Bioscene

Bioscene
Volume- 22 Number- 03
ISSN: 1539-2422 (P) 2055-1583 (O)
www.explorebioscene.com

Effectiveness of Buerger Allen Exercise on Lower Extremity Perfusion

[1] Mrs. Nisha S.; [2] Mrs. Petchi Durka; [3] Dr. Paulraj. S.

[1] Assistant Professor, Nehru College of Nursing and Research Institute, Coimbatore

[2] Assistant Professor, Ellen College of Nursing, Coimbatore

[3] Principal, Atthi Nursing College, Gudiyatham, Vellore

Abstract: A research study entitled "A study to assess the effectiveness of Buerger Allen exercise on lower extremity perfusion among diabetes mellitus (DM) patient at selected hospital, Coimbatore". A true experimental study was conducted among 60 diabetes mellitus (DM) patients through simple random sampling technique and were assessed lower extremity perfusion with a manual Ankle Brachial Index (ABI) scale. The Buerger Allen Exercise (BAE) was demonstrated 13 consecutive days and the post test was conducted on 14th day using the same tool. From the two groups, among the total 30 patients, 13 (43.3%) were males and 17 (56.7%) were females in the experimental group and among the total 30 elders, 16 (53.3%) were males and 14 (46.7%) were females in the control group. The mean lower extremity perfusion in the control group differed at pretest and posttest was statistically significant ($t = 2.112$, $p < 0.05$). The mean lower extremity perfusion in the experimental group differed at pretest and posttest was statistically significant ($t = 3.563$, $p < 0.05$). Hence, it can be interpreted that all these mean differences were found not by true difference and by chance. The study shows that Buerger Allen Exercise (BAE) was effective in improving the mean lower extremity perfusion among diabetic patients. The mean of lower extremity perfusion among diabetic patients differed at pretest and posttest was statistically significant in the experimental group where it is not significant in the control group.

Keywords: Assess, Effectiveness, Buerger Allen Exercise, Lower Extremity Perfusion, Diabetes Mellitus

Introduction

Diabetes mellitus occurs throughout the world, but is more common (especially type 2) in the more developed countries. The greatest increase in prevalence is, however, occurring in low- and middle-income countries. About 422 million people worldwide have diabetes, the majority living in low-and middle-income countries, and 1.5 million deaths are directly attributed to diabetes each year. Both the number of cases and the prevalence of diabetes have been steadily increasing over the past few decades. **(World Health Organization, 2021)**

More than half a billion people are living with diabetes worldwide, affecting men, women, and children of all ages in every country, and that number is projected to more than double to 1.3 billion people in the next 30 years, with every country seeing an increase. **(The Lancet)**

The global diabetes prevalence in 2019 is estimated to be 9.3% (463 million people), rising to 10.2% (578 million) by 2030 and 10.9% (700 million) by 2045. The prevalence is higher in urban (10.8%) than rural (7.2%) areas, and in high-income (10.4%) than low-income countries (4.0%). One in two (50.1%) people living with diabetes do not know that they have diabetes. The global prevalence of impaired glucose tolerance is estimated to be 7.5%(374million) in 2019 and projected to reach 8.0%(454million) by 2030 and 8.6% (548million) by 2045.By 2045, IDF projections show that 1 in 8 adults, approximately 783 million, will be living with diabetes, an increase of 46%.Over 90% of people with diabetes have type 2 diabetes, which is driven by socio-economic, demographic, environmental, and genetic factors. The key contributors to the rise in type 2 diabetes includes the following: urbanization, an ageing population, decreasing levels of physical activity and increasing overweight & obesity prevalence. **(International Diabetes Federation, 2021)**

Aim

The purpose of the study was to stimulate the development of collateral circulation in the legs by early recognition and prevention of PAD to those at increased risk.

Statement of the problem

A study to assess the Effectiveness of Buerger Allen Exercise on lower extremity perfusion among diabetes mellitus patients who are admitted in a selected hospital at Coimbatore

Objectives

- To describe the demographic variables of diabetic patients
- To assess the pre-test lower extremity perfusion among diabetic patients from a selected hospital at Coimbatore
- To test the effectiveness of Buerger Allen Exercise (BAE)among diabetic patients
- To assess the post-test lower extremity perfusion among diabetic patients from a selected hospital at Coimbatore
- To find the association between pre-test lower extremity perfusion and demographic variables of diabetic patients.

