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Effectiveness Of Core Strengthening Exercises Versus Dynamic Stretching Exercises On Agility In Badminton Players.

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ABSTRACT

Background: Badminton is considered a physically demanding sport. In badminton court players need to be able to change direction rapidly, accelerate quickly, and react swiftly to their opponent's shots for which a combination of speed, agility, endurance and hand – eye coordination is required. Agility is one of the important components in badminton players.

Objective: To compare the effects of core strengthening exercises and Dynamic stretching exercises on agility in badminton Players.

Methods: In this pre – post intervention study 60 badminton players were included. They were randomly divided into 2 groups with 30 individuals each. Group A was treated with core strengthening exercises and Group B with dynamic stretching exercises for 6 weeks. After pre – post assessment, data was analyzed with the help of appropriate statistical methods.

Results: According to the result, in Group A and Group B there is significant difference in agility with p value <0.001.

Conclusion: The study concluded that core strengthening exercises and dynamic stretching exercises had good effect on agility of the players but in comparison core strengthening exercises are more effective than dynamic stretching.

Keywords: Badminton, Core strengthening, Flexibility, Agility, Dynamic Stretching.

INTRODUCTION

One of the sports that is often played by all people is Badminton. It is one of the world's most popular racquet sports in the world, started in Indonesia, attracting both recreational and competitive players. [1]
In badminton, players use a racket to hit a shuttlecock. The playing field is rectangular and divided by a net separating the two playing areas [2]. Badminton is a popular sport with courts available in both indoor and outdoor settings. The physical condition of athletes plays a crucial role in supporting technical and tactical training.

To achieve success in badminton, training should prioritize speed, agility, endurance, strength, and flexibility while also having a strong foundation of endurance.[2]

During the game, badminton players execute various movement patterns such as specialized twists, jumps, footwork, and swings to strike the shuttlecock and keep it moving back and forth on the court for which they need various components such as muscular power, explosive power, speed, coordination, endurance, reaction, strength, accuracy, flexibility, agility, and balance to improve and achieve maximum sports performance. [3, 4, 5].

Agility involves the ability to quickly and efficiently change direction, accelerate, decelerate, and react to varying situations during gameplay. It comprises a combination of physical attributes, including speed, coordination, balance, and flexibility.

On the badminton court, agility plays a pivotal role, and a player with exceptional agility can reach the shuttlecock faster, cover a wider area of the court efficiently, transition between shots rapidly, and allow for quicker recovery. [6,7]

Badminton players perform the lunge step frequently, accounting for approximately 15% of total movements in a game (Kuntze et al., 2010; Mei et al., 2017). This movement requires high flexibility, rapid reactions, powerful jumps, and agile footwork throughout the game [8].

Flexibility is crucial for badminton players. It enables joints to move easily through a full range of motion without pain or resistance. Smooth movement and safety during physical activity depend on flexibility [9, 10]. Badminton players require a high level of flexibility to execute challenging movements.

Prior to participating in sports, athletes must perform warm-up exercises as it improves performance and may help prevent injuries (Woods et al., 2007). Muscle strain injuries usually happen during movements that involve rapid acceleration/deceleration and sprinting (Opar et al., 2012) [11].

Some of the best exercises to improve your performance include forward lunges, side lunges, cross-overs, standing quad stretch, seat straddle lotus, seat stretch, and knees to the chest. These exercises help players

build their stretching muscles and enhance their flexibility, which is crucial for badminton players. Flexibility enables players to move their bodies in various ways, enhancing accuracy in hitting the ball and providing them with an advantage over their opponents [12].

Literature by Turki et al., 2019 suggested dynamic stretching (DS) as the most commonly suggested warm-up protocol. The dynamic stretching technique involves a stretch to lengthen the muscle, and individuals perform it by moving parts of the body and gradually increasing reach and speed of movement (Behm and Chaouachi, 2011). It often mimics movement patterns performed during subsequent exercise [13].

According to the study conducted by Opplert and Babault in 2018; recommended that dynamic stretching provides a more sport-specific warm-up exercise, and as a precursor, it increases body temperature, improves nerve conduction, and enhances sports performance i.e., jump height, sprint speed, and agility [14].

The “core” region of the body has been anatomically described as a box, with the abdominals at the front, spinal and gluteal muscles at the back, the diaphragm on the top, and the pelvic floor and hip muscles on the bottom. It includes transverse abdominal muscle, abdominal external oblique muscle, multifidus muscles, abdominal internal oblique, psoas major muscle.

A core muscle is used to stabilize the thorax and the pelvis during dynamic movement and it also provides internal pressure to expel substances. Core strength enhances agility, reaction time, and stability in badminton, allowing for smooth movement and control maintenance [15].

