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Effect of guava leaf tea on blood sugar level among clients with type ii diabetes mellitus at a selected community, Coimbatore

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Abstract
The study assess the effect of guava leaf tea on blood sugar level among diabetic clients. True experimental, pre-test, post-test control group design was adopted in this study using purposive sampling technique. Among 40 clients, 20 were allotted to experimental and 20 clients into control group by randomization. Pre-test was done using glucometer to measure the fasting and postprandial blood sugar level. Guava leaf tea was administered for the clients along with routine treatment in experimental group after breakfast and phone reminder was given before and after dinner every day for a period of 28 days and a reminder chart was placed at client's home. Routine treatment was continued by the clients in the control group. Post-test was done on day 14 and day 28 using glucometer to measure the fasting and postprandial blood sugar level for both experimental and control group. It was identified that the mean fasting blood sugar level among clients with type II diabetes mellitus during pre-test and post-test in the experimental group was 136.05 and 105 respectively with a mean difference of 31.05. The standard deviation of pre-test and post-test were 51.42 and 30.78 respectively. The calculated 't' value 4.71 was greater than the table value 1.96 at 0.05 level of significance. The mean postprandial blood sugar level among clients with type II diabetes mellitus during pre-test and post-test in the experimental group was 198.75 and 155.85 respectively with a mean difference of 42.9. The standard deviation of pre-test and post-test were 79.43 and 58.48 respectively. The calculated 't' value 5.70 was greater than the table value 1.96 at 0.05 level of significance. Hence, it was concluded that guava leaf tea is an effective intervention in reducing the blood sugar level among clients with type II diabetes mellitus.

Keywords: Type II Diabetes Mellitus, Clients, Blood Sugar Level, Guava Leaf Tea

Introduction
Diabetes mellitus is an iceberg disease and it represents a spectrum of metabolic disorders, which has become a major health challenge worldwide (Gupta, *et al.* 2012). It has attained epidemic proportion worldwide. There are about 415 million people suffering from diabetes worldwide in 2016 and will rise up to 642 million by 2040.It will be the 7th leading cause of death in 2030. 1 in 11 adults have diabetes worldwide. By 2040, 1 in 10 adults will have diabetes. Every 6 seconds, a person dies from diabetes. (International Diabetes Federation, 2016) [2]

Need for the study
Many clients cannot maintain the glycemic control either with lifestyle or with oral hypoglycemic agent therapy. Hence, traditional medicine can be opted for the better outcome as it has minimal side effects than medicinal therapy. There are various types of traditional alternative treatments available such as yoga, massage therapy, ayurveda, homeopathy, naturopathy, acupuncture, biofeedback, faith healing, chromotherapy and chinese medicine.. Herbal preparations are used in traditional medicine as folk medicine in various forms such as whole, crushed, decoction, dried extractions, infusion and tinctures. One such folk medicine is guava leaf tea. (Mohan, Seedat & Pradeepa, 2013).
Guava leaf tea is limited to 9gm/day to reduce blood glucose levels. Psidium guajava repairs pancreas beta cells and enhance insulin secretion which then decrease blood glucose levels.

It can also reduce triglycerides, cholesterol, very low density lipoprotein (VLDL) and low density lipoprotein (LDL) cholesterol and then increase high density lipoprotein (HDL) cholesterol. (Bahrani, *et al*. 2012) [1]

Statement of the Problem

Effect of Guava Leaf Tea on Blood Sugar Level among Clients with
Type II Diabetes Mellitus at a selected community, Coimbatore.

Objectives of the study

To assess the blood sugar level among clients with type II diabetes mellitus in experimental and control group
To evaluate the effect of guava leaf tea on blood sugar level among clients with type II diabetes mellitus in the experimental group.
To find out the association between the blood sugar level among clients with type II diabetes mellitus and selected socio demographic variables

Hypothesis

H_1: There is a significant difference in the fasting blood sugar level between experimental and control group clients with type II diabetes mellitus before and after guava leaf tea administration.
H_2: There is a significant difference in the postprandial blood sugar level between experimental and control group clients with type II diabetes mellitus before and after guava leaf tea administration.
H_3: There is a significant difference in the fasting blood sugar level among experimental group clients with type II diabetes mellitus before and after guava leaf tea administration.
H_4: There is a significant difference in the postprandial blood sugar level among experimental group clients with type II diabetes mellitus before and after guava leaf tea administration.
H_5: There is a significant association between the pre-test fasting blood sugar level and the selected socio-demographic variables among clients with type II diabetes mellitus.
H_6: There is a significant association between the pre-test postprandial blood sugar level and the selected socio-demographic variables among clients with type II diabetes mellitus.

