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RESEARCH ARTICLE

A PRE-EXPERIMENTAL STUDY TO EVALUATE THE EFFECTIVENESS OF BUEGER ALLEN EXERCISE ON LEVEL OF LOWER LIMB TISSUE PERFUSION AMONG PATIENT WITH DIABETES MELLITUS ADMITTED IN SELECTED HOSPITAL U.P"

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Abstract

The objectives of the study were: (I) To assess the level of lower limb tissue perfusion among patient with diabetes mellitus before and after administration of buerger Allen exercise. (II) To evaluate the effectiveness of buerger Allen exercise on the level of lower limb tissue perfusion among patient with diabetes mellitus. (III) To find out the association between post interventional scores of lower limb tissues perfusion with the selected demographic variables. The Conceptual framework adopted for the study was based on Health Promotion Modal proposed by Nola J. pander in 1992. Quantitative Research Approach was adopted with Pre experimental: one group pre-test - post-test design. The tool used for the data collection demographic variables and Tissue Perfusion Scale with Seven Parameter for assessment of lower limb tissue perfusion. Content validity of the was done by 9 experts from the field of medicine and Nursing. The obtained data was analyzed using both descriptive and inferential statistic in terms of Frequency, Percentage, Mean, and Mean, deference, Standard Deviation, t value and Chi-square. Major finding of the study are majority **43.3% (13)** in the age group of 30-40 years. Mean post Tissue Perfusion score was higher than the Mean Tissue Perfusion score. To obtain the difference between pre and post Tissue Per score was found to be statistically significant at 0.05 level of significant. The finding of study revealed that implementation of Buerger Allen Exercise was effective for Improving Level of Lower Limb Tissue Perfusion. Majority of patients were felt relaxed and Buerger Allen Exercise used by the researcher was accepted, Buerger Allen Exercise is non-invasive, non-pharmacological and effective mean which can be used for diabetes mellitus patients as a routine practice. Based on the research finding further recommendation also given.

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Introduction:-

Health is a dynamic condition resulting from a body's constant adjustment and adaptation in response to stresses and changes in the environment for maintaining an inner equilibrium. Wellness is first and foremost a choice to assume

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responsibility for the quality of your life. It begins with a conscious decision to shape a healthy lifestyle. Wellness is a mindset, a predisposition to adopt a series of key principles in varied life areas that lead to high levels of well-being and life satisfaction.

Diabetes mellitus is a group of metabolic diseases in which a person has high blood sugar, either because the pancreas does not produce enough insulin, or because cells do not respond to the insulin that is produced. This high blood sugar produces the classical symptoms of polyuria, polydipsia, and polyphagia.

Diabetes mellitus type 2 (formerly non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes) is a metabolic disorder that is characterized by high blood glucose in the context of insulin resistance and relative insulin deficiency. This is in contrast to diabetes mellitus type 1, in which there is an absolute insulin deficiency due to destruction of islet cells in the pancreas. Type 2 diabetes makes up about 90% of cases of diabetes with the other 10% due primarily to diabetes mellitus type 1 and gestational diabetes. Obesity is thought to be the primary cause of type 2 diabetes in people who are genetically predisposed to the disease.

Any organ of the body can be affected by diabetes and among the micro vascular complications of diabetes, neuropathy results in significant disability and morbidity, about 60-70% of people with diabetes have some form of neuropathy and 75% develop peripheral neuropathy. The highest rates of neuropathy are among people who had diabetes for the past 25 years. Peripheral vascular disease affects larger portion of the population. It is the major cause of morbidity and mortality and its burden are increasing worldwide. Despite this, many people are unaware of this condition. Health promotion enables people to make choices in lifestyle which will help to prevent or reduce disease and enhance quality of life.

As per the report of International Diabetes Federation (IDF), India is looming epidemic of diabetes, and known as the diabetes capital of the world. According to IDF, India has highest number of 50.8 million people suffering from Diabetes Mellitus (DM), followed by China (43.2million) and US (26.8 million). The report projected 58.7 million DM case in India by the year of 2010- almost 7% of the adult population in the developing countries. More over 3.2 million deaths are due to DM. In Karnataka 22-26 % people are suffering with diabetes mellitus.

