



A QUASI EXPERIMENTAL STUDY TO ASSESS AND EVALUATE THE EFFECT OF BUERGER ALLEN EXERCISE ON LOWER LIMB TISSUE PERFUSION AMONG TYPE2 DIABETES MELLITUS PATIENTS ADMITTED IN FORTIS HOSPITAL NOIDA

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Abstract:

A Quasi experimental study to assess & evaluate the effect of Buerger Allen Exercise on lower limb tissue perfusion among type 2 Diabetes mellitus patients admitted in Fortis. The study was conducted at Fortis hospital, Noida. Purposive sampling technique was used to obtained adequate samples. The samples comprised of 30 experimental group samples and 30 control group samples undergoing Buerger Allen exercise. The conceptual framework of the study is based in health promotion model by Nola J. pender in 1992. The findings of the study revealed that implementation of Buerger Allen Exercise were effective for experimental group in increasing Ankle Brachial index Score. Majority of Patient felt relaxed during exercise. Buerger Allen Exercise is non-invasive, non pharmacological and effectives mean which can be used for type 2 Diabetes mellitus patient as a routine practice. Based on the research findings further recommendations also given.

Key words: Buerger Allen Exercise, Ankle Brachial index score.

Introduction:

Diabetic neuropathies are neuropathic disorders that are associated with diabetes mellitus. Relatively common conditions which may be associated with diabetic neuropathy include third nerve palsy, mononeuropathy, mononeuropathy

multiplex, diabetic amyotrophy, a painful polyneuropathy, autonomic neuropathy, and thoracoabdominal neuropathy. People with diabetes can, over time, develop nerve damage throughout the body. Some people with nerve damage have no symptoms. Others may have symptoms such as pain, tingling, or numbness ie, loss of feeling in the hands, arms, feet, and legs. Diabetic neuropathies also appear to be more common in people who have problems in controlling their blood glucose, as well as those with high levels of blood cholesterol and blood pressure and those who are overweight.

BEHAVIOR SPECIFIC COGNITION AND AFFECT:

Perceived benefits of action, perceived self efficacy, activity related affect, intrepersonal influences, and situational influences.

In present study behavior specific affect in the patient is percieved benefits of Buerger Allen Exercise, perceived barriers for Buerger Allen Exercise can be age, educational qualification, culture and personal characteristics of patients.

BEHAVIORAL OUTCOME:

Commitment to a plan of action, immediate competing demands and preferences, and health - promoting behavior.

The concept of intention and identification of a planned strategy leads to implementation of health behavior. Behavior outcomes in this study for the

patient will be the perceived benefits of Buerger Allen exercise.

- Endpoint or action outcomes directed towards attaining positive health outcome such as optimal well being, personal fulfillment and productive living In the present study health promoting outcome is improvement in lower limb tissue perfusion.

Literature review:

R.VINCENT (1995) conducted a study regarding conservative approach to the management of lower extremity associated signs and symptoms (pain, edema, tenderness, cyanosis, coldness and stiffness) show the effectiveness of Buerger's Allen exercise. The treatment involve encouragement of blood flow during the actively vasospastic phase by elevation of an active exercise part. The researcher recommended that Buerger's Allen Exercise for the improvement of lower extremity blood supply. Another article regarding intermittent claudication also highly recommended the importance of Buerger's Allen exercise (three 3 series of exercise repeat 6- 7 times in a day) among peripheral vascular disease.

SHOBNA R (2008) conducted a study among 61 patients. The result shows that post exercise, toe pressure and toe brachial pressure (TBI) increased in non -diabetic patient. But there was elevated transcutaneous oxygen tension (TcPO₂) value in diabetic patient and decreased transcutaneous carbon dioxide (TcPCO₂) decreased in all arterial disease. The study was concluded that the improvement in the TcPO₂ and decreased TcPCO₂ level in foot site in diabetes shows changes in cutaneous blood supply. The result suggested that brief exercise. Buerger - Allen Exercise for the improvement of lower extremity blood supply. The article regarding "intermittent claudication" also highly recommended the importance of Buerger - Allen exercise (three 3 series of exercise repeat 6- 7 times in a day) among peripheral vascular The result suggested that brief exercise results in an improvement as cutaneous perfusion in non critical PVD particularly patient with type 2 DM.

