



TO STUDY THE IMMEDIATE EFFECTS OF DYNAMIC STRETCHING V/S DYNAMIC STRETCHING AND KINESIO TAPING IN MARATHON RUNNERS WITH SHIN SPLINTS: A COMPARATIVE STUDY

Physiotherapy

Manasi Bhutani* Physiotherapy Intern, K J Somaiya College of Physiotherapy. *Corresponding Author

Tanvi Patole Assistant Professor, K J Somaiya College of Physiotherapy.

ABSTRACT

Background: The number of people is now becoming extremely health conscious hence taking up activities like marathons, sprinting and other forms of exercises to fulfil recreational and fitness needs. With an increasing number of sprinters chances of developing shin splints become higher. Warm ups, stretching and kinesio taping are great preventive measures and treatment protocols. **Methodology:** Group A received dynamic stretching and group B received dynamic stretching and kinesio taping. Outcome measures were time taken in seconds and pain intensity using Numerical Pain Rating Scale (NRS). **Conclusion:** Dynamic stretching along with Kinesio taping resulted in greater improvement in the 30-meter running time as compared to just dynamic stretching.

KEYWORDS

Dynamic Stretching, Kinesio Taping, Runners, Marathon Runners

INTRODUCTION

Running is a sport that has recently gained a lot of attention because of the rising awareness about health and fitness. In India, marathon running is one of the recreational sports, enjoyed by all the age groups. ⁽¹⁾ In the year 2019, the professional marathon runners in Mumbai increased by 22%. ⁽²⁾ Running improves quality of life and adds to the length of life. However, certain negative consequences are associated with running. ⁽²⁾

Most common injuries that occur due to running are overuse injuries, which involve knee, foot and the Tendo Achilles. Patellofemoral pain, muscle strains, joint sprains, tendinopathies and plantar fasciitis are common injuries amongst long distance runners. Repeated micro traumas and tears cause immense pain - Shin splints being the most common of them all. ⁽¹⁾ Pain along the shin (most commonly medial border of the tibia) due to inflammation of the tissue in that area is known as Shin Splint. There is pain associated with tenderness on palpation of the tibialis posterior muscle as well as the soleus muscle. The pain may be dull or sharp depending on how chronic it is, and tends to increase more with physical activity. ⁽²⁾

This can be treated with icing and rest. Relieving the tenderness proves to be relieving in such participants ⁽³⁾ Shin splints can also be caused by – training surfaces, improper training techniques, wrong footwear and less padding in the footwear. ⁽⁴⁾ However, using these techniques increases the time of recovery and affects the sportsmen's performance in the long run. Thus, using techniques like warm ups and stretching protocols can help avoid shin splints.

Warm ups increase the blood flow to the extremities, improves range of motion at the crucial joints before exercising, gradually increase the heart rate, blood pressure and core temperature. Warming up and stretching also make the soft tissues pliable, thus reducing the chances of injuries. ⁽²⁾ Warming up and stretching are two crucial preventive measures for individuals for beginners and long-time runners. Warming up and stretching, decreases chances of injuries. ⁽¹⁾ Shin splint treatment protocol includes two of the most common stretches that are the hamstring stretch which can either be done in long sitting or standing. TA stretch is done generally using the wall support. Dynamic stretching with 10 counts and 3 repetition is the most common prescription for such individuals. ⁽³⁾

Kinesio taping has recently gained popularity in shin splints amongst runners. Studies ⁽⁵⁾ have shown to improve pain (via the pain gate mechanism) and performance by reducing the load on the shin and the muscles around it. Using the facilitation technique of kinesio taping, the physical therapist can facilitate the muscles causing plantar and dorsiflexion. It also provides some offloading and reduced pain during running activity. ⁽⁶⁾ Thus, dynamic stretching and kinesio taping add to an effective treatment protocol for patients who are suffering from shin splints. Therefore, the aim of this study was to compare dynamic stretching vs dynamic stretching and kinesio taping in marathon runners with shin splints.

METHODOLOGY:

Approval was obtained from the institutional review board. Sample size for the research was 98, obtained using OpenEpi version 3. The mean +/- SD for dynamic stretching and kinesio taping was 3 +/- 1.2 (Anticipated) and 3.8 +/- 1.58 (from MTSS article). It was calculated using 95% confidence level and power of the study was 80. Males and Female marathon runners between the age groups of 18-25 years suffering from shin splints for less than 2 weeks and willing to participate were included in this study. Subjects suffering from other musculoskeletal problems like knee pain, back pain, ankle sprain or fractures, any neurological disorders, who were previously cured of shin splints and/or taking intervention for the same were excluded. Consent was taken and 98 subjects were divided into 2 groups using a computerized randomization sheet. The participants were then asked to run on a plain, flat surface that was 30 meter long with their maximum speed and the time taken to do so was calculated in seconds. The participants were then given a 30 seconds break after which both group A and B were asked to follow the dynamic stretching protocol for calves and hamstrings for 30 seconds long stretch with 10 repetitions. and Kinesio tape using the facilitation method was applied to those participants who were in Group B. The participants were then asked to run again on the same plain, flat surface that was 30 meters long with their maximum speed and time was calculated in seconds. Time difference was then observed and calculated to finally conclude if/whether there is a difference between the two groups.