Methodology

Quantitative research approach was adopted for the study with true experimental pretest posttest only control group design. The study was conducted in Avarampalayam, Coimbatore. Purposive Sampling technique was used to select the samples. All the 40 clients who met the sampling criteria were randomly assigned to experimental group (n=20) and control group (n=20) using lottery method. The independent variable of the study was guava leaf tea. The dependent variable of the study was blood sugar level among clients with type II diabetes mellitus. The Sociodemographic profile and blood sugar level monitoring chart was framed based on the expert opinion and the supportive literatures. Ethical consent was obtained from the institutional ethical committee. Informed consent was obtained from each study client. Guava leaf tea was administered for the clients along with routine treatment in experimental group by the researcher after breakfast and phone reminder was given before and after dinner every day for a period of 28 days and reminder chart was placed at client's home. Routine treatment was given for clients in the control group. Post-test was done on day 14 and day 28 to measure the fasting and postprandial blood sugar level for both the groups.

Results

Table 1: Effect of Guava Leaf Tea on Fasting Blood Sugar Level between Experimental and Control group Clients with Type II Diabetes Mellitus (n=40)

Days of observation	Group	Mean	Standard Deviation	Mean Difference	't' value
1	Experimental	136.0	51.42	18.2	1.31
	Control	117.8	29.95		
14	Experimental	119.15	30.78	10.35	1.0
	Control	129.5	32.29		
28	Experimental	105	24.30	40.35	6.34*
	Control	145.3	40.10		

*Significance at 0.05 level

Unpaired 't' test was used to compare the fasting blood sugar level on day 1, 14 and 28 before guava leaf tea administration between experimental and control group. It was identified that the mean fasting blood sugar level on day 1 in experimental and control group was 136.0 and 117.8 with mean difference of 18.2. Calculated standard deviation in experimental and control group was 51.42 and 29.95 respectively. The calculated 't'value 1.31 was lesser than the table value of 1.96 at 0.05 level of significance.
During day 14, the experimental and control group had a mean fasting blood sugar level of 119.15 and 129.5 with the mean difference of 10.35. The calculated standard deviation was 30.78 and 32.29 respectively. The calculated 't'value 1.0 was lesser than the table value of 1.96 at 0.05 level of significance.
On day 28, the mean fasting blood sugar level in experimental and control group was 105 and 145.35 with the mean difference of 40.35. Standard deviation were 24.30 and 40.10 respectively. The calculated' t' value 6.34 was greater than the tabulated value of 1.96 at 0.05 level of significance. Hence it shows there is a significant difference in the fasting blood sugar level between experimental and control group clients with type II diabetes mellitus before and after guava leaf tea administration.

Table 2: Effect of Guava Leaf Tea on Postprandial Blood Sugar Level between Experimental and Control group Clients with Type II Diabetes Mellitus (n=40)

Days of observation	Group	Mean	Standard Deviation	Mean Difference	't'value
1	Experimental	198.75	79.43	18.75	0.90
	Control	180	40.73		
14	Experimental	178.45	70.75	22.8	1.99 *
	Control	201.25	44.02		
28	Experimental	155.85	58.48	58.5	3.30*
	Control	214.35	49.09		

*Significance at 0.05 level

Unpaired 't' test was used to compare the postprandial blood sugar level on day 1, day 14 and day 28 of guava leaf tea administration between experimental and control group clients with type II diabetes mellitus.

It was identified that the mean postprandial blood sugar level on day 1 in experimental and control group was 198.75 and 180 with mean difference of 18.75. Calculated standard deviation was 79.43 and 40.73 respectively. The calculated 't'value 0.90 was lesser than the table value of 1.96 at 0.05 level of significance.

During day 14, the experimental and control group had a mean postprandial blood sugar level of 178.45 and 201.25 with mean difference of 22.8. Calculated standard deviation were 70.75 and 44.02 respectively. The calculated 't'value 1.99 was greater than the table value of 1.96 at 0.05 level of significance.

Then on day 28, the mean postprandial blood sugar level in experimental and control group was 155.85 and 214.35 with the mean difference of 58.5. Calculated standard deviation were 58.48 and 49.09. The calculated' t' value 3.30 was greater than the tabulated value of 1.96 at 0.05 level of significance. Hence it shows there is a significant difference in the postprandial blood sugar level between experimental and control group clients with type II diabetes mellitus before and after guava leaf tea administration.

Major findings

From the present study, it was found that the guava leaf tea was effective in reducing blood sugar level among clients with type II diabetes mellitus.

Conclusion

Clients seek out numerous ways to support their health and opt for less invasive, safe and low-cost approaches to strengthen their well-being. One such approach is guava leaf tea which people can do at home to maintain the blood sugar level. The researcher adopted guava leaf tea administration to reduce blood sugar level among clients with type II diabetes mellitus. It is found from the evidence in the present study that guava leaf tea reduces blood sugar level among clients with type II diabetes mellitus.

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