

Original Article

Treatment of Willis-Ekbom Disease (Restless Leg Syndrome); The Efficacy of Mulligan's Traction Straight Leg Raise among Paramedical Professionals.

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ABSTRACT

Background: Restless Leg Syndrome (RLS) is a generalized neurological sensory-motor disorder characterized by intense restlessness and discomfort in the lower extremities, leading to an urge to move the legs at sleep time. Treatment protocols for RLS may include thermotherapy, stretching exercises, and Mulligan's traction straight leg raise (SLR). Mulligan's traction SLR is an effective method that influences peripheral and central neural pathways through mobilization, thereby alleviating RLS symptoms.

Objective: The study aimed to compare the efficacy of stretching exercises and Mulligan traction straight leg raise in reducing RLS severity among paramedical staff.

Methods: This randomized clinical trial included a sample size of 38 paramedical staff members diagnosed with RLS using standard criteria. Participants were allocated using the Convenient Sampling Technique and randomly assigned into Group 1 (Stretching Exercises) and Group 2 (Mulligan Traction SLR) through coin tossing. Each group consisted of 19 participants. The interventions were conducted three times per week for one month. Assessments were made using the RLS Severity Scale, Numeric Pain Rating Scale, Groningen Sleep Quality Scale, and Goniometer at baseline, and after the 2nd and 4th weeks of treatment.

Results: The study indicated that both treatments were effective in treating RLS, showing a significant difference with $p < 0.05$. However, Mulligan's TSLR exhibited remarkable results in improving sleep quality, increasing SLR range of both legs, reducing pain intensity, and improving RLS symptoms, with p -values of 0.001, 0.000, 0.012, and 0.001, respectively. Data analysis was conducted using the Statistical Package for Social Sciences (SPSS) version 26.

Conclusion: The study concluded that both Stretching Exercises and Mulligan's TSLR are effective treatments for RLS. However, Mulligan's TSLR showed superior effectiveness in reducing pain levels, RLS symptoms, and in improving sleep quality and SLR range among paramedical staff members.

Keywords: Restless Leg Syndrome, Paramedical Staff, Straight Leg Raise, Mulligan TSLR, Mobilization.

INTRODUCTION

Restless Leg Syndrome (RLS), also known as Willis-Ekbom Disease, is a neurological disorder characterized by an overwhelming urge to move the legs, often accompanied by unpleasant sensations like pulling, burning, and crawling. These symptoms typically worsen during periods of rest or at night, leading to disrupted sleep. RLS is especially prevalent among professions that require prolonged standing or sitting, such as paramedics, teachers, and office workers, affecting approximately 25% of paramedical staff. The discomfort experienced is often described as paresthesia, intensifying when lying or sitting (1).

The etiology of RLS is categorized into two types: primary and secondary. Primary RLS, also known as idiopathic RLS, has no known pathology and is differentiated from secondary RLS through normal laboratory and neurological tests. Secondary RLS is associated with medical conditions such as poly-neuropathy, anemia, uremia, pregnancy, and kidney failure (3).

RLS significantly impacts quality of life, increasing the prevalence of mental illnesses, reducing life expectancy, and leading to sleep disorders, cardiovascular risks, depression, anxiety, diminished work productivity, and social isolation. It is more common in women, with a community prevalence of 5-25%, and affects about 2% of children (3).

The detrimental health effects of RLS, including chronic insomnia and sleep apnea, result in average sleep durations of just five hours per night for sufferers. This lack of sleep contributes to daytime fatigue, work-related difficulties, lack of concentration, and disruptions in both personal and professional relationships, leading to depression. Early diagnosis and treatment can effectively mitigate these negative outcomes (4).

The International Restless Legs Syndrome Study Group (IRLSSG) established clinical diagnostic criteria in 1995, emphasizing the need for leg movement, relief of symptoms through motion, symptom exacerbation during inactivity, and worsening conditions in the evening and night (5).

For primary RLS, dopaminergic drugs are the first-line treatment, offering immediate symptom relief. In cases where these are ineffective, benzodiazepines or low doses of opioids may be used, although they carry risks of side effects like drowsiness and nausea. It's crucial that the benefits of these treatments outweigh their potential adverse effects and costs, as they provide symptomatic relief rather than a cure (4).

