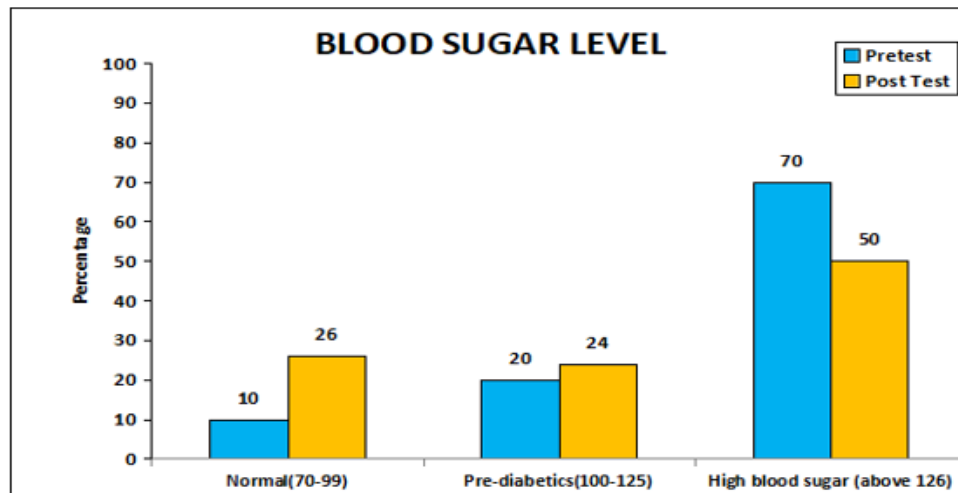
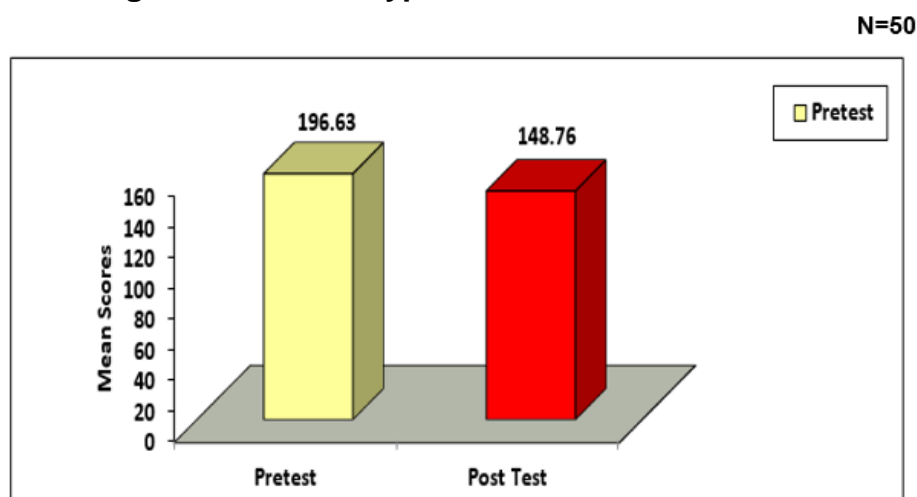


Fig 1: Percentage distribution of pretest and post test level of blood sugar among type 2 diabetes mellitus patients

**Section C: Effectiveness Of Butterfly Pea Flower Tea On Blood Sugar Level Among Patients With Type-2 Diabetes Mellitus**



Effectiveness of butterfly pea flower tea on blood sugar level among patients with type-2 diabetes mellitus

**Association Of Level Of Blood Sugar Level Among Patients With Type-2 Diabetes Mellitus 152.98**

Table 1: Association of level of blood sugar level among patients with type-2 Diabetes mellitus

N=50

Demographic Variables	Frequency	Percentage	Chi-square test
<b>Age in years</b>			$\chi^2=9.1778$ $p=0.2701$ S*
20-30	10	20	
30-40	9	18	
40-60	18	36	
<60	13	26	
<b>Sex</b>			$\chi^2=9.090$ $p=0.0025$ S*
Female	25	50	
Male	25	50	

