

# Effectiveness of Intradialytic Stretching Exercises on Reduction of Muscle Cramps Among Patients Undergoing Hemodialysis at A Selected Hospital, Navi Mumbai.

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## ABSTRACT

Literature proves that various sets of intradialytic stretching exercises are a useful strategy for preventing and treating muscle cramps during hemodialysis. Hence, the researcher decided to evaluate the effectiveness of a set of intradialytic stretching exercises on the reduction of muscle cramps among patients undergoing hemodialysis at a selected hospital, Navi Mumbai. The research design used for the study was a quasi-experimental one-group pretest and post-test group design. A non-probability purposive sampling technique is used to select 50 samples according to the inclusion criteria. The same samples are used in both experimental and control groups at two different times. Intradialytic stretching exercises were performed when the respondents suffered from muscle cramps during hemodialysis. The muscle cramp was assessed with the help of a Numerical Pain Scale, a Modified Ashworth Scale, and a Penn Muscle Cramp Frequency Score. The study results reveal that the mean difference between the experimental and control groups is as follows: the numerical pain score is 1.14, the modified Ashworth score is 3.98, and the Penn muscle frequency score is 0.66. Wilcoxon's signed-rank test scores for each scale are 6.459, 6.249, and 5.291, respectively, which is significant at 5% with a p-value of 0.000. Hence, intradialytic stretching exercises are effective in the reduction of muscle cramps during hemodialysis compared to the control group of respondents.

**Keywords:** Chronic Kidney Disease, Hemodialysis, Muscle cramps, intradialytic stretching exercises.

## INTRODUCTION

Chronic kidney disease is a progressive, devastating disease that needs nursing and medical intervention. The progression of the disease has an impact on quality of life, physical and mental well-being, functional status, independence, personal relationships, and social functioning. The prevalence of CKD reveals that out of 1.2 billion Indians, about 80 lakh develop CKD every year. <sup>(1,2)</sup>

Hemodialysis is an evidence-based modality of treatment for these patients. Hemodialysis is usually done three times a week. Each treatment lasts about four hours.

Common complications during hemodialysis are, in descending order of frequency, hypotension (20%-30%), muscle cramps (5%-20%), nausea and vomiting (5%-15%), headache (5%), chest pain (2%-5%), back pain (2%-5%), itching (5%),

and fever and chills (less than 1%). (Sherman et al., 2007).<sup>(4)</sup>

Muscle cramps are involuntary muscle contractions accompanying severe stretching pain, most commonly associated with hemodialysis. Around 33% to 86% of patients receiving hemodialysis have experienced muscle cramps, which begin with very painful muscle twitches, causing the patient to barely move. Usually, the muscle cramp can lead to the termination of the dialysis session before the planned time, making for a less effective treatment.<sup>(3)</sup>

For muscle cramps, there are pharmacological [l-carnitine (20mg/kg IV) after dialysis, oxazepam (5-10mg) 2 hours before dialysis, gabapentin 300mg given before each dialysis session, vitamin E 400 mg, and vitamin C 250 mg daily] and non-pharmacological [massage and stretching exercises, applying hot and cold to tight muscles, minimising weight gain, or minimising dialysis-related hypotension]<sup>(5,6)</sup>

Since muscle cramps are common intradialytic events, the discomfort may lead to premature termination of the treatment and non-compliance with the prescription. Taking care of hemodialysis patients is predominantly the nurse's responsibility. Several studies on small populations have shown that intradialytic stretching exercise has positive significance in alleviating muscle cramps during hemodialysis. Active contraction of the opposing muscles should accompany passive stretching. Hence, the researcher is interested in studying the effect of selective intradialytic exercises on muscle cramps during hemodialysis.

**STATEMENT:** A quasi-experimental study to evaluate the effectiveness of intradialytic stretching exercises on reduction of muscle cramps among patients undergoing hemodialysis at a selected hospital, Navi-Mumbai.

### OBJECTIVES

- To compare the effect of intradialytic stretching exercises on muscle cramps below the knee among patients undergoing hemodialysis in the experimental and the control group.

- To determine the association between muscle cramps below the knee among the patients undergoing hemodialysis in the experimental and control group with their selected demographic variables.

