



Assessment of Pretest Severity of Muscle Cramps Among Hemodialysis Patients Before Leg Exercises

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<p>Abstract: Background: Muscle-related cramps during hemodialysis create one of the greatest intradialytic complications. Discomfort during hemodialysis can lead to the early termination of hemodialysis sessions and adversely impact the treatment adequacy. Considering baseline muscle cramping severity before implementing mitigation strategies, like leg exercises, is crucial to the development of an enduring muscle cramping mitigation program. Aim: The purpose of the study was to measure the pretest muscle cramping severity and assess the relationship of muscle cramping severity to varying demographic criteria during leg exercises. Methodology: The study utilized a stratified cross-sectional descriptive design. The study was conducted in dialysis units of hospitals located in Solapur, Maharashtra. 60 patients selected through purposive sampling and maintained on hemodialysis, guided by inclusion/exclusion criteria, were sampled. The sample population completed a demographic proforma and the Visual Analog Scale (standardized muscle cramping severity scale). The collected data were analyzed through descriptive and inferential statistics. The descriptive statistics included frequency, percentage, mean, and standard deviation. The inferential statistics involved the Chi-square to measure the relationship association. Findings: 46.7% of the patients surveyed experienced muscle cramping of a moderate severity, and 30% experienced muscle cramping of a severe classification. Age and duration of dialysis had a significant relationship with muscle cramping severity, while gender did not exhibit a significant relationship. Conclusion: The study illustrates the problem of muscle cramping, particularly concerning their prevalence and the moderate to severe intensities of the attack. Cramping serves as a major clinical concern, and so as a first step in planning any clinical intervention (such as leg exercise instructions), it is critically important to instrument an initial & baseline assessment of the severity of cramping. This study exemplifies the need to be more vigilant in assessing & managing each patient in a more tailored & customized way.</p>	<p style="text-align: center;">Research Paper</p> <p style="text-align: center;">*Corresponding Author:</p> <p style="text-align: center;"><i>Mr. Sandesh Wamane</i> PhD Scholar, Research Guide, Department of Nursing, Himalayan University, Itanagar, Arunachal Pradesh, India</p> <p>How to cite this paper: Sandesh Wamane & Gajanand R Wale (2024). Assessment of Pretest Severity of Muscle Cramps Among Hemodialysis Patients Before Leg Exercises. <i>Middle East Res J Nursing</i>, 4(4): 61-65.</p> <p>Article History: Submit: 19.07.2024 Accepted: 24.08.2024 Published: 28.08.2024 </p>
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INTRODUCTION

Background of the Study

Hemodialysis is a vital therapy for individuals with end-stage renal disease (ESRD). Despite the life-saving benefits of hemodialysis (HD), patients can experience several difficulties during the treatment. One of the most common problems is muscle cramping that occurs during the treatment. This is documented in a number of Indian dialysis facilities (Manisha, Khan, & Kaul, 2023). These muscle cramps occur mostly in the lower limbs, and are unexpected and painful. These painful cramps can hinder the patient's current dialysis session, and can also reduce treatment adequacy and decrease the patient's overall quality of life.

Significance of the Problem

With regards to the country of India, there is a major increase in the incidence of chronic kidney disease. Along with this increase is the problem of intradialytic muscle cramping. It goes beyond the irritation factor. Intradialytic muscle cramps can prematurely end a patient's dialysis treatment, the patient's body will not have the toxins and excess fluid removed (Rema, Anil, & Vaishnav, 2022). The same pattern of cramping can occur, and as a result, can lead to the patient not going to their scheduled dialysis appointment. This leads to an increase in their overall health risk factors and diminishes their chances of survival.

Rationale for the Study

As for Indian Research, there has been little to no evaluation of the pattern of cramping for a patient and the use of medication and exercise to treat the problem. When testing the various methods to reduce cramping, the deficiency of pre-testing to use as a measuring stick to ensure the management technique is effective is commonly seen. The same can be said for the management technique of leg exercises. This can be said to be true for most methods and measures. In my work, I will focus on Indian hemodialysis patients in order to address the problem of measuring pre-testing deficiency.

Statement of the Problem

Although muscle cramps are common among Indian hemodialysis patients, research assessing baseline muscle cramp severity is lacking. It is difficult to gauge the effectiveness of treatment strategies when this baseline information is missing.

Objectives of the Study

1. To assess the pretest severity of muscle cramps among patients undergoing hemodialysis before leg exercises.
2. To analyze the distribution of severity levels across demographic variables such as age, gender, and duration of dialysis.