Hypothesis

H_1: There will be significant difference in the pre-test and post-test lower extremity perfusion among diabetic patients from a selected hospital at Coimbatore in the experimental and control group

H_2: There will be significant association between pre-test lower extremity perfusion and demographic variables of diabetic patients from a selected hospital at Coimbatore in the experimental and control group

Delimitations

The study is delimited to

- Patients with (type-2) diabetic who got admitted in a selected hospital at Coimbatore
- Diabetic who can understand Tamil or English and respond verbally
- A data collection period of 4 weeks
- Diabetic patients who undergone treatment for diabetes condition for a minimum period of 1 year.
- Diabetic patients who were willing to participate.

Conceptual framework

The conceptual framework provides a schematic representation of strength of relationships among the phenomena to be tested through scientific inquiry. The conceptual framework, incorporated for the present study, is **Wiedenbach's Helping Art of Clinical Nursing Theory**, 1964 (Parker, 2015).

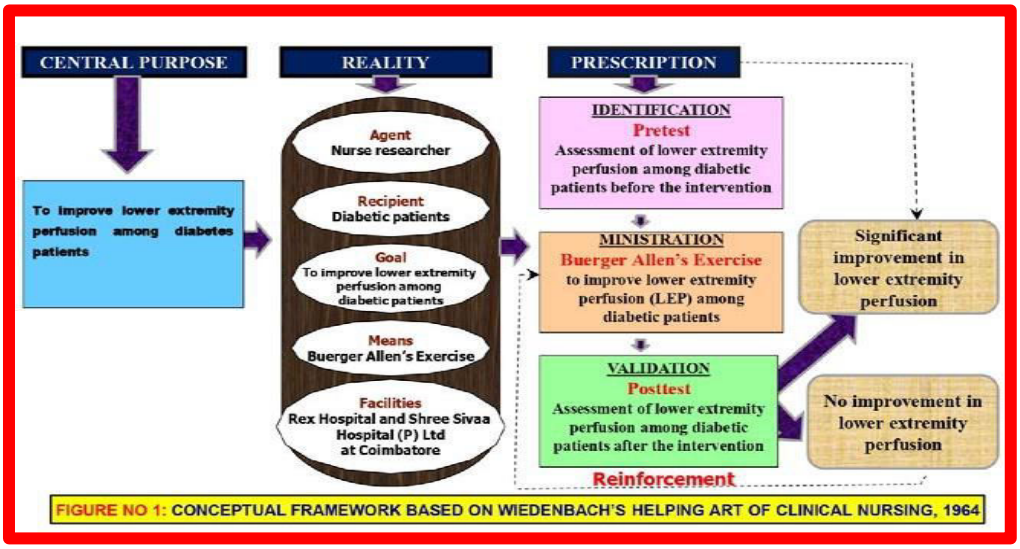

Figure:1.1. Modified Conceptual framework based on Wiedenbach`s Helping Art of Clinical Nursing, 1964

Research methodology

The research methodology is a way of explaining how a researcher intends to carry out their research. It includes the research approach, research design, and variables, setting of the study, population, sample and sample size, sampling

technique, description of the tool, pilot study, data collection procedure and plan for data analysis.

Research approach and design

In this study Effectiveness of Buerger Allen Exercise on lower extremity perfusion among diabetes mellitus patients was assessed. Therefore, a quantitative/evaluative approach was used to test the effectiveness of intervention. The investigator used Pretest-Posttest control group design for this study. There was a manipulation for the subjects with a control group and randomization.

