RESEARCH ARTICLE

A STUDY TO ASSESS THE EFFECTIVENESS OF STRETCHING EXERCISES ON LEVEL OF MUSCLE CRAMPS DURING HEMODIALYSIS AMONG CKD PATIENTS IN SELECTED HOSPITAL AT DEHRADUN (UTTARAKHAND)

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Manuscript Info	Abstract

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Background:The kidney, a critical organ, is important for maintaining the body's homeostasis system. A healthy individual excretes 1500–2000 ml of urine per 24 hours. A progressive, permanent decrease of kidney function is known as chronic renal disease. disease staging based on a declining GFR. At the point when an individual's GFR is under 15 ml/min, CKD is taken into consideration. Dialysis is frequently the therapy of choice with CKD patients. The fast elimination of salt and water due to neuromuscular hypersensitivity causes muscle cramps. Exercises are one preventive measure that can be used to stop the loss of muscle protein and keep muscles functioning. If patients experience muscle cramps while undergoing hemodialyzer, nurses can show or advise them on the intradialytic stretching exercise and encourage them to use it. Nurses can provide patients stretching exercises to help them function better if they experience muscle cramps during intradialytichaemodialysis.
Materials and Methods: A quasi-experimental research approach was used for the investigation.
A total of 60 CKD patients undergoing hemodialysis were included in the study, by using non probability purposive sampling technique. The modified Novel muscle cramps scale is used to access the level of muscles cramps.
Results:shows that the mean age of 42.30 years in experiment and 42.27 years in control group. The majority of 50% patients were belonged to 41-50 years age group, 20% patients belonged to 20-30 years and 31-40 years in experiment group. The majority of 56.7% patients were belonged to 41-50 years age group, 23.3% patients belonged to 20-30 years and 16.7% patients belonged to 31-40 years in control group in this study. the majority of 56.7% patients were male and 43.3% patients were female in experiment group. The majority of 53.3% patients were male and 46.7% patients were female in control group in this study.
shows that the majority of 83.3% patients were non-formal educated and 16.7% patients were literate in experiment group. The majority of 93.3% patients were non-formal educated and 6.7% patients were literate in control group in this study. shows that the majority of 96.7% patients had sedentary lifestyle and 3.3% patients had non-sedentary

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lifestyle in experiment group. The majority of 100% patients had sedentary lifestyle in control group in this study. shows that the majority of 50% patients were belonged to rural area and urban area equally in experiment group. The majority of 66.7% patients were belonged to rural area and 33.3% patients were belonged to urban in control group in this study. shows that the majority of 86.7% patients had none habit, 10% patients had alcohol drinking habit, and 3.3% patients had smoking habit in experiment group. The majority of 86.6% patients had none habit and 6.7% patients had alcohol drinking habit and smoking habit equally in control group in this study. shows that the majority of 63.3% patients had any medical problem and 36.6 % patients had no any medical problem in experiment group. The majority of 56.7% patients had any medical problem and 43.3 % patients had no any medical problem in control group in this study. shows that the mean weight of patients was 53.27 kg in experimental group and 51.27 kg in control group. The average duration of dialysis treatment was 14.33 days in experiment group and 11.73 days in control group. The majority of 83.3% patients took 1 glass per day water and 16.7% took 2 glasses per day water in experiment group. The majority of 90% patients took 1 glass per day water and 10% took 2 glasses per day water in control group in this study. The majority of 93.3% patients did non-daily activity in experiment and control group and 3.3% patients did cooking and brooming activity in experiment and control group in this study. The majority of 83.3% patients were 2-week sittings, 10% were 3 weeks sitting and 6.7% were 1-week sittings in experiment group. The majority of 90% patients were 2-week sittings and 10% was 1 week sitting in control group in this study. The majority of 70% patients were later stage of cramps and 30% were middle stage of cramps 2-week sittings in experiment group and control group in this study. shows that comparison between pre and post-test mean score of level of muscle cramps experienced in experiment group. There was statistical significance comparison between pre and post-test in frequency with P=0.001; duration with P=0.001; NPS with P=0.001; and interference with P=0.001in CKD patients undergoing hemodialysis after practicing stretching exercise in experience group. pre-test had higher mean score than post-test in this study. shows that comparison between pre and post-test mean score of level of muscle cramps experienced in control group. There was no statistical significance comparison between pre and post-test in frequency with P=0.070; duration with P=0.134; NPS with P=0.103; and interference with P=0.264 in CKD patients undergoing haemodialysis after practicing stretching exercise in control group. there was no such different in pre and post-test of control group. shows that comparison between pre and post-test mean score of level of muscle cramps experienced in control group. There was no statistical significance comparison between pre and post-test in frequency with P=0.070; duration with P=0.134; NPS with P=0.103; and interference with P=0.264 in CKD patients undergoing haemodialysis after practicing stretching exercise in control group. there was no such different in pre and post-test of control group.