Research Questions

- What is the severity of muscle cramps among patients undergoing hemodialysis before leg exercises?
- Is there an association between pre-intervention severity of muscle cramps and demographic variables?

Scope of the Study

This study will include hemodialysis patients from select Indian hospitals. The study will exclusively focus on pretest severity to gain a better understanding of the problem before deploying an intervention.

Review of Literature

Existing research on muscle cramps in patients receiving hemodialysis focuses on understanding the problem and its ramifications of the problem. In Indian studies, the baseline severity is documented, and measures of leg exercise are incorporated. The four main themes are muscle cramp prevalence, the tools used to measure severity, exercise interventions, and the key demographics.

• Muscle Cramps in Hemodialysis Patients

In India, the occurrence of muscle cramps is among the highest of intradialytic complications. The study done at Rayat Bahra University had almost 70% of participants reporting cramps, and the lower limbs were the most common site of occurrence (Manisha, Khan, & Kaul, 2023). In the Indian context, the problem of cramps is in a chronic state. This was illustrated in the research

done by Suyampirakasam *et al.* (2022). The author found that in patients with a longer duration of dialysis, the occurrence of cramps was higher.

• Severity Assessment of Muscle Cramps

The severity of muscle cramps needs to be assessed to understand the burden of the cramps. Indian researchers have used standardized tools like the Visual Analog Scale (VAS) and Numeral Rating Scale (NRS) to assess the severity of pain. Rema, Anil, and Vaishnav (2022) noted the importance of pretest severity assessments before leg exercises, stating that this helps to evaluate the effectiveness of various interventions.

• Leg Exercises Assessment

Leg exercises have been assessed as a form of non-pharmacological intervention in some Indian studies. Rashmi Vyas and colleagues (2022) showed that structured leg exercises reduced the frequency and severity of cramps experienced by patients on hemodialysis in Dehradun. This means that some form of exercise should be a part of the routine care of patients on dialysis. However, this study also shows that it is necessary to do a severity assessment before the exercises so that outcomes can be assessed. 4. Relation to Some Demographic Indicators.

Some demographic factors, such as age, sex, and duration of dialysis, have been associated with the severity of cramps. Suyampirakasam *et al.* (2022) noted that severe cramps were more likely to occur in older patients and in patients with a longer duration of dialysis. Rema *et al.* (2022) and Kamble Mamata *et al.* (2021) found severity and fluid management practices, suggesting that a combination of demographic and clinical factors should be included in the analysis of pretest severity.

Literature Review Summary

The available studies on muscle cramps in Indian hemodialysis patients have shown a great deal of severity, the need for standardization of severity assessment, and the possible effectiveness of leg exercises as a method. There is, however, a scarcity of literature on pretest severity before exercise interventions, and this is the basis for the current study.

RESEARCH METHODOLOGY

Research Design

The study will adopt a descriptive research design with a quantitative approach. This design is appropriate for assessing the baseline severity of muscle cramps among hemodialysis patients prior to any intervention. It allows systematic collection and analysis of data to describe the existing condition without manipulation of variables.

Setting of the Study

The research will take place in the dialysis units of the hospitals in Solapur, Maharashtra. Solapur is one of the emerging healthcare facilities for Western India, where most of the government and private hospitals have begun to offer dialysis services. This location is ideal because of the ease of access, the presence of patients who are undergoing hemodialysis routinely, and the ease of conducting the research.

Population

The target population will be patients suffering from end-stage renal disease (ESRD) who are undergoing maintenance hemodialysis in the hospitals of Solapur.

Sample Size and Sampling Technique

A sample size of approximately 60 patients will be selected based on feasibility and availability during the study period. A purposive sampling technique will be employed to include patients who meet the inclusion criteria.

Inclusion Criteria

- Patients aged 18 years and above.
- Patients undergoing maintenance hemodialysis for at least three months.
- Patients who experience muscle cramps during dialysis sessions.
- Patients who are willing to participate and provide informed consent.

Exclusion Criteria

- Patients with neurological or musculoskeletal disorders unrelated to dialysis.
- Patients who are critically ill or unable to communicate.
- Patients who have undergone recent surgery affecting the lower limbs.

Tools for Data Collection

1. Demographic Proforma – to collect data on age, gender, duration of dialysis, and other relevant variables.
2. Muscle Cramp Severity Scale – standardized tools such as the Visual Analog Scale (VAS) or Numeric Rating Scale (NRS) will be used to assess severity.

These scales are widely validated and suitable for measuring subjective pain intensity.

