Effectiveness of Intradialytic stretching exercise on reduction of muscle cramps among patient undergoing hemodialysis

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Abstract- Diabetes and high blood pressure are the most common causes of kidney disease. Your health care provider may do tests to find out why you have kidney disease. The cause of your kidney disease may affect the type of treatment you receive. The nature of the study Was quasi experimental. the research design adopted for the study was "quasi – experimental non randomized control group design". In this design total sample were collected non randomly and divided into two groups one is experimental and another one is control group. The result of Group-A(Control group) is showing insignificant differences at p values on the other hand group B (experimental group) is showing significant p value .As comparing the mean difference of cramp questionnaire chart (frequency of cramps p value = 0.001, duration of cramps p value =0.001 , level of pain p value =0.001 , temperature of leg p value=0.169 , discomfort p value=0.001)scores between both the groups, the mean difference in Group- A which is lesser than Group- B in intervention this result showed that experimental group is more effective in compared to control group. The study was concluded that intradialytic stretching exercises are significantly to reduce the muscle cramps among patients undergoing hemodialysis.

Keywords: Intradialytic stretching exercises, muscle cramps, hemodialysis patient

INTRODUCTION

Chronic kidney disease (CKD) means your kidneys are damaged and can't filter blood the way they should. The main risk factors for developing kidney disease are diabetes, high blood pressure, heart disease, and a family history of kidney failure.

Chronic kidney disease has emerged as one of the most prominent causes of death and suffering in the 21 st century, due in part to the rise in risk factors, such as obesity and diabetes mellitus, the number of patients affected by ckd has also increasing, affecting as estimated >10% of the general population worldwide, amounting to >800 million individuals.(1)

Hemodialysis is an ongoing process where patients experience complications such as hypotension, leg muscle cramps, disequilibrium syndrome and nausea during the procedure.

Leg muscle cramps are pronounced in patients who require high ultra-filtration rate and are possibly dialyzed below their dry weight. They are presumably related to reduction in muscle perfusion that occurs in response to hypovolemia. Compensatory vasoconstrictive responses may shunt blood centrally during 98 Cardiometry treatment and could play a role in promoting leg muscle cramps. Changes in intra or the extra cellular balance of potassium and concentration of ionized calcium can disturb neuromuscular transmission and produce cramps. Peripheral vascular disease associated with increased prevalence of intradialytic cramps which confirms that processes related to the dialysis treatment are responsible for the cramps. (2)

Kidney foundation in united kingdom 2010, reported that more than 500 million people are affected by chronic kidney disease worldwide and approximately one in ten adults have some form of kidney disease. The global prevalence of chronic kidney disease increased by 29.3% between 1990 and 2017.(3)

The study indicates that the examination was effective to study the findings demonstrated that lower leg stretching exercises perform during dialysis dramatically decreased muscle cramping in patients undergoing hemodialysis. there was no statistically significant link between the muscle cramps and the selected demographic characteristics in either the experimental group or control group.(4)

MATERIAL AND METHODS

Research Approach

An quantitative research approach was adopted for this study.

Research Design

Quasi-Experimental Design (pre-test post-test design with control group)

Setting

The current research was done in Shri Mahant Indresh Hospital Dehradun, Uttarakhand.

Population

In the present study, the population consists of patients undergoing hemodialysis.

Samples

The sample of present study consist of patient undergoing hemodialysis who comply with the requirements.

Sampling Technique

In the present study, all the samples who fulfill the inclusion criteria are recruited using the non-probability purposive sampling technique.

Sample Size

The calculated sample size was 60 patients undergoing hemodialysis.

Development and description of Tool

Part A: demographic data

It contains 7 items for obtaining information which includes age, gender, education , occupation , personal habits , source of information & dietary habits.

Part B: Clinical variables

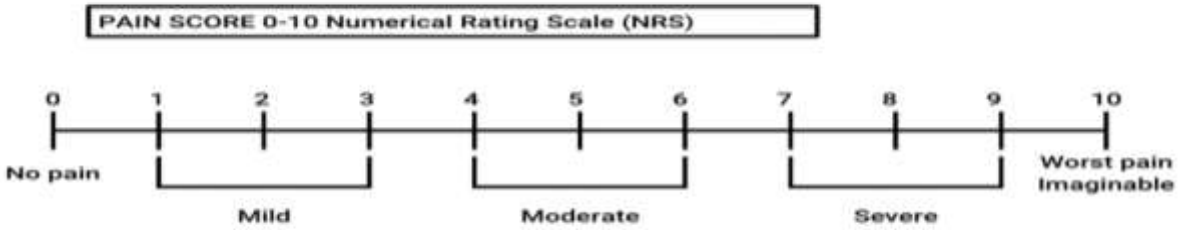
It includes duration of hemodialysis treatment, hours, sitting week, suffer from kidney disease, muscle cramp occur, location of pain, diagnosed with medical condition.