FURQAN M SIDDIQUI (2008) conducted a study to determine the cost effectiveness of exercise training to improve claudication symptoms in peripheral arterial disease. The aim of the study was to prove effectiveness of the exercise rehabilitation for the treatment of intermittent claudication, the primary symptom of PVD. The study was conducted comparing percutaneous transluminal angioplasty (PTA) and exercise rehabilitation. The effectiveness was

assessed three and six months exercise programme. Initially first three months PTA was more effective than exercise rehabilitation but after six months the researcher found that the exercise was more effective than PTA and cost effective also. The study concluded that exercise rehabilitation for claudication treatment has national implication for future PVD care.

VIVEKANAND V (2008) conducted a study using a conservative approach to the management of Suedky's Atropy" has done regarding the management of lower extremity associated signs and symptoms (pain, edema, tenderness, cyanosis, coldness and stiffness) show the effectiveness of Buerger - Allen exercise. The treatment involve encouragement of blood flow during the actively vasospastic phase by elevation of an active exercise part. The researcher recommended that Buerger - Allen Exercise for the improvement of lower extremity blood supply. The article regarding "intermittent claudication" also highly recommended the importance of Buerger - Allen exercise (three 3 series of exercise repeat 6- 7 times in a day) among peripheral vascular disease.

S LEONARDE SYME (2009)- carried out a clinical experimental study to find out the effectiveness of Buerger Allen exercise among peripheral vascular disease patients. The study conducted among 13 patients admitted in hospital setting at Italy. The study evidenced increased perfusion after doing the exercise (pretest capillary refill (2-3sec) and post test capillary refill (1-2sec) and extremity pulses increased 10% in 50% of total population .the overall benefit seen in 7 patients after 24 hours evidenced by (increased perfusion and activity). The study concluded that Buerger Allen exercise is effective for improving lower extremity perfusion.

MR. CYRIL THOMAS (2009) conducted an experimental study to assess the effectiveness of Buerger Allen exercise on improving lower extremity perfusion among diabetic clients admitted in selected hospital at Bangalore. The researcher adopted quasi experimental 75% of the type 2 diabetic patient improved peripheral perfusion after the exercise and 10% showed faster wound healing in diabetic ulcers and study concluded exercise is effective in improving extremity perfusion among type 2 DM clients.

CHANDA A (2010) conducted a study on "vascular rehabilitation" to determine high - intensity exercise training programme for vascular intermittent claudication in vascular rehabilitation. The aim of the observational study was investigating the safety and effectiveness of

the high intensity exercise training interventional programme for the patient with peripheral vascular disease. This study was conducted among 47 patients the result shows that the rehabilitation score with participation in the program and more exercise sessions led to greater improvement. More over no adverse event occurred in the study patients. The study suggested patient with PVD can safely tolerate high intensity exercise programme.

METHODOLOGY

EXCLUSION CRITERIA

- Patients having foot ulcer.
- Patient who were not willing to participate in the study.
- Critically ill patients.
- Patient who have ABI score <0.41
- Patient doing and any form of exercise.

SELECTION AND PREPARATION OF TOOL WERE BASED ON:

An extensive literature review:

- Related to Diabetes mellitus.
- Related to Buerger Allen exercise.

PART-2 Ankle Brachial Index tool

SCORE	INTERPRETATION
0.71-0.90	Mild obstruction
0.70-0.41	Moderate obstruction
0.40-0.0	Severe obstruction

The patients with mild and moderate obstruction were included in the study.

