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Acute Effects of Foam Rolling on Sprinting Performance and Agility Among UiTM Negeri Sembilan Football Players

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I. INTRODUCTION

Foam rolling is widely used as a self-myofascial release technique to enhance flexibility, reduce muscle stiffness, and improve physical readiness in athletes. Despite its popularity in warm-up routines, evidence regarding its acute effects on performance outcomes such as sprinting and agility remains inconclusive, particularly among Malaysian university athletes. This study aimed to examine the acute effects of foam rolling on 20 m sprint performance and agility among UiTM Negeri Sembilan football players.

II. METHODS

This study employed a quantitative one-group pre-test and post-test design to examine the acute effects of foam rolling on performance. A total of 16 male varsity football players aged 18-25 years participated in the study. Participants first completed pre-test measurements for 20 m sprint performance and agility. They then performed a standardised foam rolling protocol targeting major lower-limb muscle groups, including the quadriceps, hamstrings, calves, and gluteal muscles. Immediately after the intervention, post-test measurements were conducted using the same procedures. Data were analysed using paired-samples t-tests to determine differences between pre-test and post-test performance. Effect sizes were calculated using Cohen's *d*, with significance set at $p < .05$.

III. RESULTS AND DISCUSSION

The results indicated a statistically significant improvement in 20 m sprint performance following foam rolling, $t(15) = 3.49$, $p < .05$. Mean sprint time improved from 3.21 s ($SD = 0.177$) to 3.18 s ($SD = 0.177$), with a mean difference of 0.026 s. The effect size was large (Cohen's $d = 0.87$), indicating a practically meaningful improvement in linear sprint performance. In contrast, no significant difference was observed in agility performance, $t(15) = 0.48$, $p = .642$. The mean difference was minimal (0.008 s), and the effect size was small (Cohen's $d = 0.119$). These findings indicate that foam rolling did not meaningfully enhance multidirectional movement performance.

The findings suggest that foam rolling may positively influence linear sprint performance but has

limited impact on agility. The improvement in sprint performance may be attributed to reduced muscle stiffness, increased tissue compliance, improved blood flow, and enhanced neuromuscular readiness, all of which contribute to more efficient force production during acceleration. In contrast, agility is a complex skill requiring neuromuscular coordination, rapid deceleration, reactive strength, and central nervous system involvement. Foam rolling primarily affects soft tissue properties and may not sufficiently stimulate the neural and coordinative components required for multidirectional movements. These results indicate that foam rolling may be more beneficial for tasks involving linear acceleration than for tasks requiring complex movement patterns.

IV. CONCLUSIONS

This study demonstrates that an acute foam rolling intervention significantly improves 20 m sprint performance among UiTM Negeri Sembilan male varsity football players, with a large practical effect. However, foam rolling does not significantly enhance agility performance. Therefore, foam rolling may be an effective supplementary warm-up strategy for optimising linear sprint performance but should not be used as the sole method for improving agility.

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