OPEN ACCESS
Global Journal of Research in Medical Sciences
ISSN: 2583-3960 (Online)
Volume 06 | Issue 03 | May-June | 2026
Journal homepage: https://gjrpublication.com/gjrms/
Original Research Article

Effectiveness of Intradialytic Stretching Exercises on Muscle Cramps among Patients Undergoing Haemodialysis at Apollo Hospitals, Ramnagar, Visakhapatnam

*Ms. Tirumala A. [1], Dr. Manojna Yejella [2], Dr. Ch.V.S. Dharma Rao PT [3], Ms. Carunia Jeyasutha [4], Ms. Padma T. [5]

[1] Nurse Educator, Nursing, Apollo Hospitals, Ramnagar, Visakhapatnam.
[2] Register Emergency Medicine, Apollo Hospitals, Ramnagar, Visakhapatnam.
[3] Senior Physiotherapist, Apollo Hospitals, Ramnagar, Visakhapatnam.
[4] ANS, Apollo BGS Hospitals, Mysuru
[5] Nursing Superintendent, Apollo Hospitals, Ramnagar, Visakhapatnam.

DOI: 10.5281/zenodo.20056421 Submission Date: 30 March 2026 | Published Date: 06 May 2026

*Corresponding author: Ms. Tirumala A.
Nurse Educator, Nursing, Apollo Hospitals, Ramnagar, Visakhapatnam.

Abstract

Background: *Muscle cramps are a common and distressing complication among patients undergoing maintenance haemodialysis. They significantly impair quality of life and may lead to premature termination of dialysis sessions. Non-pharmacological interventions such as intradialytic stretching exercises may offer a safe and cost-effective solution.*

Objective: *To evaluate the effectiveness of intradialytic stretching exercises in reducing the frequency and severity of muscle cramps among patients undergoing haemodialysis.*

Methods: *A quantitative true experimental time-series design was adopted. The study was conducted in the dialysis unit of Apollo Hospitals, Ramnagar, Visakhapatnam. Sixty patients aged 30–60 years were selected using simple random sampling and equally allocated into experimental (n=30) and control (n=30) groups. The experimental group performed structured intradialytic stretching exercises during the 3rd–4th hour of dialysis for three consecutive days, while the control group received routine care. Muscle cramps were assessed using a standardized cramp questionnaire (score range 0–13). Data were analysed using descriptive and inferential statistics including paired and independent t-tests.*

Results: *The mean pre-test muscle cramp score in the experimental group was 9.20 ± 1.34, which significantly reduced to 4.10 ± 1.12 post-intervention ($t = 14.62$, $p < 0.001$). The control group showed no significant change (8.95 ± 1.41 to 8.40 ± 1.36; $t = 1.72$, $p > 0.05$). A significant difference was observed between groups in post-test scores ($t = 12.84$, $p < 0.001$).*

Conclusion: *Intradialytic stretching exercises significantly reduced the frequency and severity of muscle cramps among haemodialysis patients. The intervention is simple, safe, and recommended as a routine nursing practice in dialysis units.*

Keywords: *Haemodialysis, Intradialytic Exercise, Chronic Kidney Disease, Non-Pharmacological Intervention, Muscle Cramps.*

INTRODUCTION

Chronic Kidney Disease (CKD) is a progressive and irreversible decline in renal function and represents a growing global health burden. Reports published in the Journal of the American Medical Association highlight the increasing prevalence of CKD worldwide.

Haemodialysis is the most common renal replacement therapy for end-stage renal disease. However, it is associated with multiple complications such as hypotension, nausea, headache, and muscle cramps. Muscle cramps occur in approximately 33–86% of haemodialysis patients and typically develop toward the end of dialysis sessions.

The pathophysiology of muscle cramps is multifactorial, including volume contraction, electrolyte imbalance, tissue hypoxia, and hypotension. Severe cramps may lead to early termination of dialysis and reduced quality of life.

Non-pharmacological management strategies such as stretching exercises are increasingly recommended. Previous studies suggest that intradialytic stretching may improve muscle perfusion and reduce neuromuscular excitability. However, limited experimental evidence exists in the Indian setting.

This study was therefore undertaken to evaluate the effectiveness of intradialytic stretching exercises among haemodialysis patients at Apollo Hospitals, Ramnagar, Visakhapatnam.

Research Objectives

1. To assess the effect of intradialytic stretching exercises on the frequency and severity of muscle cramps in patients undergoing haemodialysis.
2. To compare the muscle cramp incidence between pre- and post-intervention in the intervention group receiving intradialytic stretching exercises.
3. To evaluate the difference in muscle cramp outcomes between the intervention group (receiving stretching exercises) and a comparison group (usual care).

