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Effectiveness of Ladies Finger Juice on Blood Glucose

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ABSTRACT

Diabetes Mellitus can manifest due to resistance of peripheral receptors to insulin or increased endogenous glucose production by the liver and is clinically characterized by hyperglycemia. Hyperglycemia is caused by inherited or acquired deficiency in production of insulin by the pancreas or by the ineffectiveness of the insulin production. Type 2 diabetes mellitus is the one of the type of diabetes mellitus. Type 2 diabetes mellitus is results from a decreased sensitivity to insulin resistance or from a decreased amount of insulin production. This study was aimed to assess the effectiveness of ladies finger juice on blood glucose level among adults with type 2 diabetes mellitus and in view of preparing pamphlet on hypoglycemia in Nanchiyampalayam at Dharapuram.

Keywords: Diabetes, Hyperglycemia, mellitus.

INTRODUCTION

The research approach used for the study was evaluative approach. The quasi experimental non equivalent control group pretest, posttest design was used for this study. The conceptual framework of the study was based on the "Wiedenbach's helping art of clinical nursing theory". Purposive sampling technique was used to select 60 samples, out of which 30 were in experimental group and 30 were in control group. The first 2 days morning, pretest fasting blood glucose level was checked by using glucometer and during the daytime demographic variables were collected from the experimental group. On the 2nd day evening the investigator had prepared the 250ml of ladies finger juice for each sample in experimental group. Instructions were given to the samples in experimental group regarding measures to be taken in hypoglycemia. From the third day morning onwards, the experimental group were asked to consume the ladies finger juice before breakfast for 15 days. Every day morning, the experimental group drank the ladies finger juice in empty stomach under the supervision of the investigator. During day time knowledge on hypoglycemia was assessed by using structured interview questionnaire for the experimental group. It took 40-45 minutes for each sample. The posttest fasting blood glucose level was checked on 7th and 16th day after intervention for the experimental group. After the posttest,

pamphlet on hypoglycemia was given to the experimental group. From next day onwards, for the control group, pretest fasting blood samples were taken and demographic variables were collected for 2 days. The first posttest fasting blood samples were taken on the 7th day. The 2nd posttest fasting blood samples were taken on the 16th day. During daytime the knowledge on hypoglycemia was assessed in control group. On the 16th day after taking the blood samples, the pamphlet on hypoglycemia was given to the control group also. Finally for all the 60 samples ladies finger seeds were given to grow it in their kitchen garden for their further use. The collected data were analyzed and tabulated by using descriptive and inferential statistics.

The mean pretest score of blood glucose level was 178 (SD±43.1) and mean posttest-I score of blood glucose level was 135 (SD±19.2) and posttest-II mean score of blood glucose level was 107 (SD ± 13.01) which showed that the mean posttest-I and posttest-II score was significantly lower than the mean pretest score in the experimental group. The paired 't' value was 7.398 and 9.882 for posttest-I and posttest-II respectively which was significant at p<0.05 level of significance.

The mean posttest-I score of blood glucose level was 135(SD±19.2) in experimental group and mean score was 177 (SD±38.6) in control group. The mean difference was 42. The independent 't' value was 5.617, which was significant at p<0.05 level of significance. The mean posttest -II score of

blood glucose level was 107(SD±13.01) in experimental group and mean score is 176 (SD±41.09) in control group. The mean difference was 69. The independent 't' value was 8.843, which was significant at $p < 0.05$ level which revealed that the ladies finger juice was effective in reducing blood glucose level among type 2 diabetes mellitus. There was significant association found between posttest level of blood glucose and sex, education and dietary pattern in experimental group.

In experimental group, majority 21(70%) of adults had moderately adequate knowledge, 9(30%) of adults had inadequate knowledge regarding hypoglycemia. In control group majority 14(47%) of adults had moderately adequate knowledge, 16(53%) of adults had inadequate knowledge regarding hypoglycemia. The pamphlet on hypoglycemia was given both experimental group and control group. The study findings revealed that ladies finger juice was beneficial and there was a significant reduction in blood glucose level among adults with type 2 diabetes mellitus.

