Original Article

Impact of Resistance Training on Anthropometric Variables in Tribal Adolescence of Tirupattur District

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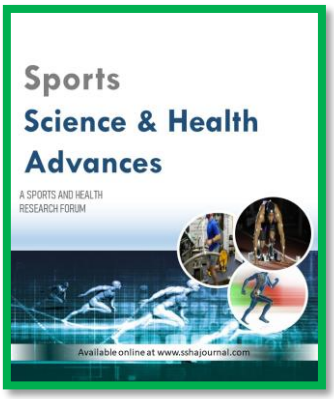

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Abstract

The study's goal was to examine or investigate the impact of resistance training on the anthropometric enhancement of tribal adolescence in Tirupattur District. The study's goal is to enhance anthropometric development through resistance training. There were 40 tribal high school volleyball players from Tirupattur district, Tamil Nadu, India. We randomly selected the players for this study. The age group ranged from 15 to 17 years. We divided the participants into two groups: the control group and the experimental group. Each group consists of 20 participants. The Lambert Adolphe Jacques Quetelet test evaluated the body mass index's anthropometric fitness component, while the Tom Venuto test assessed body fat. The experimental study's results show that resistance training produces significant improvements over anthropometric components like body mass index and body fat among tribal adolescents in Tirupattur District.

Keywords: body mass index, body fat, resistance, volleyball players

Introduction

Enhancing the tribal high school volleyball players' unique anthropometric requirements is a critical aspect of their training because it enables them to participate effectively during matches. Resistance training, the most developed training for those unique anthropometric requirements, is the only way to successfully enhance this process. By identifying the best training, we can positively support the players in achieving their expected anthropometric abilities. Resistance training supports various anthropometric components, such as body mass index and body fat. This study shows how the tribal school volleyball players adopted the respective skills and shows the impact of these skills on their performance in volleyball games. (Saeed et al., 2023.) examined the impact of resistance training on the body composition and kinematics of female volleyball players. They found that physical fitness and serving skills showed significant enhancements. (Nesic et al., 2014) examined the anthropometric characteristics and motor abilities of adolescent female volleyball players. Their findings offer valuable information for identifying talent and developing effective training methods in sports. Duncan et al. (2006) conducted a study to examine the anthropometric and physiological characteristics of junior elite volleyball players, with a particular focus on identifying positional variations. The consideration

of these aspects is of utmost importance in the context of player development and training programmes. Mielgo-Ayuso et al. (2015) examined the impact of anthropometric profiles on the physical performance of elite female volleyball players, with a specific focus on their playing positions. Resistance training is an exercise that challenges muscles through resistance, promoting strength and muscle growth. The weight lifted increases in intensity over time. Density refers to the volume of work performed in each time, often increasing with shorter rest periods. Typical exercises include squats, deadlifts, bench presses, and rows, targeting major muscle groups. We structure our workouts to focus on specific muscle groups on different days, allowing for recovery. Consistency and progressive overload are key principles for ensuring continuous adaptation and improvement in strength and muscle mass.

Review of Literature

Researchers have conducted several studies to examine the impact of resistance exercise on anthropometric factors across various groups, yielding significant findings about its potential advantages. To demonstrate this, Masanovic (2018) conducted a comparison of anthropometric measurements among junior football and volleyball players. They emphasised the unique physical characteristics of these athletes, which could potentially impact their athletic performance and training approaches. (Michael & Kamper, 2011) examined the efficacy of resistance training in children and adolescents, revealing that it yielded significant improvements, particularly after the onset of puberty. Limitations in study quality and reporting create constraints. (Newton et al., 2006) examined the effects of a four-week period of ballistic resistance training on female volleyball athletes. Over the course of the season, the study's findings revealed improvements in jump performance and neuromuscular variables. (Christou et al., 2006) examined the effects of resistance training on adolescent soccer players. They found that a combined soccer and strength training programme resulted in improved physical abilities compared to soccer training alone. (Arazi et al., 2018) examined the influence of arm movements on vertical jumping. The research initiative has proven to have significant consequences for jump height, establishing the significance of technique in optimising performance. Melrose et al. (2007) investigated the physiological and performance traits of teenage club volleyball players, with a specific focus on important anthropometric and strength variables in young female athletes.