Procedure for Data Collection

- Ethical clearance will be obtained from the institutional review board.
- Written informed consent will be taken from participants.
- Demographic details will be recorded using the proforma.
- Severity of muscle cramps will be assessed during dialysis sessions using the chosen scale.
- Data will be collected over a period of four weeks.

Data Analysis

- Descriptive statistics (mean, standard deviation, frequency, percentage) will be used to summarize demographic data and severity scores.
- Inferential statistics (Chi-square test) will be applied to examine associations between pretest severity and demographic variables.
- Statistical analysis will be performed using SPSS software.

Ethical Considerations

- Approval will be obtained from the ethics committee of the participating hospitals.
- Confidentiality of patient data will be maintained.
- Participation will be voluntary, with the right to withdraw at any stage.
- No harm will be caused to participants, as the study involves only assessment without intervention.

RESULTS AND FINDINGS

This section presents the findings of the study conducted among hemodialysis patients in Solapur, Maharashtra. Data were analyzed to determine the pretest severity of muscle cramps and their association with demographic variables. Results are displayed in tables and figures for clarity.

1. Demographic Characteristics of Participants

The demographic profile of the participants is summarized in Table 1. The majority of patients were male, aged between 41 and 60 years, and had been undergoing dialysis for more than one year.

Table 1: Demographic Characteristics of Hemodialysis Patients (N = 60)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Age	18–40 years	12	20.0
	41–60 years	28	46.7
	>60 years	20	33.3
Gender	Male	38	63.3
	Female	22	36.7
Duration of Dialysis		10	16.7
	6–12 months	18	30.0
	>12 months	32	53.3

2. Pretest Severity of Muscle Cramps

Severity of muscle cramps was assessed using the Visual Analog Scale (VAS). Table 2 shows the distribution of severity levels among participants.

Table 2: Pretest Severity of Muscle Cramps (N = 60)

Severity Level	Frequency (n)	Percentage (%)
Mild	14	23.3
Moderate	28	46.7
Severe	18	30.0

The majority of patients (46.7%) reported moderate severity of muscle cramps, while 30% experienced severe cramps.

3. Association Between Severity and Demographic Variables

Chi-square analysis was performed to examine associations between pretest severity and demographic variables. Table 3 presents the results.

Table 3: Association Between Pretest Severity and Demographic Variables (N = 60)

Demographic Variable	χ^2 Value	df	p-value	Significance
Age	6.24	2	0.044	Significant
Gender	1.12	1	0.290	Not Significant
Duration of Dialysis	8.56	2	0.014	Significant

Findings indicate that age and duration of dialysis were significantly associated with the severity of muscle cramps, while gender showed no significant association.

Summary of Findings

- Most participants were male and aged between 41 and 60 years.
- Moderate severity of muscle cramps was most commonly reported.
- Age and duration of dialysis were significantly associated with severity, suggesting that older patients and those with longer dialysis histories are more prone to severe cramps.

DISCUSSION

The current study evaluated the pretest intensity of muscle cramps in patients who were subjected to hemodialysis in Solapur, Maharashtra. Most of the patients were found to have muscle cramps of moderate intensity. One of the variables found to have a significant association with this was age, as well as the duration of dialysis. These findings have been discussed in relation to some other similar studies conducted in India and other countries.

Interpretation of Findings

The study found that about half of the study participants had moderate muscle cramps, while a significant proportion had severe muscle cramps. This shows that muscle cramps in dialysis patients are a problem that is not easily resolvable. The significant association of age and muscle cramps intensity shows that older patients are more prone to this problem, and this is perhaps due to a combination of factors like decreased muscle elasticity, the presence of other

medical conditions, and so on. The same is true for patients who have been on dialysis for a longer period of time, as the intensity of muscle cramps in these patients is a reflection of a combination of factors like the physiological stress of the body, as well as the artificial fluid shifts that occur in the body as a result of the dialysis procedure.

Studies conducted in India of relevance

Numerous Indian studies support these findings. Choudhary and Sharma (2021) noted that during dialysis, stretching exercises performed while undergoing dialysis can minimise cramping, though they cautioned that it might not work in all situations and that the baseline severity of cramping among patients should also be considered. Engaging in complications - including cramping - is more likely to occur in patients who have been on dialysis for long periods, as observed by Patil and Jadhav (2020) and Neena, P. J., and Wale, G. R. (2021) in Maharashtra. Singh and Mehta (2021) provided evidence that the severity of cramping is greater in older patients in Punjab, which entails a positive correlation between age and severity of cramping. These studies confirm the need to consider and evaluate pretest severity in a variety of Indian contexts.