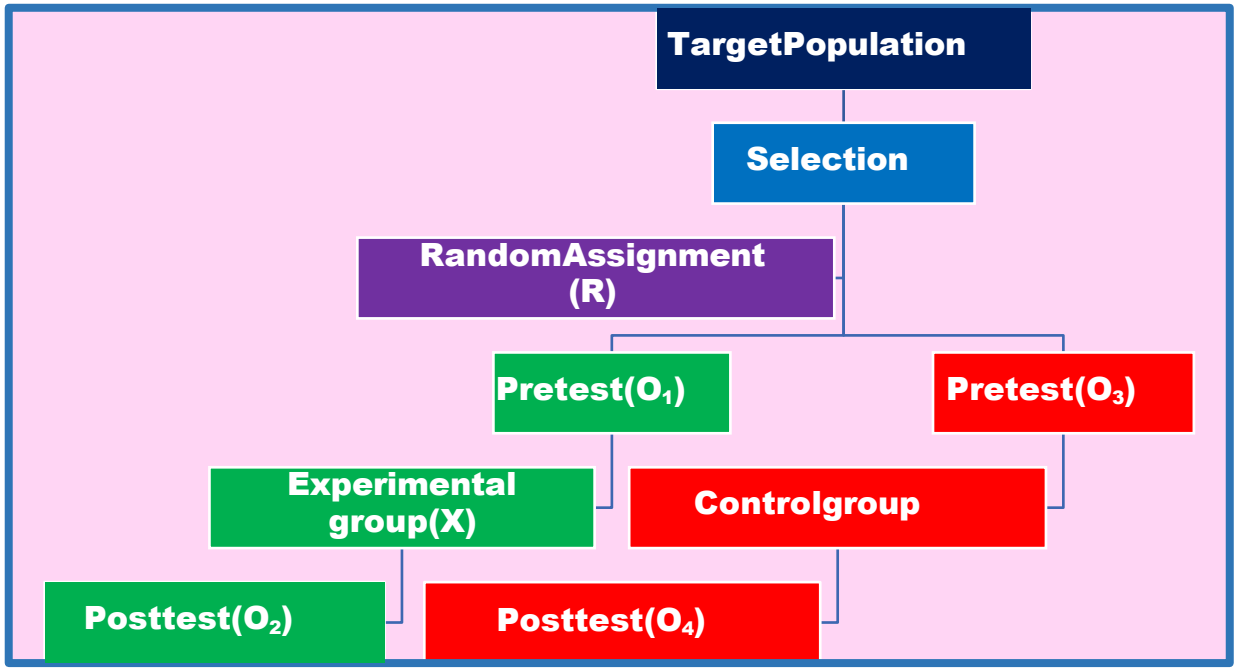

Figure:1.2. Research Design

Research variables

Independent Variable–Buerger Allen Exercise

Dependent Variable–Lower Extremity Perfusion

Setting of the study

The study was conducted in Rex Hospital and Shree Siva a Hospital (P) Ltd, Coimbatore

Population

- **Target Population:** Target population of the study was diabetic patients across the globe.
- **Accessible Population:** The diabetic patients in selected hospitals at Coimbatore were the accessible population for the study.
- **Sample Size**

The sample size was 60 (30 experimental and 30 control group) diabetic patients

Sampling Technique

Sampling Technique used in the study was Simple Random Sampling Technique. Sixty diabetic patients (30 experimental and 30 control group) were included in the study who fulfilled the sampling criteria.

Description of the tool and technique

The Tool or Instrument consists of two sections as follows:

- **Section – I (Socio Demographic Variable):** This section includes baseline variable items such as age, gender, education, type of work, monthly income, duration of diabetes mellitus, duration of wound, dietary pattern, duration of physical activity per day and source of information.
- **Section – II:** Ankle Brachial Index.

Data Collection Procedure

A prior formal written permission will be obtained from the college and the authorities of selected hospital where the study will be conducted. The study sample was selected by using probability (simple random sampling) technique among them who fulfilled the sampling (inclusion and exclusion) criteria a total of 60 diabetic patients (30 experimental and 30 control group) were recruited in the study. Before conducting the study, a brief self-introduction and explanation regarding the nature and purpose of the intervention was given. Written and oral consent was obtained from the subjects. Ankle Brachial Index (ABI) was used to assess lower extremity perfusion among diabetic patients.

The pre-test will be conducted on the first day after obtaining consent from the participants. Based on the sample selection criteria, the second day onwards the Buerger Allen Exercise was given among diabetic patients as measured by the scores on Ankle Brachial Index in the experimental group but not in the control group. Interventional program was provided through individual sessions lasting 15 to 30 min in the experimental group. The interventional program was continued for 14 days. The data was collected for duration of two weeks. The fourteenth day post test was conducted by using the same tool in the experimental and control group to assess the effectiveness of Buerger Allen Exercise.

Plan for data analysis

The data collected was analyzed by means of descriptive statistics, and inferential statistics.

Descriptive statistics

- Analysis of the baseline data was done by using frequency and percentage.
- Diabetic patients were analyzed by computing frequency, percentage mean and standard deviation.

Inferential statistics

- Unpaired "t" test was used to find out the effectiveness of Buerger Allen Exercise on diabetic patients from selected hospitals at Coimbatore.
- Chi-square analysis was used to determine the association between the lower extremity perfusion among diabetic patients and selected socio demographic variables among patients with diabetes.

Result and Discussion

The data collected was analyzed by means of descriptive statistics, and inferential statistics.