Additionally, Harris et al. (2012) performed a comprehensive examination and statistical analysis of resistance training in adolescent athletes. They emphasised the potential advantages of this training method for enhancing power and sports performance. (Payne et al., 1997) performed a meta-analysis on resistance training in children and adolescents, emphasising its advantages and offering recommendations for secure and efficient execution. (Kumar Mishra & Singh Rathore, 2013) examined the relationship between anthropometric factors and volleyball performance in male players. They used a regression equation to analyse the data and make predictions. Masanovic et al. (2019) conducted a comparative analysis of anthropometric measures and body composition among junior basketball and volleyball players in Serbia. The research aimed to elucidate the distinct physical characteristics associated with each sport. (D'isanto et al., 2018) examined the impact of cluster sets on resistance training among female volleyball athletes. The integration of cluster sets resulted in enhancements in both power and strength.

Research Objectives

1. Recognize the impact of resistance training on enhancing the body mass index of the experimental group.
2. Prepare exercises in accordance with the style of resistance training to reduce the experimental group's body fat.

Research Hypotheses

1. There is a positive impact of resistance training on enhancing the endurance of the body mass index of the tribal adolescents in Tirupattur District.
2. There is a great impact of training, according to the module on resistance training, on decreasing body fat among tribal adolescent volleyball players.

Research Methodology

This study employs an experimental design to examine the effects of resistance training on anthropometric components, specifically body mass index (BMI) and body fat percentage, among tribal adolescent volleyball players in the Tirupattur district, Tamil Nadu, India. We randomly selected 40 participants and divided them into control and experimental groups. The control group received regular training, while the experimental group underwent an eight-week resistance training programme, with sessions lasting 40 minutes per day, incorporating warm-up, resistance training, and cool-down activities. During the intervention, training intensity increased incrementally, from 30% to 60%. We collected anthropometric data, such as height, weight, BMI, and body fat percentage, using standardised techniques and equipment like skinfold callipers before and after the intervention period.

The skinfold technique involves using callipers to measure subcutaneous fat at various body sites, like the triceps and subscapular. The procedure includes pinching the skin and fat, then measuring the fold's thickness. We input measurements from multiple sites into equations like the Jackson and Pollock formula, which considers age and gender, to estimate body fat percentage. This method provides a practical and cost-effective way to assess body composition in research and fitness settings. We used SPSS software to perform statistical analysis, including paired sample t-tests and descriptive statistics, to assess within-group and between-group changes. We addressed ethical considerations, ensuring voluntary participation, informed consent, and confidentiality. We acknowledged limitations such as sample size constraints and reliance on self-reported data. The goal of this method is to provide strong evidence about how resistance training can improve anthropometric variables among tribal teenage volleyball players. This will support sports science research and guide future interventions in this population.

Results

Table 1 Statistical Analysis of Pre-Test and Post Test Scores and Computation of the Mean on resistance Training on the anthropometric Component BMI.

Table 1 BMI - Paired Samples Statistics of Control and Experimental Group

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Control group BMI Pre-Test	25.7600	20	1.23263	.27562
	Control group BMI Post Test	25.6150	20	1.33309	.29809
Pair 2	Experimental Group BMI Pre-Test	25.7600	20	1.23263	.27562
	Experimental Group BMI Post Test	24.6300	20	1.11502	.24933

Table 1 shows the BMI mean values of the control group and experimental group. Table 1 displays the control group's pre-test mean value is 25.676 and the post-test value of 25.61. The post-test score must be reduced, but without training, the control group value will slightly decrease. This value shows there is no improvement in the control group. As

the experimental group's pre-test mean value is 25.76, and the post-test score is 24.63. This value shows that the mean value has decreased. The anthropometric components, the value has decreased through resistance training. This study strongly proved that there was a significant effect was done among the experiment group.