OBJECTIVES

1. To assess the pretest and posttest level of blood glucose among adults with type 2 diabetes mellitus in experimental and control group.
2. To compare the pretest and posttest level of blood glucose among adults with type 2 diabetes mellitus in experimental and control group.
3. To find the effectiveness of ladies finger juice on blood glucose level among adults with type 2 diabetes mellitus between experimental and control group.
4. To assess the knowledge of hypoglycemia among adults with type 2 diabetes mellitus in experimental and control group.
5. To find out the association between the posttest level of blood glucose among adults with type 2 diabetes mellitus and their selected demographic variables in experimental group.

HYPOTHESES

H1: The mean posttest level of blood glucose is significantly lower than the mean pretest level of blood glucose in experimental group.

H2: The mean posttest level of blood glucose in the experimental group is significantly lower than the mean post test level of blood glucose in control group.

H3: There will be a significant association between the posttest level of blood glucose among adults with type 2 diabetes mellitus and their selected demographic variables in experimental group.

CENTRAL PURPOSE

STEP I: IDENTIFICATION OF A NEED FOR HELP

According to the therapist within the identification component there are four distinct steps. First, nurse observes the patient, looking for an inconsistency between the expected behavior of the patient and the apparent behavior. Second, nurse attempts to clarify what the inconsistency means. Third, nurse determines the cause of the inconsistency. Finally, nurse validates with the patient that her help is needed.

In this study, the general information which comprises the age, sex, religion, education, occupation, family income, type of family, marital status, dietary pattern, exercise, family history of diabetes mellitus, treatment, duration of treatment of

diabetes mellitus, frequent monitoring of blood glucose level and source of health information. The pre test blood glucose was monitored for two days and graded a uncontrolled diabetes mellitus, controlled diabetes mellitus, normal. Structured interview questionnaire were used to assess the knowledge regarding hypoglycemia and graded as adequate knowledge, moderately adequate knowledge, in adequate knowledge in both experimental and control group

STEP II: MINISTRATION OF THE HELP NEEDED

According to the theorist, in ministering to the patient, the nurse may give advice or information, make referral, apply a comfort measures or carry out a therapeutic procedures. The nurse will need to identify the cause and if necessary make an adjustment in the plan of action.

Ministration of help needed has two components,

1. PRESCRIPTION
2. REALITIES

STEP III: VALIDATION THAT NEED FOR HELP WAS MET

According to the theorist, the third component is validation. After help has been ministered, the nurse validates that the actions were indeed helpful. Evidence must come from the patient that the purpose of the nursing action has been fulfilled. In this study, validating the need for help was met by means of post assessment level of blood glucose which was done after 15 days of intervention. Positive outcomes are presence of normal and controlled diabetes mellitus. Negative outcomes are presence of uncontrolled diabetes mellitus which in turn may need ministering the needed help.

Feature extraction is a general term for methods of constructing combinations of the variables to get around these problems while still describing the Leaf data with sufficient accuracy. Here we implemented CNN technique.

METHODOLOGY

This chapter deals with the methodology adopted for the study. It includes research approach, research design, setting, population, sample and criteria for sample selection, sample size, sampling technique, instrument, and scoring procedure, method of data collection and validity, reliability and plan for data analysis.

RESEARCH APPROACH

The evaluative approach was used to the study.

SETTING OF THE STUDY

The pilot study was conducted in Nehru nagar, Dharapuram and the main study was conducted in Nanchiyampalayam, Dharapuram. It is an urban area which is 3 kilometers away from Dharapuram. The total population of the Nanchiyampalayam is 6770. It consists of 5 streets such as Tirupur Street, RC Street, Kaman Kovil Street, Nadar Street and Jinnahmaithanam Street. The people get medical aid from the government hospital and urban PHC at Dharapuram. One primary school and one higher secondary school are there for educational purpose. Water and electricity facilities are available. The common occupation in the village is agriculture. Most of the people are coolie workers going for construction works, tailoring and shop workers.

POPULATION

The target population selected for the study was adults with type 2 diabetes mellitus.

SAMPLE

The samples who were diagnosed as a type 2 diabetes mellitus residing in Nanchiyampalayam.

CRITERIA FOR SELECTION OF THE SAMPLE
INCLUSION CRITERIA

- Adults in the age group of 40-60 years.

- Adults who are having fasting blood glucose level >126 mg/dl.
- Adults who are available at the time of data collection.
- Both males and female adults.
- Adults who are willing to participate in this study.
- The adults who are on antidiabetic agents.

