

EFFECTIVENESS OF PLYOMETRIC EXERCISE IN IMPROVING AGILITY IN CHANGING DIRECTION AMONG UNDER-21 FOOTBALL VARSITY PLAYERS

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ABSTRACT

Plyometric exercise is widely recognized for enhancing explosive power, agility, and athletic performance. In football, agility and the ability to rapidly change direction are essential skills that contribute to effective gameplay. This study aimed to determine the effectiveness of plyometric exercise in improving agility in changing direction among Under-21 football varsity players of the University of Perpetual Help System Laguna – Biñan. A quasi-experimental research design was utilized in the study. Eighteen football varsity players aged 18 to 21 years old participated in the implementation. The respondents underwent a six-week plyometric training program conducted twice a week for 30 to 40 minutes per session. A 20-meter Beep Test was used as the primary outcome measure to evaluate agility and change-of-direction performance before and after the intervention. The collected data were analyzed using mean and paired t-test statistical treatment. The pre-test results revealed a mean score of 10.25 with a standard deviation of ± 1.75 , while the post-test results showed an increased mean score of 11.07 with a standard deviation of ± 1.56 . The computed t-value was -10.089 with a p-value of less than 0.001, which indicated a statistically significant difference between the pre-test and post-test scores. The findings suggest that plyometric exercise had a positive effect on improving agility in changing direction among Under-21 football varsity players. The study concluded that integrating plyometric exercises into football training programs may enhance athletic performance and agility.

Keywords: Plyometric Exercise, Agility, Change of Direction, Football Players, Beep Test

INTRODUCTION

Plyometric exercises are designed to train muscles for quick, powerful, and efficient movements, offering numerous benefits for athletes. These benefits include increased muscle power output, more forceful muscle contractions with less energy use, and faster muscle contraction speeds, all of which contribute to improved overall speed and agility. In football, agility and the ability to rapidly change direction are essential for effective gameplay. Football players frequently perform explosive movements that require quick acceleration, deceleration, and directional changes. Previous studies have shown that traditional strength and power exercises may not consistently improve change-of-direction performance. Instead, sport-specific exercises such as horizontal and lateral jumps, loaded jumps, and plyometric exercises appear to produce better outcomes in agility performance. According to Loturco et al. (2020), soccer players demonstrated slower change-of-direction performance compared to futsal, rugby, and handball players, emphasizing the need for specialized training methods.

Furthermore, research by Aksović et al. (2021) highlighted that plyometric training effectively improves explosive power, sprinting ability, and change-of-direction speed. This study aimed to determine the effectiveness of plyometric exercise in improving agility in changing direction among Under-21 football varsity players using the 20-meter Beep Test as the primary outcome measure.

LITERATURE REVIEW

Plyometric Training Effects

Plyometric training has been shown to improve speed, agility, jumping ability, and explosive strength. Huang et al. (2023) reported that an eight-week plyometric training program significantly enhanced sprinting, jumping, and agility performance among basketball players. Similarly, Kryeziu et al. (2023) found improvements in speed and explosive strength after a 12-week plyometric intervention.

Effects of Plyometric Training on Change of Direction

Rodriguez et al. (2024) concluded that plyometric training effectively improves change-of-direction performance among male football players. Branquinho et al. (2020) also demonstrated positive improvements in change-of-direction ability following an eight-week plyometric training program.

Assessment and Training Methods for Change of Direction

Jimenez-Iglesias et al. (2024) recommended a systematic plyometric training program lasting six to nine weeks with two sessions per week to improve change-of-direction performance. Similar findings were reported by Knechta et al. (2021), who implemented plyometric exercises twice weekly among hockey players.

Validity of the Beep Test

The Beep Test, also known as the Multistage Fitness Test, is widely used to assess aerobic capacity and endurance. Walker (2019) emphasized its validity in evaluating cardiovascular endurance and athletic performance. Chaeroni et al. (2024) also supported the use of the Beep Test in assessing football players' aerobic fitness.

METHODOLOGY

Research Design

The researchers utilized a quasi-experimental research design to evaluate the effectiveness of plyometric exercise in improving agility in changing direction among football varsity players.

Participants of the Study

The participants consisted of 18 football varsity players from the University of Perpetual Help System Laguna – Biñan, aged 18 to 21 years old regardless of gender. Purposive sampling was used to select participants who met the inclusion criteria.

Instrumentation

The study utilized six plyometric exercises including tuck jumps, skater hops, diagonal hurdle jumps, forward hurdle jumps, forward hurdle jumps with sprint and ball kick, and diagonal hurdle jump Y-drill. The 20-meter Beep Test served as the primary instrument for measuring agility and change-of-direction performance.

Data Gathering Procedure

The researchers first conducted a pre-test using the 20-meter Beep Test. Afterward, participants underwent a six-week plyometric training program conducted twice weekly for 30 to 40 minutes per session. Upon completion of the intervention, a post-test using the same Beep Test was conducted.

Statistical Treatment

The mean was used to determine the average pre-test and post-test scores of the respondents. A paired t-test was used to determine whether a statistically significant difference existed between the pre-test and post-test results.

RESULTS

Pre-test Scores

The pre-test results revealed a mean score of 10.25 with a standard deviation of ± 1.75 . The minimum score recorded was 5.20, while the highest score was 12.10.

Post-test Scores

The post-test results showed an increased mean score of 11.07 with a standard deviation of ± 1.56 . The minimum post-test score was 6.90, while the highest score reached 12.70.

Significant Difference Between Pre-test and Post-test Scores

The paired t-test revealed a t-value of -10.089 with a p-value of less than 0.001. Since the p-value was lower than the significance level of 0.05, the null hypothesis was rejected. This indicated a statistically significant difference between the pre-test and post-test scores after the plyometric intervention.

DISCUSSION

The findings of the study suggest that plyometric exercises significantly improved agility and change-of-direction performance among Under-21 football varsity players. The increase in the mean post-test score indicates that the intervention effectively enhanced the players' physical performance.

The results support previous studies by Rodriguez et al. (2024) and Branquinho et al. (2020), which reported that plyometric training positively affects change-of-direction ability. The reduction in score variability after the intervention also suggests more consistent performance among participants.

The improvement observed may be attributed to the Stretch-Shortening Cycle (SSC), which allows muscles to rapidly transition from eccentric to concentric contraction, generating greater force and explosive movement.

CONCLUSIONS

Based on the findings of the study, the researchers concluded that plyometric exercise had a significant positive effect on improving agility in changing direction among Under-21 football varsity players. The six-week plyometric training program effectively enhanced participants' performance in the 20-meter Beep Test.

The study further concludes that incorporating plyometric exercises into football training programs may help athletes improve agility, explosive strength, and overall athletic performance.

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