Objective-1: To describe the demographic variables of diabetic patients

Regarding age of the patients, 2 (6.7%) were less than 30 years, 3(10.0%) were between 31 to 45 years, 6 (20.0%) were between 46 to 60 years and 19 (63.3%) were aged more than 60 years in the experimental group. Regarding age of the diabetes patients, 3 (10.0%) were less than 30 years, 4 (13.3%) were between 31 to 45 years, 8 (26.7%) were between 46 to 60 years and 15 (70.0%) were aged more than 60 years in the control group.

Of the total 30 patients, 13 (43.3%) were males and 17 (56.7%) were females in the experimental group. Of the total 30 elders, 16 (53.3%) were males and 14 (46.7%) were females in the control group.

Regarding education of the diabetes patients, 16 (53.3%) were illiterate, 7 (23.3%) did up to 12^{th} std, 5 (16.7%) were diploma/degree holders and 2 (6.7%) belong to others in the experimental group. Regarding education of the diabetes patients, 14 (46.7%) were illiterate, 8 (26.7%) did up to 12^{th} std, 7 (23.3%) were diploma/degree holders and one (3.3%) belong to others in the control group.

Of the total 30 patients, 11 (36.7%) were sedentary workers, 5 (16.7%) were moderate workers, 2 (6.7%) were heavy workers and 12 (40.0%) were not working in the experimental group. Of the total 30 patients, 14 (46.7%) were sedentary workers, 4 (13.3%) were moderate workers, 3 (10.0%) were heavy workers and 9 (30.0%) were not working in the control group.

Of the total 30 patients, 16953.3%) earns less than Rs.10,000,6 (20.0%)earns Rs.10,001 to Rs. 20,000, 5 (16.7%) earns Rs. 20,001 to 30,000 and 3 (10.0%) earns more than Rs, 30,000 as monthly income in the experimental group. Of the total 30 patients, 12 (40.0%) earns less than Rs. 10,000, 6 (20.0%) earns Rs. 10,001 to Rs. 20,000, 7 (23.3%) earns Rs. 20,001 to 30,000 and 5 (16.7%) earns more than Rs, 30,000 as monthly income in the control group.

With regard to duration of diabetes mellitus, 3 (10.0%) had complaints for less than one year, 5 (16.7%) had complaints for 2 to 5 years, 9 (30.0%) had complaints for 6 to 10 years and 13 (43.3%) had complaints for more than 10 years in the experimental group. With regard to duration of diabetes mellitus, 5 (16.7%) had complaints for less than one year, 7 (23.3%) had complaints for 2 to 5 years, 10

(33.3%) had complaints for 6 to 10 years and 8 (26.7%) had complaints for more than 10 years in the control group.

Of the total 30 patients, 13 (43.3%) reside in rural area and 17 (56.7%) reside in urban area in the experimental group. Of the total 30 patients, 14 (46.7%) reside in rural area and 16 (53.3%) reside in urban area in the control group.

Of the total 30 patients, 5 (16.7%) were vegetarian and 25 (83.3%) were non vegetarian in the experimental group. Of the total 30 patients, 7 (23.3%) were vegetarian and 23 (76.7%) were non vegetarian in the control group.

Of the total 30 patients, 12 (40.0%) did no physical activity, 12 (40.0%) did physical activity for less than 30 minutes, 4 (13.3%) did physical activity for 30 minutes to 1 hour and 2 (6.7%) did physical activity for more than 1 hour in the experimental group. Of the total 30 patients, 16 (53.3%) did no physical activity, 9 (30.0%) did physical activity for less than 30 minutes, 4 (13.3%) did physical activity for 30 minutes to 1 hour and one (3.4%) did physical activity for more than 1 hour in the control group.

With regard to source of information, 3 (10.0%) received information through printed media, 8 (26.7%) received information through mass media, 14 (46.7%) received information through health care professionals and 5 (16.7%) received information through peer group/friends in the experimental group. With regard to source of information, 3 (10.0%) received information through printed media, 9 (30.0%) received information through mass media, 11 (36.7%) received information through health care professionals and 7 (23.3%) received information through peer group/friends in the control group.

Objective- 2,3 & 4: To test the effectiveness of Buerger Allen Exercise among diabetic patients

The mean lower extremity perfusion in the experimental group differed at pretest and posttest was statistically significant ($t = 3.563$, $p < 0.05$). Hence, it can be interpreted that all these mean differences were found by true difference and not by chance.