EXCLUSION CRITERIA

Adults who are diagnosed as diabetes mellitus with cardiac diseases. Adults who are diagnosed as diabetes mellitus with hypertension. Sample size for the study was 60 out of which, 30 were in experimental group and 30 were in control group.

Blood Glucose Level	Range
Un controlled diabetes mellitus	Above 126mg/dl
Controlled diabetes mellitus	101-126 mg/dl
Normal	70-100 mg/dl

Level of knowledge	Frequency	Percentage
Adequate	21-30	67-100%
Moderately adequate	11-20	34%-66%
Inadequate	0-10	0%-33%

SAMPLING TECHNIQUE

Non probability purposive sampling technique was used to select the samples for the study.

INSTRUMENT AND SCORING PROCEDURE

The instrument consists of 3 sections.

SECTION –I

It consists of demographic variables consist of age, sex, religion, education, occupation, family monthly income, type of family, marital status, dietary pattern, compliance of diabetic diet, practice of exercise, family history of diabetes mellitus, duration of treatment for diabetes mellitus, frequent monitoring of blood glucose level and source of health information.

SECTION – II

Fasting Blood glucose level adopted from **American Diabetes Association, 2013**.

SECTION-III

It consists of Structured interview questionnaire includes 30 multiple choice questions on knowledge of hypoglycemia which includes definition, causes, signs and symptoms, management, prevention and complications of hypoglycemia. Each question has four options out of which one was the correct answer. Total score was 30.

SCORE INTERPRETATION

SECTION-III

The structured interview questionnaire was used to assess the knowledge regarding hypoglycemia among adults with type 2 diabetes mellitus. It consists of 30 multiple choice questions, each correct answer was scored as (1)one and a wrong answer was scored as (0)zero. The total score was 30.The score were interpreted as below,

3. RESULT AND DISCUSSION

VALIDITY

The validity of the tool was obtained by four nursing experts in the field of community health nursing and one medical expert. The tool was modified according to the suggestions and recommendations of the experts. The accuracy of the glucometer (ACCU-CHEK Active) instrument was checked with lab analyzer. The accuracy (r=0.99) was assessed by using Karl Pearson’s formula.

RELIABILITY

The reliability of the glucometer instrument was assessed by equivalence using interrater reliability method by using Karl Pearson’s formula. The value was found to be reliable(r=0.99).Oral Permission was obtained from each subject before taking the blood sample. The reliability of the structured interview questionnaire was established by testing the internal consistency and stability. Stability was assessed by test retest method using karl pearson’s co-efficient formula. The value was found to be reliable (r=0.94). Internal consistency was assessed by split half method using Spearman brown formula. The value was found to be reliable (r=0.91).

PILOT STUDY

The pilot study was conducted in Nehru nagar, Dharapuram. The purpose of the study was explained to the samples. Non probability purposive sampling technique was used to select the samples. The sample size was 6 adults, 3 in experimental group and 3in control group and samples were selected as per the inclusion criteria. On the first 2 days the pretest fasting blood glucose level was checked by using glucometer for both groups. On the 2nd day evening the investigator prepared the 250ml ladies finger juice for each sample of experimental group. On the 3rd day morning the experimental group samples were asked to consume the ladies finger juice before breakfast for 7 days. Every day morning, the experimental group drank

the ladies finger juice in empty stomach under the supervision of the investigator. During the day time the investigator collected demographic data and level of knowledge on hypoglycemia by using structured knowledge interview questionnaire. It took taken 40 minutes per day for each sample. The posttest fasting blood glucose level was checked on 4th and 8th day for both experimental group and control group. The collected data were analyzed by using descriptive and inferential statistics.

The findings of the pilot study showed that the mean pretest level of blood glucose was (174±42.33) in the experimental group and in the control group the mean pretest level of blood glucose was (153±6.36). The mean posttest –I level of blood glucose was (143±36.66) and posttest –II level of blood glucose was (117±25.23) in the experimental group. In control group posttest –I level of blood glucose was (147±24.70) and posttest –II level of blood glucose was (145±6.44). The paired ‘t’ value for blood glucose posttest–I was 7.785 and posttest-II was 5.397 in the experimental group. The paired ‘t’ value for blood glucose posttest-I was 0.588 and posttest-II was 2.819 in the control group. The independent ‘t’ value post test-I was 0.165 and posttest-II was 2.536. The mean score of knowledge was (19±2.34) in the experimental group and the mean score of knowledge was (19±4) in the control group. The pilot study revealed that the study was feasible and practicable to conduct the main study.