Non-pharmaceutical interventions, such as physical therapies like stretching exercises, aerobic activities, thermotherapy, cryotherapy, and traction straight leg raise, have shown promise in alleviating RLS symptoms without the associated side effects of drug treatments (4). However, there is a paucity of research on these non-pharmaceutical approaches, particularly in the realm of physical therapy, necessitating further investigation (6).

Recent studies have indicated that movement-based therapies, such as stretching exercises and Mulligan traction straight leg raise (TSLR), can be effective in reducing RLS symptoms (7). Such therapies, focusing on lifestyle modifications, particularly exercise, have become a point of interest as they seem to alleviate symptoms that manifest during rest and inactivity (8).

The Mulligan Traction Straight Leg Raise technique, in particular, is believed to influence central and peripheral neuronal pathways, thereby reducing RLS symptoms. This method involves hamstring stretch reflexes that modify descending supraspinal circuits and improve nerve mobility, previously shown to enhance straight leg raise hip range of motion in normal subjects (6).

In Pakistan, research on RLS among paramedical staff is limited, particularly regarding severity control. This study aims to fill this gap by comparing the effectiveness of two treatments: stretching exercises and Mulligan traction straight leg raise. By determining the most effective treatment, this research seeks to provide a better quality of life for paramedical professionals suffering from RLS.

MATERIAL AND METHODS

In this randomized clinical trial, 38 paramedical staff members, fitting the inclusion criteria of being aged 30-50 years, with a minimum of three years in the field, and suffering from primary Restless Leg Syndrome (RLS) with an RLS score greater than 10, were selected. They were not undergoing any other medical treatment for RLS. The study excluded individuals with secondary RLS, other comorbidities, a history of spinal surgery, lumbar spine fractures, or trauma. Participants were randomly assigned into two groups using a coin toss method, ensuring a non-probability convenient sampling.

Group 1 received a combination of thermotherapy and stretching exercises, while Group 2 was treated with thermotherapy and Mulligan Traction Straight Leg Raise (TSLR). The baseline treatment for both groups was thermotherapy. Each intervention was administered three times per week over a one-month period.

The International Restless Legs Syndrome Study Group (IRLSSG) criteria were employed for the diagnosis of RLS. To assess the severity of symptoms, tools such as the RLS Rating Scale, Numeric Pain Rating Scale, Groningen Sleep Quality Scale, and Goniometer for measuring the Straight Leg Raise range were utilized. Participants underwent evaluations at the outset, after two weeks, and again at four weeks of treatment. These assessments were conducted in the same setting as the initial measurements to ensure consistency.

For statistical analysis, the data was processed using the 26th version of the Statistical Package for Social Sciences (SPSS). The evaluations conducted at baseline, and after the second and fourth weeks, were compared within groups using repeated measures ANOVA. Additionally, a One Way ANOVA was applied to compare the outcomes between the two groups. This comprehensive methodology aimed to determine the effectiveness of each treatment approach in mitigating the symptoms of RLS among paramedical staff.

RESULTS

The descriptive analysis of the study's population revealed that 81.58% were women and 18.42% were men, encompassing a total of 100%. The participants, aged between 30 and 50 years, were distributed as follows: 7.9% between 30-33 years, 5.3% from 35-44 years, 2.6% within the 45-48 year range, and 23.7% under the age of 50.

In assessing the outcomes, the group statistics indicated that the Mulligan Traction Straight Leg Raise (TSLR) group had higher mean values compared to the Stretching Exercises group. The statistical analysis revealed a significant difference in both groups, as evidenced by a p-value of less than 0.05. Specifically, the mean values for the Group 2 (Mulligan TSLR) were higher than those for Group 1 (Stretching Exercises), suggesting a greater effectiveness of the Mulligan TSLR over Stretching Exercises.