The mean lower extremity perfusion in the control group differed at pretest and posttest was statistically significant ($t = 2.112$, $p < 0.05$). Hence, it can be interpreted that all these mean differences were found not by true difference and by chance.

Objective-5: To find out the association between pre-test lower extremity perfusion and demographic variables of diabetic patients in the experimental and control group

Among those patients who were less than 30 years i.e., none (0.0%) were normal, 2(6.7%) had mild lower extremity pressure, none (0.0%) had moderate lower extremity pressure and none (0.0%) had severe lower extremity pressure. Those who were between 31to 45 years i.e., none (0.0%) were normal, one (3.3%) had mild lower extremity pressure, one (3.3%) had moderate lower extremity

pressure and one (3.3%) had severe lower extremity pressure. Those who were between 46 to 60 years i.e., none (0.0%) were normal, one (3.3%) had mild lower extremity pressure, 3 (10.0%) had moderate lower extremity pressure and 2 (6.7%) had severe lower extremity pressure. Those who were more than 60 years i.e., 5 (16.7%) were normal, 3 (10.0%) had mild lower extremity pressure, 7 (23.3%) had moderate lower extremity pressure and 4 (13.3%) had severe lower extremity pressure. The calculated 'chi-square test' value of 10.567 and the 'p' value 0.307 ($p>0.05$) shows that there was no association between lower extremity perfusion and age of the patients in the experimental group.

Among those patients who were male i.e., 2 (6.7%) were normal, 4 (13.3%) had mild lower extremity pressure, 6 (20.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those who were female i.e., 3 (10.0%) were normal, 3 (10.0%) had mild lower extremity pressure, 5 (16.7%) had moderate lower extremity pressure and 6 (20.0%) had severe lower extremity pressure. The calculated 'chi-square test' value of 3.535 and the 'p' value 0.316 ($p>0.05$) shows that there was no association between lower extremity perfusion and gender of the patients in the experimental group

Among those patients who were illiterate i.e., none (0.0%) were normal, 5 (16.7%) had mild lower extremity pressure, 7 (23.3%) had moderate lower extremity pressure and 4 (13.3%) had severe lower extremity pressure. Those patients who studied up to 12^{th} std i.e., 2 (6.7%) were normal, 2 (6.7%) had mild lower extremity pressure, one (3.3%) had moderate lower extremity pressure and 2 (6.7%) had severe lower extremity pressure. Those patients who studied diploma/degree i.e., 3 (10.0%) were normal none (0.0%) had mild lower extremity pressure, 2 (6.7%) had moderate lower extremity pressure and none (0.0%) had severe lower extremity pressure. Those patients who belong to others i.e., none (0.0%) were normal, none (0.0%) had mild lower extremity pressure, one (3.3%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. The calculated 'chi- square test' value of 14.539 and the 'p' value 0.104 ($p>0.05$) shows that there was no association between lower extremity perfusion and education of the patients in the experimental group.

Among those patients who were sedentary workers i.e., one (3.3%) were normal, 4 (13.3%) had mild lower extremity pressure, 5 (16.7%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who were moderate worker si.e., one (3.3%) were normal, (3.3%) had mild lower extremity pressure, 2 (6.7%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who were heavy workers i.e., none (0.0%) were normal, none (0.0%) had mild lower extremity pressure, one (3.3%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who did no work i.e., 3 (10.0%) were normal, 2 (6.7%) had mild lower extremity pressure, 3 (10.0%) had moderate lower extremity pressure and 4 (13.3%) had severe lower extremity pressure. The calculated 'chi-square test' value of 5.658 and the 'p'

value 0.774 (p>0.05) shows that there was no association between lower extremity perfusion and type of patients of the patients in the experimental group.

Among those patients who earns less than Rs. 10,000 i.e., 2 (6.7%) were normal, 4 (13.3%) had mild lower extremity pressure, 9 (30.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who earns between Rs. 10,001 to 20,000 i.e., one (3.3%) were normal, none (0.0%) had mild lower extremity pressure, none (0.0%) had moderate lower extremity pressure and 5 (16.7%) had severe lower extremity pressure. Those patients who earns between Rs. 20,001 to 30,000 i.e., 2 (6.7%) were normal, 2 (6.7%) had mild lower extremity pressure, one (3.3%) had moderate lower extremity pressure and none (0.0%) had severe lower extremity pressure. Those patients who earns more than Rs.30,000 i.e., none (0.0%) were normal, one(3.3%) had mild lower extremity pressure, one (3.3%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. The calculated 'chi-square test' value of 21.258 and the 'p' value 0.012* (p<0.05) shows that there was association between lower extremity perfusion and monthly income of the patients in the experimental group.

