

IMMEDIATE EFFECT OF STATIC STRETCHING WITH KINESIO TAPING Vs MUSCLE ENERGY TECHNIQUE ON HAMSTRING FLEXIBILITY IN YOUNG ADULTS WITH SEDENTARY LIFESTYLE

¹Dr.Archana Ajit Sapte (PT), ²Dr Shweta Suresh Madake(PT).

¹Associate Professor Housabai college of Physiotherapy, Nimshirgaon ,Maharashtra ²Associate Professor Wanless college of Physiotherapy Miraj, Maharashtra

¹Housabai college of Physiotherapy, Nimshirgaon , Maharashtra, India

ABSTRACT

Background: Prolonged sitting has been identified as a potential risk factor for developing hamstring muscle tightness. Sitting for six to eight hours can lead to degenerative and atrophic changes in hamstring tissue, resulting in shortening, tightness, and reduced flexibility.

Aim: To investigate the immediate effect of static stretching combined with kinesio taping vs Muscle energy technique on hamstring flexibility in young adults with sedentary lifestyles.

Methodology: This study included 120 sedentary young adults, age 18-30 yrs participants were randomly divided into two groups, each group contains 60 participants. Group A static stretching with kinesiotaping & Group B administered only MET. Participants with hamstring tightness, assessed using the passive knee extension test, were recruited. All subjects were briefed about the study and intervention, and informed consent was obtained. Pre- and post-treatment outcome measures included the passive knee extension test and the Numeric Pain Rating Scale (NPRS). A universal goniometer was used to measure range of motion.

Results: The findings demonstrated that both static stretching combined with kinesio taping & MET produced greater improvements in hamstring flexibility among sedentary young adults.

Conclusion: Static stretching with kinesio taping & MET effective in improving hamstring flexibility. The techniques are simple, easy to apply, and can be clinically implemented to address hamstring tightness in sedentary populations.

Keywords: hamstring tightness, static stretching, kinesio taping, muscle energy technique

INTRODUCTION

The hamstring muscles originate from the pelvis and play a crucial role in pelvic and lumbar vertebral movements. When shortened, these muscles can alter pelvic and lower back mechanics during functional activities. Muscle tightness occurs due to reduced tissue extensibility, leading to decreased joint range of motion. Hamstrings are particularly susceptible to tightness, which can restrict knee joint mobility and impair functional performance. Several factors, including prolonged sitting and sedentary behavior, contribute to hamstring shortening and tightness, making flexibility interventions essential for maintaining musculoskeletal health. If the hamstring muscles are unable to achieve knee extension beyond 160 degrees while the hip is flexed at 90 degrees, this condition is defined as hamstring tightness (Jabbar et al., 2021). Hamstrings are a group of muscles in which flexibility inhibition is commonly observed in both the general and athletic populations (Yadav et al., 2020). Tight hamstring muscles can restrict anterior pelvic tilt during forward bending, thereby increasing stress on the muscles and ligaments of the lumbar region. Consequently, hamstring tightness may serve as a risk factor for the development of low back pain and other postural alterations (Fatima et al., 2021). Hamstring tightness is commonly observed in individuals who spend long hours working at office desks. The findings of this study may contribute to the prevention of work-related musculoskeletal problems by highlighting the importance of maintaining adequate muscular flexibility. Additionally, the study aims to raise awareness about the lack of normal flexibility among desk job employees.

Static Stretching

Static stretching is a widely used technique that involves elongating soft tissues just beyond their point of resistance and maintaining the extended posture for a period of time with a constant stretch force. For many years, static stretching has been considered a safer alternative to ballistic stretching and is recognized as an effective method to improve flexibility. It remains the most common intervention to enhance muscular flexibility and range of motion, predominantly employed to lengthen muscles. Hamstring muscle length is typically measured using the ankle–knee extension test.