Further analysis using the RLS Rating Scale, Groningen Sleep Quality Scale (GSQS), Numeric Pain Rating Scale (NPRS), and Straight Leg Raise (SLR) range demonstrated significant differences within both groups at all assessment levels (follow-ups), again with p-values less than 0.05. This indicates that both interventions were effective. Comparatively, the scores of the RLS Rating Scale, GSQS, NPRS, and SLR range also showed significant differences between the two groups at all assessment levels, due to p-values less than 0.05. These findings reveal that the mean values for the Mulligan TSLR group were consistently higher than those for the Stretching Exercises group, underscoring the superiority of the Mulligan TSLR in treating Restless Leg Syndrome among paramedics.

Table 1: Between Groups Comparison of Restless Leg Syndrome Rating Scale Assessment

Assessment	Groups	Means	Standard Deviation	Mean Difference	P-Value
Baseline Assessment	Stretching exercises	23.47	4.846	0.895	0.557
	Mulligans TSLR	24.37	4.437		
2 nd Assessment	Stretching exercises	14.95	4.007	2.105	0.079
	Mulligans TSLR	12.84	3.114		
3 rd Assessment	Stretching exercises	9.11	5.021	5.526	0.001
	Mulligans TSLR	3.58	4.032		

In table 1, the significant difference was found between both Groups at 2nd & 3rd assessment with p value of 0.079 and 0.001 ($p < 0.05$) and a mean difference of 2.105 and 5.526 respectively.

Table 2: Between Groups Comparison of Groningen Sleep Quality Scale

Assessment	Groups	Means	Standard Deviation	Mean Difference	P-Value
Baseline Assessment	Stretching exercises	11.11	2.622	0.526	0.566
	Mulligans TSLR	11.63	2.967		
2 nd Assessment	Stretching exercises	6.53	2.547	0.842	0.288
	Mulligans TSLR	5.68	2.262		
3 rd Assessment	Stretching exercises	4.00	2.687	2.737	0.001
	Mulligans TSLR	1.26	1.968		

Table 2 shows that, no significant difference was indicated for the GSQS between both groups on second assessment with p value of 0.288 ($p > 0.05$). At third assessment the significant difference was found between both Groups with p value of 0.001 ($p < 0.05$) and a mean difference of 2.737.

Table 3: Between Groups Comparison of Numeric Pain Rating Scale Assessment

Assessment	Groups	Means	Standard Deviation	Mean Difference	P-Value
Baseline Assessment	Stretching exercises	6.84	1.214	0.211	0.617
	Mulligans TSLR	7.05	1.353		
2 nd Assessment	Stretching exercises	4.37	1.012	0.211	0.514
	Mulligans TSLR	4.16	0.958		
3 rd Assessment	Stretching exercises	2.21	1.084	1.053	0.012

	Mulligans TSLR	1.16	1.344		
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Table 3 shows that, no significant difference found for the NPRS between Group 1 and 2 on second assessment with p value of 0.514 ($p > 0.05$). At third assessment the significant difference was found between both Groups with p value of 0.012 ($p < 0.05$) and a mean difference of 1.053.

Table 4: Between Groups Comparison of Goniometer Assessment Left leg SLR Range

Assessment	Groups	Means	Standard Deviation	Mean Difference	P-Value
Baseline Assessment	Stretching exercises	44.74	8.020	1.158	0.736
	Mulligans TSLR	45.89	12.503		
2 nd Assessment	Stretching exercises	57.42	9.605	7.053	0.018
	Mulligans TSLR	64.47	7.926		
3 rd Assessment	Stretching exercises	70.74	11.264	16.000	0.00
	Mulligans TSLR	86.74	4.724		

Table 4 shows that after 2nd and 3rd assessment the significant difference was found with p value of 0.018 and 0.000 ($p < 0.05$) with mean difference of 7.053 and 16.00 respectively.

