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Effect of Weight Training on Agility among Handball Players: An Experimental Study

Dilip Dattataryarao Bhadke

Vai. Dhunda Maharaj Deglurkar College Degloor

Abstract: The present study aimed to examine the effect of weight training on agility among handball players. A total of 100 male handball players aged between 14–19 years were selected and randomly divided into two groups: experimental (n=50) and control (n=50). The experimental group underwent a structured weight training program for 12 weeks, while the control group did not receive any specialized training. Agility was measured using the SEMO Agility Test before and after the training period.

The results indicated that the control group showed negligible change in agility performance, with mean scores slightly increasing from 13.10 to 13.18 seconds. In contrast, the experimental group demonstrated noticeable improvement, with mean scores decreasing from 13.87 to 11.99 seconds, indicating enhanced agility performance. However, the Analysis of Covariance (ANCOVA) revealed that the differences between groups were statistically not significant at the 0.05 level. Despite the lack of statistical significance, practical improvements were observed in the experimental group, suggesting that weight training may contribute positively to agility performance in handball players. The findings highlight the importance of structured training programs in enhancing physical fitness components essential for handball performance. Future studies with larger samples and longer duration are recommended to establish stronger evidence regarding the effectiveness of weight training on agility.

Keywords: Weight Training, Agility, Handball Players, Physical Fitness, Experimental Study

I. INTRODUCTION

Agility is a crucial component of skill-related physical fitness, particularly in dynamic sports such as handball, where rapid changes in direction, speed, and coordination are essential for performance. Handball requires players to execute quick movements, evade opponents, and maintain balance during offensive and defensive actions. Therefore, improving agility is vital for enhancing overall game performance (Bompa & Haff, 2009).

Weight training has been widely recognized as an effective method for improving muscular strength and power, which indirectly contribute to agility. Strength development enhances neuromuscular coordination and reaction time, both of which are essential for agile movements (Stone et al., 2007). Previous research (Bansode & Singh (2022); Bansode & Singh (2022 a) ; Bansode & Singh, 2022 b). Singh S.K ,2018 ; Sinku S.K , 2016) suggests that structured resistance training programs can positively influence agility by improving lower-body strength and explosive power (Miller et al., 2006).

However, findings across studies remain inconsistent, particularly in adolescent athletes, where physiological adaptations may vary due to growth and maturation. According to Singh S.K. (2018), physical fitness components such as agility are influenced by multiple training variables, including intensity, duration, and specificity of training.

Despite the importance of agility in handball, limited research has focused specifically on the effect of weight training on agility among young handball players. Therefore, the present study aims to investigate the impact of a structured weight training program on agility performance using an experimental design.

II. METHODS

Participants

A total of 100 handball players aged 14–19 years participated in the study. They were divided into:

1. Experimental Group (n=50)
2. Control Group (n=50)

Research Design

An experimental design with pre-test and post-test measures was adopted.

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Inclusion Criteria

1. Willing participants
2. Collegiate-level handball players
3. Age between 14–19 years

Exclusion Criteria

1. Injured or physically ill participants
2. Chronic diseases (asthma, heart disease, etc.)
3. Substance use during the study period

Variable

1. Dependent Variable: Agility
2. Independent Variable: Weight Training

Test Used

1. SEMO Agility Test

Training Programme

The experimental group underwent a 12-week weight training program (4 days/week, 60 minutes/session).

Statistical Analysis

Mean, Standard Deviation, and ANCOVA were used. Significance level was set at 0.05.

III. RESULTS

Table-1
Means &SDs of Pre & Post test of handball players With respect to Agility among Control group.

components	Test	Number	Mean Scores (Sec.)	Standard Deviations
Agility	Pre Test	50	13.10	2.07
	Post Test	50	13.18	2.11

Table-1 presents the mean scores and standard deviations of agility performance among handball players in the control group during pre-test and post-test conditions. The mean value of the pre-test was 13.10 seconds with a standard deviation of 2.07, whereas the post-test mean slightly increased to 13.18 seconds with a standard deviation of 2.11. This marginal increase in mean time indicates a slight decline in agility performance, as higher time reflects lower agility. The minimal change between pre and post values suggests that there was no significant improvement in agility among the control group. Since no specific training intervention was provided, the results imply that regular routine activities alone were insufficient to bring noticeable changes in agility performance.

