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# Effect of Weight Training on Speed Performance of Handball Players

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**Abstract:** The purpose of the present study was to examine the effect of weight training on speed performance among handball players. A total of 100 male handball players aged between 14–19 years were selected and divided into two groups: an experimental group (n=50) and a control group (n=50). The experimental group underwent a structured 12-week weight training program, while the control group continued their routine activities without any specialized training. Speed performance was measured using the 50-yard dash test, conducted before and after the training period. Descriptive statistics such as mean and standard deviation were calculated, and Analysis of Covariance (ANCOVA) was applied to determine the significance of differences at the 0.05 level.

The results revealed that the experimental group showed improvement in speed performance, as the mean time decreased from 8.12 seconds in the pre-test to 7.20 seconds in the post-test. The control group showed minimal change, with mean values of 8.09 and 8.01 seconds respectively. However, ANCOVA results indicated that the improvement in speed was not statistically significant.

The study concludes that while weight training may contribute to improvements in speed, the effect was not significant within the duration of the study. It is recommended that weight training be combined with speed-specific exercises for better results.

**Keywords**: Weight Training, Speed, Handball, Physical Fitness, 50 Yard Dash

## I. INTRODUCTION

Speed is one of the most important physical fitness components required for successful performance in handball. It enables players to execute rapid movements such as sprinting, fast breaks, and defensive actions. Speed is defined as the ability to perform movements in the shortest possible time and is influenced by muscular strength, neuromuscular coordination, and reaction ability.

Weight training is widely used in sports to enhance muscular strength and power. It is believed that improvements in strength can contribute to better sprinting performance by increasing force production during movement (Bompa & Buzzichelli, 2019). However, the relationship between weight training and speed development is complex and may depend on the type and intensity of training.

According to Bansode & Singh (2022); Bansode & Singh (2022 a); Bansode RD & Singh SK (2022 b). Singh S.K (2018); Sinku S.K (2016) McArdle et al. (2015), resistance training improves muscle function and performance, but its direct effect on speed may not always be significant unless combined with specific sprint training. Singh S.K. (2020) also reported that structured physical training enhances overall athletic performance, but different components of fitness require targeted training methods.

Therefore, the present study aims to investigate the effect of weight training on speed performance among handball players using the 50-yard dash test.

## II. METHODOLOGY

**Research Design**

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

**Participants**

1. Total Subjects: 100 handball players
2. Experimental Group: 50
3. Control Group: 50

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4. Age Range: 14–19 years

**Inclusion Criteria**

1. Willingness to participate
2. Collegiate-level handball players

**Exclusion Criteria**

1. Injury or illness
2. Chronic medical conditions
3. Substance abuse

**Training Programme**

The experimental group underwent a **12-week weight training program** (4 days/week, 60 minutes/session). The control group followed their regular routine.

**Variable Measured**

1. Speed (50-yard dash test)

**Statistical Analysis**

1. Mean and Standard Deviation
2. Analysis of Covariance (ANCOVA)
3. Level of significance: 0.05

## III. RESULTS

Table – 1
Means & SDs of Pre & Post test of handball players with respect to Speed among Control group.

| Components | Test | Number | Mean Scores | Standard Deviations |
|---|---|---|---|---|
| Speed | Pre Test | 50 | 8.09 | 2.09 |
| | Post Test | 50 | 8.01 | 1.99 |

Table 1 presents the mean scores and standard deviations of speed performance among handball players in the control group during pre- and post-test conditions. The pre-test mean score was 8.09 seconds with a standard deviation of 2.09, whereas the post-test mean slightly decreased to 8.01 seconds with a standard deviation of 1.99. This minor improvement indicates that there was only a negligible change in speed performance among the control group participants. Since no specific training intervention was administered to this group, the slight reduction in time may be attributed to regular practice or familiarity with the test procedure. Overall, the results suggest that without structured training, improvement in speed ability remains minimal and not practically significant.

Figure-1 shows Means &SDs of Pre & Post test of Handball players with respect to Speed among Control group.

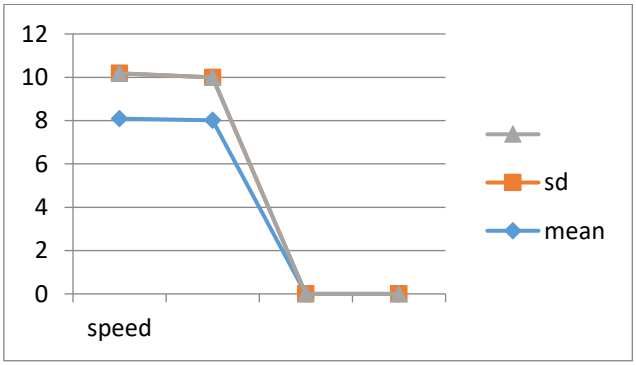


Table – 2
Means & SDs of Pre & Post test of handball players with respect to Speed among Experimental group.

| components | Test | Number | Mean Scores | Standard Deviations |
|---|---|---|---|---|
| Speed | Pre Test | 50 | 8.12 | 2.01 |
| | Post Test | 50 | 7.20 | 1.94 |

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Table 2 presents the mean scores and standard deviations of speed performance among handball players in the experimental group during pre- and post-test conditions. The pre-test mean score was 8.12 seconds with a standard deviation of 2.01, whereas the post-test mean decreased to 7.20 seconds with a standard deviation of 1.94. This reduction in mean time indicates a clear improvement in speed performance after the training program. The decrease in time reflects enhanced sprinting ability and better physical performance among the players. The slight reduction in standard deviation suggests more consistent performance among participants. Overall, the results indicate that the experimental training program had a positive effect on improving the speed ability of handball players.