Conclusion: This indicates that the examination was effective to the study's findings demonstrated that lower leg stretching exercises performed during dialysis dramatically decreased muscle cramping in patients undergoing haemodialysis. There was no statistically significant link between the muscle cramps and the selected

demographic characteristics in either the experimental or control groups.

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Introduction:-
The kidney, a critical organ, is important for maintaining the body's homeostasis system. A healthy kidney is a sophisticated reprocessing device that drains fluids from the blood to purify it. Your two kidneys filter your blood, taking out surplus water and wastes so that urine can be produced. Blood sodium, calcium, phosphorus, and potassium levels should be in balance. Your kidneys keep you healthy by removing the acid that your body's cells make. Your body's neurons, muscles, and other tissues might not function properly if this equilibrium is lost. The kidneys receive blood several times daily. The kidneys filter 150–200 ml of blood every day. GFR should be between 90 and 120 ml/min in a healthy individual. A healthy individual excretes 1500–2000 ml of urine per 24 hours. A progressive, permanent decrease of kidney function is known as chronic renal disease. disease staging based on a declining GFR. At the point when an individual's GFR is under 15 ml/min, CKD is taken into consideration. The etiology, age, and medical services all affect the prognosis of renal disorders. Numerous fatalities have been avoided since 1973 thanks to dialysis and kidney transplantation.

Through the process of dialysis, substances are removed from the blood and transferred to a solution (dialysate). Dialysis is typically necessary at the point when an individual's GFR is under 15 ml/min. Moving fluid and molecules from one compartment to another via a semipermeable membrane is the process of dialysis. It is frequently the therapy of choice with CKD patients. The fast elimination of salt and water due to neuromuscular hypersensitivity causes muscle cramps. Exercises are one preventive measure that can be used to stop the loss of muscle protein and keep muscles functioning.

Objectives of the study were:-
1. To assess the pre-test level of muscle cramps during hemodialysis among CKD patients in selected hospital at Dehradun, Uttarakhand.
2. To find out the effectiveness of stretching exercise on level of muscle cramps among CKD patients by comparing pre and post intervention of stretching exercises in control and experimental groups undergoing hemodialysis among CKD patients in selected hospital at Dehradun, Uttarakhand.
3. To associate the pretest level of muscles cramps among CKD patients in control and experimental groups with their selected sociodemographic variables in selected hospital at Dehradun, Uttarakhand.

Method:-
A quasi-experimental research approach was used for the investigation. The investigator used non-probability purposive sampling technique for selecting 60 samples. An The Novel muscle cramps scale was used to assess the level of muscle during hemodialysis of the samples. The reliability of the tool was determined by 'test-retest method' and using 'Karl Pearson's correlation co-efficient formula'. Descriptive and inferential statistics was used to analyze the data. The investigator reviewed related literature to describe the tool to assess the level of muscle during hemodialysis of the samples. Tool divided in to three sections. Section I: Demographic data Demographic variables of the samples consist of items such as Age, Gender, Educational status, Lifestyle, Residency, Habits, other medical problems. Section II: The section has clinical variables. It consists of data such as-Weight of patient, Water intake per day, Daily activity, Duration of dialysis treatment, how many sittings do you have in a week, In which phase of treatment, you feel muscle cramps. Section III: The section has The Novel muscle cramps scale is used to access the muscle cramps. The muscle cramps questionnaire chart was designed to assess the level of muscle during hemodialysis, before and after intervention. It contains various features of muscles cramps such as frequency of muscle cramps, duration of muscle cramps, level of pain which has comprehensive scored as level of muscle cramps ranging from (0- 12).

Table 1:- Demographic variables.
Table 1.1:- Descriptive statistics of demographic variables (Age) of muscle cramps experienced in experiment and control group N=60.

S. no.	Demographic Variable	Categories	Experiment (n=30) (%)	Control (n=30) (%)
1	Age	Mean ± SD	42.30 ± 11.34	42.27 ± 11.25

		20-30 years	6 (20%)	7 (23.3%)
		31-40 years	6 (20%)	5 (16.7%)
		41-50 years	15 (50%)	17 (56.7%)
		More than 50 years	3 (10%)	1 (3.3%)

Table 1.1 shows that the mean age of 42.30 years in experiment and 42.27 years in control group. The majority of 50% patients were belonged to 41-50 years age group, 20% patients belonged to 20-30 years and 31-40 years in experiment group. The majority of 56.7% patients were belonged to 41-50 years age group, 23.3% patients belonged to 20-30 years and 16.7% patients belonged to 31-40 years in control group in this study.

