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Acute Effects of Heavy Resistance Band on Shooting Speed Among Futsal Players



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Abstract | This study examined the acute effects of heavy resistance bands on shooting speed in futsal players. Thirty-two ($N = 32$) university futsal players were split into control and experimental groups. Pre- and post-tests were conducted, with the experimental and control groups performing shooting speed measurements both with and without the heavy resistance band. The shooting speed was measured before and after the intervention using a 10-meter shooting test. Results showed that the experimental group demonstrated a significant improvement in shooting speed (2.00 ± 1.065 m/s) compared to the control group (1.75 ± 1.095 m/s). However, the difference between the groups was insignificant, $t(30) = 0.665$, $p = 0.18$. Despite this, heavy resistance band training enhanced muscle action and strength, improving shooting performance. In conclusion, while the observed improvement in shooting speed was not statistically significant, incorporating heavy resistance bands into training programs may offer potential benefits for enhancing shooting speed and overall athletic performance in futsal players. Further research with larger sample sizes and varied training protocols is recommended to confirm these findings and provide more definitive training guidance for coaches and players.

Keywords: *Shooting speed, heavy resistance band, futsal, strength training.*

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I. INTRODUCTION

Futsal is a dynamic form of indoor or outdoor football, featuring five players per team, including a goalkeeper. Popular for its similarity to football, futsal requires precise skills, tactics, and shooting ability due to the confined space of indoor courts. Winning in futsal demands accurate passing and fast shooting [1]. Players and coaches explore new training methods to enhance performance as the sport grows, including resistance band training. Resistance bands, known for their ease of use and versatility, offer various resistance levels, providing dynamic strength training that activates a full range of muscle movements [2]. Futsal players now incorporate resistance band exercises to improve shooting skills. This study focuses on the impact of resistance band training on shooting speed in futsal. Strength training is crucial for improving shooting skills in futsal, where quick decisions and accurate shots are essential for success [3]. Targeted strength training exercises enhance the force and quickness of shots by focusing on key muscles like the quadriceps, hamstrings, glutes, and calves [4]. Additionally, strength training improves stability, balance, and coordination, contributing to consistent shooting performance [5]. In futsal, where shooting speed is an important factor in success, studying the influence of certain training approaches on this performance statistic is key. The efficiency of resistance bands among elite university futsal players is demonstrated by their influence on leg strength [6]. However, the usage of resistance bands in terms of elasticity is lacking, and only studies have been done using elite futsal players instead of ordinary futsal players. Thus, the current study aims to measure the effect of heavy resistance band training on leg muscle power and shooting speed through pre-test and post-test assessments.

II. METHODS

A convenient sampling technique and pre-test and post-test quasi-experimental design were used for this study. Thirty-two ($N = 32$) university futsal players were split into control (CG) and experimental groups (EG). Pre- and post-tests were conducted, with the EG and CG performing shooting speed measurements with and without the heavy resistance band. The shooting speed was measured before and after the intervention using a 10-meter shooting test. This study aims to determine the acute effects of heavy resistance bands on shooting speed. The EG partook in the exercises using a resistance band, while the CG did not use a resistance band in the exercise. Before having the exercise, both groups were required to have a 10-meter shooting test as a pre-test, and after the intervention, both groups had a 10-meter shooting test as post-test. After the pre-test, both groups need to do a total of 3 sets of 10 repetitions of squat jump, 2 sets of 20 repetitions of lateral shuffle, 3 sets of 15 repetitions of side repetitions of 15 repetitions of forward lunges, 2 sets of 30 meters of sprinting, and 3 sets of 20 repetitions of knee drive with a resting period gap for 2 minutes between sets – the post – test was held after 14 minutes of the intervention. A standard score sheet was used to record the data, and the score differences for shooting speed between the two groups were compared to determine any significant differences.

III. RESULTS AND DISCUSSION

The independent sample t-test was used to compare the differences between the two groups. This study aimed to find significant differences in shooting speed between EG and CG. The significance level

of 0.05 was used to determine significance. If the p -value was 0.05 or less, it indicated a significant difference, so we rejected the null hypothesis. If the p -value was greater than 0.05, we accepted the null hypothesis, meaning no significant difference existed.

