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## EXTENDED ABSTRACT

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### COMPARATIVE EFFICACY OF SPORTS MASSAGE AND FOAM ROLLING ON MUSCLE PERFORMANCE IN UNIVERSITY-LEVEL FUTSAL ATHLETES

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#### I. INTRODUCTION

This study evaluates the effects of sport massage (SM) and foam rolling (FR) on muscle performance among UiTM Negeri Sembilan futsal players. Despite their growing popularity, evidence on their effectiveness in improving strength, power, and endurance remains inconsistent. By comparing these interventions, this research seeks to clarify their impact and provide practical insights for optimizing athletic training and recovery strategies [1].

#### II. METHODS

A quasi-experimental design involving 10 randomly selected UiTM Negeri Sembilan futsal players aged 18–25 was employed. Participants met strict inclusion criteria, ensuring active training history and no recent injuries. Muscle performance was assessed using the broad jump and agility T-test before, immediately and 72 hours after 90 minutes training with 80% intensity. This approach provided reliable data to evaluate the comparative effects of 15 minutes of SM and 15 minutes of foam rolling on power, and agility.

#### III. RESULTS

#### A. Effectiveness of Sport Massage and Foam Rolling

Sport massage and foam rolling both significantly improved agility and power performance among participants, with no statistically significant differences observed (p> 0.05; Table 1). These interventions demonstrated comparable effectiveness, suggesting interchangeability as recovery strategies. Participant feedback indicated no adverse effects or complaints, highlighting both methods' suitability for athlete recovery.

#### B. Figure and Table

All the results presented that there was a significant effect of the SM and FR for Agility and Power between the two-time frames. Based on the study, it showed that there was a significant effect on both treatments towards Agility, Power. However, the result also showed that there is no significant difference effect for both treatments. It can be concluded that both SM and FR are highly effective treatments for futsal players to improve performance after a match.

 TABLE I

 The effect of sport massage and foam rolling on power and agility





Fig. 1 Comparison of the Effects of Sport Massage  $% \left( {{{\rm{AS}}} \right)_{\rm{AS}}$  and Foam Roller on Agility



Fig. 2 Comparison of the Effects of Sport Massage and Foam Roller on Power

Figure 1 shows each treatment has changes which were an increment for a three-time series. From the mean value, it showed that the SM group has the lowest value for Agility which was 9.52 while the FR group has the lowest value of 10.1 respectively. Figure 2 demonstrates each treatment has changes which were a decrement of both Power for a three-time period. From the mean value, it showed that the SM group has the highest value for Power which is 2.27 compared to FR which has the value of 2.19. Based on the current study, it showed that there was a significant effect on both treatment towards agility, power. However, the result also showed that there is no significant difference effect for

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both treatments. It can be concluded that SM and FR was the best treatment overall for the futsal players to improve performance after a match.

#### IV. DISCUSSIONS

This study examined the effects of SM and FR on agility and power among UiTM Negeri Sembilan futsal players. The findings indicate that both interventions significantly improved agility (p<0.001) and power (p<0.001), with no significant difference between them, confirming their equal effectiveness as recovery strategies.

Agility improvements align with prior research demonstrating that FR enhances flexibility and reduces muscle stiffness, key factors in agility performance [2]. Similarly, sports massage has been shown to improve circulation and muscle relaxation, contributing to agility gains [3]. Power performance also benefited from both interventions, supporting previous findings that foam rolling enhances range of motion and alleviates muscle fatigue [4,5]. Additionally, sports massage aids in reducing muscle soreness and improving recovery, facilitating better power output [6,7].

#### V. CONCLUSIONS

Overall, this study reinforces the effectiveness of both techniques in athletic recovery, suggesting their practical application for optimizing futsal performance. Sport massage and foam rolling both effectively enhanced agility and power, showing no significant differences in outcomes. Both methods are viable strategies for athlete recovery and performance enhancement.

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