ANALYSIS AND INTERPRETATION OF DATA

Frequency and percentage distribution of Demographic characteristics of the patients in experimental and control group N=60

S.N.	Sample Characteristics	Experimental Group (n=30)		Control Group (n=30)	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1.	Age(in Years)				
	21-30	-	-	-	-
	31-40	-	-	-	-
	41-50	30	100	30	100
2.	Sex				
	Male	18	60	19	63.3
	Female	12	40	11	36.7
3.	Educational Qualification				
	Illiterate	08	26.7	06	20
	Primary and Secondary	11	36.7	13	43.3
	Graduation	08	26.7	08	26.7
	Post- Graduation	03	10	03	10
4.	Occupation				
	Unemployed	01	03.3	-	-
	Self-employed	13	43.3	10	33.3
	Private sector	08	26.7	11	36.7
	Government	08	26.7	09	30.0

- Effect of Buerger Allen Exercise on lower limb tissue perfusion.

STEPS OF DEVELOPMENT OF THE TOOLS

The Following steps were involved in development of tool:

1. Review of literature.
2. Developing demographic data tool through expert opinion and validation.
3. Ankle Brachial index tool was the standardized tool used to assess the lower limb tissue perfusion.

DESCRIPTION OF TOOL

The Tool consists of three parts
Part-1: Demographic data.

Part-2: Ankle Brachial Index tool

Part 3: Buerger Allen Exercise

PART-1 Demographic data

The demographic data of patients which consist of age, sex, education, occupation, income, dietary pattern, duration of illness, and history of diabetes and hypertension

5.	Family Income				
	10000	-	-	-	-
	10000-15000	07	23.3	07	23.3
	20000 and above	23	76.7	23	76.7
6.	Diet				
	Vegetarian	18	60	18	60
	Non-Vegetarian	12	40	12	40
7.	Diabetes Medication				
	Yes	29	96.7	29	96.7
	No	01	3.3	01	3.3
8.	History of Pressure Ulcer				
	Yes	01	3.3	-	-
	No	29	96.7	30	100
9.	Exercise				
	Yes	18	60	15	50
	No	12	40	15	50
10.	Other Illness				
	Hypertension	-	-	-	-
	Cardiac	30	100	30	100
	Hyperlipidemia	-	-	-	-
	Renal & respiratory	-	-	-	-

- In the study all the patients in experimental and control group were in age group between 41-50.
- More than half 60% (18) patients were male and 40% (12) were female in experimental group, 63.3% (19) patients were male and 36.7 % (11) were female in control group.
- In experimental group 36.7% (11) patients had primary and secondary education and 26.7% (8) patients were illiterate and had graduation level education .Only 10% (3) patients had post graduation degree.
- In control group 36.7% (11) patients had private job and 33.3% (10) patients were self-employed, remaining 30.0% (9) patients had government job.
- In control group 76.7% (23) patients had Rs. 20000 and Above family income where as 23.3% (7) patients had 10000-15000 family income.
- In experimental group 76.7% (23) patients were had 20000 and above family income 23.3% (7) patients had Rs.10000-15000 family income.
- In control group 96.7% (29) patients were diabetic and 3.3% (1) patient was non diabetic.
- In experimental group, 96.7% (29) patients were diabetic and 3.3% (1) patient was non diabetic.
- In control group all patients (30) did not have any history of pressure ulcer.
- In experimental group 3.3% (1) patient had history of pressure ulcer.
- More than half (18) patients were doing exercise less than half (12) patients were not doing any exercise in experimental group.
- In control group half (15) patients were doing exercise while half (15) patients not doing any exercise.

