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Effectiveness of Holy Basil Leaves Extract in Reducing Blood Sugar among Diabetes Mellitus Clients

^{1*}Jagadeeswari.J, ²Faheem Ahammad Bhat, ³Preethi Priyadharshini.T

¹Clinical Instructor, Department of Obstetrics & Gynecological Nursing, Saveetha College of Nursing, SIMATS, Thandalam, Chennai, Tamilnadu, India

^{2,3}B.Sc (N) IV Year, Saveetha College of Nursing, SIMATS, Thandalam, Chennai, Tamilnadu, India

Abstract: Diabetes is a condition that requires treat throughout life. If left untreated or improperly treated, it will significantly shorten its life or reduce its value. Most can be avoided by simply ingesting Prevention and appropriate management of diseases that will surely develop Allows for a normal, active and healthy life. The aim of the study is to evaluate the effectiveness of Holy Basil Leaves Extract among diabetic clients. Quantitative Approach with experimental design, pre-test and post-test design used in the study was adopted with a sample size of 60. Data was collected by using structured questionnaire and observation plan. Pre-study Fasting blood glucose was measured before intervention in experimental and control groups. The researchers personally administered 50 ml of holy basil leaf extract to experimental groups after breakfast in the morning for 15 days daily. Post-test fasting blood glucose levels were measured using a glucometer. Collected data were analyzed using descriptive and inferential statistics. Experimental groups show results that are averages of pre-tests 172.27, 140.23 after testing. Difference from mean (32.033) For the SD (11.467) value, the SD value increases by 11.467. Comparison of blood glucose levels before and after the test $t=15.301$ with $df=29$. The p-value is zero and is statistically significant. The findings of the study revealed that there is a effectiveness of holy basil leaves extract in reducing the Blood sugar among Diabetic mellitus client which is statistically proved.

I. INTRODUCTION

Diabetes presents a significant public health burden on the basis of its increased morbidity, mortality, and economic costs. Every fifth person who suffers from diabetes mellitus in the world today is an Indian. Out of total number of person suffering from diabetes mellitus in the world which is around 150 million roughly, 135 are Indians. Individuals with diagnosed diabetes are at an increased risk for vascular disease, including micro vascular complications (e.g., retinopathy, neuropathy, and nephropathy) and macro vascular complications (egg, coronary heart disease and stroke), and lower extremity amputations.¹

Long-term consequences of diabetes mellitus include: retinopathy with potential Improved glycaemia control clearly reduces the risk of micro vascular disease among individuals with diagnosed diabetes and is associated with lower risk of atherosclerosis and macro vascular disease. Treatment for individuals with diabetes has traditionally focused on control of glycaemia to reduce these vascular complications.²

The long-term effects of diabetes mellitus include progressive development of the specific complications of retinopathy with potential blindness, nephropathy that may lead to renal failure, and/or neuropathy with risk of foot ulcers, amputation, Charcot joints, and features of autonomic dysfunction, including sexual dysfunction. People with pre-diabetes are advised to change their diets to control their blood sugar levels.³

Herbal extracts, teas and powders have been used for a long time to treat pre-diabetes and diabetes. They are thought to work in a number of different ways to help normalise blood sugar levels, including by improving pancreatic function and increasing the availability of insulin, a hormone that regulates blood sugar levels. In the last few years there has been an exponential growth in the field of herbal medicine and these drugs are gaining popularity both in developing and developed countries because of their natural origin and less side effects. The World Health Organization (WHO) has listed 21,000 plants, which are used for medicinal purposes around the world. Among these 2500 species are in India, out of which 150 species are used commercially on a fairly large scale. India is the largest producer of medicinal herbs and is called as botanical garden of the world.⁴



Alternative medicine along with reduced dosage of allopathic medicines can produce a better control on the effect of fasting blood sugar. Since allopathic medicines have more side effects compared to alternative medicine, and alternative medicine is advantageous in terms of the affordability and feasibility. Hence alternative medicine plays a vital role in the better control of the blood sugar. Alternative medicine also emphasis in improving the quality of life be it treatment of diseases or promoting well-being of the individual.⁵

Holy basil is a relative of the more familiar species used in cooking.⁶ The stem and leaves of holy basil contain a variety of constituents that may have biological activity, including saponins, flavonoids, triterpenoids, and tannins. The leaf also contains an essential oil composed of eugenol and other volatile compounds.⁷ Several of these constituents have antioxidant and anti-inflammatory properties according to test tube studies.⁸ The extracts of holy basil leaf have also lowered blood sugar, reduced some measures of the response to physical stresses, recent trends and current innovations create a very good opinion on alternative therapy and Indian medicines, so the investigator took this study to assess the effectiveness of holy basil leaves extract on lowering blood sugar level. The aim of the study is to evaluate the effectiveness of Holy Basil Leaves Extract among diabetic clients.