Table 1.2:- Descriptive statistics of demographic variables (gender) of muscle cramps experienced in experiment and control group N=60.

S. no.	Demographic Variable	Categories	Experiment (n=30) (%)	Control (n=30) (%)
2	Gender	Female	13 (43.3%)	14 (46.7%)
		Male	17 (56.7%)	16 (53.3%)

Table 1.2 shows that the majority of 56.7% patients were male and 43.3% patients were female in experiment group. The majority of 53.3% patients were male and 46.7% patients were female in control group in this study.

Table 1.3:- Descriptive statistics of demographic variables (education level) of muscle cramps experienced in experiment and control group N=60.

S. no.	Demographic Variable	Categories	Experiment (n=30) (%)	Control (n=30) (%)
3	Education level	Literate	5 (16.7%)	2 (6.7%)
		Non-formal	25 (83.3%)	28 (93.3%)

Table 1.3 shows that the majority of 83.3% patients were non-formal educated and 16.7% patients were literate in experiment group. The majority of 93.3% patients were non-formal educated and 6.7% patients were literate in control group in this study.

Table 1.4:- Descriptive statistics of demographic variables (lifestyle) of muscle cramps experienced in experiment and control group N=60.

S. no.	Demographic Variable	Categories	Experiment (n=30) (%)	Control (n=30) (%)
4	Lifestyle	Non-sedentary	1 (3.3%)	0 (0%)
		Sedentary	29 (96.7%)	30 (100%)

Table 1.4 shows that the majority of 96.7% patients had sedentary lifestyle and 3.3% patients had non-sedentary lifestyle in experiment group. The majority of 100% patients had sedentary lifestyle in control group in this study.

Table 1.5:- Descriptive statistics of demographic variables (residency) of muscle cramps experienced in experiment and control group N=60.

S. no.	Demographic Variable	Categories	Experiment (n=30) (%)	Control (n=30) (%)
5	Residency	Rural	15 (50%)	20 (66.7%)
		Urban	15 (50%)	10 (33.3%)

Table 1.5 shows that the majority of 50% patients were belonged to rural area and urban area equally in experiment group. The majority of 66.7% patients were belonged to rural area and 33.3% patients were belonged to urban in control group in this study.

Table 1.6:- Descriptive statistics of demographic variables (habit) of muscle cramps experienced in experiment and control group N=60.

S. no.	Demographic Variable	Categories	Experiment (n=30) (%)	Control (n=30) (%)
6	Habit	Alcohol	3 (10%)	2 (6.7%)
		Smoking	1 (3.3%)	2 (6.7%)
		None	26 (86.7%)	26 (86.6%)

Table 1.6 shows that the majority of 86.7% patients had none habit, 10% patients had alcohol drinking habit, and 3.3% patients had smoking habit in experiment group. The majority of 86.6% patients had none habit and 6.7% patients had alcohol drinking habit and smoking habit equally in control group in this study.

Table 1.7:- Descriptive statistics of demographic variables (any medical problem) of muscle cramps experienced in experiment and control group N=60.

S. no.	Demographic Variable	Categories	Experiment (n=30) (%)	Control (n=30) (%)
7	Any medical problem	Yes	19 (63.3%)	17 (56.7%)
		No	11 (36.7%)	13 (43.3%)

Table 1.7 shows that the majority of 63.3% patients had any medical problem and 36.6 % patients had no any medical problem in experiment group. The majority of 56.7% patients had any medical problem and 43.3 % patients had no any medical problem in control group in this study.

Table 2:- Clinical Variables.
Table 2:- Descriptive statistics of clinical variables of muscle cramps experienced in experiment and control group N=60.

S. no.	Clinical Variable	Categories	Experiment (n=30) (%)	Control (n=30) (%)
1	Weight of patients	Mean ± SD	53.27 ± 5.62	51.27 ± 4.33
2	Duration of dialysis treatment	Mean ± SD	14.33 ± 10.45	11.73 ± 9.169
3	Water intake per day	1 glass	25 (83.3%)	27 (90%)
		2 glasses	5 (16.7%)	3 (10%)
4	Daily activity	Brooming & Cooking	1 (3.3%)	1 (3.3%)
		Cooking	1 (3.3%)	1 (3.3%)
		None	28 (93.3%)	28 (93.3%)
5	Sittings	1 week	2 (6.7%)	3 (10%)
		2 weeks	25 (83.3%)	27 (90%)
		3 weeks	3 (10%)	0 (0%)
6	Stage of cramps	Later	21 (70%)	21 (70%)
		Middle	9 (30%)	9 (30%)

Table 2 shows that the mean weight of patients was 53.27 kg in experimental group and 51.27 kg in control group. The average duration of dialysis treatment was 14.33 days in experiment group and 11.73 days in control group.