Hypothesis of the study:

H1: Intradialytic stretching exercises reduce the frequency of muscle cramps in haemodialysis patients.

H2: Intradialytic stretching exercises reduce the intensity of muscle cramps in haemodialysis patients.

H3: Intradialytic stretching exercises are associated with a reduction in muscle cramps among haemodialysis patients.

H0: Intradialytic stretching exercises are not associated with a reduction in muscle cramps among haemodialysis patients.

MATERIALS AND METHODS

Research Approach and Design:

Quantitative evaluative approach was followed; Time series true experimental design was found suitable for the study.

- **Duration of the study: Three Months (-2025 to -2026)**
- **Data collection method: (Google form, Observational method)**
- **Sampling Method: Simple randomized Sampling**

Research setting

The study was conducted in dialysis unit of Apollo Hospitals, Ramnagar, Visakhapatnam.

Population:

Total sample of 60 belong to 30 to 60 years were selected with the use of simple randomized sampling technique as per the statistical calculation and equally allocated to control group 30 samples and experimental group 30.

Sample

In the present study the sample consists of the patients with muscle cramps while undergoing haemodialysis and who met inclusion criteria.

Criteria for Sample Selection

Inclusion criteria:

- Patients who are in the age group of 30 to 60 years.
- Patients undergoing haemodialysis three times per week with muscle cramps.
- Patients who can understand Telugu or English language, Hindi, Odia.

Exclusion criteria:

- Patients undergoing emergency haemodialysis & on first cycle of haemodialysis.
- Patient s with femoral catheter & with any lower limb disability

Sampling Technique

All patients who met the inclusion criteria were selected by using the simple randomized sampling technique.

Research tool: The research tool consisted of two sections

Section A: Questionnaire to collect demographic and clinical variables.

Cramp questionnaire chart was used to assess the muscle cramps. The cramp questionnaire chart developed by Base math.S.S.Morris, permission was obtained. It contains various features of muscle cramps such as the frequency of muscle cramps, duration of muscle cramps, and level of pain, temperature and discomfort which was comprehensively scored as level of muscle cramps ranging from (0-13).

Section B: Tool to assess muscle cramps.

Part I: Demographic Variables: It includes age, gender, education and occupation of the patient.
Part II: Clinical variables: It includes, duration of haemodialysis treatment, experience of muscle cramps during haemodialysis, muscle cramps restrict activities and movements during haemodialysis, location of muscles cramps, muscles involved in cramps, co morbid illness.

Details of pre-test & post-test (Intervention)

On the first day pre-test was conducted to group 1 (control) and group 2 (study). Intradialytic stretching exercises was formed in which flexion, extension and rotation of ankle of both legs in clockwise and anti-clockwise direction for 15 minutes and stretching of the calf muscles for 5 times during haemodialysis. Implementation of Intradialytic stretching exercises at the end of second hour of haemodialysis in a frequency of twice per day between 3rd and 4th hour for three days. Post test was assessed at the end of first day, 2nd and 3rd day during haemodialysis for group 2 (study). Stretching exercise was implemented only for group 2 (study). Group 1 (control) received the routine care.

Ethical Considerations

The study was conducted after obtaining formal approval from Apollo Hospital Health City, Visakhapatnam. Administrative permission was secured from the Medical Superintendent and the Head of the Dialysis Unit prior to data collection.

Written informed consent was obtained from all participants after providing detailed information regarding the purpose, procedures, duration, benefits, and potential minimal risks of the study. Participants were informed that their participation was entirely voluntary and that they had the right to withdraw from the study at any time without affecting their treatment or care.

Intervention

The experimental group performed:

- Ankle flexion and extension
- Clockwise and anticlockwise ankle rotation
- Calf muscle stretching (5 repetitions)

Duration: 15 minutes during the 3rd–4th hour of dialysis for 3 consecutive days.
The control group received routine care.