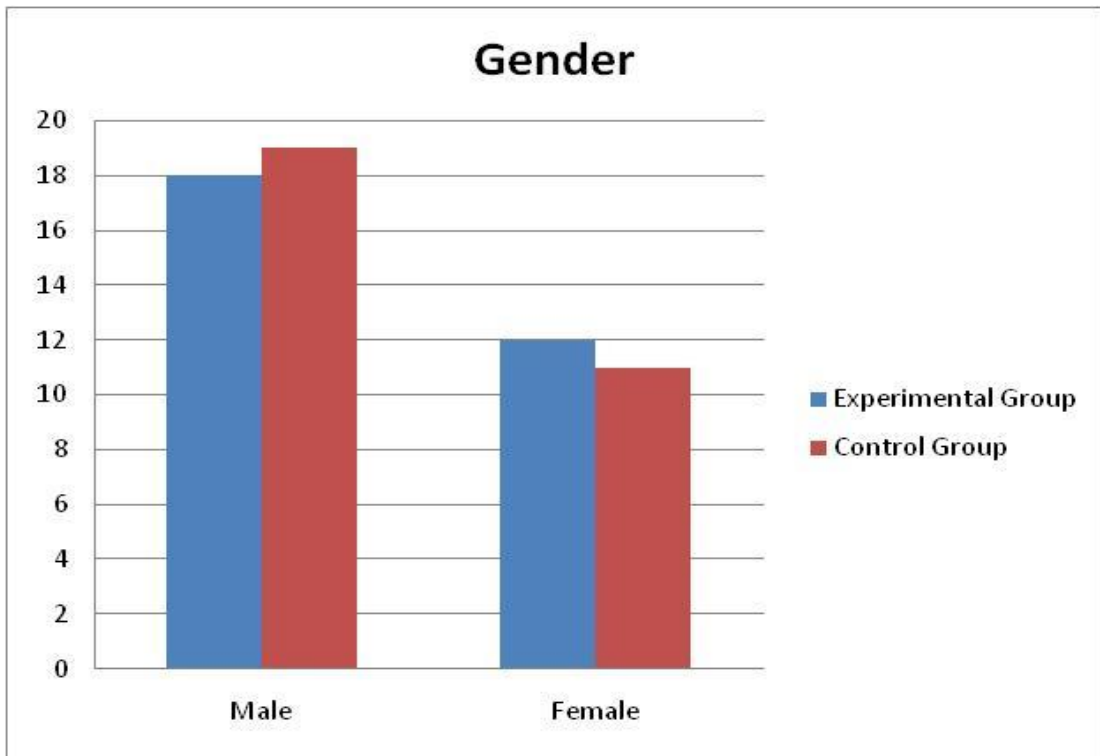


Figure Bar diagram showing the percentage distribution of type 2 diabetes mellitus patient according to their gender in experimental and control group.