Table 5: Between Groups Comparison of Goniometer Assessment Right leg SLR Range

Assessment	Groups	Means	Standard Deviation	Mean Difference	P-Value
Baseline Assessment	Stretching exercises	40.47	10.997	6.579	0.078
	Mulligans TSLR	47.05	11.341		
2 nd Assessment	Stretching exercises	57.21	8.489	8.474	0.007
	Mulligans TSLR	65.68	9.770		
3 rd Assessment	Stretching exercises	71.32	11.156	15.211	0.000
	Mulligans TSLR	86.53	6.050		

Table 5 shows that, there was a significant difference was found between both groups after 2nd and 3rd assessment with p value of 0.007 and 0.00 ($p < 0.05$) and a mean difference of 8.474 and 15.211 respectively.

DISCUSSION

The primary objective of this study was to evaluate the comparative effectiveness of Stretching Exercises and Mulligan's Traction Straight Leg Raise (TSLR) in alleviating symptoms of Restless Leg Syndrome (RLS) among paramedical staff. This included assessing improvements in pain reduction, sleep quality, range of motion (ROM), and alleviation of restlessness. A total of 38 subjects diagnosed with RLS were randomly divided into two groups, with Group 1 receiving Stretching Exercises and Group 2 undergoing Mulligan's TSLR. Both groups were provided with thermotherapy as a baseline treatment. Assessments conducted before the intervention, and subsequently at the second and fourth weeks, showed significant improvements in both groups. However, the Mulligan's TSLR group exhibited more pronounced improvements in reducing RLS symptoms, pain intensity, enhancing ROM, and improving sleep quality compared to the Stretching Exercises group.

Previous research has indicated that nearly 25% of paramedical staff members suffer from RLS, a condition often linked to the shift work commonly experienced in healthcare settings (9). Studies have also shown that RLS prevalence increases with age and is more common in women (10). Past studies have highlighted the efficacy of Mulligan's TSLR in reducing RLS symptoms (11, 12), pain levels (13, 14), and improving ROM (15). Similarly, stretching exercises have been proven effective in reducing RLS symptoms (16), pain levels (17), and improving sleep quality (18) and ROM (19, 20).

In this study, both interventions yielded a significant reduction in RLS symptom severity and pain levels, along with improvements in sleep quality and ROM. However, Mulligan's TSLR demonstrated more substantial results in treating RLS among paramedics than Stretching Exercises.

The study, while insightful, does have certain limitations. The research was conducted within a limited clinical setting, which may not fully represent the wider paramedic population. The age range of the participants was confined to 30-50 years. Including a broader age range could potentially yield different results. Furthermore, focusing solely on paramedics may limit the applicability of the findings to other populations.

While both Mulligan's TSLR and Stretching Exercises were effective in treating RLS symptoms among paramedics, Mulligan's TSLR showed greater efficacy in all measured outcomes. Future research could benefit from a more diverse sample, both in terms of age and professional background, to further validate and expand upon these findings.

CONCLUSION

In this randomized clinical trial, it was heartening to find that both Stretching Exercises and Mulligan's Traction Straight Leg Raise (TSLR) stood out as effective, accessible, and affordable non-pharmacological treatments for Restless Leg Syndrome. Significantly, Mulligan's TSLR emerged as the more impactful approach, excelling in reducing pain levels, alleviating RLS symptoms, and enhancing sleep quality and range of motion for the paramedical staff members involved in the study. This finding underscores the potential of targeted physical therapies in providing relief and improving the quality of life for those suffering from this challenging condition.