Section B : cramp questionnaire chart-

The cramp questionnaire chart was used to assess the severity of muscle cramps during hemodialysis, before & after intervention. It contains various feature of muscle cramps such as frequency of muscle cramps , duration of muscle cramps, level of pain , temperature, & discomfort which was comprehensively scored as level of muscle cramps ranging from (0-13).

Score interpretation-

CRAMPS	SCORE
No cramp	0
Mild cramps	1-4
Moderate cramps	5-8
Severe cramps	9-13



RESULT

Section 1: Section first shows That Percentage distribution of demographic data and clinical data. In control and experimental group

Table 1: frequency and percentage distribution in demographic data (control group) N=30

Demographic data	**Frequency (f)**	**Percentage (%)**
Age		
<20 years	0	0%
21-40 years	7	23.33%
41-60 years	23	76.66%
>60 years	0	0%
Gender		
Male	22	73.33%
female	8	26.66%
Education		
primary	2	6.66%
secondary	19	63.33%
Undergraduate	9	30%
postgraduate	0	0%
Occupation		
Employed	3	10%
Self employed	3	10%
Unemployed	24	80%

Personal habits		
Alcoholism	1	3.33%
Smoking	2	6.66%
Chewing tobacco	1	3.33%
None	26	86.66%
Source of information		
Books	1	3.33%
Newspaper	2	6.66%
Personal communication	27	90%
Television	0	0%
Diet		
Vegetarian	9	30%
Nonvegetarian	21	70%

Percentage wise distribution of Muscle cramps patients who are undergoing to Hemodialysis control group In the relation To their age group Shows that the highest percentage was in the age group. 41 to 60 years. 76.66 percentage. 21 to 40 years. 23.33%. Then more than 60 years and more than 20 years are Zero percentage. Gender Wise Male are more compare than female Male are 73 .33 percentage Females are 26 .66 percentage. Education, more in secondary education. 63 .333 Then undergraduate, 30% is primary 6 .66 percentage And post graduate are zero percentage Occupations more are unemployed. 80% self Employed are 10% and employed are 10%. Personal habits include Less are alcoholic. Smoker and chewing tobacco. More are none 86.66. source of information More from personal communication 90. According to diet, more patients are nonvegetarian 70 percentage and vegetarian are less 30 percentage.

Table 2: Frequency and percentage distribution in demographic data (experimental group) N=30

Demographic data	**Frequency (f)**	**Percentage (%)**
Age		
<20 years	0	0%
21-40 years	6	20%
41-60 years	24	80%
>60 years	0	0%
Gender		
Male	22	73.33%

Female	8	26.66%
Education		
Primary	16	53.33%
Secondary	10	33.33%
Undergraduate	4	13.33%
Postgraduate	0	0%
Occupation		
Employed	2	0%
Self employed	28	6.6%
Unemployed	0	93.33%
Personal habits		
Alcoholism	0	0%
Smoking	0	0%
Chewing tobacco	0	0%
None	30	100%
Source of information		
Books	0	0%
Newspaper	2	6.66%
Personal communication	28	93.33%
Television	0	0%
Diet		
Vegetarian	15	50%
Nonvegetarian	15	50%

Percentage wise distribution of Muscle cramps patients who are undergoing to Hemodialysis experimental group In the relation To their age group Shows that the highest percentage was in the age group. 41 to 60 years. 80 percentage. 21 to 40 years. 20%. Then more than 60 years and more than 20 years are Zero percentage. Gender Wise Male are more compare than female Male are 73 .33 percentage Females are 26 .66 percentage. Education, more in primary education. 53.333 Then secondary, 33.33% is primary 6 .66 percentage And undergraduate are 13.33 percentage Occupations more are unemployed. 93.33% self Employed are 6.66% and employed are 0%. Personal habits include no one are alcoholic Smoker and chewing tobacco More are none 100%. source of information More from personal communication 93.33%. According to diet, both type patients are nonvegetarian 50% and vegetarian are 50%.

Section 2: Description of the effectiveness of intradialytic stretching exercise in reduction of muscle cramps between control and experimental group patient undergoing hemodialysis.