II. MATERIALS AND METHODS

Quantitative Approach with experimental design, pre-test and post-test design used in the study was adopted with a sample size of 60. with arthritis, 30 experimental and 30 control who satisfied the inclusion criteria were selected by convenience sampling method at Koyambedu area. The Inclusion Criteria of the study are Clients with Type II diabetes mellitus on Oral Hypoglycemic Agents with the age group of 40 ± 60 yrs, clients who are all having fasting blood sugar above 130mg/dl. TM Patients who are able to speak and understand, Tamil or English, Type 2 diabetes mellitus clients on Oral Hypoglycemic Agents patients who are all willing to participate in this study. Exclusion criteria are Clients who are on insulin therapy. Clients who are associated with other co $\pm$ morbid illness Clients whose fasting blood sugar is above 180 mg/dl. Data was collected by using structured questionnaire and observation plan. Pre-study Fasting blood glucose was measured before intervention in experimental and control groups. The researchers personally administered 50 ml of holy basil leaf extract to experimental groups after breakfast in the morning for 15 days daily. Post-test fasting blood glucose levels were measured using a glucometer. Collected data were analyzed using descriptive and inferential statistics.

III. RESULTS AND DISCUSSIONS

Section A: Sample Characteristics

The study shows that in the experimental group, 11(36.7%) were aged between 40- 60 years, 17(56.7%) were male, 21(70%) were Hindus, 17(56.7%) belonged to upper middle class, 21(70%) belonged to nuclear family, 14(46.7%) of fathers had intermediate or post high school diploma education, 10(33.3%) of mothers had intermediate or post high school diploma education, 11(36.7%) of fathers were semi-professionals and 6(20%) of mothers were clerical, shop owner, farmer and skilled workers.

Section B: Pre and post assessment of blood sugar level among experimental and control group

Table1: Pre and Post assessment score of blood sugar level among experimental and control group

Type of blood sugar	Group	N	Mean	SD	Paired t test
Pre- test	Experiment	30	172.27	9.720	t = 4.68 P= 0.001
	Control	30	159.27	11.715	
Post- test	Experiment	30	140.23	14.330	t=5.01 P= 0.0001
	Control	30	157.33	11.828	

The table 1 above shows a comparison of pre-tests and post-tests. Test the blood glucose levels of the experimental and control groups. it shows that the comparison was made by the student's independent test and Pre-test values for experimental and control groups were 4.68, df = 58, p=0.001 is statistically significant. Also, the t-value of the posttest below-5.01 for experimental and control groups, df=58, p=0.001 statistically significant.

Section C: Comparison Of Pre And Post Test In Both Group**Table 2.** Comparison of pre test and post test blood sugar level among Experiment and Control group.

Group	Level of assessment	Mean Blood sugar level	Mean difference in effectiveness with 95% CI	Percentage of effectiveness with 95% CI
Experiment	Pre-test	172.27	32.04(27.86- 36.22)	18.6%(16.17 - 21.02)
	Post-test	140.23		
Control	Pre-test	159.27	1.94 (1.3 - 2.58)	1.22% (0.82 - 1.62)
	Post-test	157.33		

Table 2 above shows the efficacy of Holy Basil leaves extract used to lower blood sugar levels in experimental and control groups. For the experimental group, the mean difference value is 32.04 with a confidence of 95%. Between the interval and control groups, the mean difference value is only 1.94% 95% confidence interval. This result shows the effectiveness of holy basil leaves help lower blood sugar levels. Finally average effectiveness Holy basil leaves in the experiment were 18.6% and the distribution was found. Within 16.17% - 21.02%. However, in the control group there was an average decrease Distributions within 1.22% and 0.82% - 1.62% were found.

Section D: Effectiveness of Holy Basil Leaves on Blood Sugar among Diabetic clients**Table 3:** Effectiveness of Holy basil leaves extract on reducing blood sugar Level among experimental and control group

Blood test	Group	Reducing % of blood sugar level	Benefit of study
Fasting	Experimental	18.6%	17.38%
	Control	1.22%	

The above table shows the distribution of post test reduction of Blood sugar level among Type II Diabetic client in both experimental and control group. Majority of the Type II Diabetic client in experimental group 63.3% (19) of participants had 30mg and above reduction in blood sugar level, but in control group there is no reduction in blood sugar level of 30mg and above. In experimental group 23.3% (7) of participants had 20-29 mgs reduction in blood sugar level, but in control group 6.7 % (2) of participants had 20-29 mgs reduction in blood sugar level.

The study is supported by Chauhan, Dr. (2017). Conducted a study to assess the Effect of Ocimum Sanctum Tulsi Powder on Hyperlipidemic and Hyperglycemic Male Patients. Total 40 subjects (20 hyperlipidemic male and 20 hyperglycaemic male) were selected randomly from "Manan Clinic" at Sama area in Vadodara city. Dose of 1 capsule (3 gm tulsi powder) was given in early morning empty stomach and breakfast after half an hour for 45 days to each subject. After 45 days of supplementation, a significant lowering of the blood lipid profile as well as a significant lowering of the blood glucose was observed in male patients. The study suggested that Ocimum sanctum L. powder capsules had significant reduction in all report but if these capsules are given for longer period of time at least for 3 months with higher doses, we get the better results.⁹

IV. CONCLUSION

The findings of the study revealed that there is an effectiveness of holy basil leaves extract in reducing the Blood sugar among Diabetic mellitus client which is statistically proved.

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AUTHORS CONTRIBUTION

All the authors actively participate in the work of study. All the authors read and approved the final manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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