Kinesio Taping

According to Kase, Kinesio taping is a structured wrapping method that utilizes elastic Kinesio tape to prevent sports injuries and reduce discomfort, oedema, and muscle spasms. The tape is thin and elastic, capable of stretching to 120–140% of its original length, thereby minimizing mechanical restrictions compared to traditional rigid tape. Kinesio taping is frequently applied to athletes as a preventive measure against injuries. In this study, the effects of different taping techniques on hamstring flexibility were evaluated. Specifically, the biceps femoris was taped using two approaches: (1) application without stress, and (2) inhibition of the muscle. Muscle energy technique MET involves the patient actively contracting particular muscle against a precise clinician-controlled counterforce, the exercise is followed by passive stretching & rest. MET involves patients voluntary contraction of their muscle at

different intensities in a precisely controlled direction. It is used to promote circulation, strengthen & lengthen muscles, reduce oedema. It has been shown that MET works better than static stretching to increase flexibility of shortened muscle.

Passive Knee Extension

The Passive Knee Extension Test (PKET) is used to assess joint range of motion and the quality of movement, particularly end-feel characteristics. Additionally, the test serves as a measure of hamstring muscle tightness. Assessing hamstring flexibility is clinically significant both for predicting the outcomes of hamstring injuries and for monitoring recovery.

MATERIALS & METHODOLOGY

Inclusion criteria –

18-30 years young desk work people with hamstring tightness & without any past hamstring injury

Both male & female population included in the study

Exclusion criteria –

Past hamstring injury

Skin allergy, sensitivity & any H/o nerve injury

Material used-

Pen, Paper, Consent form, Universal goniometer, Kinesio tape, Sanitizer, Gloves

Outcome measure –

Passive knee extension test

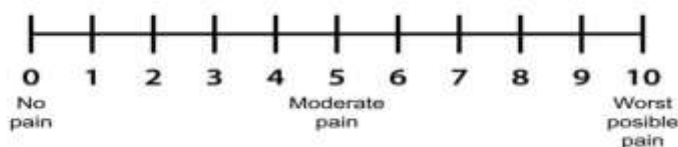
Reliability (ICC – 0.97-0.98)

Position of patient is spine lying Procedure: The patient is lying down with the hip of the leg being evaluated at a 90-degree angle. On the exam table, the opposing leg remains flat. With the patient's ipsilateral hip still in 90 degrees of flexion, the physician extends the knee until the hamstring muscle reaches the maximum allowable strain. After that, a goniometer is used to measure the knee angle. Goniometer Placement: The fulcrum is placed on lateral epicondyle of femur. The moving arm pointed towards the lateral malleolus and the stationary arm is pointed toward to the greater trochanter.

Numerical Pain Rating Scale-

Reliability [ICC: 0.80 -0.95]

Rate your pain by choosing the number that best describes your pain:



PROTOCOL

All the subjects participated voluntarily and explained about study procedure prior to the start of the study. An informed consent was obtained from all the participants.

All the participants were well explained about study procedures and any questions or concerns have been addressed.

In this study among 120 participants randomly, 60 subjects selected and were given static stretching with Kinesio taping (Group A) and other 60 were given MET (Group B)

STATIC STRETCHING: The Passive Static Stretching was used to assist "Group A."• Position of Subject: Lie on the back. Standing by the bedside is the therapist's position. Method: The individual was urged to lie down on a bed and unwind completely. Up until the subject's hamstring muscle could tolerate further stretching, the therapist himself flexed their hip and extended their knee. With one leg fully extended on the bed while the test was being conducted on another, the therapist held this position for at least 30 seconds before placing the tested leg back on the bed. Three times every 30 seconds is the treatment frequency per day. Duration of treatment: one session.

KINESIO TAPING: The participants were in a standing position with their trunk bent and their knee extended. KT with a width of 5 cm was given to the hamstring muscles using the fascia technique, from the ischial tuberosity to the back of the knee with 25% tension. After that, the medial and lateral sides of the knee were wrapped with the Y-shaped tape. Every day for four weeks, the participants' right extremity hamstrings were stretched using the PNF technique's "contract-relax" method.