### HYPOTHESIS

- H<sub>0</sub>- There is no significant reduction of muscle cramps below the knee among patients undergoing intradialytic exercises during hemodialysis.
- H<sub>1</sub>- There will be a significant reduction of muscle cramps below the knee among patients undergoing intradialytic exercises during hemodialysis.

**RESEARCH DESIGN:** Quasi-experimental one-group pretest and post-test group design

### VARIABLES

- **Independent variable:** Intradialytic stretching exercises
- **Dependent variable:** Muscle cramps score among patients undergoing hemodialysis.

**SETTING OF THE STUDY:** The study was conducted in the dialysis unit of D. Y. Patil Hospital, Nerul, Navi Mumbai.

**STUDY POPULATION:** All the CKD patients who are attending hemodialysis in the Dialysis unit of D.Y. Patil Hospital Nerul, Navi Mumbai.

**SAMPLE:** Patients with muscle cramps below the knee in the Dialysis unit of D.Y. Patil Hospital Nerul, Navi Mumbai.

**SAMPLE SIZE:** 50 patients undergoing hemodialysis and suffering from muscle cramps.

**SAMPLING TECHNIQUE:** Non-probability purposive sampling technique. Same respondents were used in both experimental and control groups at two different points of time. The respondents were first selected for the control group during

their first contact with the researcher and later when they came for the next cycle of dialysis they were selected to be a part of the experimental group.

## SAMPLING CRITERIA

Inclusion criteria:

- Patients who are diagnosed with CKD and have experienced muscle cramps in the previous session of hemodialysis. Patients will be dropped if they do not experience muscle cramps during the current hemodialysis session.
- Patients who are receiving dialysis at least for the last 2 months.
- Patients who will be experiencing below the knee muscle cramp during dialysis.
- Patients who are undergoing hemodialysis 2 to 3 times a week.
- Above 18 years of age.
- Willing to participate.

Exclusion criteria:

- Patients who had lower extremities deformities and altered sensation.
- Patients who are on ventilator support.
- Patients who are going for emergency dialysis.
- Patients with altered hemodynamics.
- Patients with mental retardation or dementia.
- Patients who are not willing to participate.

## TOOLS

Based on the study objectives, the tool designated for the study are as follow:

### Tool 1 - Interview schedule

**Section A:** This includes demographic variables such as age, gender, education, occupation, and health habits.

**Section B:** This includes clinical variables such as diagnosis, associated illness, duration of illness,

number of sittings per week, hours during hemodialysis, and how long on hemodialysis.

**Section C:** This includes a past history of muscle cramps during hemodialysis.

### Tool 2-Observational tool

It consists of tools for the assessment of muscle cramps. The pre-test includes a numerical pain scale and a modified Ashworth scale, and in the post-test; the numerical pain scale, modified Ashworth scale, and Penn muscle frequency scale are used.

## CONTENT VALIDITY

To determine the face, content, and construct validity, the tool was given to experts from the nursing and physiotherapy fields, internally and externally. After receiving their valuable inputs, the researcher, in consultation with the research guide, made the necessary modifications and finalised the tool.

## RELIABILITY

The researcher used standardised tools for the assessment of muscle cramps. The numeric pain scale has a reliability score of 0.96, the modified Ashworth scale has a reliability score of Kappa coefficient 0.84 for interrater and intratester comparisons, and the Penn muscle frequency scale has a reliability score of Kappa coefficient 0.812 for interrater and 0.857 for intratester comparisons.

## ETHICAL ASPECTS

The main study was conducted after the approval of the ethical committee of the Internal Ethical Committee, D.Y. Patil University School of Nursing ethical committee (file no: EC/NEW/IND/2021/1547). Confidentiality and anonymity was maintained. Permission was obtained from the hospital authorities and the concerned Head of the nursing department, a nephrologist before the data collection. The researcher contacted each respondent personally. Eligible respondents were identified and written informed consent was obtained from all the respondents on the informed consent form after

explaining the research protocol individually to each of the respondents.