CONTROL GROUP- ANALYSIS

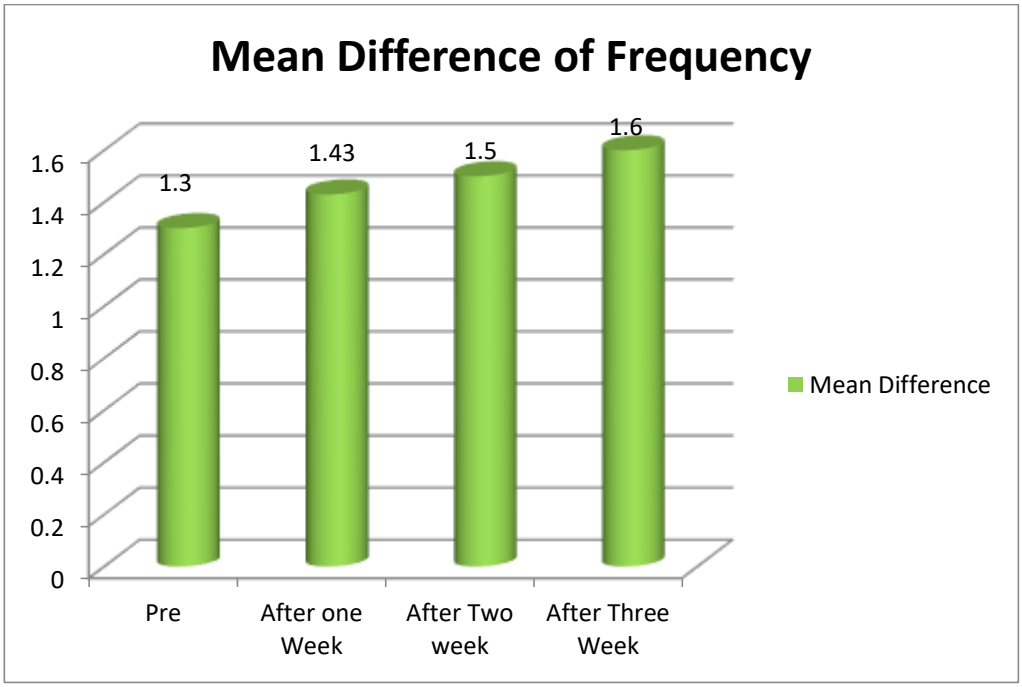
Table 3: Comparison between Frequency within control group

N=30

Group A	Mean ±SD	F-value	P- Value	Result
Pre	1.30 ± 0.466	1.942	0.127	Insignificant
After one Week	1.43 ± 0.504			
After Two week	1.50 ± 0.508			
After Three Week	1.60 ± 0.458			

Table-1 Comparison within Group A showing Mean ± SD of frequency ranges at Pre, after one week, two week and three week score measurement

To analyze the difference in the frequency within groups one way ANOVA test was used. The difference in frequency scores pre Mean & SD 1.30 ± 0.466, after one week Mean & SD 1.43 ± 0.504, two week Mean & SD 1.50 ± 0.508 and three week scores Mean & SD 1.60 ± 0.458.