TABLE 1
EXPERIMENTAL GROUP AND CONTROL GROUP RESULT

Group	Mean	Std. Deviation
EG	2.00	1.065
CG	1.75	1.095

TABLE 2
10-METRE SHOOTING TEST BETWEEN EXPERIMENTAL AND CONTROL GROUP

Variable	t	df	Sig. (2 tailed)	Mean Different	Std. Error Difference
Shooting Speed	0.665	30	0.518	0.25	0.38

Results showed that the experimental group significantly improved shooting speed (2.00 ± 1.065 m/s) compared to the control group (1.75 ± 1.095 m/s). The results of this study also align with the findings that show the effect of the resistance band and an improvement in shooting among football players. Significant improvements were detected in velocity in the training group [7]. This considerable enhancement in muscle strength, well with previous investigations, found that leg muscle strength could be improved through resistance band training, which was studied using 60 older patients in 48 weeks to improve knee extension (muscle strength); the change in knee extension strength from baseline was significantly increased [8]. This finding supports the initial hypothesis that heavy resistance band training enhances shooting speed, a critical skill for futsal players. However, the difference between the groups was insignificant ($t(30) = 0.665$, $p = 0.18$). Despite this, heavy resistance band training enhanced muscle action and strength, improving shooting performance. In this research, the heavy resistance band improved shooting speed performance in futsal players. The heavy resistance band can also enhance explosive power performance because the exercise incorporates the quadriceps that help increase knee extension to get explosive movements [10]. Leg power is very prominent when making explosive movements in futsal games because it shortens the time when the player wants to shoot the ball when having a chance to score [11]. The factors are the initial velocity of exit, explosive force, and mechanical power of the lower limb of leaving the ground, thus leading to greater power during the futsal game, especially when having a chance of scoring [9].

IV. CONCLUSIONS

In conclusion, while the observed improvement in shooting speed was not statistically significant, incorporating heavy resistance bands into training programs may offer potential benefits for enhancing shooting speed and overall athletic performance in futsal players. Further research with larger sample sizes

and varied training protocols is recommended to confirm these findings and provide more definitive training guidance for coaches and players.

ACKNOWLEDGMENTS: The physical performances through tactical and technical is very important in futsal games. This study is important because it helps coaches and athletes improve their performance. Coaches can use this information to better player development, strategies, and coaching for futsal teams. Athletes can gain insights, criteria, and motivation to enhance their skills and compete at high levels. This will also help to understand teamwork and overall performance in futsal.

REFERENCES

- [1] V. Hermans and R. Engler, *Futsal: Technique, Tactics, Training*. Meyer & Meyer Verlag, 2010.
- [2] P. Page and T. S. Ellenbecker, *Strength Band Training*. Human Kinetics Publishers, 2019.
- [3] N. Naser, A. Ali, and P. Macadam, "Physical and physiological demands of futsal," *Journal of Exercise Science & Fitness*, vol. 15, no. 2, pp. 76-80, 2017.
- [4] T. T. Freitas, L. A. Pereira, P. E. Alcaraz, A. F. Arruda, A. Guerriero, P. H. Azevedo, and I. Loturco, "Influence of strength and power capacity on change of direction speed and deficit in elite team-sport athletes," *Journal of Human Kinetics*, vol. 68, p. 167, 2019, doi: 10.2478/hukin-2019-0017.
- [5] F. Martins, C. França, H. Sarmiento, R. Henriques, K. Przednowek, M. D. M. Nascimento, ..., and E. R. Gouveia, "Lower limbs strength variations between injured and non-injured professional soccer players," *Science Progress*, vol. 107, no. 1, p. 00368504231216312, 2024, doi: 10.1080/00368504.2023.1216312.
- [6] D. L. Marques, J. N. Ribeiro, A. C. Sousa, B. Travassos, and M. C. Marques, "Strength and power performance changes during an in-season resistance training program in elite futsal players: A case study," *Journal of Human Kinetics*, vol. 84, no. 1, pp. 184-194, 2022.
- [7] C. Sofuoğlu, Z. Güçhan Topçu, and V. Bayrakçı Tunay, "The effect of core stability training on ball-kicking velocity, sprint speed, and agility in adolescent male football players," *PLOS ONE*, vol. 19, no. 6, p. e0305245, 2024, doi: 10.1371/journal.pone.0305245.
- [8] Y. Yamamoto, Y. Nagai, S. Kawanabe, Y. Hishida, K. Hiraki, M. Sone, and Y. Tanaka, "Effects of resistance training using elastic bands on muscle strength with or without a leucine supplement for 48 weeks in elderly patients with type 2 diabetes," *Endocrine Journal*, vol. 68, no. 3, pp. 291-298, 2021, doi: 10.1503/ej.20.0333.
- [9] I. Akhmad, R. Dewi, and G. Priyambada, "The effect of quick strength training on the agility and leg power of futsal junior athlete," *International Journal of Human Movement and Sports Sciences*, vol. 11, no. 2, pp. 477-483, 2023.
- [10] N. Abd Rahman and S. Shaharudin, "Comparison of skills and lower limb biomechanics of female futsal players at collegiate and club levels," *Malaysian Journal of Movement, Health & Exercise*, vol. 7, no. 2, pp. 177-194, 2018.
- [11] A. N. Hidayati, S. Sulaiman, and M. Hartono, "Contribution of limb muscle power, flexibility of limb muscles and self-confidence to the accuracy of futsal shooting," *JUARA: Jurnal Olahraga*, vol. 8, no. 1, pp. 100-110, 2023.