Figure- 2 shows the Means &SDs of Pre & Post test of handball players with respect to Speed among experimental group.

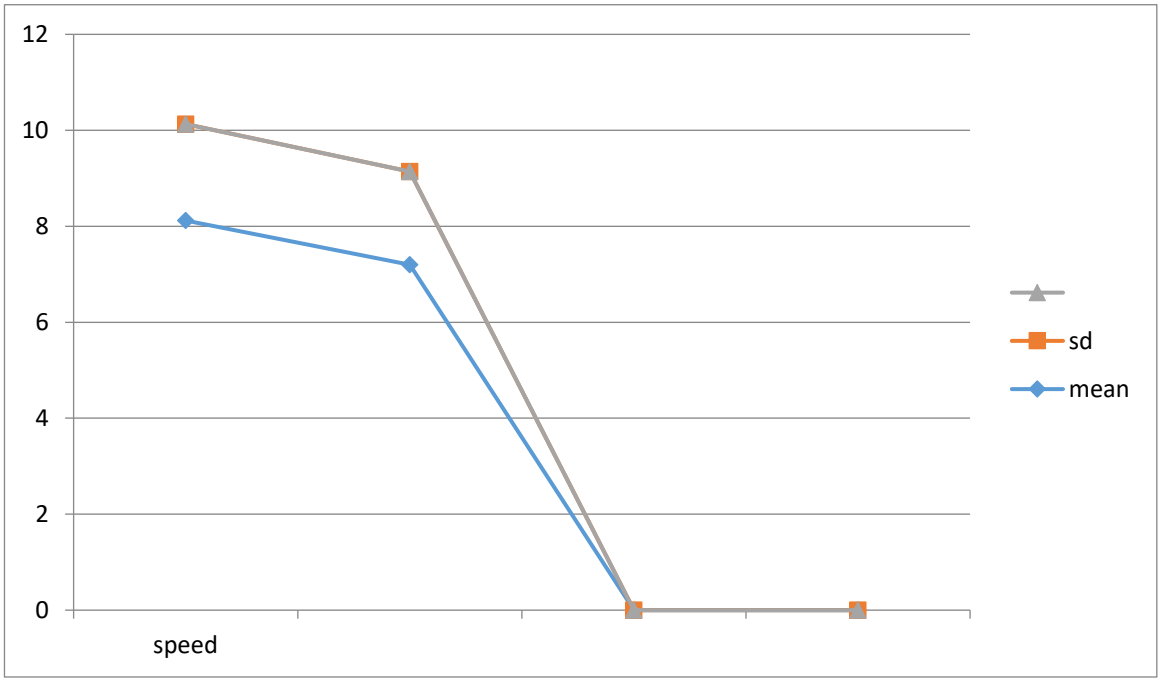


Table-3
Analysis of Covariance of effects of Weight training on Skill-related Physical fitness components With respect to Speed Handball players.

| source of variation | DF | Ssx | Ssy | Ssxy | Ssyx | mssyx | F-ratio |
|---|---|---|---|---|---|---|---|
| **Treatment Group** | 3 | 0.16 | 12.67 | 1.23 | 1.78 | 2.18 | **1.66** |
| **ErrorsGroup Means** | 197 | 8.34 | 9.84 | 6.78 | 8.90 | 1.31 | |

***Not Significant***

Table 3 presents the Analysis of Covariance (ANCOVA) results for speed performance among handball players. The treatment group has a degree of freedom of 3 with a mean square value (MSSyx) of 2.18, while the error mean square value is 1.31 with 197 degrees of freedom. The obtained F-ratio is 1.66, which is not significant at the 0.05 level.

These results indicate that there is no statistically significant effect of the training intervention on speed ability among handball players after adjusting for pre-test scores. Although some improvement in mean performance was observed in the experimental group, it was not sufficient to reach the level of statistical significance. Therefore, it can be concluded

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that weight training alone did not produce a significant improvement in speed performance. Hence, the hypothesis regarding significant improvement in speed ability is rejected.

## IV. DISCUSSION

The results of the study indicate that weight training led to some improvement in speed performance among handball players; however, the improvement was not statistically significant. The experimental group showed a reduction in sprint time, suggesting enhanced performance, but the ANCOVA results did not support a significant effect.

This finding suggests that while weight training improves muscular strength, it may not directly translate into improved speed unless combined with speed-specific training such as sprint drills or plyometric exercises. Bompa and Buzzichelli (2019) emphasized that speed development requires specialized training methods. Similarly, McArdle et al. (2015) Bansode & Singh (2022); Bansode & Singh (2022 a) ; Bansode RD & Singh SK (2022 b). Singh S.K (2018) ; Sinku S.K (2016)

noted that resistance training alone may not be sufficient to significantly improve sprint performance.
Singh S.K. (2020) also highlighted that different physical fitness components require targeted training approaches. The minimal improvement observed in the control group indicates that regular activity alone is insufficient for meaningful performance gains.

## V. CONCLUSION

Weight training alone does not produce a statistically significant improvement in speed performance among handball players. It should be combined with speed-specific training for better results.

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