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EXTENDED ABSTRACT

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COMPARATIVE EFFECTS OF SPORTS MASSAGE AND FOAM ROLLING ON MUSCLE RECOVERY IN UNIVERSITY LEVEL FUTSAL PLAYERS

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I. Introduction

Muscle soreness is a common challenge among futsal players, impacting performance and recovery. This study evaluates the effectiveness of sport massage (SM) and foam roller (FR) techniques in reducing muscle soreness and compares their efficacy. Addressing gaps in recovery strategies, particularly for futsal players, this research provides insights into evidence-based practices for optimized recovery.

II. Methods

Ten futsal players from UiTM Negeri Sembilan, with at least six months of consistent training, were selected. Participants underwent 15-minute SM and FR sessions targeting quadriceps, hamstrings, adductors, gluteus, and gastrocnemius muscles. Muscle soreness was measured using the Sit-to-Stand test (pain scale), knee extensor (pain scale), and knee flexion range of motion (goniometer) at five intervals: pre-training, immediately post-training, 24, 48, and 72 hours post-training.

III. Results and Discussion

A. Sit to Stand

A mixed ANOVA analysis revealed no significant difference between SM and FR on the pain scale during the Sit-to-Stand test across five time points ($p = 0.876$, $F(1,18) = 0.025$). Both treatments showed similar trends, suggesting no superior effect on pain reduction.

B. Knee Extensor

Similarly, the pain scale for knee extensor strength showed no significant difference between SM and FR ($p = 0.758$, $F(1,18) = 0.098$). Neither treatment displayed a marked advantage in alleviating soreness.

C. Knee Flexion Range of Motion

For knee flexion range of motion (ROM), both treatments yielded comparable results, with no significant difference observed ($p = 0.192$, $F(1,18) = 1.84$). ROM improvements were similar across time points, indicating equivalence in effectiveness.

TABLE I
P-values and effect sizes (η^2) for performance scores (sit-to-stand, knee extensors) and range of motion.

Effect	p	Eta Square
PS (Sit to Stand)	<.001	0.785
PS (Knee Extensor)	<.001	0.786
ROM	0.011	0.056

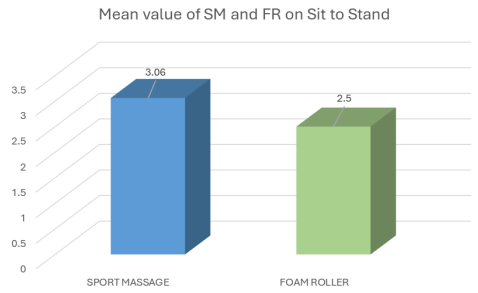

Fig. 1 Mean value of SM and FR on Sit to Stand

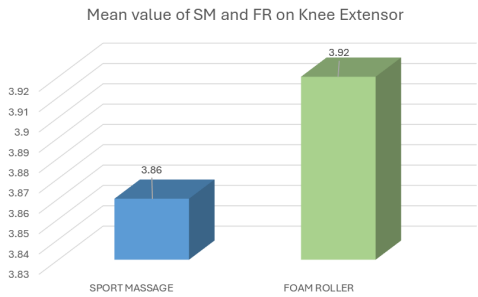

Fig. 2 Mean value of SM and FR on Knee Extensor

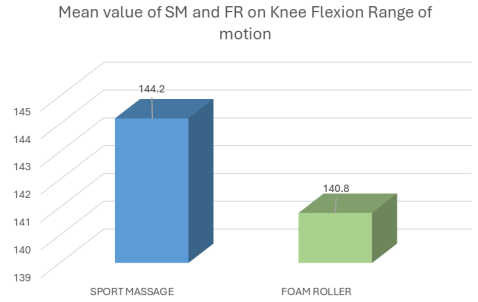

Fig. 3 Mean value of SM and FR on Knee Flexion Range of Motion

Figure 1 shows the mean value of SM and FR on it to stand. The result shows FR smaller than SM, so it shows that FR is better than SM. The main effect of the pain scale was significant. The main different effect for pain scale was not significant. The null hypothesis for the effect of SM and FR on the pain scale was failed to reject. Figure 2 shows the mean value of SM and FR on the knee extensor. The result shows SM smaller than FR, so it shows that SM is better than FR. The main effect of the pain scale was significant. The main different effect for pain scale (knee extensor) was not significant. The null hypothesis for the effect of SM and FR on the pain scale was failed to reject. Figure 3 shows the mean value of SM and FR on Knee range of motion. The result shows FR bigger than SM, so it shows that SM is better than FR. The main effect of ROM was significant. The main different effect for ROM is not significant. The null hypothesis for the effect of SM and FR on the ROM was rejected.

IV. Discussions

The purpose of this study was to compare the effects of Sport Massage (SM) and Foam Roller (FR) on reducing muscle soreness among futsal players at UiTM Negeri Sembilan after a match. Both SM and FR are widely used recovery techniques designed to alleviate delayed onset muscle soreness (DOMS) and enhance athletic recovery. These treatments influence key physiological biomarkers, including the pain scale (PS) and knee range of motion (ROM). The findings indicate that both SM and FR led to a reduction in PS while contributing to improvements in ROM over the recovery period.

Based on the results, Sport Massage (SM) was found to be more effective in reducing pain. Previous studies have demonstrated that SM effectively alleviates symptoms of DOMS, with significant pain reduction occurring within 24 to 48 hours post-intervention [1]. This is attributed to increased blood circulation, reduced muscle tension, and the facilitation of metabolic waste removal. Similarly, this study found that SM contributed to improved ROM [2].

Furthermore, Foam Roller (FR) demonstrated positive effects on muscle recovery, particularly in improving ROM and reducing muscular fatigue [3]. FR techniques, which involve self-myofascial release through controlled pressure application, were found to facilitate muscle relaxation and reduce tension, ultimately contributing to greater flexibility and recovery [4]. Research suggests that FR, when applied at consistent intervals post-exercise, aids in reducing acute muscle damage and alleviating soreness while promoting faster recovery [5].

Additionally, both SM and FR showed a significant effect in reducing muscle injuries caused by excessive strain, supporting their role in mitigating DOMS, which commonly occurs after strenuous exercise or repeated match play. Based on this study's findings, both treatments effectively contributed to pain relief and increased knee ROM, making them viable recovery strategies for futsal players.

V. Conclusions

The study found no significant difference between sport massage and foam roller in reducing muscle soreness among futsal players across pain scale and range of motion measures. Both interventions were equally effective, suggesting either method can be used as part of recovery strategies for futsal athletes.

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