Statistical Analysis

- Descriptive statistics (Mean, SD, Percentage)
- Paired t-test (within group)
- Independent t-test (between groups)
- Significance level: $p < 0.05$

RESULTS

Table 1: Comparison of Pre-test and Post-test Muscle Cramp Scores (Experimental Group)

Test	Mean	SD	t-value	p-value
Pre-test	9.20	1.34		
Post-test	4.10	1.12	14.62	<0.001*

*Significant at $p < 0.05$

Table 2: Comparison of Pre-test and Post-test Muscle Cramp Scores (Control Group)

Test	Mean	SD	t-value	p-value
Pre-test	8.95	1.41		
Post-test	8.40	1.36	1.72	>0.05

(Not significant)

Table 3: Comparison of Post-test Scores Between Experimental and Control Groups

Group	Mean	SD	t-value	p-value
Experimental	4.10	1.12		
Control	8.40	1.36	12.84	<0.001*

*Highly significant

ARTICLE WITH GRAPHS

TITLE: Effectiveness of Intradialytic Stretching Exercises on Muscle Cramps

RESULTS WITH GRAPHS

Figure 1: Bar Chart showing comparison of muscle cramp scores

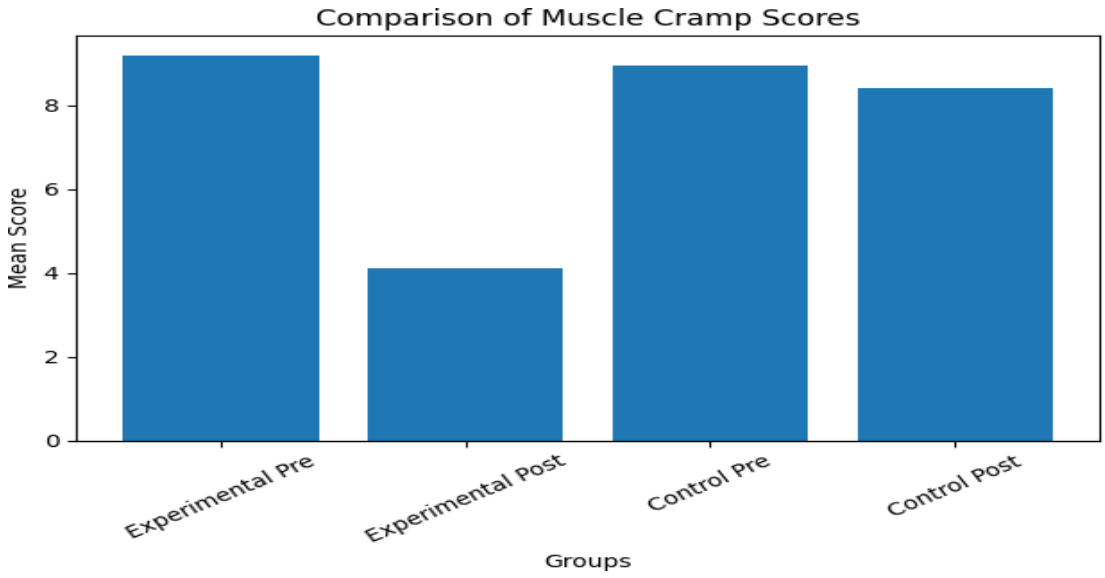
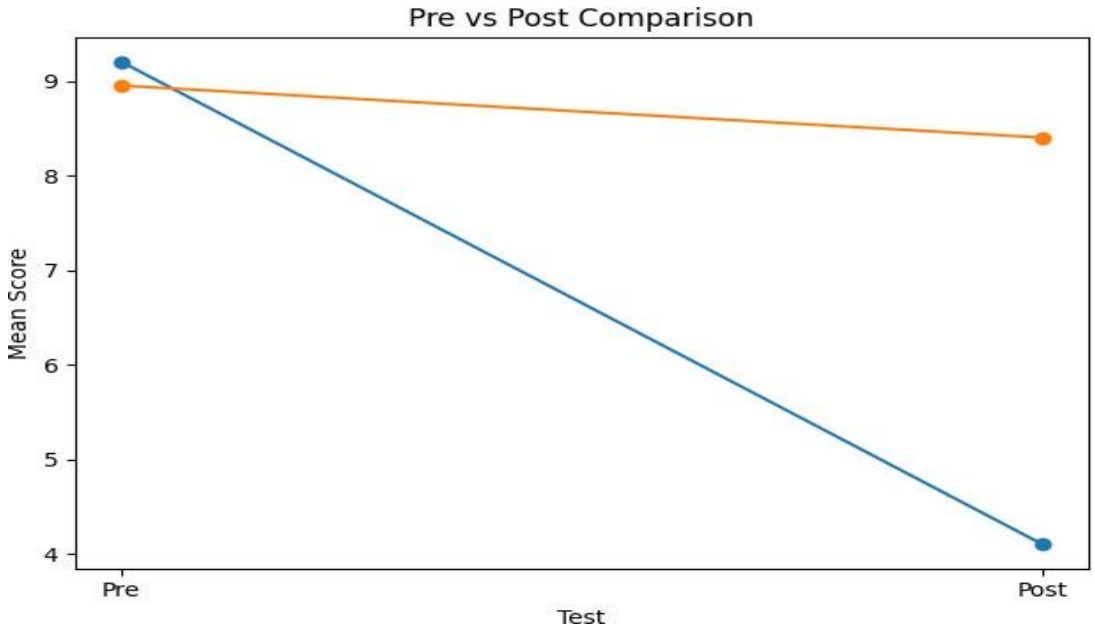


Figure 2: Line Graph showing pre and post compare



The graphs clearly show a significant reduction in muscle cramps in the experimental group compared to the control group.

