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**EXTENDED
ABSTRACT**

Acute Effects of Weighted Plyometric Exercises on Sprint, Agility, and Jump Performance in UiTM Football Players

Nur Anis Izzati Kamaruzaman¹, Adam Linoby¹, Razif Sazali¹, Yusandra Md Yusoff¹, Amrun Haziq¹, Aizzat Adnan¹, & Muhammad Zulqarnain^{1*}

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

*Corresponding author: zulqarnain9837@uitm.edu.my

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I. INTRODUCTION

Explosive performance is crucial for football athletes, especially at the collegiate level, where sprinting, jumping, and quick directional changes are key to success. Plyometric training, which utilizes the stretch-shortening cycle (SSC), is widely used to improve neuromuscular efficiency and explosive power. Recently, the addition of external loads, such as weighted vests, has been integrated into plyometric training to enhance its intensity and potential benefits.

Despite its increasing use, limited research has focused on the acute effects or the immediate impact of weighted plyometric exercises, particularly among university-level football players. Most existing studies have targeted elite or professional athletes, leaving a gap in understanding how these interventions affect collegiate populations with different conditioning levels. This study investigates the short-term effects of weighted versus unweighted plyometric training on sprint time, agility, and jump height in UiTM football players

II. METHODS

This study employed a quasi-experimental pretest-posttest control group design. A total of 24 healthy male football players (aged 18–25) from UiTM were selected and divided into two groups: the weighted plyometric group (WPG) and the non-weighted plyometric group (NWPG). Participants were matched by fitness level and training background using stratified random sampling.

The performance variables assessed were:

- Sprint performance: 20-meter sprint test using electronic timing gates.
- Agility performance: Illinois Agility Test.
- rest period, post-test measurements were taken to assess acute effects.
- Jump performance: Vertical jump height measured using a Vertec device

Each group performed a standardized warm-up, followed by specific plyometric exercises. WPG used weighted vests (adjusted by body weight) during drills.

III. RESULTS AND DISCUSSION

Results revealed significant improvements ($p < 0.05$) in sprint, agility, and jump performance in the WPG. The

NWPG showed a significant improvement only in jump height. The inclusion of weighted resistance likely enhanced muscle activation and force output during SSC movements.

These findings align with previous research suggesting that external loading during plyometrics may stimulate neuromuscular priming, leading to better short-term performance. For collegiate players, integrating weighted drills may enhance warm-up effectiveness and match readiness.

TABLE I
GROUP DESCRIPTIVES

Group	N	Mean	Median	SD	SE
UPG	12	3.24	3.25	0.0303	0.00874
WPG	12	3.25	3.25	0.0363	0.0105
UPG	12	3.20	3.20	0.0402	0.01161
WPG	12	3.11	3.11	0.0505	0.0146
UPG	12	10.54	10.58	0.2203	0.06359
WPG	12	10.51	10.47	0.1979	0.0571
UPG	12	10.43	10.46	0.2444	0.07054
WPG	12	10.13	10.08	0.1972	0.0569

TABLE II
INDEPENDENT SAMPLE T-TEST

		Statistic	df	p	Mean difference	SE difference
Sprint_Pre	Student's t	-0.733	22.0	0.471	-0.0100	0.0136
Sprint_Post	Student's t	4.696	22.0	<0.001	0.0875	0.0186
Agility_Pre	Student's t	0.292	22.0	0.773	0.0250	0.0855
Agility_Post	Student's t	3.300	22.0	0.003	0.2992	0.0907
Jump_Pre	Student's t	-0.140 ^a	22.0	0.890	-0.1083	0.7764
Jump_Post	Student's t	-3.626	22.0	0.001	-3.1583	0.8710

Note. $H_a \mu_{UPG} \neq \mu_{WPG}$

^a Levene's test is significant ($p < 0.05$), suggesting a violation of the assumption of equal variances

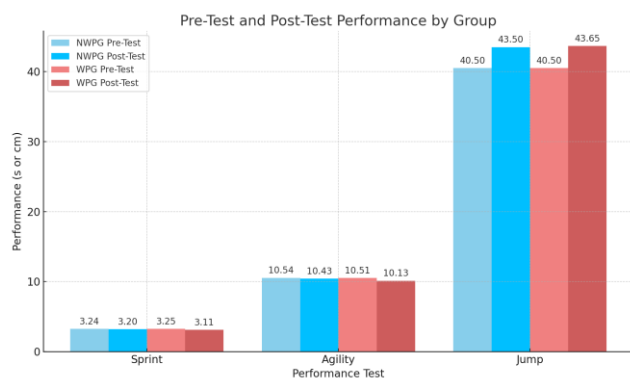


Fig. 1 Pre-test and post-test performance.

IV. CONCLUSIONS

Weighted plyometric exercises elicit greater acute performance improvements compared to non-weighted exercises in sprinting, agility, and jumping among university football players. This supports their implementation in pre-competition routines to boost performance safely and efficiently. Further research should explore long-term effects, different age groups, and female athletes to enhance generalizability.

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