



Effect of an 8-Week Resistance Band Circuit Training Programme on Agility of Women Amateur Handball Players

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Abstract

This study aimed to evaluate the effect of an 8-week resistance band circuit training programme on the agility of 40 female Amateur Handball players from Calicut, India. The participants were allocated randomly into two groups: an experimental group and a control group. The experimental group engaged in a resistance band circuit training program. The control group was given a standard training program, while the experimental group received a regular training program for eight weeks. The subjects underwent testing in agility utilizing a shuttle run both before and after an eight-week training programme. The results of the research demonstrated a statistically significant difference, at the 0.05 level, between the adjusted post-test mean of the resistance group and the control group in terms of agility. The findings of the study showed that there was a significant difference in agility due to the resistance band circuit programme. This study shows that eight weeks of the resistance band programme is very useful in improving women's handball athletes, emphasizing the crucial importance of agility for maximizing their athletic performance.

Keywords: Resistance band circuit training, Exercise, Agility, Athletes.

Introduction

Handball is a high-speed and dynamic sport that requires a blend of physical abilities, such as agility, speed, coordination, and teamwork. This sport is both demanding and thrilling, as it necessitates the utilization of hands for passing, catching, and shooting the ball, as well as employing the body to obstruct adversaries and protect one's own goal. The qualities of agility and coordination are essential for handball players since they have a direct influence on their performance on the court. Below is a comprehensive elucidation of the requirements for agility and coordination in the sport of handball. Handball is a fast sport that necessitates players to rapidly alter their course, increase and decrease their speed, and respond to the actions of their adversaries. Agility enables athletes to effectively navigate in various directions, elude defenders, and generate chances to score. The activity encompasses a fusion of equilibrium, velocity, adaptability, and physical mastery. Rapid and accurate footwork is necessary to maneuver through narrow areas, swiftly change direction, and sustain stability while executing diverse manoeuvres. Players possessing high agility are capable of executing maneuvers such as cutting, pivoting, and evading with fluidity and efficiency, allowing them to generate space and elude defenders. Players must fast accelerate to achieve maximum velocity and decelerate swiftly to come to a halt or alter their course. Agility enables players to effectively create and manage their speed, enabling

them to quickly respond to game events. Excellent hand-eye coordination, as players need to catch, throw, and control the ball accurately while moving and under pressure. Coordination involves the synchronization of hand movements, footwork, and body positioning. Players need to coordinate their upper and lower body movements to execute various skills, such as jumping, shooting, and defending. This includes maintaining balance, timing movements correctly, and using proper body positioning to maximize efficiency and effectiveness. Developing agility in handball requires specific training exercises that focus on improving these skills. Regular practice, drills, and conditioning programs can help players enhance their agility, coordination, and overall performance on the handball. Resistance band circuit exercises can be beneficial for handball players in several ways. Here are some specific reasons why incorporating resistance band circuit exercises into their training routine can be advantageous. Resistance bands provide variable resistance throughout the range of motion, which helps in developing strength and power in specific muscle groups used in handball. This can enhance throwing power, shooting accuracy, and overall performance on the court. Resistance band exercises can target specific muscle groups and improve stability and joint integrity. This can help in preventing common handball-related injuries, such as sprains, strains, and overuse injuries. Resistance band exercises can mimic the movement patterns and demands of

handball, making them highly specific to the sport. This can improve muscle coordination and neuromuscular control, leading to better performance during matches. Bands can be used to add resistance to agility drills, helping to improve quickness, reaction time, and change of direction abilities. This can be particularly beneficial for handball players who need to move swiftly and change directions rapidly during gameplay. Resistance band exercises can be used to provide a low-impact option for strengthening muscles and improving the range of motion during the recovery. Integrating resistance band circuit exercises into a handball player's training regimen helps bolster their muscular strength, explosive power, agility, and injury resilience. Seeking guidance from a proficient strength and conditioning coach or sports therapist is crucial to creating a customized program that aligns with the specific requirements and objectives of the individual player. Circuit training is a method of improving overall physical fitness by performing a series of exercises at different stations. These exercises can involve intense aerobic activity, as well as employing one's own body weight or external weights. A "circuit" in exercise refers to the completion of all the required exercises in the program. Circuit training is highly beneficial for enhancing fitness as it can effectively enhance muscle strength, endurance, and aerobic fitness. Circuit training can be conducted by employing weight training exercises or by utilizing one's body weight to generate resistance. An accomplished athlete must possess both speed and agility, as rapid movements and changes in direction are essential in

various games or sports activities. Although certain individuals may possess inherent speed and agility, these attributes can also be developed via deliberate practice and training. It is crucial to bear in mind that the enhancement of speed and agility will not occur if a player engages in training while fatigued. Training for speed and agility should be done when a player is in a state of relative freshness, following a thorough warm-up. Agility is a crucial attribute in numerous sports that are played on a court or field.

Materials and Methods

This study employed a randomized group design. The study included a cohort of 40 female Handball players from Calicut, all of them were Amateur and aged between 17 and 20 years. The participants were allocated randomly into two groups: an experimental group (n = 20) and a control group (n = 20). The experimental group engaged in an 8-week resistance circuit training program. The control group abstained from engaging in any specific physical activity training program throughout the same time frame. The subjects underwent testing in the specific physical attribute of agility utilizing a shuttle run both before and after an 8-week resistance band circuit training program. The training regimen consisted of a 10-minute warm-up, a 10 to 30-minute workout, and a 10-minute cooldown, totaling 40 minutes. The training regimen's intensity was augmented biweekly. The data concerning specific physiological variables were analyzed using ANOVA to ascertain the disparity between the starting and final means for both the experimental and control groups at a significance level of 0.05.

