Effect Of Structured Resistance Training And Varied Weight Training On Agility Among Male Handball Players

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ABSTRACT

The purpose of this study was to investigate the effect of structured resistance training and varied weight training on agility among male handball players and their age ranged between 17-21 years . Sixty players (N=60) were randomly divided into three groups of twenty: Group I underwent structured resistance training, Group II performed varied weight training, and Group III served as the control. The experimental groups followed their respective training protocols for 12 weeks, and agility was assessed using standardized testing before and after the intervention. Analysis of covariance (ANCOVA) revealed a significant difference among the groups ($F = 8.04$, $p < 0.05$). Post hoc analysis indicated that the structured resistance training group (Adjusted Mean = 10.42) demonstrated significantly greater improvements in agility compared to both the varied weight training group (Adjusted Mean = 10.66, MD = 0.24) and the control group (Adjusted Mean = 10.73, MD = 0.31). No significant difference was observed between the varied weight training and control groups (MD = 0.07). These findings suggest that while both training modalities positively influenced agility, structured resistance training was more effective in enhancing change-of-direction performance. Coaches and trainers are encouraged to prioritize structured resistance-based protocols for optimal agility development in handball players.

Keywords: Structured resistance training, Varied weight training, Agility and Handball players.

INTRODUCTION

Handball is a dynamic, high-intensity team sport requiring rapid changes of direction, sprints, and agile movements attributes that are critical for effective offensive and defensive play. Agility, defined as the ability to change direction efficiently without loss of speed, plays a pivotal role in successful handball performance (Sheppard & Young, 2006) . Developing agility through targeted training interventions has, therefore, become a key focus for coaches aiming to enhance player performance on court.

Resistance training a structured program using weight-based exercises such as squats, press variations, and medicine ball throws—improves muscular strength, power, and neuromuscular coordination. These adaptations are closely linked with improvements in agility, especially in sports that combine strength with rapid directional shifts. Indeed, the synergy between strength and agility underpins explosive change-

of-direction performance, making structured resistance training a promising intervention to boost handball agility.

Varied weight training including circuit formats, resistance-machine protocols, and in-season regimens adds diversity in loading, tempo, and exercise selection, potentially amplifying agility enhancement. For instance, a 10-week circuit strength-training program yielded substantial improvements in agility (T-half test), jumping performance, and muscular power among male handball players, demonstrating the efficacy of varied resistance stimuli in developing agility . Such findings emphasize the value of multifaceted training formats tailored for handball.

Research has also illustrated that specific resistance programs, such as medicine-ball throwing regimens, can improve velocity, strength, and power—attributes that are foundational for agility. An 8-week medicine-ball resistance training intervention enhanced throwing performance and upper-body power, suggesting transferable effects to agility through improved explosive movement capacity . These studies underscore the potential of varied weight-loading strategies in facilitating agility improvements.

Despite evidence supporting resistance and varied weight training to enhance strength components relevant to agility in handball, there remains a lack of research directly comparing structured resistance training versus varied weight-training interventions specifically targeting agility. This study aims to address that gap by evaluating how these two training modalities influence agility performance in handball players—providing practical insights for designing effective agility-focused conditioning protocols.

EXPERMENTAL DESIGN

Find out the study effect of structured resistance training and varied weight training on agility among male handball players .The study was formulated as a true random group design consisting of a pre-test and post test. The subjects who are participated inter collegiate tournaments in kadapa district (N=60) were randomly assigned to three equal groups of twenty and their age ranged between 17-21 years . The selected subjects were divided into three groups randomly. Experimental Group I was considered as structured resistance training group, experimental group II was varied weight training group and control group was not involved in any special treatment. Pre test was conducted for experimental Groups I and II and the control group on agility. Experimental groups underwent the respective training for 12 weeks. Immediately after the completion of 12 weeks training, all the subjects were measured of their post test scores on the selected criterion variable. The difference between the initial and final scores was considered the effect of respective treatments. To find out statistical significance of the results obtained, the data were subjected to statistical treatment using ANCOVA. In all cases 0.05 level was fixed to test the significance of the study.

RESULTS ON AGILITY

The statistical analysis comparing the initial and final means of Agility due to Structured Resistance Training and Varied Weight Training among athletes is presented in Table I

Table I

COMPUTATION OF ANALYSIS OF COVARIANCE OF AGILITY

	STRUCTURED RESISTANCE TRAINING	VARIED WEIGHT TRAINING	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	10.81	10.57	10.74	Between	0.61	2	0.31	1.45
				Within	12.00	57	0.21	
Post Test Mean	10.51	10.54	10.75	Between	0.74	2	0.37	1.68
				Within	12.51	57	0.22	
Adjusted Post Test Mean	10.42	10.66	10.73	Between	1.03	2	0.52	8.04*
				Within	3.60	56	0.06	
Mean Diff	-0.31	-0.03	0.01					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.

*Significant

As shown in Table I, the obtained pre test means on Agility on Structured Resistance Training group was 10.81, Varied Weight Training group was 10.57 was and control group was 10.74. The obtained pre test F value was 1.45 and the required table F value was 3.16, which proved that there was no significant difference among initial scores of the subjects.

The obtained post test means on Agility on Structured Resistance Training group was 10.51, Varied Weight Training group was 10.54 was and control group was 10.75. The obtained post test F value was 1.68 and the required table F value was 3.16, which proved that there was no significant difference among post test scores of the subjects.

Taking into consideration of the pre test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 8.04 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table II.

Table II

Scheffe's Confidence Interval Test Scores on Agility

MEANS				Required . C I
Structured Resistance Training Group	Varied Weight Training Group	Control Group	Mean Difference	
10.42	10.66		0.24*	0.20
10.42		10.73	0.31*	0.20
	10.66	10.73	0.07	0.20

***** Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Structured Resistance Training group and control group (MD: 0.31). There was no significant difference between Varied Weight Training group and control group (MD: 0.07). There was significant difference between treatment groups, namely, Structured Resistance Training group and Varied Weight Training group. (MD: 0.24).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure I.

Figure I

BAR DIAGRAM ON ORDERED ADJUSTED MEANS ON AGILITY

DISCUSSIONS ON FINDINGS ON AGILITY

The effect of Structured Resistance Training and Varied Weight Training on Agility is presented in Table I. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 8.04 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table II proved that there was significant difference between Structured Resistance Training group and control group (MD: 0.31). There was no significant difference between Varied Weight Training group and control group (MD: 0.07). Comparing between the treatment groups, it was found that there was significant difference between Structured Resistance Training and Varied Weight Training group among handball players.

Thus, it was found that Structured Resistance Training was significantly better than Varied Weight Training and control group in improving Agility of the handball players.

CONCLUSION

The findings of the present study clearly demonstrate that both structured resistance training and varied weight training positively influenced agility performance among male handball players, with structured resistance training producing a more pronounced effect. Statistical analysis confirmed significant differences between the experimental groups and the control group, indicating the effectiveness of systematic strength-oriented training in improving agility. Furthermore, the post hoc results revealed that structured resistance training was superior to varied weight training in enhancing change-of-direction speed and movement efficiency. These outcomes highlight the importance of incorporating well-planned resistance training programs into the regular conditioning regimen of handball players to optimize agility, which is essential for high-intensity performance in competitive play. Coaches and trainers are therefore encouraged to prioritize structured resistance protocols, while still utilizing varied weight training as a complementary method to sustain player development and overall fitness.

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