Exercise training for improving of tissue perfusion among diabetic patient helps in potential mechanisms like formation of collateral circulation and increased blood flow, changes micro circulation and, changes in muscle metabolism and oxygen extraction, prevention inflammation and muscle injury, cost effective. Buerger - Allen exercise has shown an effect on improving tissue perfusion. Buerger - Allen exercise is an active postural exercise in which gravity alternatively fills and empties the blood vessels for preventing level of tissue perfusion and promoting collateral circulation in lower extremities.

Objectives:-

1. To assess the level of lower limb tissue perfusion among patient with diabetes Mellitus before and after administration of buerger Allen exercise.
2. To determine the association between post-test level of lower limb tissues perfusion with the selected demographic variables.

Materials And Method:-

The research design is the master plan specifying the methods and procedures for collecting and analyzing the needed information in research study”

The research design is **Pre Experimental: One Group Pre-Test Post-Test Design** was selected for the study. Sample comprised of 30 patients having diabetes Mellitus on U.P. selected using Non Probability Sampling Technique. After obtaining the Ethical permission from the institutional Ethical committee of Yashoda hospital, Ghaziabad, to Conducting the research study, a formal permission for conducting research was obtained from I.C.U. area at the Yashoda Hospital. Sample in the pre- experimental group and control group were first screened according to the inclusion and exclusion criteria. The study included the patient above 18 years of the age, having at least one of the following symptoms Pedal edema, colure of the skin, Pedal Pulses Sensation, Temperature and Pain. The study subject was selected based on the criteria that they had these symptoms. Demographic profile sheet was

developed by investigator order to collect the background information of the patients with diabetic mellitus. The tool comprises of 3 items of the personal data, these are- Age, gender occupation.

Tissues perfusion assessment scale was prepared which comprised of seven parameter (Color of the Skin, Temperature, Capillary refill, Pedal Edema, Pedal edema, Pedal Pules, Sensation, Pain) with score Grading (good, poor, Very Poor). The study subjects were assessed for symptoms of diabetic mellitus on the level of tissue perfusion before and after intervention and score were recorded. The maximum score was 21 and minimum score 1 was for level of tissues perfusion and 1-7 good tissue perfusion, 8-14 poor tissues perfusion and 15-21 very poor tissues perfusion. The tissue perfusion scale included Color of the skin, temperature, capillary refill, pedal edema, pedal pulses, sensation and pain. Data were analyzed using descriptive and inferential statistics

Result:-

Table 1:- Findings related to frequency and percentage distribution of the demographic variable.

S. No	Sample Characteristic	Frequency (f)	Percentage (%)
1	Age in years 30-40 41-50 51-60	13 8 9	43.3 26.7 30
2	Gender Male Female	20 10	66.7 33.3
3	Educational Illiterate Primary and secondary school. Higher secondary Graduation Post-graduation and above	0 10 13 7 0	0 33.3 43.3 23.4 0
4	Occupation a. Unemployed b. Self-employed c. Private sector d. Government sector	0 7 10 13	0 23.4 33.3 43.3
5	Monthly family income a. ≤ 5,000 b. 5001-10,000 c. 15,001 and above.	2 10 18	6.7 33.3 60
6	Diet pattern a. Vegetarian. b. Non-Vegetarian	18 12	60 40
7	Smoking Habit a. Smoker b. Non –smoker	20 10	66.7 33.3
8	Previous exposure to exercise Programme. Yes No.	0 30	0 100

1. In this study majority **43.3% (13)** in the age group of 30-40 years, about **30 % (9)** were in the age group of 41-50 and about **26.7% (8)** were in the age group of 41-50.
2. Majority **66.7% (20%)** of sample was male and **33.3% (10)** of sample was female.
3. Majority of the sample were higher secondary **43.3 % (13)**, about **33.3 % (10)** were primary and secondary, about Graduation were **23.4 % (7)**, post-graduation and above, and none of Illiterate and post-graduation.
4. Majority of the sample **43.3 % (13)** were government sector, about **33.3 % (10)** private sector, about **23.33 % (7)** self-employee, **33.33 % (10)**.