DATA COLLECTION PROCEDURE

he main study was done in pandiyan nagar at tiruppur and the streets included were Tirupur Street, ponmalar streer and vip Street. Data collection was done for a period of 5 weeks. Permission was obtained from the ethical committee, Block medical officer of Ponnapuram and Counsellor of Nanchiyampalayam. The oral permission was obtained from each participant prior to the study. The Purposive sampling technique was used to select 60 samples, out of which 30 were in experimental group from Tirupur street, Kaman Kovil street and 30 were in control group from Jinnahmaithanam street. The first 2 days morning, pretest fasting blood glucose level was checked by using glucometer (average value of blood glucose was taken for calculation) and during the daytime demographic variables were collected from the experimental group. On the 2nd day evening the investigator had prepared the 250ml of ladies finger juice for each sample in experimental group. Instructions were given to the samples in experimental group regarding measures to be taken in hypoglycemia. From the third day morning onwards, the experimental group were asked to consume the ladies finger juice before breakfast for 15 days. Every day morning, the experimental group drank the ladies finger juice in empty stomach under the supervision of the investigator. During day time knowledge on hypoglycemia was assessed by using structured interview questionnaire for the experimental group. It took 40-45 minutes for each sample.

The posttest fasting blood glucose level was checked on 7th and 16th day after intervention for the experimental group. After the posttest, pamphlet on hypoglycemia was given to the experimental group. From next day onwards, for the control

group, pretest fasting blood samples were taken and demographic variables were collected for 2 days. The first posttest fasting blood samples were taken on the 7th day. The 2nd posttest fasting blood samples were taken on the 16th day. During daytime the knowledge on hypoglycemia was assessed in control group. On the 16th day after taking the blood samples, the pamphlet on hypoglycemia was given to the control group also.

Finally for all the 60 samples ladies finger seeds were given to grow it in their kitchen garden for their further use. The collected data were analyzed and tabulated by using descriptive and inferential statistics

SUMMARY OF THE STUDY

The aim of the study was assess the effectiveness of ladies finger juice on blood glucose level among adults with type 2 diabetes mellitus and in view of preparing pamphlet on hypoglycemia in Nanchiyampalayam at Dharapuram. The design used for the present study was quasi experimental non equivalent control group pre test, post test design. The conceptual framework was based on Wiedenbach’s helping art of clinical nursing theory (1969). Sample size was 60 out of which 30 were in experimental group and 30 were in control group. The sample were selected by non probability purposive sampling technique and level of blood glucose and knowledge were assessed by glucometer and structured interview questionnaire.

The first 2 days morning, pretest fasting blood glucose level was checked by using glucometer and during the daytime demographic variables were collected from the experimental group. On the 2nd day evening the investigator had prepared the 250ml of ladies finger juice for each sample in experimental group. Instructions were given to the samples in experimental group regarding measures to be taken in hypoglycemia. From the third day morning onwards, the experimental group were asked to consume the ladies finger juice before breakfast for 15 days. Every day morning, the experimental group drank the ladies finger juice in empty stomach under the supervision of the investigator. During day time knowledge on hypoglycemia was assessed by using structured interview questionnaire for the experimental group. It took 40-45 minutes for each sample. The posttest fasting blood glucose level was checked on 7th and 16th day after intervention for the experimental group. After the posttest, pamphlet on hypoglycemia was given to the experimental group. From next day onwards, for the control group, pretest fasting blood samples were taken and demographic variables were collected for 2 days. The first posttest fasting blood samples were taken on the 7th day. The 2nd posttest fasting blood samples were taken on the 16th day. During daytime the knowledge on hypoglycemia was assessed in control group. On the 16th day after taking the blood samples, the pamphlet on hypoglycemia was given to the control group also. Finally for all the 60 samples ladies finger seeds were given to grow it in their kitchen garden for their further use. The collected data were analyzed and tabulated by using descriptive and inferential statistics.