### PROCESS OF DATA COLLECTION

The investigator obtained formal written consent. Each respondent was his/her control at two different points of the study. The respondents were first selected for the control group during their first contact with the researcher, and later, when they came for the next cycle of dialysis, they were selected to be a part of the experimental group. The samples for the control group were recruited first based upon the inclusion criteria - that they experienced muscle cramps during their previous hemodialysis session; a pretest (Numerical Pain Scale and Modified Ashworth Scale) was administered to them. If they did not experience muscle cramps during the current session, they were scheduled to be dropped. A post-test (Numerical pain scale, Modified Ashworth Scale, and Penn Muscle Cramp Frequency Scale) was conducted after conventional care, without the researcher's intervention. The respondents were informed that they would be in the experimental group at their next hemodialysis session. At the next session of hemodialysis, the researcher greeted the respondents, selected them, and administered a pretest. When they experienced muscle cramps, the researcher implemented the intradialytic exercises and recorded the results of the post-test. The researcher ensured that the routine conventional treatment aspects remained uninterrupted in both the sessions for the respondents.

### RESULTS

In this study, the researcher found out that the majority of the respondents were in the age group of 30-39 years of age. Males account for 50% of respondents, while females also account for 50% of the respondents. The highest percentage of 54% of the respondents had completed their secondary education, 50% had bad health habits of chewing tobacco; and 72% of the respondents were employed.

The highest percentage, 52% of the respondents, had both diabetes and hypertension as an

associated illness; 50% of the respondents were on hemodialysis for 1-2 years of duration.

34% of the respondents had 3.5 liters of ultrafiltration volume removed during the current hemodialysis.

During the current hemodialysis, 46% of the respondents experienced muscle cramps in the calf and soleus muscles. 66% of them experienced muscle cramps in the middle hour of the hemodialysis.

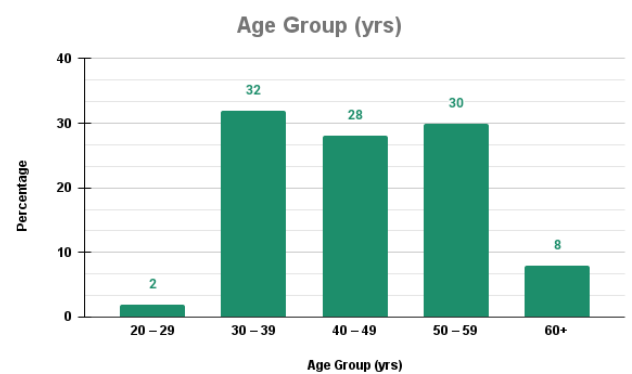


Figure 1: Bar graph showing percentage-wise distribution according to the age of the respondents

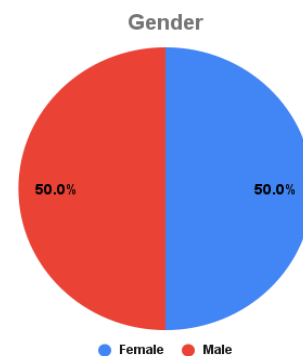


Figure 2: pie diagram showing percentage-wise distribution according to the gender of the respondents

**Assessment of level of muscle cramps among score respondents undergoing hemodialysis**

**Table 1:** Frequency distribution and level of significance of Pain Scores among respondents undergoing hemodialysis.

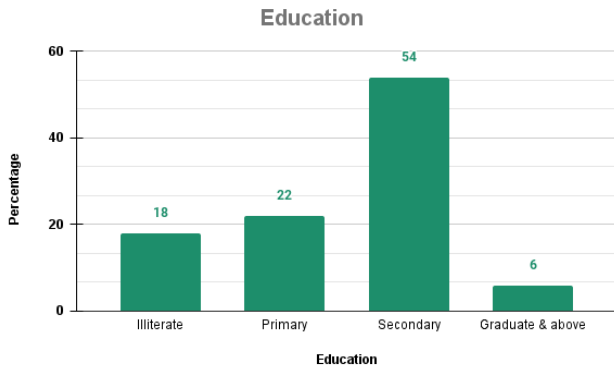
Numerical Pain Intensity Scale	Normal	Mild	Moderate	Severe	Total	Chi-Square test	P-Value	Sig. at 5% level
<b>Experimental group</b>	0	1 – 3	4 – 6	7 – 10		83.448*	0.000	Yes
Pre Test	0	5 (10%)	45 (90%)	0	50			
Post Test	26 (52%)	24 (48%)	0	0	50			
<b>Total</b>	<b>26</b>	<b>29</b>	<b>45</b>	<b>0</b>	<b>100</b>			
<b>Control Group</b>								
Pre Test	0	10 (20%)	40 (80%)	0	50	31.566*	0.000	Yes
Post Test	10 (20%)	27 (54%)	13 (26%)	0	50			
<b>Total</b>	<b>10</b>	<b>37</b>	<b>53</b>	<b>0</b>	<b>100</b>			