DISCUSSION

The present study demonstrated a statistically significant reduction in muscle cramp frequency and severity among patients who performed intradialytic stretching exercises.

The experimental group showed a marked reduction in mean cramp scores compared to the control group, indicating the effectiveness of the intervention. The findings are consistent with previous interventional studies that reported improved muscle perfusion and reduced neuromuscular irritability following structured stretching programs.

The intervention was simple, cost-effective, and feasible within routine dialysis care, suggesting its practical applicability in clinical settings.

CONCLUSION

Intradialytic stretching exercises significantly reduced muscle cramp frequency and severity among haemodialysis patients. The findings support incorporating structured stretching protocols into routine dialysis nursing practice to enhance patient comfort and quality of life.

REFERENCES

1. Hawkes, C., Yach, D., Gould, C., et al. (2009). The global burden of chronic diseases: Overcoming impediments to prevention and control. *Journal of the American Medical Association, 291*(21), 2616–2622. https://doi.org/10.1001/jama.291.21.2616
2. Kovesdy, C. P., et al. (2020). *Pathogenesis, consequences, and treatment of metabolic acidosis in chronic kidney disease.*
3. Xie, Y., et al. (2018). Analysis of the Global Burden of Disease study highlights the global, regional, and national trends of chronic kidney disease epidemiology from 1990 to 2016. *Kidney International, 94*(3), 567–581. https://doi.org/10.1016/j.kint.2018.04.011
4. Neild, G. H., et al. (2016). Life expectancy with chronic kidney disease: An educational review. *Pediatric Nephrology, 32*(2), 243–248. https://doi.org/10.1007/s00467-016-3383-8
5. Asgari, M. R., et al. (2017). Incidence and severity of nausea and vomiting in a group of maintenance hemodialysis patients. *Journal of Renal Injury Prevention, 6*(1), 49–55. https://doi.org/10.15171/jrip.2017.09
6. Yong, G. L., & Jewell, D. (2002). Intervention for leg cramps in pregnancy. *Cochrane Database of Systematic Reviews*, (1), CD000121. https://doi.org/10.1002/14651858.CD000121
7. Kwatra, V., Khan, M. A., Quadri, S. A., et al. (2018). Differential diagnosis and treatment of restless leg syndrome: A literature review. *Cureus, 10*(9), e3297. https://doi.org/10.7759/cureus.3297
8. Beladi-Mousavi, S. S., Alemzadeh-Ansari, M. J., Alemzadeh-Ansari, M. H., & Beladi-Mousavi, M. (2012). Long-term survival of patients with end-stage renal disease on maintenance hemodialysis. *Iranian Journal of Kidney Diseases, 6*(6), 452–456.
9. Ahmad, S., Robertson, H. T., Golper, T. A., et al. (1990). Multicenter trial of L-carnitine in maintenance hemodialysis patients II: Clinical and biochemical effects. *Kidney International, 38*(5), 912–918. https://doi.org/10.1038/ki.1990.290
10. Rocco, M. V., & Burkart, J. M. (1993). Prevalence of missed treatments and early sign-offs in haemodialysis patients. *Journal of the American Society of Nephrology, 4*, 1178–1183.
11. Lekha, J., et al. (2017). Effectiveness of intradialytic stretching exercises on prevention and reduction of muscle cramps among patients undergoing haemodialysis at Coimbatore. *IOSR Journal of Nursing and Health Science, 6*(2), 47–53.
12. Salem, S. S., et al. (2017). Effectiveness of intra-dialytic stretching exercises on leg muscle cramp among haemodialysis patients at Kasr El-Einy Center. *Journal of Nursing and Health Science, 6*(2), 47–53. https://doi.org/10.9790/1959-0602094753

CITATION

Tirumala, A., Yejella, M., Dharma Rao, C. V. S., Jeyasutha, C., & Padma, T. (2026). Effectiveness of Intradialytic Stretching Exercises on Muscle Cramps among Patients Undergoing Haemodialysis at Apollo Hospitals, Ramnagar, Visakhapatnam. In Global Journal of Research in Medical Sciences (Vol. 6, Number 3, pp. 4–8). https://doi.org/10.5281/zenodo.20056421