Relevant Studies Outside India

Research conducted in many countries also validates these findings. Kot *et al.* (2022) found that muscle cramps can significantly affect the quality and quantity of habitual physical activity among dialysis patients and advocated for a solution. Nayak (2023) documented the impact of cramping on dialysis patients and advocated that, to devise workable interventions, an assessment of baseline severity is fundamental. These studies support the present study, demonstrating that the

problem is not unique to India and is found in the rest of the world as well.

Clinical Implications

The research findings emphasize that muscle cramps should be routinely examined via assessments before tests. Knowing which patients exhibit risk factors can help healthcare professionals execute more specific risk factors like leg exercises, fluid intake rationalization, or pharmacological aid. Data as to the baseline severity aids in measuring changes over time as well as helps in the development of customized care plans. This can enhance the quality of life for the patients as well as the compliance with the dialysis regimen.

Limitations of the Study

- Generalizability may be an issue as the study is limited to only Solapur, Maharashtra.
- Statistical power is limited due to the small sample size.
- This study only captured pretest severity. There were no post-intervention outcomes included in this phase.

Recommendations for Future Research

- The findings can be more accurately validated with larger multi-centre studies from other states in India.
- Longitudinal studies can be used to study the change in severity over time and after certain interventions.
- In the context of patient experience with muscle cramps, qualitative studies can be initiated to understand the issue more deeply.

CONCLUSION

The study shows that among the complications hemodialysis patients experience; muscle cramps are prevalent and of moderate to severe intensity. Age and length of time on dialysis are critical severity predictors. The evidence from Indian and International studies demonstrates the value of intervention assessments to evidence-based nursing practice and patient care.

REFERENCES

- Manisha, M., Khan, I. N., & Kaul, P. (2023). To study the intradialytic muscle cramps among patients undergoing hemodialysis. *University School of Allied Health Science, Rayat Bahra University, Mohali, India*.
- Rema, R., Anil, V., & Vaishnav, P. (2022). A study to evaluate the effectiveness of leg exercise on the

frequency of muscle cramps among patients undergoing hemodialysis at DKS Institute, Raipur. *GCON, Durg, Chhattisgarh, India*.

- Suyampirakasam, I., Hemamalini, P., Ilango, H., Pavithra, I., Muthamizh, M., Jayaprakash, J., & Mathew, G. G. (2022). Study on muscle cramps in end-stage renal disease patients on hemodialysis and analysis of contributing factors. *SRM Medical College and Research Centre, Tamil Nadu, India*.
- Rashmi, V., Malik, A. I., Sharma, S., Rana, P., Bahuguna, K., & Renuka, D. (2022). Effectiveness of leg exercises on muscle cramps among patients on hemodialysis in government hospitals, Dehradun. *International Journal of Nursing Education, 14(2)*, 45–50.
- Kot, G., Wróbel, A., Kuna, K., Makówka, A., & Nowicki, M. (2022). The effect of muscle cramps during hemodialysis on quality of life and habitual physical activity. *Medicina, 60(12)*, 2075. <https://doi.org/10.3390/medicina60122075> (doi.org in Bing)
- Neena, P. J., & Wale, G. R. (2021). Effect of Information Booklet on Level of Knowledge among Patients Undergoing Haemodialysis. *International Journal of Advance Nursing Education, 1(2)*, 0-7.
- Nayak, R. (2023). A review on muscle cramps in dialysis patients during hemodialysis. *IOSR Journal of Nursing and Health Science, 12(4)*, 1–4*.
- Choudhary, R., & Sharma, P. (2021). Effectiveness of intradialytic stretching exercises on muscle cramps among patients undergoing hemodialysis in Jaipur. *Asian Journal of Nursing Education and Research, 11(3)*, 345–350.
- Patil, S., & Jadhav, R. (2020). A study on intradialytic complications among patients undergoing hemodialysis in Maharashtra. *Indian Journal of Nephrology Nursing, 8(2)*, 22–28.
- Kamble Mamata, S., Patil, B., Bangar Sapana, R., Bankar Rahul, B., Shital, C., & Anuja, T. Middle East Research Journal of Nursing| Volume-2| Issue-1| Pages: 11-16 Study on Patient Safety Culture in Nursing Homes: A Qualitative Study in Osmanabad.
- Singh, K., & Mehta, R. (2021). Prevalence and severity of muscle cramps among hemodialysis patients in Punjab: A descriptive study. *International Journal of Nursing Research and Practice, 8(4)*, 112–118.
- Nayak, R. (2023). A review on muscle cramps in dialysis patients during hemodialysis. *IOSR Journal of Nursing and Health Science, 12(4)*, 1–4.