**Table 2:** Frequency distribution and chi-square test of Modified Ashworth Scale Score among respondents undergoing hemodialysis.

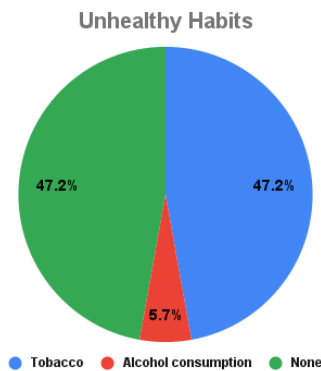
Modified Ashworth Scale	Normal	Mild	Moderate	Severe	Total	Chi-square test	P-Value	Sig. at 5% level
<b>Experimental Group</b>	0	1 – 5	6 – 10	11 – 15		82.439*	0.000	Yes
Pre Test	0	0	36 (72%)	14 (28%)	50			
Post Test	11 (22%)	34 (68%)	5 (10%)	0	50			
<b>Total</b>	<b>11</b>	<b>34</b>	<b>41</b>	<b>14</b>	<b>100</b>			
<b>Control Group</b>								
Pre Test	0	8 (16%)	24 (48%)	18 (36%)	50	21.961*	0.000	Yes
Post Test	0	12 (24%)	38 (76%)	0	50			
<b>Total</b>	<b>0</b>	<b>20</b>	<b>62</b>	<b>18</b>	<b>100</b>			

**Table 3:** Frequency distribution and chi-square test of Penn Muscle Cramp frequency Score among respondents undergoing hemodialysis

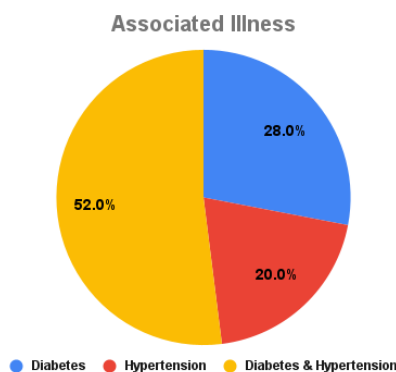
Penn Muscle Cramp frequency Score	Score	Total	Chi-square test	P-Value	Sig. at 5% level				
<b>Control Group</b>	0	1	2	3	4	22.431*	0.000	Yes	
Post Test	18 (36%)	0	16 (32%)	16 (32%)	0	50			
<b>Experiment Group</b>									
Post Test	29 (58%)	0	16 (32%)	5 (10%)	0	50	41.242*	0.000	Yes



**Figure 3:** Bar graph showing percentage-wise distribution according to the educational status of the respondents.



**Figure 4:** Pie diagram showing percentage-wise distribution according to the unhealthy habits of the respondents.



**Figure 5:** Pie diagram showing percentage-wise distribution according to the associated illness of the respondents.

**The above tables reveal that:**

**Numerical pain score:**

- In the experimental group, all the respondents experienced pain. 90% (n = 45) of the respondents had moderate pain, 10% (n = 5) of them had mild pain, and none of them had severe pain in the pretest. After the intradialytic stretching exercises, 52% (n = 26) respondents had no pain, 48% (n = 24) respondents had mild pain, and none of them had moderate or severe pain in the post-test. The Chi-square value is 83.448 with a p-value of 0.000 at the 5% level of significance. Hence, it shows that there is a significant reduction in the level of pain in the experimental group.
- In the control group too, all the respondents experienced pain. 80% (n = 40) of the respondents had moderate pain, 20% (n = 10) of them had mild pain, and none had severe pain in the pretest. After the conventional care, 54% (n = 27) of the respondents had mild pain, 26% (n = 13) of them had moderate pain, 20% (n = 10) of them had no pain, and none had severe pain in the post-test. The Chi-square value is 31.556 with a p-value of 0.000 at the 5% level of significance. Hence, it shows that there is a significant reduction in the level of pain in the control group.