STATISTICAL ANALYSIS

Normality test using Shapiro -wilk

outcome measures	Time frame	Group A z value	Group A p value	Group B z value	Group B p value
PKET (RT)	Pre	0.862	0.001	0.887	0.001
	Post	0.914	0.001	0.996	0.001
PKET (LT)	Pre	0.911	0.001	0.913	0.001
	Post	0.916	0.001	0.903	0.001
NPRS (RT)	Pre	0.883	0.001	0.888	0.001
	Post	0.855	0.001	0.847	0.001
NPRS (LT)	Pre	0.867	0.001	0.884	0.001
	Post	0.845	0.001	0.835	0.001

TABLE NO 1- shows the mean ,standard deviation ,z-value ,p-value of both outcome measures between both groups pre and post test respectively.

Group	Gender		Total participated subjects
	male	Female	
A	25	35	60
B	20	40	60

TABLE NO 2- shows gender wise distribution in both the groups

DISCUSSION

The focus of this study was to compare the effect of static stretching with Kinesio taping versus muscle energy technique (MET) on hamstring flexibility in sedentary young adults. The results of the present study indicate that hamstring flexibility improved in both groups following intervention.

Manual treatment such as MET utilizes the muscles' own energy in the form of mild isometric contractions, employing autogenic or reciprocal inhibition to stretch and relax the muscles. Static stretching, on the other hand, is a passive approach where the therapist applies the force, while MET requires active patient participation. This distinction highlights the neuromuscular activation component of MET, which may contribute to longer-lasting flexibility gains compared to static stretching.

Previous studies have suggested that connective tissue exhibits both elastic and viscous properties, with creep representing the temporary lengthening of tissue during stretching. The increased flexibility observed after MET may therefore be attributed to biomechanical changes, neurophysiological adaptations, or enhanced stretch tolerance MET is also thought to improve joint mobility in addition to muscular flexibility by requiring active contraction against controlled resistance.

Static stretching activates the Golgi tendon organ, reducing muscle tension and allowing elongation of the parallel elastic component. However, participants with low pain thresholds often reported discomfort during static stretching, whereas those undergoing MET experienced fewer complaints. This may be due to the lower contraction force and increased range achieved with MET, resulting in less intrinsic stress on the muscle.

Kinesio taping (KT) was applied in this study to further enhance outcomes. KT elevates the skin, increases blood and lymphatic flow, and activates cutaneous mechanoreceptors, thereby improving muscle function and range of motion. Over the four-week application period, KT contributed to reduced hamstring tightness and improved active knee extension. While short-term stretching does not alter the viscoelastic structure of muscle, it improves tolerance and reduces central neuromuscular inhibition, leading to better flexibility when practiced regularly.

Overall, both static stretching with Kinesio taping and MET were effective in improving hamstring flexibility. However, MET demonstrated greater effectiveness in achieving improvements within a shorter duration, particularly among individuals with lower pain thresholds.

CONCLUSION

It was concluded that both static stretching with Kinesio taping and muscle energy technique (MET) are effective in improving knee range of motion (ROM) and reducing hamstring tightness among Sedentary lifestyle young people. However, muscle energy technique proved to be more effective than static stretching, achieving improvements in a shorter duration and with greater efficiency.

LIMITATION

Regular follow-ups could have provided deeper insights into immediate and progressive changes. Due to time constraints and the availability of the population, consistent follow-ups were not possible, which limited the scope of observation.

FUTURE SCOPE

1. Studies can be extended to varied sedentary life populations to analyze whether similar outcomes are observed across different age group and their demands.
2. Long-term effects of these interventions can be monitored to better understand their sustained impact and to aid in the development of more comprehensive rehabilitation protocols.

REFERENCES

1. Standingr SGH. Gray's anatomy: the anatomical basis of clinical practice. Churchill Livingstone/Elsevier. 2008.
2. Kisner C, Colby LA, Borstad J. Preface to the Seventh Edition, in Therapeutic Exercise: Foundations and Techniques. McGraw-Hill Education: New York, NY. 2018;7e.