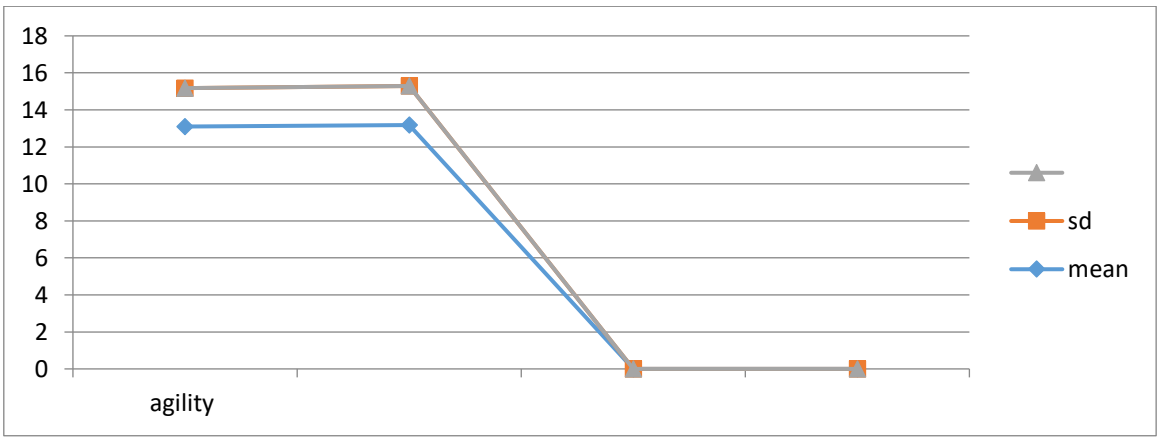

Figure-1 shows the Means &SDs of Pre & Post test of handball players With respect to Agility among Control group.

Table-2 : Means &SDs of Pre & Post test handball players With respect to Agility among Experimental group.

components	Test	Numbers	Mean Scores	Standard Deviations
Agility	Pre Test	50	13.87	2.32
	Post Test	50	11.99	2.03

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Table-2 presents the mean scores and standard deviations of agility performance among handball players in the experimental group during pre-test and post-test conditions. The pre-test mean value was 13.87 seconds with a standard deviation of 2.32, while the post-test mean decreased to 11.99 seconds with a standard deviation of 2.03. This reduction in mean time indicates a considerable improvement in agility performance, as lower time reflects better agility. The noticeable difference between pre and post-test scores suggests that the training intervention had a positive effect on agility among the experimental group. Therefore, it can be inferred that structured training contributed effectively to enhancing the agility performance of handball players.