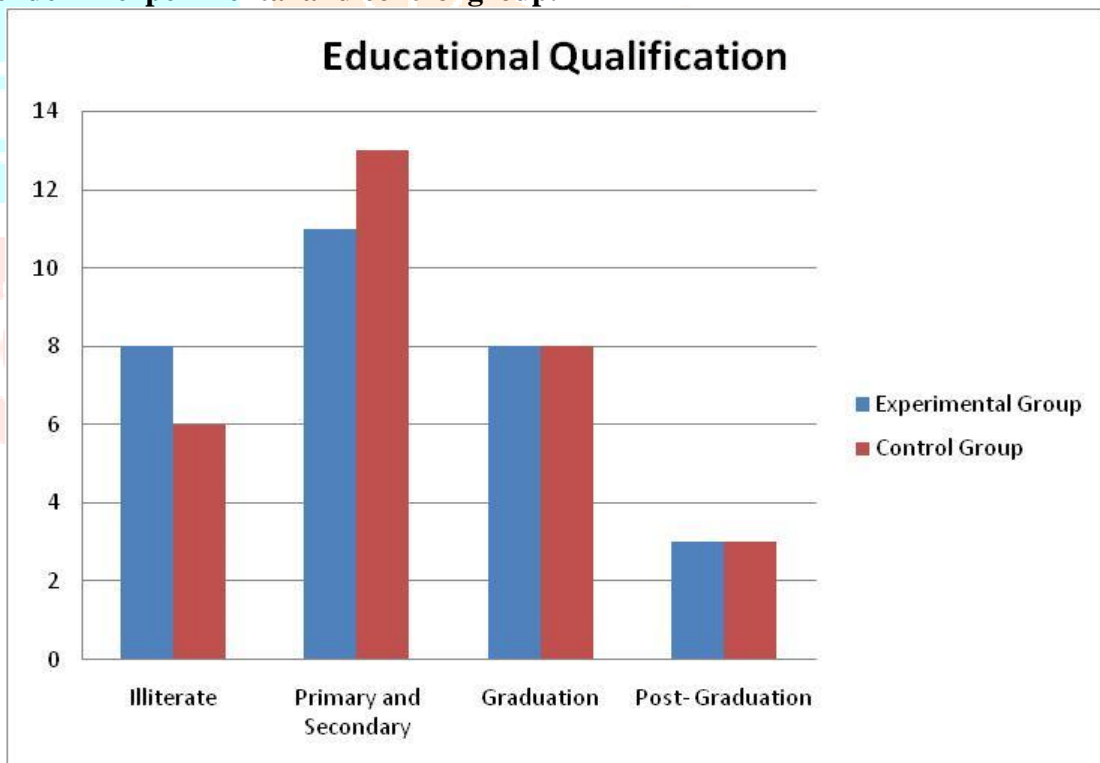


Figure Bar diagram showing the percentage distribution of type 2 diabetes mellitus patient according to their educational qualification in experimental and control group.