**Modified Ashworth score:**

- In the control group, 48% (n = 24) of the respondents had moderate muscle cramp scores on the Modified Ashworth Scale during the pretest, 36% (n = 18) of them had severe muscle cramp scores, and 16% (n = 8) of them had mild muscle cramp scores. After the conventional care, 76% (n = 38) of the respondents had moderate muscle cramp scores on the Modified Ashworth Scale during the post-test, 24% (n = 12) of them had mild scores and none of them had severe scores. The Chi-square value is 21.961 with a p-value of 0.000 at the 5% level of significance. Hence, it

shows that there is a significant reduction in the muscle cramp score in the control group.

- In the experimental group, at the pretest, 72% (n=36) of the respondents had moderate muscle cramp scores on Modified Ashworth Scale, and 28% (n=14) of them had severe muscle cramp scores. After Intradialytic exercises, at the post-test, 68% (n=34) of the respondents had mild muscle cramp scores on Modified Ashworth Scale, 10% (n=5) of the respondents had moderate muscle cramp scores and 22% (n=11) of the respondents had no muscle cramps. Chi-square value is 82.439 with p-value of 0.000 at 5% level of significance. Hence, it shows that there is a significant reduction in the muscle cramp scores in the experimental group.

**Penn muscle cramp frequency score:**

- In the control group, at the post-test, 36% (n =18) of the respondents did not experience muscle cramps and therefore had a score of 0 on the Penn muscle scale, and 32% (n =16) of the respondents each had a score of 3 and 2. The chi-square value is 22.431 with a p-value of 0.000 at the 5% level of significance. Hence, it shows that there is a significant reduction in the muscle cramp frequency score in the control group.
- In the experimental group, after the intradialytic exercises, 58% (n = 29) of the respondents did not experience muscle cramps and therefore had a score of 0 on the Penn scale, 32% (n = 16) of the respondents scored 2; and 10% (n = 5) of the respondents scored 3 in the post-test. The chi-square value is 41.242 with a p-value of 0.000 at the 5% level of significance. Hence, it shows that there is a significant reduction in the muscle cramp frequency score in the experimental group.

## Effectiveness of intradialytic stretching exercises in reducing muscle cramps among respondents undergoing hemodialysis

Table 4: Comparison of the effectiveness of intradialytic stretching exercises in reducing muscle cramps among experimental and control groups of respondents undergoing hemodialysis:

Sr. no	Muscle cramp score	Experimental group		Control group		Mean difference	Wilcoxon Signed rank test	P-Value	Sig. at 5% level
		Mean	Standard deviation	Mean	Standard deviation				
1. Numerical Pain Scale									
	Pre-test	4.60	1.22	4.16	1.39	1.14	6.459*	0.000	Yes
	Post-test	0.98	1.03	2.12	1.36				
2. Modified Ashworth Scale									
	Pre-test	9.10	2.33	9.30	2.94	3.98	6.249*	0.000	Yes
	Post-test	2.48	1.82	6.46	2.45				
3. Penn Muscle Frequency score									
	Post-test	0.94	1.15	1.60	1.27	0.66	5.291*	0.000	Yes

The above table 4 reveals that the mean difference between the experimental and control groups is as follows: the numerical pain score is 1.14, the modified Ashworth score is 3.98, and the Penn muscle frequency score is 0.66. The Wilcoxon's signed-rank test scores for each scale are 6.459, 6.249, and 5.291, respectively, which is significant at 5% with a p-value of 0.000. Hence, intradialytic stretching exercises are effective in the reduction of muscle cramps during hemodialysis compared to the control group of respondents. Therefore, the null hypothesis (H0) that there is no significant reduction of muscle cramps below the knee among patients undergoing intradialytic exercises during hemodialysis is rejected and the alternative hypothesis is accepted.

## Association between muscle cramp scores among the respondents undergoing hemodialysis in the experimental and control group with their selected demographic variables.