The majority of 83.3% patients took 1 glass per day water and 16.7% took 2 glasses per day water in experiment group. The majority of 90% patients took 1 glass per day water and 10% took 2 glasses per day water in control group in this study.

The majority of 93.3% patients did non-daily activity in experiment and control group and 3.3% patients did cooking and brooming activity in experiment and control group in this study.

The majority of 83.3% patients were 4-week sittings, 10% were 3 weeks sitting and 6.7% were 1-week sittings in experiment group. The majority of 90% patients were 2-week sittings and 10% was 1 week sitting in control group in this study.

The majority of 70% patients were later stage of cramps and 30% were middle stage of cramps 2-week sittings in experiment group and control group in this study.

Table 3:- Frequency and Percentage of Pre-test of muscle cramps experienced variables in experiment and control group N=60.

S. no.	Pre-Test	Categories	Experiment (n=30) (%)	Control (n=30) (%)

1	Frequency	Mild	1 (3.3%)	4 (13.3%)
		Moderate	24 (80%)	25 (83.3%)
		Sever	5 (16.7%)	1 (3.3%)
2	Duration	Mild	2 (6.7%)	5 (16.7%)
		Moderate	22 (73.3%)	24 (80%)
		Sever	6 (20%)	1 (3.3%)
3	NPS	Mild	3 (10%)	4 (13.3%)
		Moderate	25 (83.3%)	25 (83.3%)
		Sever	2 (6.7%)	1 (3.3%)
4	Interference	Mild	3 (10%)	3 (10%)
		Moderate	26 (86.7%)	27 (90%)
		Sever	1 (3.3%)	0 (0%)

Table 3 shows that 3.3% patients had mild pre frequency muscle cramps experienced in experimental group, 80% patients had moderate pre frequency muscle cramps experienced in experimental group, 16.7 patients had severe pre frequency muscle cramps experienced in experimental group. 13.3% patients had mild patients pre frequency muscle cramps experienced in control group,83.3% patients had moderate pre frequency muscle cramps experienced in control group, 3.3% patients had severe patients pre frequency muscle cramps experienced in control group. The 6.7% patients had mild pre duration muscle cramps experienced in experimental group, 73.3% patients had moderate pre duration muscle cramps experienced in experimental group, 20 % patients had severe pre duration muscle cramps experienced in experimental group and 16.7% patients had mild pre duration muscle cramps experienced in control group, 80% patients had moderate pre duration muscle cramps experienced in control group and 3.3 % patients had severe pre duration muscle cramps experienced in control group. The majority of 10% patients had mild pre NPS muscle cramps experienced in experimental group, 83.3% patients had moderate pre NPS muscle cramps experienced in experimental group, 6.7 % patients had severe pre NPS muscle cramps experienced in experimental group.13.3% patients had mild pre NPS muscle cramps experienced in control group,83.3% patients had moderate pre NPS muscle cramps experienced in control group and 3.3% patients had moderate pre NPS muscle cramps experienced in control group.10% patients had mild pre interference muscle cramps experienced in experimental group, 86.7% patients had moderate pre interference muscle cramps experienced in experimental group and 3.3 % patients had severe pre interference muscle cramps experienced in experimental group. 10% patients had mild pre interference muscle cramps experienced in control group, 90% patients had moderate pre interference muscle cramps experienced in control group and 0% patients had severe pre interference muscle cramps experienced in control group.

Table 4:- Frequency and Percentage of Post-test of muscle cramps experienced variables in experiment and control group N=60.

S. no.	Post Test	Categories	Experiment (n=30) (%)	Control (n=30) (%)
1	Frequency	Mild	24 (80%)	4 (13.3%)
		Moderate	6 (20%)	25 (83.3%)
		Severe	0 (0%)	1 (3.3%)
2	Duration	Mild	21 (70%)	5 (16.7%)
		Moderate	9 (30%)	24 (80%)
		Severe	0 (0%)	1 (3.3%)
3	NPS	Mild	19 (63.3%)	4 (13.3%)
		Moderate	11 (36.7%)	25 (83.3%)
		Severe	0 (0%)	1 (3.3%)
4	Interference	Mild	15 (50%)	3 (10%)

		Moderate	3 (10%)	0 (0%)
		Severe	12 (40%)	27 (90%)