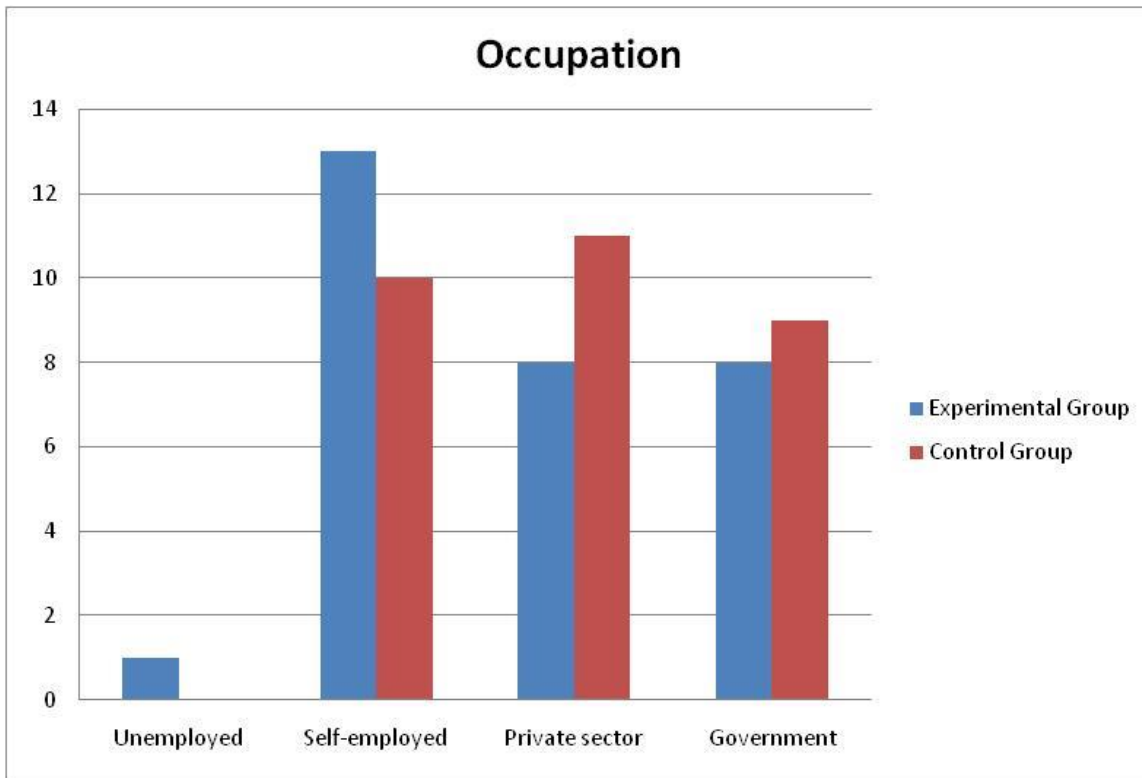


Figure Bar diagram showing the percentage distribution of type 2 diabetes mellitus patient according to their occupation in experimental and control group.

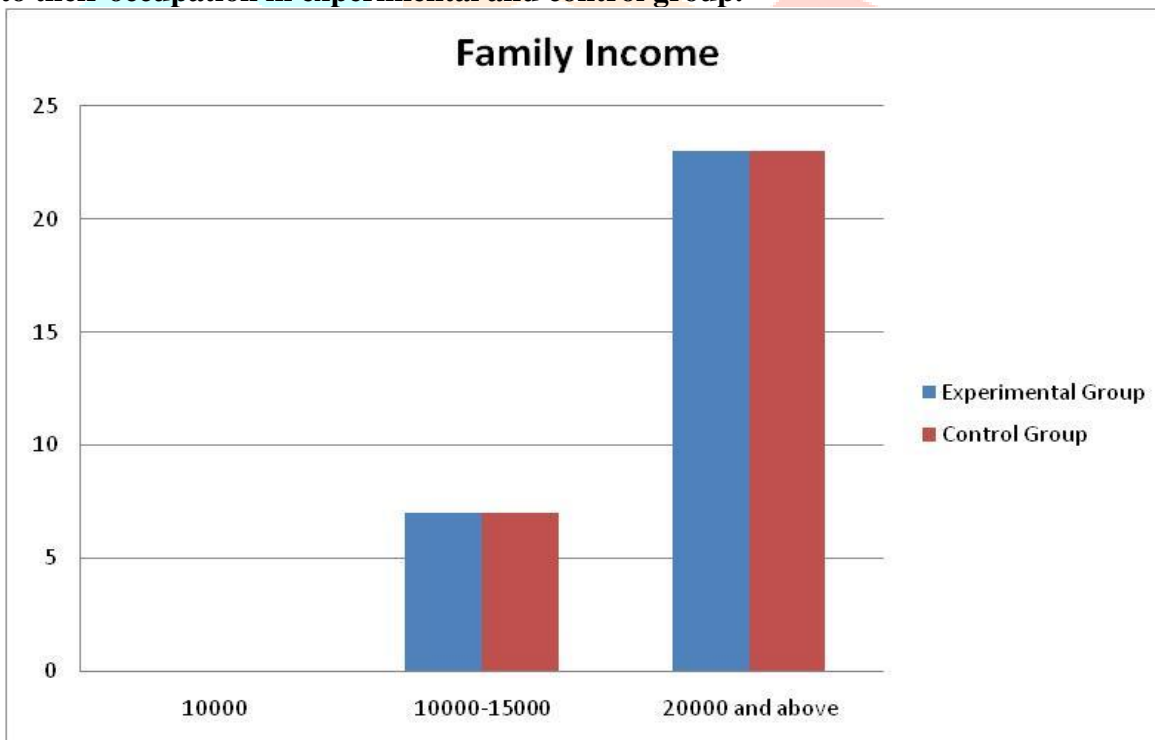


Figure Bar diagram showing the percentage distribution of type 2 diabetes mellitus patient according to their family income in experimental and control group.

