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Effectiveness of guava leaf tea in reducing postprandial blood glucose among type -2 diabetic clients

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Abstract

The present aim was to assess the effectiveness of guava leaf tea in reducing postprandial blood glucose among type-2 diabetic clients at Thirumazhisai, Thiruvallur District. A quantitative research approach and Pre experimental one group pre-test post-test research design was adopted for the present study. 35 type II diabetes mellitus clients selected by purposive sampling technique. Structured questionnaire was used to collect the demographic variables and observation schedule to assess the postprandial blood glucose among type II diabetic clients. Among 35 study participants the mean score of blood glucose was 305.43 ± 67.27 and the post test mean score was 197.28 ± 29.52 . The calculated paired 't' test value of $t = 11.740$ was found to be statistically significant at $p < 0.001$ level. Hence the findings of present study concluded that, that Guava Leaf Tea on blood glucose administered to the type II diabetes mellitus clients was found to be effective and there was significant reduction in the level of blood glucose in the post test.

Keywords: Guava leaf, postprandial blood sugar, type 2 diabetes mellitus, glucometer

Introduction

As diabetes mellitus is one of the largest global health emergencies of the 21st century, TYPE 2 diabetes is the most frequently accounts for about 90-95% of all diagnosed cases of DM [1]. The global prevalence of T2DM is 8-9% and has been rising more rapidly in middle and low income countries [2]. According to national diabetes statistics report 2020 by CDC (Centers for disease control and prevention) 34.2 million have diabetes worldwide among 26.9 million of diagnosed and 7.3 million people who are undiagnosed and 26.8 million was adults [3]. There is a huge economic burden of diabetes in India and variations were recorded in different zones, it was observed that the cost of drugs accounts as a major burden of cost of diabetes, and suggested few interventions to cope with this high economic burden [4, 5]. Some studies revealed the leaf extract of guava has traditionally been used for the treatment of diabetes in East Asia and other countries and Active component of the aqueous guava leaf extract and its inhibition of alpha-glycosidase enzymes *in vitro*, safety of the extract and Guava Leaf Tea, reduction of postprandial blood glucose elevation [6, 7]. In more developed countries, the cure and prevention of T2DM have become important concerns, on the other hand, T2DM is expected to become a more serious problem in developing countries because of urbanization and consequent lifestyle changes, perhaps most by "western style diet" which is high in fat [8]. Research studies indicates that a majority of cases of TYPE 2 DM could be prevented through healthy diet and regular physical activity [9]. A healthy diet includes reducing the amount of calories, replacing saturated fats and eating fibers and avoiding alcohol and tobacco and regular physical activity is effective in preventing spikes includes combination of aerobic (jogging, swimming, cycling) and resistance training and more onset of diabetes to a younger age in the recent years may be a long lasting adverse effects on the nation's health and economy [10]. Early identification of at risk individuals using simple screening tools like the Indian Diabetes Risk Score (IDRS) and appropriate lifestyle interventions would greatly help in preventing or postponing the onset of diabetes and thus reducing the burden on the community and the nation as a whole [11, 12]. So, the main aim of the present study was to assess the effectiveness of guava leaf tea in reducing postprandial blood glucose among type -2 diabetic and to associate the posttest level of post-prandial blood glucose among Type II Diabetic clients with their selected demographic variables.

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Methods and Materials

The study used quantitative research approach and Pre experimental one group pre-test post-test research design with the sample size of the study was 35 who has type II diabetes mellitus clients who were selected by purposive sampling technique and who fulfilled the inclusion criteria. The inclusive criteria were Type II diabetes client residing at thirumazhisai, who has fasting blood glucose level more than 120mg/dl, whose age group more than 35 years, who have only diabetes mellitus and the exclusion criteria were who have systematic disease apart from Diabetes mellitus and who are not willing to participate in this study. The study was conducted at Thirumazhisai, Thiruvallur District. Structured questionnaire was used to collect the demographic variables and observation schedule to assess the postprandial blood glucose. On day 1 pretest was conducted among the samples and on the same day Guava Leaf Tea was given to the samples and the post test was conducted after 7 days. The data was collected for a period of 1 week and the collected data were analyzed using descriptive and inferential statistics.

Result and discussion

Section-A: Demographic Characteristics

Among 35 study participants, with regards to age 10 were in the age group of between 51 – 60 and 61 – 70 years respectively, 18 were female, 12 had HSS and Diploma education, 9 were coolie, 11 had monthly income of <10000, 14 were Hindus, 14 were both a and b, 11 had duration of illness for 1 – 3 years, 29 had taken treatment for DM, 21 had family history of diabetes mellitus, 20 had regularly practiced exercise, 24 were regular in taking medication, 15 had a BMI of <18.5, 14 slept for 8 hours per day and 14 checked blood glucose status once in a month.