RESULTS:

Baseline was assessed and data was analyzed using Data was analyzed using GraphPad Instat software version 3.10. Paired T test was used to compare the time in seconds between the two groups (group A – dynamic stretching only and group B- dynamic stretching and kinesio taping)

Table – 1 Pre And Post Time And Nrs In Group A And Group B

	Group A		NRS (pain)	
	Pre	Post	Pre	Post
Mean	5.47	5.45	5.52	4.5
SD	1.51	1.5	1.36	1.62
P value		0.05		<0.0001
Significance	Significant		Significant	
	Group B		NRS (pain)	
	Pre	Post	Pre	Post
Mean	5.15	5.08	5.83	4.57
SD	1.24	1.24	1.56	1.62
P value		0.0003		<0.0001
Significance	Significant		Significant	

Table – 2 Pre And Post Time Difference And Nrs Difference In Group A And Group B

	Time Difference Pre and Post		NRS difference Pre and Post	
	Group A	Group B	Group A	Group B
Mean	0.014	0.066	1	1.28
SD	0.0339	0.0773	0.7638	0.6137
P value	0.0115	<0.0001	0.003	<0.0001
Significance	Significant		Not Significant	

DISCUSSION

This study was conducted to compare the immediate effects of dynamic stretching in 49 marathon runners with shin splints as Group A vs dynamic stretching and kinesio taping in 49 marathon runners with shin splints as Group B. It was found that there was significant difference in pre and post timings and pain scale (on NRS) of the marathon runners when they're given both dynamic stretching vs dynamic stretching and kinesio taping individually within groups and a significant difference in time intervals between the two groups. However, there was no significant difference in the pain scale (NRS) between the groups.

Marathon runners with shin splints were randomly allotted to Group A and Group B. They were taught self-dynamic stretching for hamstring and gastroc soleus muscles. These muscles form an important part of the lower extremity kinetic chain. Any tightness in these muscle groups affects the kinetic chain and range of motion. Thus, increasing the risk of injury. Dynamic stretching increased the flexibility and alignment of the lower limb. ⁽⁷⁾ There was a significant difference between pre and post running timings and pain intensity in marathon runners after they practiced dynamic stretching. M Kovac in his study ⁽⁸⁾ advocated the use of dynamic stretching as a warm up protocol that improved power, range of motion and hence the performance of those individuals. He also mentioned that an athlete's range of motion is improved by dynamic stretching as compared to static stretching.

Participants in group B received Kinesio taping along with dynamic stretching. There was a significant improvement in running time and pain intensity between pre and post intervention. These results could be attributed to the effect of Kinesio taping. It reduces overloading and stress on the muscles during running. This causes an offloading effect on the lower extremity kinetic chain. This mechanism has contributed to reduction in pain among the marathon runners. ^(5,6) This added to the overall outcome. Maggie C's study ⁽⁶⁾ on 20 individuals with Medial tibial stress syndrome proved that Kinesio taping significantly increased the time-to-peak force after application. She also stated that kinesio tape decreased the rate of mechanical loading on shin splints.

In Group B, Dynamic stretching along with Kinesio taping gave an additive effect on the runners with shin splints. This caused a greater improvement in running time interval between the pre and post readings of this group as compared to Group 1. Study by T Fadaei ⁽⁹⁾ stated that Kinesio taping improved lower extremity function and reduced pain in athletes with shin splints. However, in his study, results stated that the decrease in pain was only for 24 hours after the application of tape. Thus, the additive effect of dynamic stretching and kinesio taping provided a better outcome as compared to dynamic stretching alone.

The limitation of the study was subjects recruited in the study had variable experience in running. Therefore, in the future it can be performed on participants with the same experience in the running time period.

CONCLUSIONS

There was a significant improvement in pre and post running timings and pain intensity within the groups. A significant improvement was also noted in pre and post running time differences between the two groups. However, there was no significant difference in the pre and post pain intensity between the two groups. Dynamic stretching along with Kinesio taping resulted in greater improvement in the 30-meter running time as compared to just dynamic stretching.

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