Among those patients who had diabetes mellitus less than one year i.e., one (3.3%) were normal, one (3.3%) had mild lower extremity pressure, none (0.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who had diabetes mellitus between 2 to 5 years i.e., none (0.0%) were normal, 3 (10.0%) had mild lower extremity pressure, one (3.3%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who had diabetes mellitus between 6 to10 years i.e., 2 (6.7%) were normal, one (3.3%) had mild lower extremity pressure, 4 (13.3%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who had diabetes mellitus for more than 10 years i.e., 2 (6.7%) were normal, 2 (6.7%) had mild lower extremity pressure, 6 (20.0%) had moderate lower extremity pressure and 2 (6.7%) had severe lower extremity pressure. The calculated 'chi-square test' value of 7.554 and the 'p' value 0.580 (p>0.05) shows that there was no association between lower extremity perfusion and duration of diabetes mellitus in the experimental group.

Among those patients who were from rural area i.e., 4 (13.3%) were normal, 4 (13.3%) had mild lower extremity pressure, 4 (13.3%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who were from urban area i.e., one (3.3%) were normal, 3 (10.0%) had mild lower extremity pressure, 7 (23.3%) had moderate lower extremity pressure and 6 (20.0%) had severe lower extremity pressure. The calculated 'chi-square test' value of 5.904 and the 'p' value 0.116 (p>0.05) shows that there was no association between lower extremity perfusion and nature of residence in the experimental group.

Among those patients who were vegetarian i.e., one (3.3%) were normal, none (0.0%) had mild lower extremity pressure, 3 (10.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who were non vegetarian i.e., 4 (13.3%) were normal, 7 (23.3%) had mild lower extremity pressure, 8 (26.7%) had moderate lower extremity pressure and 6 (20.0%) had severe lower extremity pressure. The calculated 'chi-square test' value of 2.359 and the 'p' value 0.501 ($p>0.05$) shows that there was no association between lower extremity perfusion and dietary pattern in the experimental group.

Among those patients who does no physical activity i.e., 3 (10.0%) were normal, 2 (6.7%) had mild lower extremity pressure, 3 (10.0%) had moderate lower extremity pressure and 4 (13.3%) had severe lower extremity pressure. Those patients who does physical activity less than 30 minutes i.e., one (3.3%) were normal, 4 (13.3%) had mild lower extremity pressure, 6 (20.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who does physical activity between 30 minutes to 1 hour i.e., one (3.3%) were normal, one (3.3%) had mild lower extremity pressure, none (0.0%) had moderate lower extremity pressure and 2 (6.7%) had severe lower extremity pressure. Those patients who does physical activity more than 1 hour i.e., none (0.0%) were normal, none (0.0%) had mild lower extremity pressure, 2 (6.7%) had moderate lower extremity pressure and none (0.0%) had severe lower extremity pressure. The calculated 'chi-square test' value of 10.753 and the 'p' value 0.293 ($p>0.05$) shows that there was no association between lower extremity perfusion and duration of physical activity in the experimental group.

Among those patients received information through print media i.e., one (3.3%) were normal, 0 (0.0%) had mild lower extremity pressure, one (3.3%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who received information through mass media i.e., 2 (6.7%) were normal, one (3.3%) had mild lower extremity pressure, 4 (13.3%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who received information through health care professional i.e., one (3.3%) were normal, 6 (20.0%) had mild lower extremity pressure,3 (10.0%) had moderate lower extremity pressure and 4 (13.3%) had severe lower extremity pressure. Those patients who received information through peer group/friends i.e., one (3.3%) were normal, none (0.0%) had mild lower extremity pressure, 3 (10.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. The calculated 'chi- square test' value of 8.930 and the 'p' value 0.444 ($p>0.05$) shows that there was no association between lower extremity perfusion and source of information in the experimental group.

Among those patients who were less than 30 years i.e., none (0.0%) were normal, 2 (6.7%) had mild lower extremity pressure, none (0.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those

who were between 31 to 45 years i.e., none (0.0%) were normal, one (3.3%) had mild lower extremity pressure, 3 (10.0%) had moderate lower extremity pressure and none (3.3%) had severe lower extremity pressure. Those who were between 46 to 60 years i.e., 2 (6.7%) were normal, one (3.3%) had mild lower extremity pressure, 3(10.0%) had moderate lower extremity pressureand2 (6.7%) had severe lower extremity pressure. Those who were more than 60 years i.e., 4 (13.3%) were normal, 4 (13.3%) had mild lower extremity pressure, 5 (16.7%) had moderate lower extremity pressure and 2 (6.7%) had severe lower extremity pressure. The calculated 'chi- square test' value of 8.590 and the 'p' value 0.436 ($p>0.05$) shows that there was no association between lower extremity perfusion and age of the patients in the control group.