Table 4 shows that the majority of 80% patients had mild pre frequency muscle cramps experienced in experimental group, 20% patients had moderate pre frequency muscle cramps experienced in experimental group,0 patients had severe pre frequency muscle cramps experienced in experimental experienced group. 13.3% patients had mild patients pre frequency muscle cramps experienced in control group, 83.3% patients had moderate pre frequency muscle cramps experienced in control group, 3.3% patients had severe patients pre frequency muscle cramps experienced in control group.70% patients had mild pre duration muscle cramps experienced in experimental group, 30% patients had moderate pre duration muscle cramps experienced in experimental group, 0 % patients had severe pre duration muscle cramps experienced in experimental group and 16.7% patients had mild pre duration muscle cramps experienced in control group, 80% patients had moderate pre duration muscle cramps experienced in control group and 3.3 % patients had severe pre duration muscle cramps experienced in control group.63.3% patients had mild pre NPS muscle cramps experienced in experimental group, 36.7% patients had moderate pre NPS muscle cramps experienced in experimental group, 0% patients had severe pre NPS muscle cramps experienced in experimental group.13.3% patients had mild pre NPS muscle cramps experienced in control group,83.3% patients had moderate pre NPS muscle cramps experienced in control group and 3.3% patients had moderate pre NPS muscle cramps experienced in control group. The majority of 50% patients had mild pre interference muscle cramps experienced in experimental group, 10% patients had moderate pre interference muscle cramps experienced in experimental group and 40 % patients had severe pre interference muscle cramps experienced in experimental group.10% patients had mild pre interference muscle cramps experienced in control group, 0% patients had moderate pre interference muscle cramps experienced in control group and 90% patients had severe pre interference muscle cramps experienced in control group.

Table 1:- Comparison Between Pre And Post-Test Experienced In Experiment Group-
Table 1:- Comparison between pre and post-test mean score of level of muscle cramps experienced in experiment group in CKD patients undergoing hemodialysis after practicing stretching exercise N=30.

S. no.	Experiment group	Pre-test (mean ± SD)	Post-test (mean ± SD)	Paired t test	DF	P-value	Result
1	Frequency	6.57 ± 1.67	3.13 ± 1.33	25.834	29	0.001	Significant
2	Duration	7.03 ± 1.67	4.07 ± 1.20	11.207	29	0.001	Significant
3	NPS	6.40 ± 1.49	4.13 ± 1.22	15.00	29	0.001	Significant
4	Interference	6.47 ± 1.38	4.23 ± 1.07	12.592	29	0.001	Significant

Table 1. shows that comparison between pre and post-test mean score of level of muscle cramps experienced in experiment group. There was statistical significance comparison between pre and post-test in frequency with P=0.001; duration with P=0.001; NPS with P=0.001; and interference with P=0.001in CKD patients undergoinghemodialysis after practicing stretching exercise in experience group. pre-test had higher mean score than post-test in this study.

Table 2:- Comparison Between Pre And Post-Test Experienced Incontrol Group-
Table 2:- Comparison between pre and posttest mean score of level of muscle cramps experienced in Control group in CKD patients undergoing hemodialysis after practicing stretching exercise N=30.

S. no.	Control group	Pre-test (mean ± SD)	Post-test (mean ± SD)	Paired t test	DF	P-value	Result
1	Frequency	6.30 ± 1.44	6.07 ± 1.31	1.882	29	0.070	Insignificant
2	Duration	6.30 ± 1.58	6.13 ± 1.36	1.542	29	0.134	Insignificant
3	NPS	5.93 ± 1.46	5.80 ± 1.37	1.682	29	0.103	Insignificant
4	Interference	6.00 ± 1.08	5.90 ± 1.03	1.140	29	0.264	Insignificant

Table 2. shows that comparison between pre and post-test mean score of level of muscle cramps experienced in control group. There was no statistical significance comparison between pre and post-test in frequency with P=0.070; duration with P=0.134; NPS with P=0.103; and interference with P=0.264 in CKD patients undergoing hemodialysis after practicing stretching exercise in control group. there was no such different in pre and post test of control group.

Table 1:- Association Between Level Of Muscle Cramps (Frequency) In Experimental Group And Selected Socio-Demographic Variables N=60.

