A Study to Determine the Baseline Data of Spatial and Temporal Gait Variables and Their Correlation with Biomotor Skill in Badminton Players- Pilot Study

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ABSTRACT:

Introduction: Badminton is an individual and non-contact sports which require jumps, lunges, quick changes of direction, and rapid arm movements from a wide variety of body positions. The performance of the game no time limit, full of uncertainty, higher explosive requirements, speed and full range of sports.

Objectives: To find out the correlation & Impact of training on temporal & spatial variable with biomotor skill in badminton players.

Methods: A total 12 Badminton players. Online Survey was made as per a review of the literature and then the list of different exercises, and questionnaires were sent to professional physiotherapists and coach for designing the basic protocol, and as per the response received from them designing of the training program was initiated. The experimental group performed stair running, jump squat, power skips, squat, calf hops, one leg squat & planks. Outcome measures used were Sensamove mini balance board, Vertical jump height, Illinois Agility test, Temporal & Spatial Variable- as step length, stride time & cadence.

Results: In the Control group agility, power, gait variables & balance show negative results. Moreover agility, power, gait variables & balance shows significant changes in the experimental group(p=.001) it shows that the designed program is effective to enhance the fitness training for improving speed, power, balance , gait variables and accuracy of badminton players.

Conclusions: The exercise program has a positive effect on performance. The basic designed program having an effect and improving the speed, and physical fitness parameters of Badminton Players.

1. Introduction

Badminton is an individual and non-contact sports which require jumps, lunges, quick changes of direction, and rapid arm movements from a wide variety of body positions. The physical demands of badminton suggested that severe injuries to the limbs may frequently occur.[1]

Badminton features the performance of the game no time limit, full of uncertainty, higher explosive requirements, speed and full range of sports.[2]

Playing badminton sport for a long time will cause a series of biological adaption and modifications to the motor system. Long-time badminton sport has adaptive impact on the foot. In badminton special physical conditioning, in terms of action controls such as reaction time, foot stepping and static or dynamic balances, which are important motor demands in the sport.[3]

Players conduct various movement patterns during the game including twists, jumps, and swings to strike the shuttle-cock for moving back and forth on the court.[4]

Having an ideal gait and run pattern can be of almost importance in a player's performance. Observational gait analysis is regularly performed by physical therapists to determine treatment goals and issued as an evaluation tool during rehabilitation.[5]

2. Objectives

This Study main objective is to find out the correlation & Impact of training on temporal & spatial variable with biomotor skill in badminton players

3. Methods

Players were preliminarily screened based on the selection criteria i.e. inclusion and exclusion criteria. 15-30 years old both Male and Female Badminton Players are included. And excluded history of any previous surgeries or fracture at the Upper Limb/ lower limb during last 3 months.

Online Survey was made as per a review of the literature and then the list of different exercises, and questionnaires were sent to professional physiotherapists and coach for designing the basic protocol, and as per the response received from them designing of the training program was initiated.

12 district and state-level Badminton players, had been selected for the study. The study was selected by Randomized Controlled Trial. In the first group, 6 badminton players underwent a designed and tested basic training program called experimental group ($n = 6$). While the second group of 6 players underwent regular activities called the control group ($n = 6$). The experimental group performed stair running, jump squat, power skips, squat, calf hops, one leg squat & planks, 3 days per week for one month that is 4 weeks. Players who had given a concert for a training session in the both group had followed a proper moderate intensity of 10 min warm-up before intervention. Outcome measures used were Sensamove mini balance board, Vertical jump height, Illinois Agility test, Temporal & Spatial Variable- as step length, stride time & cadence.

Players had been measured before and after end of 1st week, end of 2nd week, end of 3rd week & end of 4th week in both groups.

Initially, in the first two weeks, every exercise performed by 1 sets of 10 repetitions. And Third & Fourth weeks of the training program, the exercises were performed in 1 sets of 15 repetitions. The rest of the ten to twenty seconds is included after every exercise set.

4. Results

The results of delivery stride length, Step length, cadence, Illinois agility test, vertical jump height test and Sensamove mini balance, pre and post-strength and conditioning training program in control and experimental groups.

Mean Comparison of VJH(p=.001), IAT(p=.001), Balance(p=.001), Cadence(p=.001), step length(p=.001) and stride length(p=.001) values using t- test between both group. And all are statistical significant for both group.

Within group comparison of VJH,IAT, Cadence, step length and stride length are statistical significant for experimental group. VJH(p=.130), IAT(p=.604), Step length(p=.024), stride length(p=.532) and cadence(p=.279) are not significant for control group. And Balance (p=.001) is significant for both group.

5. Discussion

This pilot study result helps to overview the whole research. In the Control group agility, power, gait variables & balance show negative results it might possible due to a lack of strength of muscles with time to not following any interventional or exercise programs. Moreover agility, power, gait variables & balance shows significant changes in the experimental group it shows that the designed program is effective to enhance the fitness training for improving speed, power, balance , gait variables and accuracy of badminton players.

Pilot study results are positive and support alternative hypotheses.

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