Among those patients who were male i.e., 3 (10.0%) were normal, 4 (13.3%) had mild lower extremity pressure, 7 (23.3%) had moderate lower extremity pressure and 2 (6.7%) had severe lower extremity pressure. Those who were female i.e., 3 (10.0%) were normal, 4 (13.3%) had mild lower extremity pressure, 4 (13.3%) had moderate lower extremity pressure and 3 (10.0%) had severe lower extremity pressure. The calculated 'chi-square test' value of 0.889 and the 'p' value 0.828 ($p>0.05$) shows that there was no association between lower extremity perfusion and gender of the patients in the control group.

Among those patients who were illiterate i.e., 2 (6.7%) were normal, 4 (13.3%) had mild lower extremity pressure, 7 (23.3%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who studied up to 12^{th} std i.e., one (3.3%) were normal, 3 (10.0%) had mild lower extremity pressure, 2 (6.7%) had moderate lower extremity pressure and 2 (6.7%) had severe lower extremity pressure. Those patients who studied diploma/degree i.e., 3 (10.0%) were normal, one (3.3%) had mild lower extremity pressure, 2 (6.7%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who belong to others i.e., none (0.0%) were normal, none (0.0%) had mild lower extremity pressure, none (0.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. The calculated 'chi- square test' value of 10.276 and the 'p' value 0.329 ($p>0.05$) shows that there was no association between lower extremity perfusion and education of the patients in the control group.

Among those patients who were sedentary workers i.e., 2 (6.7%) were normal, 5 (16.7%) had mild lower extremity pressure, 7 (23.3%) had moderate lower extremity pressure and none (0.0%) had severe lower extremity pressure. Those patients who were moderate workers i.e., none (0.0%) were normal, one (3.3%) had mild lower extremity pressure, 2 (6.7%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure.Thosepatientswhowereheavyworkersi.e.,2(6.7%)werenormal,none(0.0%)had mild lower extremity pressure, none (0.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who did not work i.e., 2 (6.7%) were normal, 2 (6.7%) had mild lower extremity

pressure, 2 (6.7%) had moderate lower extremity pressure and 3 (10.0%) had severe lower extremity pressure. The calculated 'chi- square test' value of 12.603 and the 'p' value 0.181 (p>0.05) shows that there was no association between lower extremity perfusion and type of patients of the patients in the control group.

Among those patients who earns less than Rs. 10,000 i.e., 2 (6.7%) were normal, 4 (13.3%) had mild lower extremity pressure, 5 (16.7%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who earns between Rs. 10,001 to 20,000 i.e., 2 (6.7%) were normal, none (0.0%) had mild lower extremity pressure, 2 (6.7%) had moderate lower extremity pressure and 3 (10.0%) had severe lower extremity pressure. Those patients who earns between Rs. 20,001 to 30,000 i.e., 2 (6.7%) were normal, 3 (10.0%) had mild lower extremity pressure, one (3.3%) had moderate lower extremity pressure and none(0.0%) had severe lower extremity pressure. Those patients who earns more than Rs. 30,000 i.e., none (0.0%) were normal, one (3.3%) had mild lower extremity pressure, 3 (10.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. The calculated 'chi-square test' value of 11.250 and the 'p' value 0.259 (p>0.05) shows that there was no association between lower extremity perfusion and monthly income of the patients in the control group.

Among those patients who had diabetes mellitus less than one year i.e., one (3.3%) were normal, 2 (6.7%) had mild lower extremity pressure, none (0.0%) had moderate lower extremity pressure and 2 (6.7%) had severe lower extremity pressure. Those patients who had diabetes mellitus between 2 to 5 years i.e., none (0.0%) were normal, 3 (10.0%) had mild lower extremity pressure, 3 (10.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who had diabetes mellitus between 6 to10 years i.e., 4 (13.3%) were normal, 2 (6.7%) had mild lower extremity pressure, 3 (10.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who had diabetes mellitus for more than 10 years i.e., one (3.3%) were normal, one (3.3%) had mild lower extremity pressure, 5 (16.7%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. The calculated 'chi-square test' value of 10.906 and the 'p' value 0.282 (p>0.05) shows that there was no association between lower extremity perfusion and duration of diabetes mellitus in the control group.