Table 2 BMI -Paired Samples Test

				95% CI				
	Mean	**SD**	**SEM**	***Lower***	***Upper***	**'t'**	**Df**	**Sig.**
Control Group Pre-Test and Post-Test	.14500	.57443	.12845	.12384	41384	1.129	19	.273
Experimental Pre-Test and Post-Test	1.1300	.40275	.09006	.94151	1.31849	12.547	19	.000

The paired values in table 2 clearly show that the experimental group performed well compared to the control group. Thus, resistance training is effective to enhance anthropometric components BMI and Statistical Analysis of Pre-Test and Post Test Scores and Computation of the Mean on Resistance Training on the anthropometric Component BMI.

Table 3 Body Fat Paired Samples Statistics of Control and Experimental Group

		Mean	**N**	**Std. Deviation**	**Std. Error Mean**
Pair 1	Control Group Pre- Test	17.5100	20	1.88118	.42064
	Control Group Post- Test	17.6450	20	2.00328	.44795
	Experimental Group Pre-Test	17.5100	20	1.88118	.42064
Pair 2	Experimental Group Post-Test	16.0800	20	1.68354	.37645

Table 3 shows the Body fat mean values of the control group and experimental group. Table 3 displays the control group's pre-test mean value is 17.5100 and the post-test value of 17.6450. The post-test score has to be decreased, but without training, the control group value is nothing change, even the mean value is increased. This value shows there is no improvement in the control group. As the experimental group's pre-test mean value is 17.5100, and the post-test score is 16.0800. This value shows that the mean value has decreased. The Body Fat of anthropometric components, the value has increased through resistance training. This study strongly proved that there was a significant effect was done among the experiment group.

Table 4 Body Fat - Paired Samples Test

				95 % CI				
	Mean	SD	SEM	*Lower*	*Upper*	't'	Df	sig
Control Group	.13500	.31669	.07081	.28321	.01321	1.906	19	.072
Experimental	1.43000	.31305	.07000	1.28349	1.57651	20.429	19	.000

In table 4 the paired values clearly show that the experimental group performed well compared to the control group. Thus, resistance training is effective to enhance anthropometric components Body Fat.

Discussion

The results of this experimental study showed that the experimental participants in resistance training for a period of six weeks were able to improve their performance in anthropometric and selected variables. After analysing the two values, the researcher found that there were significant differences between the control group and the experimental group. There was a significant development in the harmonising and stretching abilities of

the experiment group. Masanovic et al. (2021) compared the anthropometric measures and body composition of elite handball and volleyball players in the Serbian National League. Their findings offer useful insights for coaches and researchers. In their study, Muhammadiyah Pekajangan Pekalongan (2023) examined the relationship between body anthropometry and volleyball skills in a sample of students from SMA Negeri 1 Kajen. The researchers obtained valuable insights into the levels of skill mastery among the participants. (Milić et al., 2017) examined the anthropometric and physical performance variables in top female volleyball athletes, with a particular focus on their significance in identifying talent and determining player achievement. (Moreno et al., 2014) examined the impact of a brief resistance programme on the vertical jump capacity of highly skilled male volleyball athletes during the competitive season. (Guide: Dr. Minakshi Pathak, 2022) investigates the influence of anthropometrics on the offensive and defensive abilities of volleyball players from Telangana. The research highlights the connection between physical fitness and performance.

The Suggestions for Future Study

The study's limitations encompass a comparatively limited sample size and a narrow emphasis on anthropometric characteristics. In order to improve the applicability of the findings, future research should use larger and more varied samples. Furthermore, conducting an examination of a wider range of performance measures and integrating qualitative insights would yield a more comprehensive comprehension. Further research should also take into account external factors, such as participants' compliance with the training programme. Although this study has many limitations, it lays the groundwork for future research on culturally customised training methods that promote comprehensive growth among tribal volleyball players.

Conclusions

The exercises prepared by the researcher according to resistance training positively affected the development of body fat, decreased endurance, and significantly increased endurance among tribal high school students' volleyball players. The enhancement of the anthropometric body mass index by using resistance training had a positive impact on the experimental group. The training has a positive effect on the enhancement of range, body mass index, and adapting nature. The ability of tribal volleyball players to play actively following resistance training.

Conflict of Interest: No Conflict of Interest declared among authors

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