Demographical Variable	Categories	Frequency			Chi-square test	DF	P-value	Result
		Mild (n=1)	Moderate (n=24)	Sever (n=5)				
Age	20-30 years	0	6	0	4.20	6	0.651	Insignificant
	(%)	0.0%	25.0%	0.0%				
	31-40 years	0	5	1				
	(%)	0.0%	20.8%	20.0%				
	41-50 years	1	10	4				
	(%)	100.0%	41.7%	80.0%				
	more than 50 years	0	3	0				
	(%)	0.0%	7.50%	0.0%				
Gender	Female	1	9	3	2.206	2	0.332	Insignificant
	(%)	100.0%	37.5%	60.0%				
	Male	0	15	2				
	(%)	0.0%	62.5%	40.0%				
education level	literate	0	5	0	1.50	2	0.472	Insignificant
	(%)	0.0%	20.8%	0.0%				
	Non-formal	1	19	5				
	(%)	100.0%	79.2%	100.0%				
Lifestyle	Non-sedentary	0	1	0	0.259	2	0.879	Insignificant
	(%)	0.0%	4.2%	0.0%				
	sedentary	1	23	5				
	(%)	100.0%	95.8%	100.0%				
Residency	Rural	0	10	5	6.667	2	0.036	Significant
	(%)	0.0%	41.7%	100.0%				
	Urban	1	14	0				
	(%)	100.0%	58.3%	0.0%				
Habits	alcohol	0	3	0	1.154	4	0.886	Insignificant
	(%)	0.0%	12.5%	0.0%				
	None	1	20	5				
	(%)	100.0%	83.3%	100.0%				
	smoking	0	1	0				
	(%)	0.0%	4.2%	0.0%				
did you have any medical problem	No	1	9	1	2.333	2	0.312	Insignificant
	(%)	100.0%	37.5%	20.0%				
	Yes	0	15	4				
	(%)	0.0%	62.5%	80.0%				

Table1. shows that association between selected socio-demographic variables and level of muscle cramps (frequency) in experimental group.

There was no statistical significant association between level of muscle cramps (frequency) and age. The obtained $\chi 2$ value 4.20 and the table value at df (6) 12.592 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (frequency) and gender. The obtained $\chi 2$ value 2.206 and the table value at df (2) 5.99 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (frequency) and education status. The obtained χ2 value 1.50 and the table value at df (2) 5.99 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (frequency) and lifestyle. The obtained χ2 value 0.259 and the table value at df (2) 5.99 was no significant at p>0.05 level.

There was statistical significant association between level of muscle cramps (frequency) and residency. The obtained χ2 value 6.667 and the table value at df (2) 5.99 was significant at p<0.05 level.

There was no statistical significant association between level of muscle cramps (frequency) and habits. The obtained χ2 value 1.154 and the table value at df (4) 9.488 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (frequency) and any medical problem. The obtained χ2 value 2.333 and the table value at df (2) 5.99 was no significant at p>0.05 level.

Table 2:- Association Between Level Of Muscle Cramps (Duration) In Experimental Group And Selected Socio-Demographic Variables N=60.

Demographical Variable	Categories	Duration			Chi-square test	DF	P-value	Result
		Mild (n=2)	Moderate (n=22)	Sever (n=6)				
Age	20-30 years	0	4	2				
	(%)	0.0%	18.2%	33.3%	3.03	6	0.805	Insignificant
	31-40 years	1	4	1				
	(%)	50.0%	18.2%	16.7%				
	41-50 years	1	11	3				
	(%)	50.0%	50.0%	50.0%				
	more than 50 years	0	3	0				
	(%)	0.0%	13.6%	0.0%				
Gender	Female	1	9	3				
	(%)	50.0%	40.9%	50.0%	0.197	2	0.906	Insignificant
	Male	1	13	3				
	(%)	50.0%	59.1%	50.0%				
education level	literate	0	3	2				
	(%)	0.0%	13.6%	33.3%				
	Non-formal	2	19	4	1.745	2	0.418	Insignificant
	(%)	100.0%	86.4%	66.7%				
Lifestyle	Non-sedentary	0	0	1				
	(%)	0.0%	0.0%	16.7%	4.138	2	0.126	Insignificant
	sedentary	2	22	5				
	(%)	100.0%	100.0%	83.3%				
Residency	Rural	1	11	3				
	(%)	50.0%	50.0%	50.0%				
	Urban	1	11	3	0.00	2	0.999	Insignificant
	(%)	50.0%	50.0%	50.0%				
Habits	alcohol	0	2	1				
	(%)	0.0%	9.1%	16.7%				
	None	2	19	5	0.897	4	0.925	Insignificant
	(%)	100.0%	86.4%	83.3%				
	smoking	0	1	0				
	(%)	0.0%	4.5%	0.0%				
did you have	No	1	8	2				

any medical problem	(%)	50.0%	36.4%	33.3%	0.183	2	0.913	Insignificant
	Yes	1	14	4				
	(%)	50.0%	63.6%	66.7%				

Table2. shows that association between selected socio-demographic variables and level of muscle cramps (duration) in experimental group.