Among those patients who were from rural area i.e., 5 (16.7%) were normal, 3(10.0%) had mild lower extremity pressure, 5 (16.7%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who were from urban area i.e., one (3.3%) were normal, 5 (16.7%) had mild lower extremity pressure, 6 (20.0%) had moderate lower extremity pressure and 4 (13.3%) had severe lower extremity pressure. The calculated 'chi-square test' value of 4.946 and the 'p' value 0.176 (p>0.05) shows that there was no association between lower extremity perfusion and nature of residence in the control group.

Among those patients who were vegetarian i.e., 3 (10.0%) were normal, 2 (6.7%) had mild lower extremity pressure, one (3.3%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who were non vegetarian i.e., 3 (10.0%) were normal, 6 (20.0%) had mild lower extremity pressure, 10 (33.3%) had moderate lower extremity pressure and 4 (13.3%) had severe lower extremity pressure. The calculated 'chi-square test' value of 3.676 and the 'p' value 0.299 ($p>0.05$) shows that there was no association between lower extremity perfusion and dietary pattern in the control group.

Among those patients who does no physical activity i.e., 2 (6.7%) were normal, 5 (16.7%) had mild lower extremity pressure, 6 (20.0%) had moderate lower extremity pressure and 3 (10.0%) had severe lower extremity pressure. Those patients who does physical activity less than 30 minutes i.e., 3 (10.0%) were normal, 2 (6.7%) had mild lower extremity pressure, 2 (6.7%) had moderate lower extremity pressure and 2 (6.7%) had severe lower extremity pressure. Those patients who does physical activity between 30 minutes to 1 hour i.e., one (3.3%) were normal, one (3.3%) had mild lower extremity pressure, 2 (6.7%) had moderate lower extremity pressure and 0 (0.0%) had severe lower extremity pressure. Those patients who does physical activity more than 1 hour i.e., none (0.0%) were normal, none (0.0%) had mild lower extremity pressure, one (3.3%) had moderate lower extremity pressure and none (0.0%) had severe lower extremity pressure. The calculated 'chi-square test' value of 4.808 and the 'p' value 0.851 ($p>0.05$) shows that there was no association between lower extremity perfusion and duration of physical activity in the control group.

Among those patients received information through print media i.e., one (3.3%) were normal, one (3.3%) had mild lower extremity pressure, none (0.0%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who received information through mass media i.e., 3 (10.0%) were normal, 4 (13.3%) had mild lower extremity pressure, one (3.3%) had moderate lower extremity pressure and one (3.3%) had severe lower extremity pressure. Those patients who received information through health care professional i.e., none (0.0%) were normal, 3 (10.0%) had mild lower extremity pressure, 8 (26.7%) had (0.0%) had severe lower extremity pressure. Those patients who received information through peer group/friends i.e., 2 (6.7%) were normal, none (0.0%) had mild lower extremity pressure, 2 (6.7%) had moderate lower extremity pressure and 3 (10.0%) had severe lower extremity pressure. The calculated 'chi- square test' value of 18.619 and the 'p' value 0.029* ($p<0.05$) shows that there was association between lower extremity perfusion and source of information in the control group.

References:

1. Zhang et al. (2023). Quantitative model for assessment of lower-extremity perfusion in patients with diabetes. Medical Physics; 50(1). P. 3019-3026.
2. Nacef et al. (2022). Detection of Lower Extremity Occlusive Peripheral Artery Disease (LEOPAD) by Measuring Systolic Pressure Index in Type 2 Diabetic Patients. Journal of Diabetes Research and Therapy; 7(1). P. 1-5.
3. Filho, Teodoro, Pereira and Miranda (2021). Prevalence of peripheral arterial disease and associated factors in people with type 2 diabetes. Fisioter. Mov; 34(1). P. 1-12.
4. Reshma, Islam, Sunil & Markose (2020). Lower Extremity Perfusion among Patient with Type 2 Diabetes Mellitus in a Tertiary Care Hospital, Kochi. Indian Journal of Public Health Research & Development; 11(1). P. 319-324.
5. Hassan et al. (2020). Assessment of Peripheral Vascular Disease Degree among Diabetic Patient Who Attend in Out-Patient Clinics. Minia Scientific Nursing Journal; 7(1). P. 87-93