REFERENCES

1. Kamble PA, Jadhav A, Yadav T, Chotai K. Effect of Mulligan's traction straight leg raise in nurses with restless leg syndrome. *Int J Health Sci Res.* 2019;9(9):296-300.
2. Ameri M, Mirhosseini S, Basirinezhad MH, Ebrahimi H. Prevalence of Restless Legs Syndrome and Its Relationship with Fatigue in Critical Care Nurses. *Indian J Crit Care Med.* 2021;25(11):1275-9.
3. Jafarimanesh H, Vakilian K, Mobasseri S. Thermo-therapy and cryotherapy to decrease the symptoms of restless leg syndrome during the pregnancy: A randomized clinical trial. *Complement Ther Med.* 2020;50:102409.
4. Giannaki CD, Hadjigeorgiou GM, Karatzaferi C, Maridaki MD, Koutedakis Y, Founta P, et al. A single-blind randomized controlled trial to evaluate the effect of 6 months of progressive aerobic exercise training in patients with uraemic restless legs syndrome. *Nephrol Dial Transplant.* 2013;28(11):2834-40.
5. Nagandla K, De S. Restless legs syndrome: pathophysiology and modern management. *Postgrad Med J.* 2013;89(1053):402-10.
6. Dinkins EM, Stevens-Lapsley J. Management of symptoms of Restless Legs Syndrome with use of a traction straight leg raise: a preliminary case series. *Man Ther.* 2013;18(4):299-302.
7. Shahgholian N, Jazi SK, Karimian J, Valiani M. The effects of two methods of reflexology and stretching exercises on the severity of restless leg syndrome among hemodialysis patients. *Iran J Nurs Midwifery Res.* 2016;21(3):219-24.
8. Aliasgharpour M, Abbasi Z, Pedram Razi S, Kazemnezhad A. The Effect of Stretching Exercises on Severity of Restless Legs Syndrome in Patients on Hemodialysis. *Asian J Sports Med.* 2016;7(2):e31001.
9. Ameri M, Ebrahimi H, Khosravi A, Mirhosseini S, Khatibi MR. Effect of Local Warm Compression on Restless Leg Syndrome and Fatigue among Critical Care Nurses: A Parallel Randomized Clinical Trial. *Critical care research and practice.* 2022;2022.
10. Allen RP, Walters AS, Montplaisir J, Hening W, Myers A, Bell TJ, et al. Restless legs syndrome prevalence and impact: REST general population study. *Archives of internal medicine.* 2005;165(11):1286-92.
11. Kamble PA, Jadhav AS, Yadav T, Chotai K. Effect of Mulligan's traction straight leg raise in nurses with restless leg syndrome. *Int J Health Sci Res.* 2019;9(9):296-300.
12. Fatima A, Mehmood Z, Ahmad S. Effects of Mulligan Traction Straight Leg Raise Versus Passive Straight Leg Raise in Lumbar Radiculopathy Patients. *Journal of Islamic International Medical College (JIIMC).* 2022;17(2):86-90.
13. Çoban Ö, Ün Yıldırım N, Yaşa ME, Sonkaya AR. Effects of Different Exercise Programs on Symptoms, Sleep, and Quality of Life in Patients with Primary Restless Legs Syndrome. *Movement Disorders Clinical Practice.* 2023;10(9):1349-59.
14. Ameri M, Mirhosseini S, Basirinezhad MH, Ebrahimi H. Prevalence of restless legs syndrome and its relationship with fatigue in critical care nurses. *Indian Journal of Critical Care Medicine: Peer-reviewed, Official Publication of Indian Society of Critical Care Medicine.* 2021;25(11):1275.
15. Ergin N, Kılıç BB, Ergin A, Varlı S. Sleep quality and related factors including restless leg syndrome in medical students and residents in a Turkish university. *Sleep and Breathing.* 2022;26(3):1299-307.
16. Fauzi A, Triaswati R. The effect of intradialytic stretching training on restless legs syndrome and sleep quality in hemodialysis patients. *Korean Journal of Adult Nursing.* 2021;33(1):37-43.
17. Aliasgharpour M, Abbasi Z, Razi SP, Kazemnezhad A. The effect of stretching exercises on severity of restless legs syndrome in patients on hemodialysis. *Asian journal of sports medicine.* 2016;7(2).
18. Shamekh AH, Hassan NZ, Rashwan ZI, Fathalla NF. Effect of stretching exercises versus thermotherapy on restless legs syndrome symptoms, pain, and quality of sleep among pregnant women. *International Journal of Health Sciences.* 2022;6(S6):11204-20.

19. Pawar AH, Metgud S. Comparative effectiveness of Mulligan's traction straight leg raise and bent leg raise in low back ache with radiculopathy—a randomized clinical trial: Citeseer; 2010.
20. Hall T, Cacho A, McNee C, Riches J, Walsh J. Effects of the Mulligan traction straight leg raise technique on range of movement. *Journal of Manual & Manipulative Therapy*. 2001;9(3):128-33.