There appears to be no statistical relationship between the biographical variables, the clinical variables and the muscle cramps scores measured on the three tools for the respondents of the experimental and control groups, except that an association has been demonstrated between the pain scores and health habits in the experimental group.

## DISCUSSION

The main purpose of the present study was to evaluate the effectiveness of intradialytic stretching exercises on muscle cramps below the knee among patients undergoing hemodialysis in the experimental and the control group at a selected hospital, Navi-Mumbai.

The present study findings revealed that by using the numerical pain scale, 90% (n = 45) of the respondents had moderate pain, 10% (n = 5) of them had mild pain, and none of them had severe pain in the pretest. After the intradialytic stretching exercises, 52% (n = 26) respondents had no pain, 48% (n = 24) respondents had mild pain, and none of them had moderate or severe pain in the post-test. The Chi-square value is 83.448 with a p-value of 0.000 at the 5% level of significance.

Using the Modified Ashworth Scale, at the pretest, 72% (n = 36) of the respondents had moderate muscle cramp scores on the Modified Ashworth Scale, and 28% (n = 14) of them had severe muscle cramp scores. After intradialytic exercises, at the post-test, 68% (n = 34) of the respondents had mild muscle cramp scores on the Modified Ashworth Scale, and 10% (n = 5) of the respondents had moderate muscle cramp scores, and 22% (n = 11) of the respondents had no muscle cramps. The Chi-square value is 82.439 with a p-value of 0.000 at the 5% level of significance.

By using the Penn muscle cramp frequency scale, after the intradialytic exercises, 58% (n = 29) of

the respondents did not experience muscle cramps and therefore had a score of 0 on the Penn scale, 32% (n = 16) of the respondents scored 2; and 10% (n = 5) of the respondents scored 3 in the post-test. The chi-square value is 41.242 with a p-value of 0.000 at the 5% level of significance. Hence, it shows that there is a significant reduction in the muscle cramp score in the experimental group.

A similar study was conducted by Sasirekha. C, (2017) on the effectiveness of intradialytic exercises on muscle cramps among patients undergoing hemodialysis in Salem, India. The results reveal that 46.8% of respondents had moderate muscle cramp scores and 26.88% had mild and severe muscle cramp scores in the pre-test. After the intradialytic exercises, 80% had no muscle cramp score, 10% had a mild score, 6.68% had a moderate score, and 3% had a severe muscle cramp score. Hence, it shows that there is a significant reduction in the muscle cramp frequency score in the experimental group.

Kishor k M, Renuka. K, & Nalini.S et al., (2016) conducted a quasi-experimental study at East Coast Hospitals, Pondicherry aimed to assess the effect of intradialytic stretching exercises on muscle cramps among patients undergoing hemodialysis. The study reveals that in the pre-test assessment n=19 (47.5%) respondents had severe muscle cramps, n=18 (45%) respondents had moderate muscle cramps; and n=3 (7.5%) respondents had mild muscle cramps; whereas in the post-test n=3 (7.5%) respondents had severe muscle cramp, n=11(27.5%) respondents had moderate muscle cramp; n=17 (42.5%) respondents had mild muscle cramp and n=9 (22.5%) respondents did not have muscle cramps. The study concluded that intradialytic stretching exercises help for the reduction in muscle cramps.

The mean difference of the experimental and control group are as follows: numerical pain score is 1.14, modified Ashworth score is 3.98 and Penn muscle frequency score is 0.66. The Wilcoxon's signed-rank test score of each scale are 6.459,

6.249 and 5.291 respectively, which is significant at 5% with the p-value of 0.000. Hence, intradialytic stretching exercises are effective in the reduction of muscle cramps during hemodialysis compared to the control group of respondents. Therefore, the null hypothesis ( $H_0$ ) that there is no significant reduction of muscle cramps below the knee among patients undergoing intradialytic exercises during hemodialysis is rejected and the alternative hypothesis is accepted.

A similar study was conducted by Punithavathi R. (2016) to evaluate the effectiveness of intradialytic low-intensity stretching exercises on muscle cramps among patients undergoing hemodialysis. revealed that the post-test mean score of muscle cramps in the experimental group was  $33.40 \pm 6.48$ . whereas in the control group it was  $44.26 \pm 5.99$ . The calculated 't' value of 6.698 was found to be statistically significant at  $p < 0.0001$  level.