5. Majority of sample that **60 % (18)** were 15001 and above, **33.3 % (10)** were in 5001-10,000 and less than were **6.66 % (2)**.
6. Majority of sample were vegetarian **60 % (18)**, and remaining were **40 % (12)** non-vegetarian.
7. Majority of the **66.7% (20)** were smoker and remaining **33.3% (10)** were non-smoker.
8. Majority of samples don't have previous exposure to exercise training program that **100 % (10)**.

Table 2:- Findings related to frequency and percentage distribution of level of lower limb tissue perfusion before and after administering Buerger Allen exercise.

Grading of LLTP	Pre-Test		Post-Test	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Mild	2	6.66	17	56.66
Moderate	27	90	13	43.33
sever	1	3.33	0	0

Table 2 shows the frequency and percentage of lower limb tissue perfusion in pre interventional score were (6.66%) mild, (90%) moderate and (3.33%) were severe and post interventional score were (56.66%) mild, (43.33%) moderate and none was severe.

Table 3:- Findings related to the level of lower limb tissue perfusion before and after administering buerger Allen exercise.

H₀₁: There is no significant difference in the level of lower limb tissue perfusion among patients with diabetes mellitus before and after administering Buerger - Allen exercise as measured by tissue perfusion scale at the 0.05 level of significance.

Observation	Mean	Mean difference	Standard deviation	't' value
Pre Intervention Score	10.36	3.36	3.854	5.109497
Post Interventional Score	7			

Table 3 shows that the mean pre interventional level of lower limb tissue perfusion score and mean post interventional level of lower limb tissue perfusion score was 10.36 The calculated 't' value was 5.109497 at 0.05 level of the significance and df (29) which was greater than table value (1.699). Hence null hypothesis H₀₁ was rejected

This shows that the obtained mean difference of lower limb tissue perfusion was a true difference and not by chance. It can be concluded that the buerger Allen exercise was effective in improving the lower limb tissue perfusion

Discussion:-

This study aimed to assess the effects of Burger Allen exercise on the level of lower limb tissue per fusion among diabetes mellitus patients. Results showed that Burger Allen exercise for half an hour leads to positive change.

In the present study, performing exercise resulted in an improving the lower limb tissue per fusion among diabetes mellitus patients. These changes were significant, and can be important from clinical viewpoint.

A similar quasi experimental study was conducted by MS.E. Selmer Mellisha, to assess the effectiveness of Buerger Allen exercise on lower extremity perfusion and pain among patients with type 2 Diabetes Mellitus admitted in selected hospitals, Chennai. It was conducted among 60 samples with type 2 diabetes mellitus by using non probability purposive sampling technique. Pre-test was conducted to assess the level of pain and lower extremity perfusion and Buerger Allen exercise was administered for the experimental group for a period of five days and post test was conducted on the sixth day. Comparison of pre and post-test findings showed that in the experimental group, the mean score of level of lower extremity pain was reduced from 4.33 to 1.30. The reduction of pain was statistically significant difference at 1% level of significance (p=0.001). The mean score of level of lower extremity perfusion was increased from 44.50 to 52 and it showed a statistically significant difference at 1% level of significance (p=0.001).

Conclusion:-

The following conclusion was drawn from the finding of the study. The present study most of the patients were belongs to the age group of 30-40 years. Intervention of Burger Allen Exercise was effective for diabetic patients in improving the lower limb tissue perfusion. Burger Allen Exercise is easy, non-invasive, non-pharmacological and effective on the level of lower limb tissue perfusion. The selected demographic variable did not have any significant association with the post interventional lower limb tissue perfusion score. Therefore, it can be concluded that Burger Allen Exercises were effective in improving lower limb tissue perfusion among patients with diabetes mellitus.

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