



The efficacy of kinesiology tape on dynamic and perceived ankle stability in male international futsal players

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Background: Futsal carries a higher injury risk than traditional 11-a-side football.¹ Intrinsic non-contact mechanisms are most frequent in futsal (67.2% of total injuries) and ankle ligament sprains are the second most common injury.^{1,2} Following an ankle sprain, individuals often experience instability as a result of reduced neuromuscular control and proprioception of the affected joint, leaving them prone to re-injury.^{3,4} Kinesiology tape (KT) claims to stimulate cutaneous mechanoreceptors, enhancing proprioceptive feedback, joint awareness and neuromuscular control, however the current evidence base is inconclusive.^{3,5}

Objective: Assess the efficacy of KT on both dynamic ankle stability and subjective perceived ankle stability in male international futsal players.

Method: Participants: Eleven male international futsal players (age 24.6 ± 3.5 ; height $176.6\text{cm} \pm 6.9\text{cm}$; weight $71.7\text{kg} \pm 8.5\text{kg}$) randomly allocated into control ($n=6$) or intervention ($n=5$) groups. There were no significant differences in anthropometry between groups. **Design:** A two-arm randomised controlled trial. **Intervention:** Participants undertook a baseline star excursion balance test (SEBT), consisting of the anterior (ANT [figure 1.1]), posteromedial (PM [figure 1.2]) and posterolateral (PL) directions alongside a modified Cumberland Ankle Instability Tool questionnaire (CAIT-Q).^{6,7} Following baseline assessments, the intervention group had 4 strips of KT applied to their supporting lower limb (non-dominant $n=4$, dominant $n=1$ [figure 2.1-2.4]). Both groups participated in a coach-led training session and conducted a second SEBT and CAIT-Q upon conclusion. The intervention group kept the KT on for the training session and re-assessment. **Main Outcome Measures:** Mean difference between pre and post training measures for each direction of the the SEBT and CAIT-Q. **Analysis:** The difference between pre and post training measures were calculated using Microsoft Excel (Version 16.35, Microsoft, Washington, USA) as displayed in figures 4.0 and 5.0. Independent sample t-tests were conducted to analyse the differences between intervention and control group outcome measures using SPSS (Version 26, IBM, New York, USA).