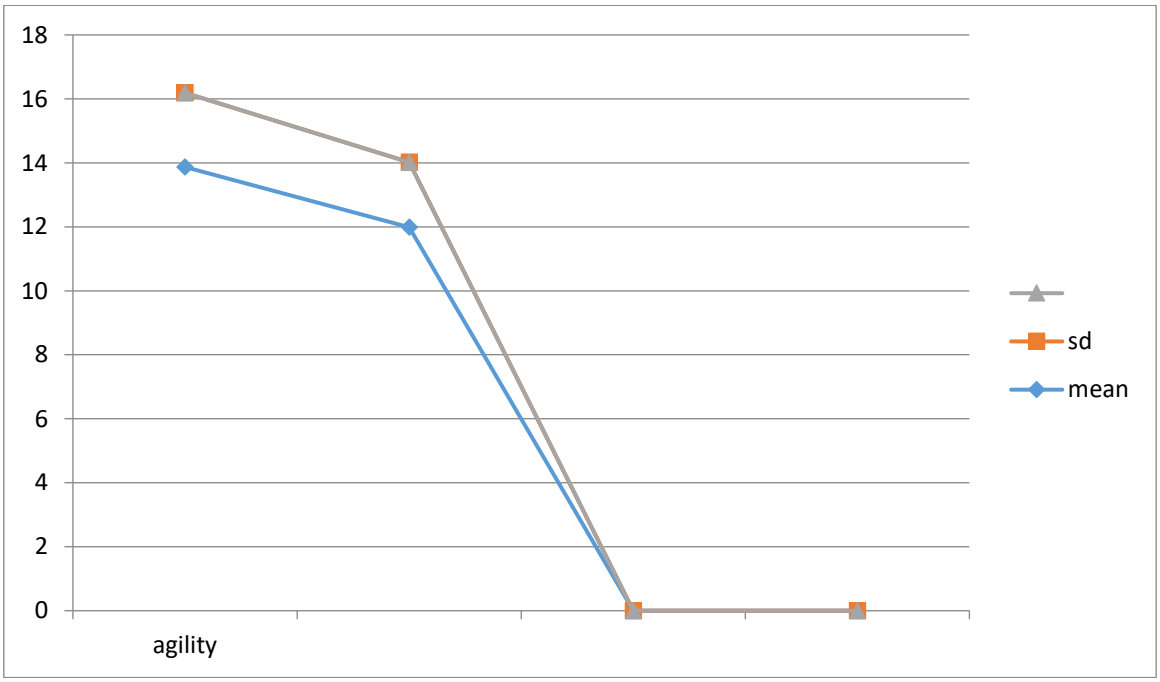

Figure- 2 shows that,Means& SDs of Pre & Post test handball players With respect to Agility among Experimental group.

Table-3
Analysis of Covariance of effects of weight training With respect to Agility among handball players.

Sourece Of Variation	DF	Ssx	Ssy	Ssxy	Ssyx	Mssyx	F-ratio
Treatment group Mean	3	0.54	12.45	1.09	1.70	1.85	1.68
Errors group Mean	197	13.67	15.43	2.34	2.58	1.10	

Not Significant

Table-3 presents the Analysis of Covariance (ANCOVA) of the effects of weight training on agility among handball players. The obtained F-ratio for the treatment group mean is 1.68, which is lower than the required value for significance at the 0.05 level. This indicates that there is no statistically significant difference between the adjusted post-test means of the experimental and control groups. Although the experimental group showed improvement in agility performance, the variation was not sufficient to reach statistical significance. The error mean square value (1.10) further reflects variability within the groups. Hence, it can be concluded that weight training did not produce a significant effect on agility among handball players in this study. Therefore, the hypothesis regarding significant improvement in agility is not supported.

IV. DISCUSSION

The findings of the present study indicate that weight training resulted in practical improvements in agility among handball players, as evidenced by reduced completion time in the experimental group. This improvement may be attributed to enhanced muscular strength and neuromuscular coordination developed through resistance training.

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However, the ANCOVA results revealed that the improvement was not statistically significant. This may be due to factors such as limited training duration, sample variability, or developmental differences among adolescent participants. Similar findings were reported by Miller et al. (2006), who observed improvements in agility without significant statistical differences.

The control group showed negligible change, confirming that without structured training, agility does not improve significantly. According to Singh S.K. (2018), agility development requires specific and progressive training stimuli. Thus, while weight training appears beneficial, its isolated effect on agility may not be sufficient without incorporating sport-specific drills.

REFERENCES

[1]. Bompa, T. O., & Haff, G. G. (2009). *Periodization: Theory and methodology of training*. Human Kinetics.
[2]. Miller, M. G., Herniman, J. J., Ricard, M. D., Cheatham, C. C., & Michael, T. J. (2006). The effects of a 6-week plyometric training program on agility. *Journal of Sports Science & Medicine*, 5(3), 459–465.
[3]. Singh, S. K. (2018). *Physical fitness and sports performance*. New Delhi: Academic Publications.
[4]. Stone, M. H., Stone, M., & Sands, W. A. (2007). *Principles and practice of resistance training*. Human Kinetics.
[5]. Sheppard, J. M., & Young, W. B. (2006). Agility literature review. *Journal of Sports Sciences*, 24(9), 919–932.
[6]. Verkhoshansky, Y. (2011). *Special strength training manual for coaches*. Ultimate Athlete Concepts.
[7]. Young, W., James, R., & Montgomery, I. (2002). Is muscle power related to running speed with changes of direction? *Journal of Sports Medicine and Physical Fitness*, 42(3), 282–288.

