

INTERNATIONAL GRADUATE COLLOQUIUM

i-SPEAK **2026**

**SPORTS AND PHYSICAL EXERCISE
ASSEMBLY OF KNOWLEDGE SHARING**

SERIES 1. 2026

COLLOQUIUM PROCEEDINGS

EXTENDED ABSTRACT



Malaysia, 10 February 2026



eISBN 978-629-7989-01-3



Comparison of Massage Gun Therapy and PNF Stretching on Agility and Flexibility Among University-Level Athletes

Mohamad Khairulazeem Mamat^{1*}

¹Faculty of Sports Science and Recreation, Universiti Teknologi MARA Negeri Sembilan, Seremban Campus, Malaysia

*Corresponding author: ajim.46mat@gmail.com

Keywords: Massage Gun, PNF Stretching, Agility, Flexibility

I. INTRODUCTION

Agility and flexibility are essential for athletes, especially in sports that require rapid changes of direction and full range of motion. While PNF stretching has been widely used to improve flexibility, the effects of massage gun therapy on both agility and flexibility remain underexplored. This study aimed to compare the effects of massage gun therapy and PNF stretching on agility and flexibility among university athletes.

II. METHODS

A total of 42 university athletes participated in the study, with 21 athletes assigned to each group. The massage gun therapy group received treatment using a massage gun applied to major lower-body muscle groups for 2 minutes per group, three times per week over six weeks. The PNF stretching group performed hold-relax stretching on the same muscle groups for 30 seconds per stretch, three times per week for six weeks. Agility was assessed using the T-Test, and flexibility was evaluated using the Sit-and-Reach Test. All measurements were taken before and after the intervention.

III. RESULTS AND DISCUSSION

Both groups showed significant improvements in agility and flexibility ($p < .001$). The massage gun therapy group showed an 18.0% improvement in agility, from 13.3 $\pm$ 0.81 s to 10.9 $\pm$ 0.84 s, and a 6.6% increase in flexibility, from 42.6 $\pm$ 7.17 cm to 45.4 $\pm$ 6.65 cm. The PNF stretching group showed a 17.4% improvement in agility, from 13.2 $\pm$ 0.82 s to 10.9 $\pm$ 0.81 s, and a 10.6% improvement in flexibility, from 42.4 $\pm$ 7.21 cm to 46.9 $\pm$ 6.51 cm. Between-group comparisons revealed that the massage gun therapy group showed significantly greater improvement in agility ($p < .001$), while flexibility improvements were similar between groups ($p = .450$).

TABLE I
SUMMARY OF PRE-TEST AND POST-TEST

Test	Group	Pre-Test Mean $\pm$ SD	Post-Test Mean $\pm$ SD	% Improvement
Agility t-test (s)	Massage Gun Group	13.3 $\pm$ 0.81	10.9 $\pm$ 0.84	18.0%
	PNF Stretching Group	13.2 $\pm$ 0.82	10.9 $\pm$ 0.81	17.4%
Sit-and-Reach (cm)	Massage Gun Group	42.6 $\pm$ 7.17	45.4 $\pm$ 6.65	6.6%
	PNF Stretching Group	42.4 $\pm$ 7.21	46.9 $\pm$ 6.51	10.6%

TABLE II
INDEPENDENT SAMPLE T-TEST

Variable	t(df)	P-value	MD	Cohen's
Agility t-test (s)	- 9.22(40)	<.001	-2.35	-2.846
Sit-and-Reach (cm)	- 0.70(40)	0.486	-1.43	-0.217

IV. CONCLUSIONS

Massage gun therapy appears to be a more effective intervention for improving agility among university athletes, while both massage gun therapy and PNF stretching are equally effective in enhancing flexibility. These findings suggest that massage gun therapy may be a useful addition to warm-up routines, especially for athletes seeking to enhance agility.

ACKNOWLEDGMENT

The author thanks all participants, the supervisor, the UiTM Faculty of Sports Science, family members, and friends for their vital support and contributions.

REFERENCES

- [1] Cheatham, S. W., Baker, R. T., Behm, D. G., Stull, K., & Kolber, M. J. (2021). Mechanical percussion devices: A survey of practice patterns among healthcare professionals. *International Journal of Sports Physical Therapy*, 16(3), 766–777.

- [2] Chan, C., Cheng, C., & Chan, C. K. (2021). The effectiveness of proprioceptive neuromuscular facilitation (PNF) stretching in improving flexibility and strength among athletes. *Journal of Strength and Conditioning Research*, 35(7), 2035–2043.
- [3] Sajedi, S., & Khoshraftar, S. (2019). The impact of proprioceptive neuromuscular facilitation stretching on rehabilitation and flexibility in soccer players. *Journal of Sports Rehabilitation*, 28(3), 211–219.
- [4] Lim, C. H., Tan, J. L., & Wong, P. L. (2022). A comparative study on the effects of massage gun versus static stretching on flexibility and recovery among athletes. *Journal of Sports Rehabilitation*, 31(3), 250–257.
- [5] Konrad, A., Glashüttner, C., Reiner, M. M., Bernsteiner, D., & Tilp, M. (2020). The acute effects of a percussive massage treatment with a Hypervolt device on plantar flexor muscles' range of motion and performance. *Journal of Sports Science and Medicine*, 19, 690–6