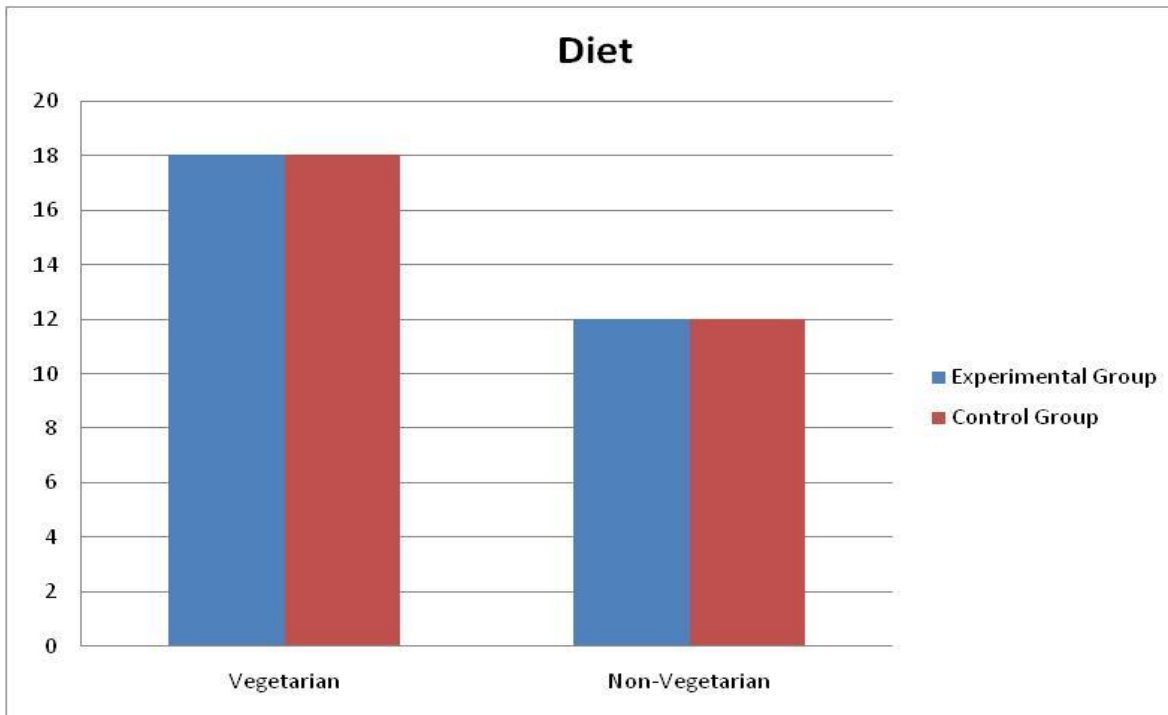


Figure Bar diagram showing the percentage distribution of type 2 diabetes mellitus Patient according to their dietary habits in experimental and control group .



Figure Pie diagram showing the percentage distribution of patient according to their occupation in experimental group.

The statistical tests used are mean, standard deviation, standard deviation error and t test.

The result of analysis shows that Buerger Allen Exercises are effective in lower limb tissue perfusion of type 2 Diabetes Mellitus patient. It helps to maintain the peripheral circulation and reduce lower limb arterial obstruction.

CONCLUSION

- The following conclusion was drawn from the findings of the study.
- In present study most of the patients were belong to the age group of 41 to 50 years in both experimental and control group.
- More than half 60% (18) patients were male and 40% (12) were female in experimental group, 63.3% (19) patient were male and 36.7% (11) patients were female in control group.

- In experimental group 36.7% (11) patient had primary and secondary education and 26.7% (8) patients were illiterate and had graduation level education. Only 10% (3) patients had post graduation degree.
- In control group 36.7% (11) Patient had private job and 33.3% (10) patients were self employed, remaining 30% (9) patients had government job.
- In control group 76.7% (23) patients had rs.20000 and above family income whereas 23.35(7) patients had 10000-15000 family income.
- In experimental group 76.7% (23) had a family income of 20,000 and above family income 23.3% (7) patients had 10000-15000 family income.

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