There was no statistical significant association between level of muscle cramps (duration) and age. The obtaind χ2 value 3.03 and the table value at df (6) 12.592 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (duration) and gender. The obtaind χ2 value 0.197 and the table value at df (2) 5.99 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (duration) and education status. The obtained χ2 value 1.745 and the table value at df (2) 5.99 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (duration) and lifestyle. The obtained χ2 value 4.138 and the table value at df (2) 5.99 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (duration) and residency. The obtained χ2 value 0.00 and the table value at df (2) 5.99 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (duration) and habits. The obtained χ2 value 0.897 and the table value at df (4) 9.488 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (duration) and any medical problem. The obtained χ2 value 0.183 and the table value at df (2) 5.99 was no significant at p>0.05 level.

Table 3:- Association Between Level Of Muscle Cramps (Nps) In Experimental Group And Selected Socio-Demographic Variables N=60.

Demographical Variable	Categories	NPS			Chi-square test	DF	P-value	Result
		Mild (n=2)	Moderate (n=22)	Sever (n=6)				
Age	20-30 years	1	4	1	7.353	6	0.289	Insignificant
	(%)	33.3%	16.0%	50.0%				
	31-40 years	0	6	0				
	(%)	0.0%	24.0%	0.0%				
	41-50 years	2	13	0				
	(%)	66.7%	52.0%	0.0%				
	more than 50 years	0	2	1				
	(%)	0.0%	8.0%	50.0%				
Gender	Female	2	11	0	2.199	2	0.333	Insignificant
	(%)	66.7%	44.0%	0.0%				
	Male	1	14	2				
	(%)	33.3%	56.0%	100.0%				
education level	literate	1	2	2	11.952	2	0.003	Significant
	(%)	33.3%	8.0%	100.0%				
	Non-formal	2	23	0				
	(%)	66.7%	92.0%	0.0%				
Lifestyle	Non-sedentary	1	0	0	9.31	2	0.001	Significant
	(%)	33.3%	0.0%	0.0%				
	sedentary	2	25	2				
	(%)	66.7%	100.0%	100.0%				
Residency	Rural	2	13	0	2.373	2	0.305	Insignificant

	(%)	66.7%	52.0%	0.0%				
	Urban	1	12	2				
	(%)	33.3%	48.0%	100.0%				
Habits	alcohol	0	3	0	0.923	4	0.921	Insignificant
	(%)	0.0%	12.0%	0.0%				
	None	3	21	2				
	(%)	100.0%	84.0%	100.0%				
	smoking	0	1	0				
	(%)	0.0%	4.0%	0.0%				
did you have any medical problem	No	1	8	2	3.703	2	0.157	Insignificant
	(%)	33.3%	32.0%	100.0%				
	Yes	2	17	0				
	(%)	66.7%	68.0%	0.0%				

Table 3. shows that association between selected socio-demographic variables and level of muscle cramps (NPS) in experimental group.

There was no statistical significant association between level of muscle cramps (NPS) and age. The obtained $\chi2$ value 7.353 and the table value at df (6) 12.592 was no significant at $p>0.05$ level.

There was no statistical significant association between level of muscle cramps (NPS) and gender. The obtained $\chi2$ value 2.199 and the table value at df (2) 5.99 was no significant at $p>0.05$ level.

There was statistical significant association between level of muscle cramps (NPS) and education status. The obtained $\chi2$ value 11.952 and the table value at df (2) 5.99 was significant at $p=0.003$ level.

There as statistical significant association between level of muscle cramps (NPS) and lifestyle. The obtained $\chi2$ value 9.31 and the table value at df (2) 5.99 was significant at $p=0.001$ level.

There was no statistical significant association between level of muscle cramps (NPS) and residency. The obtained $\chi2$ value 2.373 and the table value at df (2) 5 was no significant at $p>0.05$ level.

There was no statistical significant association between level of muscle cramps (NPS) and habits. The obtained $\chi2$ value 0.923 and the table value at df (4) 9.488 was no significant at $p>0.05$ level.

There was no statistical significant association between level of muscle cramps (NPS) and any medical problem. The obtained $\chi2$ value 3.703 and the table value at df (2) 5.99 was no significant at $p>0.05$ level.

Table 4:- Association Between Level Of Muscle Cramps (Interference) In Experimental Group And Selected Socio-Demographic Variables N=60.