A study conducted by Salem, S, Mohamed, S. et. al (2017) on the effect of Intradialytic stretching exercises on muscle cramps among patients undergoing hemodialysis. revealed that there was a significant difference between the study participants' leg cramp intensity and frequency before and after the application of stretching exercises with  $t=8.27$  at  $p$  value-0.000 and  $t=5.22$  at  $p$ -value-0.000 respectively. The study concluded that Intradialytic stretching exercises was effective to reduce muscle cramps.

There appears to be no statistical relationship between the biography variables, the clinical variables and the muscle cramps scores measured on the three tools for the respondents of the experimental and control groups; except for an association has been demonstrated between the pain scores and health habits in the experimental group.

A similar study conducted by Lekha.J., Abraham, E., and Malarvizhi.G. (2017) conducted a study on



the effectiveness of Intradialytic stretching exercises on the prevention and reduction of muscle cramps among patients undergoing hemodialysis in Coimbatore. The study concluded that stretching exercises during hemodialysis prevents the occurrence of muscle cramps and improves the quality of life among patients undergoing hemodialysis. There was no association found between the level of muscle cramps and demographic variables.

### **CONCLUSION**

The present study evaluated the effectiveness of intradialytic stretching exercises on reduction of muscle cramps among patients undergoing hemodialysis at a selected hospital, Navi-Mumbai. The findings of the study revealed that Intradialytic stretching exercises was effective on the significant reduction of muscle cramps among patients undergoing hemodialysis. There appears to be no statistical relationship between the biography variables, the clinical variables and the muscle cramps scores measured on the three tools for the respondents of the experimental and control groups; except for an association has been demonstrated between the pain scores and health habits in the experimental group.

### **LIMITATIONS**

- The study was limited only to the patients attending the hemodialysis unit in D. Y. Patil Hospital.
- Purposive sampling technique was used for sample selection which limits the generalization.
- The same respondents are used in both experimental and control groups at two different times.
- Due to prolonged treatment or associated illness, some of the patients got used to the muscle cramps, which makes it difficult to assess the intensity of the muscle cramps.

### **IMPLICATIONS**

The findings of the present study have an implication for nursing education among patients undergoing hemodialysis, nursing practice, nursing administration, and nursing research.

#### **Nursing Service**

- Nursing professionals can use stretching exercises as a non-pharmacological intervention in case of various situations like pain, fatigue, muscle cramps, etc.

#### **Nursing Administration**

- Periodically organize formal training programs for nurses to know about the other alternative therapies.
- Encouraging the student and staff to disseminate the findings.

#### **Nursing Education**

- The educational authority should be advisable to incorporate Intradialytic stretching exercises in patients undergoing hemodialysis by involving nurses.
- Nursing students should be equipped with the knowledge on the benefits of exercises.

#### **Nursing Research**

- The study serves as reference material and a reliable source of related literature for future investigators.
- The study findings can be utilized by the nurses as a resource for evidence-based practice.

### **RECOMMENDATIONS**

- The present study can be replicated with more samples for generalization.
- The study can be done using various sets of intradialytic stretching exercises and evaluate the best set of exercises that help to reduce muscle cramps
- A similar study with varying time periods of intradialytic stretching exercises can be used with more sessions.

## SUMMARY

Muscle cramps are the most prevalent intradialytic complications and it is a subjective feeling that can be expressed by the patients. There are many pharmacological and non-pharmacological measures to treat muscle cramps but the data from various studies showed that there was no complete relief from the muscle cramps. The study was taken to evaluate the effectiveness of intradialytic stretching exercises on reduction of muscle cramps among patients undergoing hemodialysis at a selected hospital, Navi-Mumbai. The findings of the study revealed that Intradialytic stretching exercises was effective in the significant reduction of muscle cramps among patients undergoing hemodialysis. There appears to be no statistical relationship between the biography variables, the clinical variables and the muscle cramps scores measured on the three tools for the respondents of the experimental and control groups; except for an association has been demonstrated between the pain scores and health habits in the experimental group.

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