- 3.Koli BK, Anap DB. Prevalence and severity of hamstring tightness among college student: A cross sectional study. *Int J Clin Biomed Res.* 2018;65-8.
- 4.Tamang V. Comparative Analysis of Immediate Effects of Static Stretch and Muscle Energy Technique in Hamstring Flexibility in Collegiate of Ziro (Arunachal Pradesh).
5. Coskunsu DK, Mutlu EK, Ozdincler AR. Proprioceptive neuromuscular facilitation stretching combined with Kinesio taping for hamstring flexibility in amateur athletes: a single-blind, randomized, controlled trial. *Physiotherapy Quarterly.* 2021 Jul 1;29(3):56-61.
6. From Delee JC, Drez D Jr: *Orthopaedic Sports Medicine: Principle and Practice* . Philadelphia, WB Saunders, 1994 [478-479 (7)]
- 7.Krohn K, Castro D, Kling J. The effects of kinesio tape on hamstring flexibility Washington DC, America. 2011 Oct 10.
8. Kisner, Carolyn. *Therapeutic exercise: Foundation and techniques* / Carolyn Kisner, Lynn Allen Colby.--6th ed. P. ; cm. [87-88 (4)]
9. Fu, T.C., Wong, A.M., Pei, Y.C., Wu, K.P., Chou, S.W. and Lin, Y.C., 2008. Effect of Kinesio taping on muscle strength in athletes—a pilot study. *Journal of science and medicine in sport*, 11(2), pp.198-201.
- 10.Koli BK, Anap DB. Prevalence and severity of hamstring tightness among college student: A cross sectional study. *International Journal of Clinical and Biomedical Research.* 2018 Apr 15:65-8
- 11.Demir E, Yağcı N. The effects of kinesio tape and stretching on hamstring muscles flexibility. *JOURNAL OF CLINICAL AND ANALYTICAL MEDICINE.* 2019.
12. Adkitte R, Rane SG, Yeole U, Nandi B, Gawali P. Effect of muscle energy technique on flexibility of hamstring muscle in Indian national football players. *Saudi Journal of Sports Medicine.* 2016 Jan 1;16(1):28-31
- 13.Fredriksen,H., Dagfinrud, H., Jacobsen, v., & Maehlum, s. (2007). Passive knee extension test to measure hamstring muscle tightness . *Scandinavian journal of Medicine & Science in Sports*,1997; 7(5), 279-282.
14. Modarresi S, Lukacs MJ, Ghodrati M, Salim S, MacDermid JC, Walton DM. A systematic review and synthesis of psychometric properties of the numeric pain rating scale and the visual analog scale for use in people with neck pain. *The Clinical Journal of Pain.* 2022 Feb 1;38(2):132-48.
- 15.Weerasekara I, Kumari HM, Withanage GW, Weeraratna LR, Wanniarachchi CD, Yancy M, Viganeshwaran S, Priyanthi S, Suraweera HJ. The prevalence of hamstring tightness among the male athletes of University of Peradeniya in 2010. *Journal of SLSAJ.* 2012;12:56-8.
- 16.Ahmad F, Irfan A, Samad M, Sattar M, Shehzadi M, Atif A. The effects of static stretching and muscle energy technique (MET) for young adults with hamstring tightness. *Journal of Health and Rehabilitation Research.* 2023 Dec 31;3(2):1161-6.
- 17.Kumar GM, Rajalaxmi V, SENTHIL NATHAN CV, Ramachandran S, Kirthika V, Sudhakar S, Padmanabhan K, Yuvarani G. Comparative Efficiency of Muscle Energy Technique and Static Stretching in Enhancing Triceps Surae Flexibility. *Journal of Clinical & Diagnostic Research.* 2018 Aug 1;12(8).
- 18.Waseem M, Nuhmani S, Ram CS. Efficacy of Muscle Energy Technique on hamstring muscles flexibility in normal Indian collegiate males. *Calicut medical journal.* 2009;7(2):e4.
- 19.Biswas S, Alagingi NK. Compare the effectiveness of static stretching and muscle energy technique on hamstring tightness among student population. *Compare.* 2018 Mar;3(2).
20. Kase K. Clinical therapeutic applications of the Kinesio (R) taping method. Albuquerque.

Copyright & License:



© Authors retain the copyright of this article. This work is published under the Creative Commons Attribution 4.0 International License (CC BY 4.0), permitting unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.