Demographical Variable	Categories	Interference			Chi-square test	DF	P-value	Result
		Mild (n=3)	Moderate (n=26)	Sever (n=1)				
Age	20-30 years	2	4	0	5.795	6	0.447	Insignificant
	(%)	66.7%	15.4%	0.0%				
	31-40 years	0	6	0				
	(%)	0.0%	23.1%	0.0%				
	41-50 years	1	13	1				
	(%)	33.3%	50.0%	100.0%				
	more than 50 years	0	3	0				
	(%)	0.0%	11.5%	0.0%				
Gender	Female	1	12	0	0.971	2	0.615	Insignificant
	(%)	33.3%	46.2%	0.0%				
	Male	2	14	1				
	(%)	66.7%	53.8%	100.0%				

education level	literate	1	4	0	0.831	2	0.66	Insignificant
	(%)	33.3%	15.4%	0.0%				
	Non-formal	2	22	1				
	(%)	66.7%	84.6%	100.0%				
Lifestyle	Non-sedentary	0	1	0	0.159	0.02	0.924	Insignificant
	(%)	0.0%	3.8%	0.0%				
	Sedentary	3	25	1				
	(%)	100.0%	96.2%	100.0%				
Residency	Rural	2	13	0	1.333	2	0.513	Insignificant
	(%)	66.7%	50.0%	0.0%				
	Urban	1	13	1				
	(%)	33.3%	50.0%	100.0%				
Habits	alcohol	0	3	0	30.399	4	0.001	Significant
	(%)	0.0%	11.5%	0.0%				
	None	3	23	0				
	(%)	100.0%	88.5%	0.0%				
	smoking	0	0	1				
	(%)	0.0%	0.0%	100.0%				
did you have any medical problem	No	1	10	0	0.629	2	0.73	Insignificant
	(%)	33.3%	38.5%	0.0%				
	Yes	2	16	1				
	(%)	66.7%	61.5%	100.0%				

Table 4. shows that association between selected socio-demographic variables and level of muscle cramps (Interference) in experimental group.

There was no statistical significant association between level of muscle cramps (Interference) and age. The obtained $\chi2$ value 5.795 and the table value at df (6) 12.592 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (Interference) and gender. The obtained $\chi2$ value 0.971 and the table value at df (2) 5.99 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (Interference) and education status. The obtained $\chi2$ value 0.831 and the table value at df (2) 5.99 was no significant at p>0.05 level.

There was no statistical significant association between level of muscle cramps (Interference) and lifestyle. The obtained $\chi2$ value 0.159 and the table value at df (2) 5.99 was no significant at p>0.05 level.

There was no statistically significant association between level of muscle cramps (Interference) and residency. The obtained $\chi2$ value 1.333 and the table value at df (2) 5.99 was no significant at p>0.05 level.

There was statistical significant association between level of muscle cramps (Interference) and habits. The obtained $\chi2$ value 30.399 and the table value at df (4) 9.488 was significant at p=0.001 level.

There was no statistical significant association between level of muscle cramps (Interference) and any medical problem. The obtained $\chi2$ value 0.629 and the table value at df (2) 5.99 was no significant at p>0.05 level.

Discussion:-
The present study was conducted to evaluate the effectiveness of lower leg stretching exercises on level of muscles cramps among patients undergoing hemodialysisin selected at Dehradun Uttarakhand. The investigator collected the samples by non-Probability purposive Sampling Technique. The investigator collected the data by using The modified Novel muscle cramps scale to evaluate the level of muscles cramps among patients undergoing hemodialysisin selected hospital at Dehradun Uttarakhand. The investigator used quasi experimentaldesign. The tool consists of demographic variables, clinical variables, and Novel muscle cramps scale to evaluate the level of muscle cramps.The main study was conducted in the month of July, on 60 CKD patients undergoing hemodialysis and who

met the inclusion criteria, who were selected by non-Probabilitypurposive sampling technique. After the selection of samples, pretest was done and after that intervention, lower legs stretching exercises given and level of muscle cramps was reassessed by using the modified Novel muscle cramps scale.After taking a pretest of the samples. The descriptive statistics (frequency, percentage, mean, standard deviation) and inferential statistics(t-test) were used to analyze the data, and to test the study hypotheses The data identified from the present study shows that comparison between pre and post-test mean score of level of muscle cramps experienced in experiment group there was statistical significance comparison between pre and post-test in frequency with P=0.001; duration with P=0.001; NPS with P=0.001; and interference with P=0.001in CKD patients undergoing hemodialysis after practicing stretching exercise in experience group. pre-test had higher mean score than post-test in this study. shows that comparison between pre and post-test mean score of level of muscle cramps experienced in control group. There was no statistical significance comparison between pre and post-test in frequency with P=0.070; duration with P=0.134; NPS with P=0.103; and interference with P=0.264 in CKD patients undergoing hemodialysis after practicing stretching exercise in control group. there was no such different in pre and posttest of control group.

Conclusion:-
This indicates that the was effective to stretching exercises of lower leg muscles during hemodialysis could lessen the score of muscular cramps in those who are receiving the treatment.

Conflict Of Interest
The authors declare that they have no competing interests. Ethics declarations Ethics approval and consent to participate. State College of Nursing, institute's Ethics Committee reviewed this study and granted ethical approval. consents have been obtained from participants.

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