Core exercises enhance the player's stability and build his hips, back, and pelvis muscles. They help to balance and improve overall agility. The set of the best badminton exercises to improve your performance includes high plank, superman pulls, V-ups, V-sits, plank knee cross, and leg raise.

Core strengthening exercises plays a crucial role in badminton training, and in enhancing performance on the court. It also helps to improve the coordination between upper and lower extremities, reduces risk of injury, prevents lower extremity injuries and improves performance. It helps players control body balance, maintain energy equilibrium, and enhance their skills [16].

Therefore, this study had been conducted to check the Effectiveness of Core Strengthening Exercise Versus Dynamic Stretching Exercise on Agility in Badminton Players.

PROCEDURE

All the subjects were selected for the study according to the selection criteria. Demographic data and consent were taken from them. Included participants were divided into 2 groups by simple random sampling method. Group A received core strengthening exercises. Participants were instructed to perform Plank, Bridging, Leg Raise and Crunches (3 sets of 10 reps). These exercises were performed for 6 weeks, 3 days/week. Group B received dynamic stretching exercise. Participants were instructed to perform Arm Crossover, Rotator cuff stretch, walking lunge with trunk rotation, lateral shuffle, Frankenstein walk, heel up and modified shuttle run. Session consisted of 3 sets of 15 reps for 6 weeks, 3 days/week.

Pre and Post assessment were taken before and after 6 weeks of the treatment respectively with the help of compass drill test.

STUDY DESIGN:

- Type of study - Experimental Study
- Study Duration - 12 months
- Place of study - Badminton clubs across Mumbai

SAMPLE DESIGN:

- Study Sample - 60
- Sample population - Badminton players
- Sampling type - Convenient

RESULTS

Table no 1 – Age wise distribution of group a & group b.

Age Group (Years)	Group A (Core)				Group B (Flexibility)			
	Number of players	Percentage	Mean	SD	Number of players	Percentage	Mean	SD
15 – 20	10	33.33	17.50	1.5092	13	43.33	18.85	0.8006
20 – 25	20	66.67	22.20		17	56.67	22.12	

Above table depicts the baseline characteristics between both the groups.

Table no 2 – Comparison of means of compass drill test in group a & group b.

Compass Drill Test	Pre		Post	
	Mean	SD	Mean	SD
Group A	11.57	1.20	9.71	1.11
Group B	10.10	0.89	9.03	0.92

Above table depicts the intra group analysis and inter group analysis of compass drill test.

Table No 3 – Paired and unpaired test for compass drill in both groups

Compass Drill Test	Paired t test		Unpaired t test	
	't' value	'p' value	't' value	'p' value
Group A	18.78	<0.001	2.58	0.01
Group B	29.53	<0.001		

Above table represents results of paired and unpaired t test of mean score of total score of Compass Drill Test of subjects from both the groups.

The t value of compass drill test of Group A is lower than Group B. It depicts that Group A (core Strengthening Exercises) showed a higher improvement in agility than Group B (Dynamic stretching Exercises).

DISCUSSION

This study assessed the effectiveness of core strengthening exercises versus dynamic stretching exercise on agility in badminton player between the age group 15 to 25 years in a metropolitan city of India using outcome measure such as compass drill test this test was used to check the agility of players.

A total of 60 badminton players were included based on selection criteria. The included participants were divided into two groups A and B by simple random sampling method. Mean age of players from core group was 20.63 years and mean age of players from flexibility group was 20.70 years.

Group A received core strengthening exercises. Participants were instructed to perform Plank, Bridging, Leg Raise and Crunch. 3 sets each consisting of 10 reps. These exercises were performed for 6 weeks, 3 days/week.

Group B received dynamic stretching exercise. Participants were instructed to perform Arm Crossover, Rotator cuff stretch, walking lunge with trunk rotation, lateral shuffle, Frankenstein walk, heel up and modified shuttle run. Session consisted of 3 sets of 15 reps for 6 weeks, 3 days/week.

Pre and Post assessment was taken after 6 weeks of treatment respectively with the help of Compass Drill Test.

The result shows that mean difference values of compass drill test results before and after core strengthening exercises in core group i.e., Group A and mean difference values of compass drill test results before and after dynamic stretching exercises group i.e., Group B. It suggests that the mean difference of core group exceeds the mean difference of flexibility group by 0.83 seconds.

CONCLUSION

Both, core strengthening Exercises and Dynamic Stretching Exercises were effective in improving the agility, but agility improved more in core strengthening exercises. Statistically significant difference was found within groups A and B.

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DECLERATION

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