Section-B: Assess the Level of Postprandial Blood Glucose among Type II Diabetes Mellitus Clients

The analysis revealed that in the pretest, 25 had blood glucose level of more than 250 mg/dl and 10 had blood glucose in the range of 180-250 mg/dl. Whereas in the post test, 21 had blood glucose in the range of 180-250 mg/dl and 14 had blood glucose level of less than 180 mg/dl. (Table 1 and Fig.1).

Table 1: Frequency and percentage distribution of level of postprandial blood glucose among Type II diabetes mellitus clients. n = 35

Blood Glucose	Less than 180 mg/dl		180 – 250 mg/dl		More than 250 mg/dl	
	No.	%	No.	%	No.	%
Pretest	0	0	10	28.57	25	71.43
Post Test	14	40.0	21	60.0	0	0

Section C: Effectiveness of guava leaf tea on postprandial blood glucose among Type II diabetes mellitus clients

The findings of the analysis illustrated that the pre test mean score of blood glucose was 305.43 ± 67.27 and the post test mean score was 197.28 ± 29.52 . The calculated paired 't' test value of $t = 11.740$ was found to be statistically significant at $p < 0.001$ level. This clearly infers that Guava Leaf Tea on blood glucose administered to the type II diabetes mellitus clients was found to be effective and there was significant reduction in the level of blood glucose in the post test. (Table 2)

The present study findings is supported by the study conducted by Umadevi, S (2014) to compare the pre and post blood glucose level in relation to intake of guava leaf tea among clients in both experimental and control group. An experimental study with pre test post test research design

was used and a sample of 60 Type II Diabetic Adults (30 in experimental and 30 in the control group) is selected by using simple random sampling technique. 50 ml of guava leaf tea was given to the clients in experimental group half hour after breakfast daily for 14 days. The obtained data were analyzed by using descriptive and inferential statistics. The findings of the study showed that there was a significant ($p \leq 0.05$) level with a confidence interval of 95% reduction in blood glucose level after administering guava leaf tea in the experimental group. The study reveals that greater significance of guava leaf tea was observed in the age group of 30-40 yrs, less duration of illness 0-1yr, and habit of doing exercise when compared to others. Guava leaf is cost effective, easily available, known by all people and improves the general well being of the clients, prevents them from developing complications and reduces the dosage of the drug.

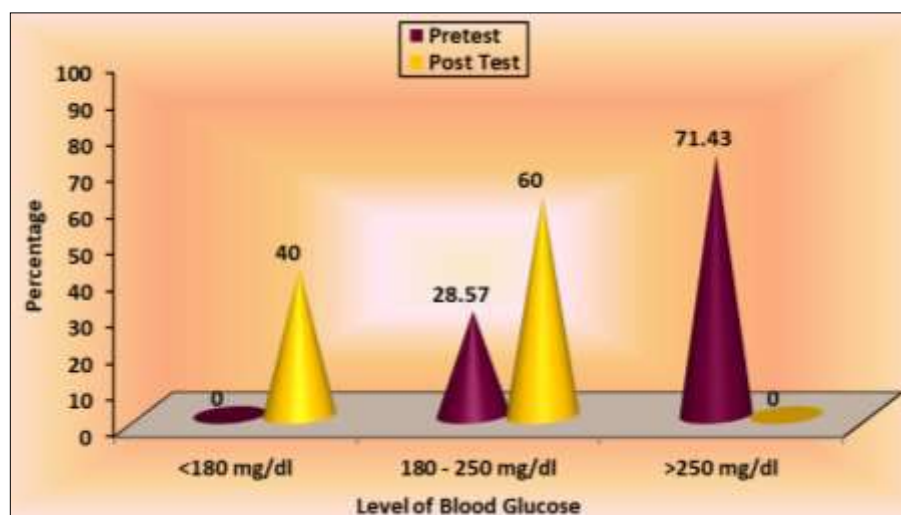


Fig 1: Percentage distribution of level of postprandial blood glucose among Type II diabetes mellitus clients.

Table 2: Comparison of pretest and post test level of postprandial blood glucose among type II diabetes mellitus clients. n = 35

Blood Glucose	Mean	S.D	Paired 't' test Value
Pretest	305.43	67.27	t = 11.740 p = 0.0001 S***
Post Test	197.28	29.52	

***p<0.001, S – Significant

Section D: Associate The Level Of Postprandial Blood Glucose With their Selected Demographic Variables.

The findings showed that the demographic variables duration of illness and exercise had shown statistically significant association with post test level of blood glucose among type II diabetes mellitus clients at $p < 0.05$ level.

Conclusion

Thus the findings of the present study revealed that, assess the effectiveness of guava leaf tea in reducing postprandial blood glucose among type -2 diabetic clients that blood glucose level was reduced significantly in the post test after the administration Guava Leaf Tea.

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