Figure 1.1: Measurement of ANT SEBT



Figure 1.2: PM SEBT



Figure 2.1-2.4: Four-strip KT application

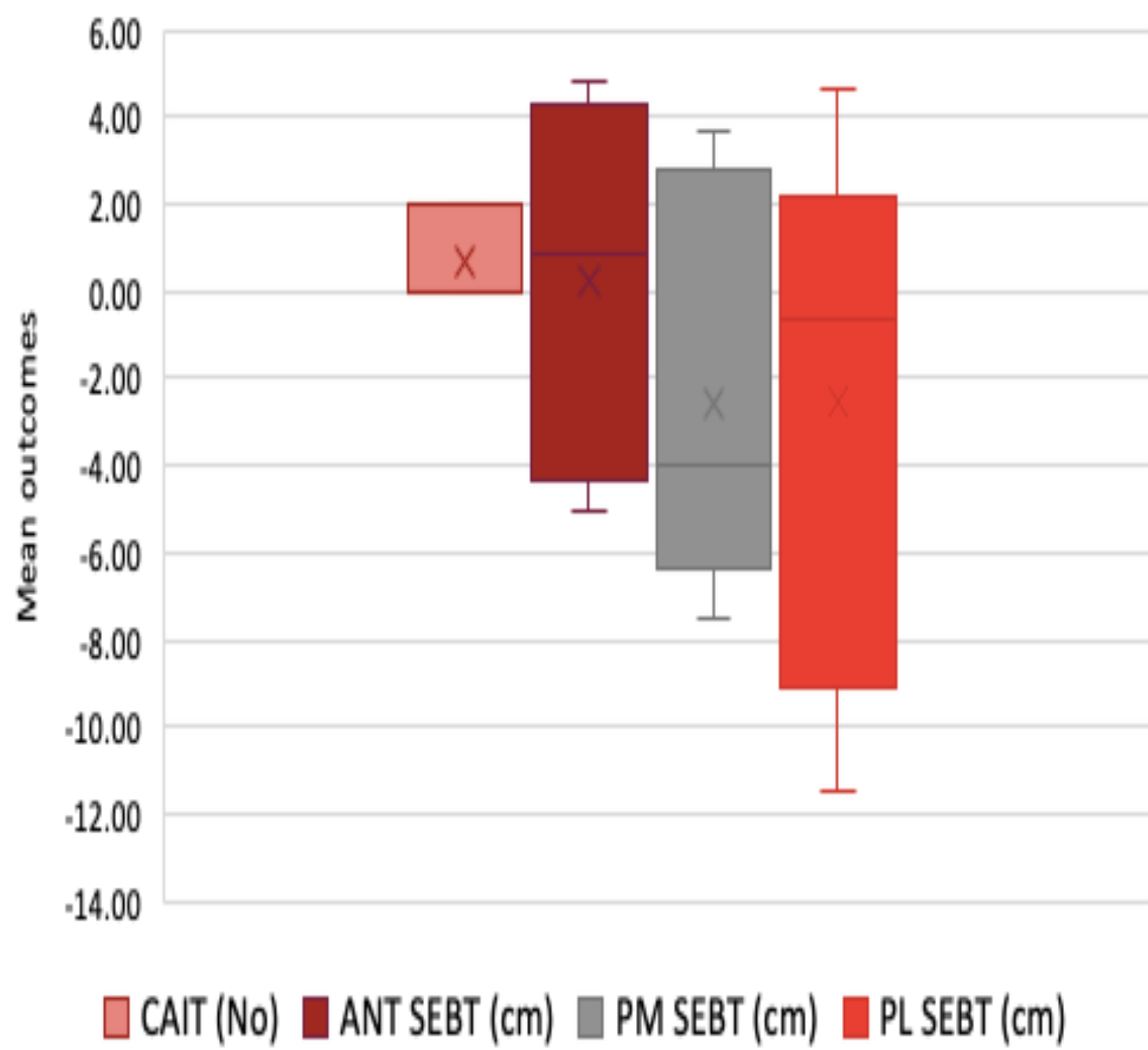


Figure 4.0: Difference between pre and post training outcomes - Control

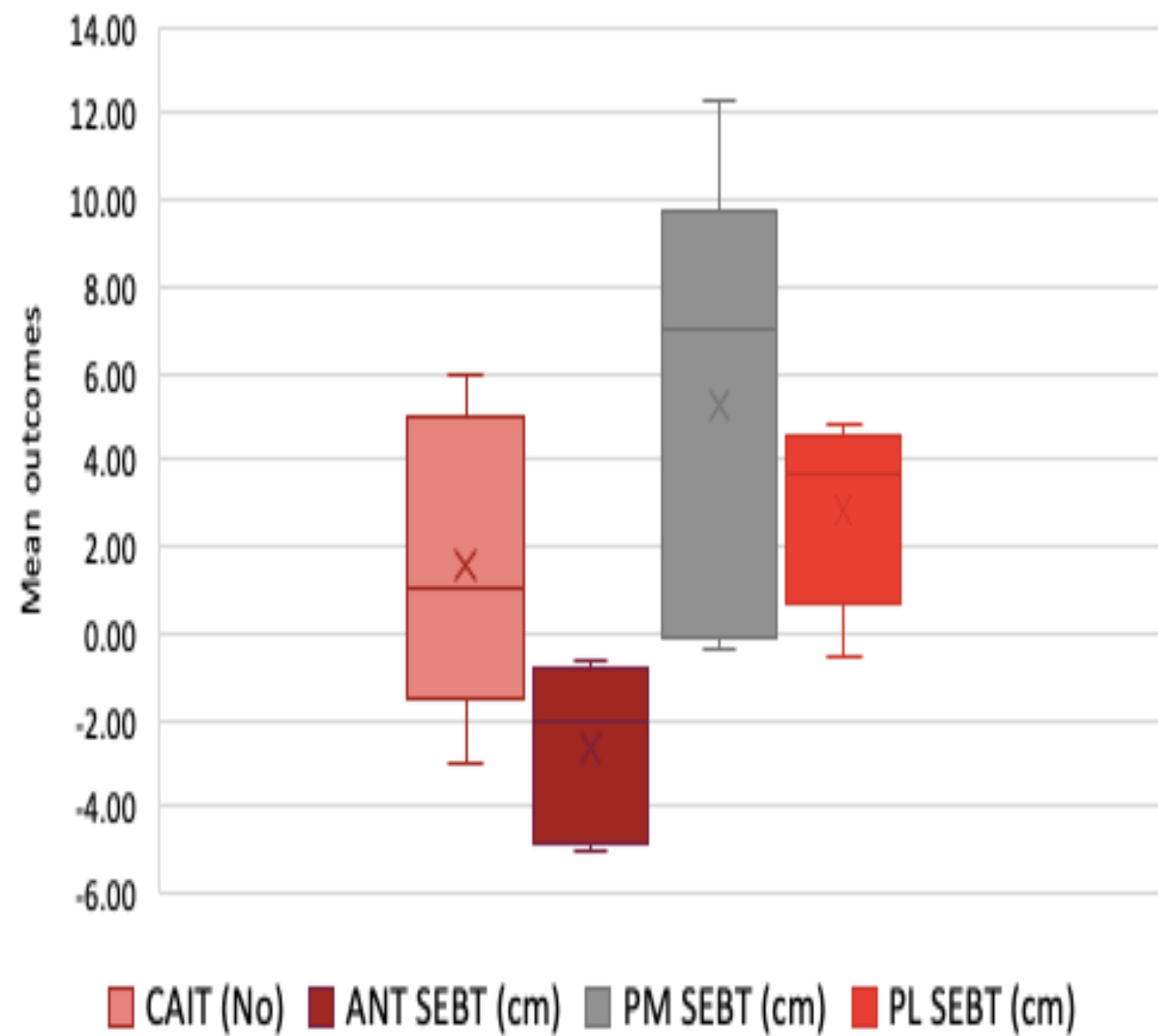


Figure 5.0: Difference between pre and post training outcomes - Intervention

Table 1: T-test descriptive statistics between groups

Outcome Measure	Mean Difference	Std. Error Difference	Sig. (2-tailed)	95% CI Interval of the Difference
SEBT Anterior (cm)	2.92	2.03	0.18	-1.67 to 7.50
SEBT Posteromedial (cm)	-7.82	3.00	0.03	-14.60 to -1.04
SEBT Posterolateral (cm)	-5.36	2.69	0.09	-11.83 to 1.18
CAIT (No)	-0.93	1.62	0.59	-5.23 to 3.36

Results: Descriptive statistics for the difference in outcome measures between groups are provided in table 1. No significant differences were established between control and intervention groups for the CAIT-Q [control $M=0.67 \pm 1.03$; intervention $M=1.60 \pm 3.51$; $t=-5.75$, $P=0.59$], ANT SEBT [control $M=0.25 \pm 4.10$; intervention $M=2.67 \pm 2.04$; $t=1.440$, $P=0.18$] or PL SEBT [control $M=-2.53 \pm 6.14$; intervention $M=2.83 \pm 2.18$; $t=-1.991$, $P=0.09$]. The magnitude of difference in the means for each of these outcome measures was small (eta squared = CAIT-Q 0.04, ANT SEBT 0.19, PL SEBT 0.31). A significant difference was observed for the PM SEBT between control [$M=-2.55 \pm 4.62$] and intervention [$M=5.27 \pm 5.33$; $t=-2.609$, $P=0.03$]. The magnitude of difference in the means was medium (eta squared = 0.43). A Mann-Whitney test provided a non-parametric comparison. These results were consistent with those of the parametric equivalent identifying the posteromedial angle of the SEBT as the only outcome measure to establish a significant difference between groups ($P=0.05$).

Conclusion: The application of KT only resulted in a significant difference towards the PM SEBT. The most commonly injured ankle ligament (anterior talofibular ligament) is not in a vulnerable position during PM movement.^{8,9} Therefore, it is unlikely that the application of KT will reduce the risk of non-contact injuries in futsal. No significant difference was established between CAIT-Q outcomes, suggesting KT also provided no influence towards perceived stability. Muscular fatigue within the kinetic chain can influence dynamic stability and deficit SEBT outcomes, therefore, fatigue may have impacted the post-training measures.¹⁰ Additionally, the small sample size within this cohort may influence the reliability of findings. A larger pool of participants may strengthen the reliability and validity of outcomes.

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