<b>Monthly income</b>			$\chi^2=9.6052$ $p=0.0222$ S*
Below 5000	2	4	
5000-10,000	25	50	
10,000-20,000	17	34	
Above 20,000	6	12	
<b>Age at diabetes diagnosed</b>			$\chi^2=15.68$ $p=0.003$ S*
30-40 years	33	66	
40-50 years	14	28	
50-60 years.	3	6	
Above 60 years	-	-	
<b>Do you take more sugar in regular diet</b>			$\chi^2=2.784$ $4p=0.4260$ S*
1 time a day	17	34	
1 time a week	14	28	
1 time a month	4	8	
1 time a year	15	30	
<b>Have you taking any other medication for other conditions</b>			$\chi^2=5.425$ $p=0.0198$ S*
Hypertension	46	92	
Heart disease	4	8	
Cholestrol	-	-	
Asthma	-	-	
<b>Anyhistory of amputation</b>			$\chi^2=7.071$ $p=0.2913$ S*
Leg	1	2	
knee	0	0	
Finger	3	6	
toes	46	92	

## DISCUSSION

**The first objective was to assess the pre-test and post-test level of blood sugar level among patients with type-2 Diabetes mellitus.**

Reveled the pre-test of experimental group the pre-test the normal blood sugar level is 3(6%), pre-diabetes is 2(4%) and high-blood sugar level is 45(90%) and in the post-test normal level is 13(26%), pre-diabetes is 12(24%) and high-blood sugar level is 25(50%)

**The second objective was to assess the effectiveness of Butterfly pea flower tea on blood sugar level among patients with type-2 diabetes mellitus.**

The analysis shows that the pre-test mean score of academic stress was  $196.63 \pm 62.73$  and post- test mean score was  $148.76 \pm 58.29$ . The mean difference score was 47.870. The calculated paired' test value of  $t = 3.954$  was statistically significant at  $p < 0.001$  level. This clearly shows that after the administration of butterfly pea flower tea among type 2 diabetes mellitus had significantly reduced the blood sugar level. Hence the research hypothesis H1 that stated earlier **“There is statistically significant difference on the level of blood sugar level after consuming butterfly pea flower tea among type-2 diabetes mellitus”** was accepted. These findings are consistent with the following study done by Charoonsri Chusak, et al., (2018) conducted a study on “Acute effect of Clitoria ternatea flower beverage on glycemic response and antioxidant capacity in healthy subjects: a randomized crossover trial”. To determine the effects of Clitoria ternatea flower extract (CTE) on postprandial plasma glycemia response and antioxidant status in healthy men. In a randomized, crossover study, 15 healthy men (ages  $22.53 \pm 0.30$  years; with body mass index of  $21.57 \pm 0.54$  kg/m<sup>2</sup>) consumed five beverages: (1) 50 g sucrose

in 400 mL water; (2) 1 g CTE in 400 mL of water; (3) 2 g CTE in 400 mL of water; (4) 50 g sucrose and 1 g CTE in 400 mL of water; and (5) 50 g sucrose and 2 g CTE in 400 mL of water. Incremental postprandial plasma glucose, insulin, were measured during 3 h of administration. These findings suggest that an acute ingestion of CTE increases plasma antioxidant capacity without hypoglycemia in the fasting state. It also improves postprandial glucose, insulin when consumed with sucrose.

**The third objectives was to determine the association between the effectiveness of level of blood sugar level among patients with type-2 Diabetes mellitus.**

The analysis findings revealed that the demographic variable age, sex, monthly income, age at diagnosed, sugar in regular diet, medications for other condition had shown statistically significant association with post- test level of blood sugar level of type 2 diabetes mellitus at  $p < 0.05$  level. The other demographic variables had not shown statistically significant association with post- test level of blood sugar level of type 2 diabetes mellitus at  $p < 0.05$  level.

## CONCLUSION

The analysis revealed that butterfly pea flower tea administered among the patients with type-2 diabetes mellitus was found to be effective in reducing the level of blood sugar among the patients with type-2 diabetes mellitus.

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**Conflict of Interest:** Author declares no conflict of interest.

**Authors Contribution :** Sindhu priya developed the study concept and design, Steny Sharon collected the clinical data, Bhuvaneshwar and anitha performed the statistical analysis and interpretation of data, suganthi study supervision, Sindhu priya critical revision of the manuscript for the intellectual content and drafting of the manuscript. All authors read and approved the final manuscript.

**Conflict of Interest and Finding Support:** The authors for the current project have no financial investment and are not the investor in any of the health sectors related to the project and not received any consultation payments. They did not have any patents linked to the project

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