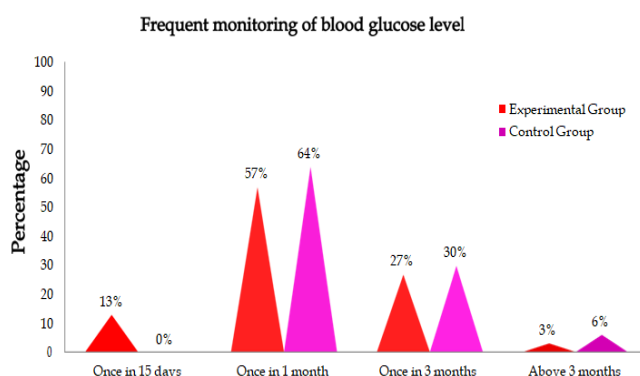


Fig 1: Percentage distribution of adults according to their Frequent monitoring of blood glucose level

MAJOR FINDINGS OF THE STUDY

The major findings were, In experimental group, among the adults majority (50%) were in the age group of 56-60 years ,(20%) of the adults were in the age group of 40-45 years, (17%) were in the age group of 51-55 years,(13%) were in the age group of 46-50 years. In control group, majority (43%) of the adults were in the age group of 56-60 years, (10%) were in the age group of 40-45 years,(23%) were in the age group of 46-50 years, (23%) were in the age group of 51-55 years.

In the experimental group and control group, majority (57%) of the adults were female and (43%) were male.

In the experimental group, majority (90%) of the adults was belonged to Hindu religion, (3%) were belonged to Christian religion, (7%) were belonged to Muslim religion. In the control group (100%) were belonged to Muslim religion. In the experimental group, majority (33%) of the adults had no formal education, (13.3%) had completed their primary school education and (27%) had completed their high school education, (13.3%) had completed their higher secondary school education, (13.3%) had completed their graduate education. In the control group, majority (53%) of the adults had completed their primary school education, (27%) had no formal education and (10%) had completed their high school education, (10%) had completed their higher secondary school education.

In the experimental group , the highest percentage (46%) of the adults were coolie workers,(17%) were government employees and (17%) were private employees,(20%) were un employees . In the control group, the highest percentage (53.3%) were un employees, (40%) were coolie workers,(3.3%) were government employees and (3.3%)were private employees.

In the experimental group, majority, (60%) of the adults were belonged to the group of Rs.5000-6000 family monthly income, (7%) were belonged to the group of Rs.6001-7000 and (10%) were belonged to the group of Rs.7001- 8000,(23%) were belonged to the group of above Rs.8001 . In the control group, majority (73%) were belonged to the group of Rs.5000-6000 family monthly income, (10%) were belonged to the group of

Rs.6001-7000 and (7%) were belonged to the group of Rs.7001-8000,(10%) were belonged to the group of above Rs.8001.

In the experimental group and control group, majority (57%) of the adults were in nuclear family, (43%) were in joint family. In the experimental group, majority (97%) of the adults were married,(3%) were unmarried. In the control group, majority (93%) were married,(7%) were unmarried.

In the experimental group, majority (83%) of the adults were belonged to non vegetarian,(17%) were belonged to vegetarian. In the control group, majority (80%) were belonged to non vegetarian, (20%) were belonged to vegetarian.

In the experimental group, majority (83%) of the adults were had compliance of diabetic diet, (17%) were not had compliance of diabetic diet in the experimental group. In the control group, (50%) were compliance of diabetic diet, (50%) were not had compliance of diabetic diet.

In the experimental group, majority (70%) of the adults were not practicing exercise, (30%) were practicing exercise in the experimental group. In the control group, majority (73%) were not practicing exercise, (27%) were practicing exercise.

In the experimental group, majority (83%) of the adults had no family history of diabetes mellitus, (17%) had family history of diabetes mellitus .In the control group , majority (60%) had no family history of diabetes mellitus, (40%) had family history of diabetes mellitus.

In the experimental group, majority,(36%) of the adults were belonged to 1 year-2 year and (27%) were belonged to 3 year-4 year,(20%) were belonged to above 5 years, (17%) were belonged to below 1 year. In the control group ,majority (43%) were belonged to above 5 years ,(7%) were belonged to below 1 year,(20%) were belonged to 1 year-2 year and (30%) were belonged to 3 year-4 year.