Table – I: Bi-weekly schedule of resistance band circuit training programme

Exercise	1-2 weeks	3-4 weeks	5-6 weeks	7-8 weeks	Repetitions
Jogging	10 min	10 min	10 min	10 min	-
Lateral Band Walks Forward	10sec	20 sec	30 sec	40 sec	2 each
Lateral Band Walks sideways	10sec	20 sec	30 sec	40 sec	2 each
Band Resisted Shuffle	10sec	20 sec	30 sec	40 sec	2 each
Band Jump Squats	10sec	20 sec	30 sec	40 sec	2 each
Jumping jacks using resistance bands	10sec	20 sec	30 sec	40 sec	2 each
Band resisted high knees	10sec	20 sec	30 sec	40 sec	2each
Band resisted agility ladder	10sec	20 sec	30 sec	40 sec	2 each
Band resisted zig-zag movement	10sec	20 sec	30 sec	40 sec	2 each

Results

The statistical analysis of the gathered agility data is detailed in the table below. ANOVA was utilized to analyze the agility-related data for both the

experimental and control groups. A significance level of 0.05 was selected. Table 2 presents the mean discrepancy in criterion measurements between the experimental and control groups.

Table 2: Analysis of Covariance on Agility of Resistance Band Training Group and the Control Group

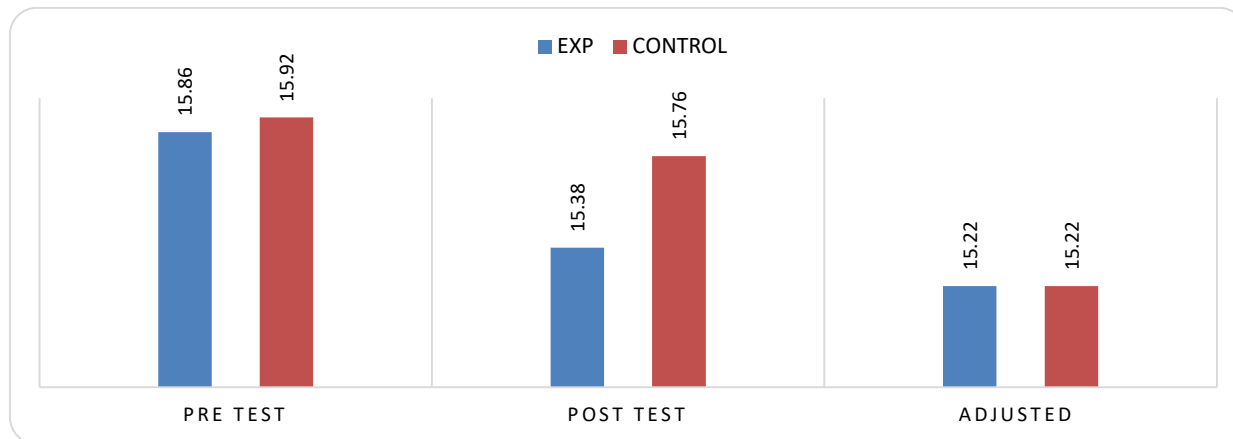
Variables	Test	RBTG	CG	Source of Variance	Sum of Squares	df	Mean Square	F- Value
Agility	Pre-Test Means	15.86	15.92	BG	0.42	1	0.42	0.76
				WG	21.49	37	0.56	
	Post Test Means	15.38	15.76	BG	6.06	1	6.06	16.28*
				WG	14.13	38	0.37	
	Adjusted Means	15.22	15.72	BG	7.77	1	7.77	36.71*
				WG	7.81	37	0.21	

Note: RBTG- Resistance Band Circuit Training Group, CG- Control Group

To achieve significance at a 0.05 level. The adjusted post-test means for the control group and the resistance band training group are 15.72 and 15.22, respectively. At the 0.05 level of significance, the F ratio of 36.71 derived for the adjusted post-test mean exceeds the critical value from the table.

The findings of the research demonstrated a statistically significant distinction, at the 0.05 level, between the adjusted post-test mean of the resistance band training group and the control group in terms of agility. Figure 1 indicates the mean values of agility for both the control group and the training group, including pre-test, post-test, and changed post-test values.

Figure 1: The pre-, post, and adjusted post-test mean values of the Resistance Band Training Group and Control Group in Agility.



Conclusion

This study shows that there was a significant difference in agility due to the resistance band circuit training programme. So, we can say eight weeks of resistance band circuit training programme is very useful to improve women's handball athletes. The importance of agility in female athletes is of utmost since it improves performance and minimizes the likelihood of injuries. An 8-week resistance band circuit training program showed significant improvements in agility. This training program developed enhanced proprioception, speed, and coordination, essential qualities for competitive sports. The specialized technique designed specifically for the physiological requirements of women resulted in holistic growth, facilitating rapid changes in direction and accurate movements on the playing field or court. Targeted training enhances the abilities and endurance of female athletes, emphasizing the crucial importance of agility in maximizing their athletic performance.

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