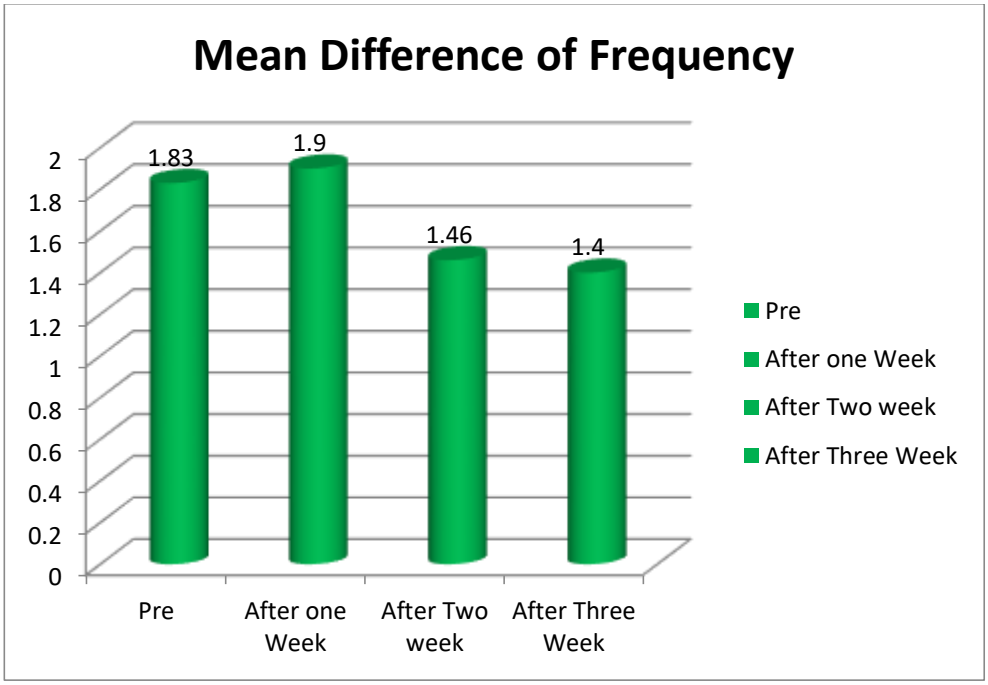
EXPERIMENTAL GROUP- ANALYSIS

Table 4: Comparison between Frequency within Group B **N=30**

Group A	Mean ±SD	F-value	P- Value	Result
Pre	1.83 ± 0.379	9.475	0.001	significant
After one Week	1.90 ± 0.402			
After Two week	1.46 ± 0.507			
After Three Week	1.40 ± 0.498			

Table-4: Comparison within Group B showing Mean ± SD of frequency ranges at Pre, after one week, two week and three week score measurement

To analyze the difference in the frequency within groups one way ANOVA test was used. The difference in frequency scores pre Mean & SD 1.83 ± 0.379, after one week Mean & SD 1.90 ± 0.402, two week Mean & SD 1.46 ± 0.507and three week scores Mean & SD 1.40 ± 0.498.



DISCUSSION

Objective 1: To assess the level of muscle cramps among the patient undergoing hemodialysis.

Percentage wise distribution of Muscle cramps patients who are undergoing to Hemodialysis control group In the relation To their age group Shows that the highest percentage was in the age group. 41 to 60 years. 76.66 percentage. 21 to 40 years. 23.33%. Then more than 60 years and more than 20 years are Zero percentage. Gender Wise Male are more compare than female Male are 73 .33 percentage Females are 26 .66 percentage. Education, more in secondary education. 63 .333 Then undergraduate, 30% is primary 6 .66 percentage And post graduate are zero percentage Occupations more are unemployed. 80% self Employed are 10% and employed are 10%. Personal habits include Less are alcoholic. Smoker and chewing tobacco. More are none 86.66. source of information More from personal communication 90. According to diet, more patients are nonvegetarian 70 percentage and vegetarian are less 30 percentage. Percentage wise distribution of Muscle cramps patients who are undergoing to Hemodialysis experimental group In the relation To their age group Shows that the highest percentage was in the age group. 41 to 60 years. 80 percentage. 21 to 40 years. 20%. Then more than 60 years and more than 20 years are Zero percentage. Gender Wise Male are

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Marc Evans et.al 2022 Chronic kidney disease (CKD) is a complex disease which affects approximately 13% of the world's population. Over time, CKD can cause renal dysfunction and progression to end-stage kidney disease and cardiovascular disease. Complications associated with CKD may contribute to the acceleration of disease progression and the risk of cardiovascular-related morbidities. Early CKD is asymptomatic, and symptoms only present at later stages when complications of the disease arise, such as a decline in kidney function and the presence of other comorbidities associated with the disease. In advanced stages of the disease, when kidney function is significantly impaired, patients can only be treated with dialysis or a transplant. With limited treatment options available, an increasing prevalence of both the elderly population and comorbidities associated with the disease, the prevalence of CKD is set to rise. This review discusses the current challenges and the unmet patient need in CKD.(5)

Objective 2: To determine the effectiveness of intradialytic stretching exercise on reducing the muscle cramps among patient undergoing hemodialysis.

The result of Group-A(Control group) is showing insignificant differences at p values on the other hand group B (experimental group) is showing significant p value .As comparing the mean difference of cramp questionnaire chart (frequency of cramps p value = 0.001, duration of cramps p value =0.001 , level of pain p value =0.001 , temperature of leg p value=0.169 , discomfort p value=0.001)scores between both the groups, the mean difference in Group- A which is lesser than Group- B in intervention this result showed that experimental group is more effective in compared to control group.

Dhudum et.al 2020 Muscle cramps are one among the common complications experienced by the hemodialysis patients. Sometimes the muscle cramps are so severe that the patients discontinue hemodialysis. Intradialytic stretching exercises are one of the non-pharmacological interventions used to treat muscle cramps. The objective of the study was to review the effectiveness and safety of Intradialytic stretching exercises on muscle cramps among hemodialysis patients.(6)

It was found that most of the studies used quasi experimental, pretest posttest control were selected for the main analysis. The present systematic review was conducted following group design and only three studies used true experimental designs. The sample size was between the range of 30 to 70 and there was not even a single study with sample size 100 and above. Majority of the studies used cramps assessment chart and pain assessments scales for data collection. All the studies concluded that intradialytic stretching exercises are effective interventions in reducing the muscle cramps among hemodialysis patients.

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