In the experimental group, majority(57%) of the adults were belonged to once in a month , (13%) were belonged to once in 15 days and (27%) were belonged to once in 3 months,(3%) were belonged to above 3 months. In the control group, majority (64%) were belonged to once in a month, (30%) were belonged to once in 3 months and (6%) were belonged to above 3 months.

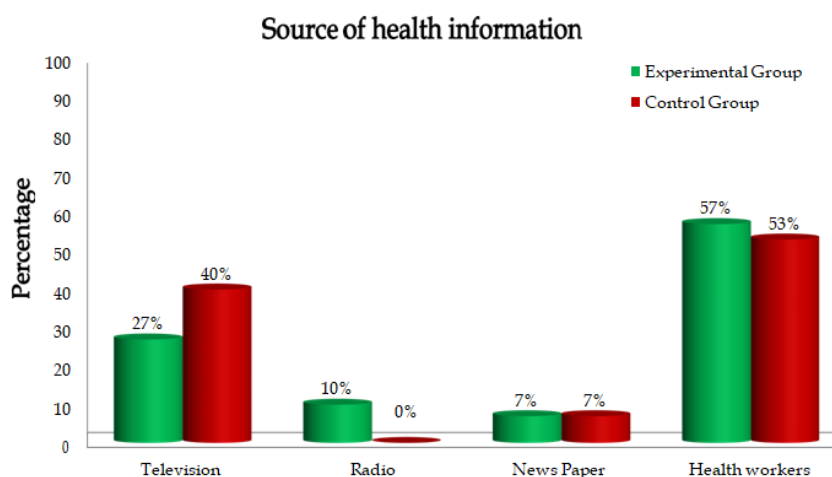


Fig 2: Percentage distribution of adults according to their Source of health information

In the experimental group, majority (57%) of the adults were got health information from health workers, (27%) were got health information from television, (10%) were got health information from radio and (7%) were got health information from newspaper. In the control group, majority (53%) were got health information from health worker, (40%) were got health information from television, (7%) were got health information from newspaper.

With regard to level of blood glucose and the mean posttest-I score was 135 (SD±19.2) and posttest-II mean score of was 107 (SD ± 13.01) was lower than the mean pretest score was 178 (SD± 43.1). The paired 't' value for experimental group was 7.398 and 9.882 (table value=2.05) at p<0.05 level of significance, which showed that, there was a significant reduction in level of blood glucose in experimental group.

The mean posttest –I score of blood glucose level in the experimental group 135(SD±19.2) and in control group mean posttest score of blood glucose was 177 (SD±38.6), the mean difference was 42. The independent 't' value was 5.617. The mean posttest –II score of blood glucose level in experimental group was 107(SD±13.01) was significantly lower than the mean posttest score of blood glucose in control group 176 (SD±41.09), the mean difference was 69. The independent 't' value was 8.843(table value=2.02) which was significant at p<0.05 level of significance. This showed that there was a significant difference in the level of blood glucose between experimental group and control group.

In relation with area wise mean, SD of knowledge of hypoglycemia and the mean score was 0.80(SD±0.92) for the

area of definition, 1.90 (SD±1.92) for the area of causes and symptoms, 1.43 (SD±1.00) for the area of diagnostic findings, 2.83(SD±0.94) for the area of treatment, 3.53 (SD±1.43) for the area of prevention and 0.90 (SD±0.71) for the area of complications and the highest mean score was 3.53 for the area of prevention, the lowest mean score was 0.80 for the area of definition and over all mean score were 11.92 in experimental group.

There was an association between posttest level of blood glucose among adults with type 2 diabetes mellitus and their selected demographic variables using Beta coefficient. The values revealed that there was significant association found between posttest level of blood glucose and sex, education and dietary pattern in experimental group.

CONCLUSION

The present study was conducted to evaluate the effectiveness of ladies finger juice on blood glucose level among adults with type 2 diabetes mellitus and in view of preparing pamphlet on hypoglycemia in Nanchiyampalayam at Dharapuram. The independent 't' value blood glucose level was t=5.617 for post test-I, t=8.843 for posttest-II which were significant at p<0.05 level. The results of the study revealed that ladies finger juice is highly effective in reducing blood glucose level among adults with type 2 diabetes mellitus. This study concluded that the regular drinking of ladies finger juice helps to control the blood glucose level which turns into prevent complications.

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