

# Influence of Badminton Skills Training on Selected Bio-Motor and Skill Performance Variables of College-Level Students with Hearing Impairment

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## Abstract

The purpose of the study is to find out the influence of badminton skills training on selected bio-motor and skill performance variables of college-level students with hearing impairment. Participants: To achieve the purpose of the study 12 college students with hearing impairment from Ramakrishna Mission Vidyalaya Industrial Training Institute, Coimbatore was randomly selected as subjects. The subject's ages ranged from 15 to 21 years. Parameters: For this study, Badminton skills training was selected as an independent variable. Bio Motor parameters namely speed and skill performance parameters namely short service and long service were selected dependent variables. Speed, short serve and long serve was measured by 50 meters run test, French short serve test and Poole long serve test respectively. Experimental Design and Statistical Techniques: The study was formulated as a truly random group design, consisting of a pre-test and a post-test. A paired 't' test was used to test the mean difference between the pre and post-test. In this statistical test level of significance was chosen at 0.05. The protocol of Badminton skills training: Standardized training protocol, a two days orientation was given to the subjects in which the methods and techniques of the training program were explained by using sign language interpretation and physical demonstration. The training program consisted of twelve weeks of five days each week in ninety minutes of training per day. The training schedule indicates that the training aim, drills and repetition of first to the fourth week, fifth to eight weeks and ninth to twelfth weeks. The training contains the day of the week, training aim, drills and repetition were detailly given in the schedule. Conclusion: Badminton skills training has a positive effect on speed, short serve and long serve of students with HI.

**Keywords:** Badminton skill training, speed, short serve, long serve, hearing impairment.

## Introduction

The ability to perceive sound is called Hearing. A person suffering from hearing impairment has difficulty in perceiving or identifying sound clearly due to auditory problems. If the impairment is incurable, the child may need to use a hearing aid or receive a cochlear implant, depending on the nature of the lesion. With the help of appropriate auditory and

speech training, even children with severe hearing impairment could gradually show improvement in response to sound<sup>1</sup>.

According to the American Speech-Language-Hearing Association, hearing loss is classified as mild (20-40 dB), moderate (40-60 dB), severe (60-80 Db) and profound (over 80 dB loss)<sup>2</sup>. Causes of

hearing loss are diverse and generally include ageing, disease, noise and genetic reasons. Hearing loss may also be classified according to the timing of loss. The congenital form is present at birth or within the first few days of life. However, acquired hearing loss occurs later in life and generally after language has been acquired to some extent. When instructing individuals with hearing loss who also have other disabilities, an instructor needs to understand the unique needs and appropriate adaptations necessary for that particular individual. For example, an individual with Down syndrome or cerebral palsy may not be able to communicate the parameters of his or her hearing loss or preferred mode of communication<sup>3</sup>.

Badminton is a racquet sport in which leaps, veers, and quick arm movements are needed<sup>4</sup>. The sport is played by two or four people without physical contact on a rectangle court divided into two equal areas by a net<sup>5</sup>. Badminton is a rapidly developing sport worldwide. There are 188 member countries in the International Badminton Federation, and there are 111 million licensed players around the world<sup>6</sup>. Badminton players have to perform a different movement at the time of playing a game<sup>7</sup>.

Badminton requires specific physical conditioning in terms of motor and action controls; coordinative variables such as reaction time, foot stepping and static or dynamic balances, which are essential motor demands in this sport<sup>7, 8</sup>. Badminton players need optimum strength and dynamic balance at the time of rapid postural movements.

Badminton has more popularity, that it is played as a recreational activity everywhere. This is the reason for the increasing badminton among students with disabilities. If the skills of badminton are practised, they can take part in the sport. According to the needs of the students with disabilities, the game can be adapted. It is essential to focus on improvement<sup>9</sup>.

Physical educators and coaches need to be aware of the differences between hearing impairment (HI) and normal people, and that people who are HI have unique needs. HI person without any residual hearing will not be concerned with background noise or poor acoustics, and a normal individual usually does not know sign language. A better understanding of the needs of individuals who are normal and good communication among all involved will enable physical education teachers and coaches to create a successful physical activity experience for students.

The purpose of the study was to examine the badminton skills training on selected bio-motor variables namely speed and skill performance variables namely short serve and long serve of college-level students with hearing impairment.

## **Materials and Methods**

### **A. Participants**

To achieve the purpose of the study 12 college students with hearing impairment from Ramakrishna Mission Vidyalaya Industrial Training Institute, Coimbatore was randomly selected as subjects. The subject's ages ranged from 15 to 21 years.

### **B. Parameters**

For this study, Badminton skills training was selected as an independent variable. Bio Motor parameters namely speed and skill performance parameters namely short service and long service were selected dependent variables.

### **C. Experimental Design and Statistical Techniques**

The study was formulated as a truly random group design, consisting of a pre-test and a post-test. A paired 't' test was used to test the mean difference between the pre and post-test. In this statistical test level of significance was chosen at 0.05.

## A. Criterion Measures

**Table – 1: Selection of test**

S. No	Dependent variables	Test item/Equipment	Unit of measurement
Bio-motor variables			
1.	Speed	50-metersrun	In seconds
Skill Performance variables			
1.	Short serve	French short service test	Points
2.	long serve	Poole long service test	Points



**Figure-1 indicates the procedure for short serve and long serve**

## B. Protocol of Badminton skills training

Standardized training protocol, a two days orientation was given to the subjects in which the methods and techniques of the training program were explained by using sign language interpretation and physical demonstration. The training program consisted of twelve weeks of five days each week in ninety minutes of training per day.

TableII, TableIII and TableIV indicate that the training aim, drills and repetition of the first to the fourth week, the fifth to eight week and the ninth to twelfth-week training schedule respectively. The training contains the day of the week, training aim, drills and repetition were detailly given in the schedule.

**Table - 2**

Weeks	Aim	Drills	Repetition	Set	Duration in three sets/ Drill	Total duration
<b>1st to 4th-week training schedule</b>						
Monday	Speed / Forehand smash	3/3	15	3	30min	90min
Tuesday	Abdominal Muscular strength / long service	3/3	15	3	30min	90min
Wednesday	Flexibility / short service	3/3	15	3	30min	90min
Thursday	Speed / Forehand smash	3/3	15	3	30min	90min
Friday	Abdominal Muscular strength / long service	3/3	15	3	30min	90min
<b>5th to 8th week- week training schedule</b>						
Monday	Flexibility / short service	3/3	20	3	30min	90min
Tuesday	Speed / Forehand smash	3/3	20	3	30min	90min
Wednesday	Abdominal Muscular strength / long service	3/3	20	3	30min	90min
Thursday	Speed / Forehand smash	3/3	20	3	30min	90min
Friday	Flexibility / short service	3/3	20	3	30min	90min
<b>9th to 12th week- week training schedule</b>						
Monday	Speed / Forehand smash	3/3	15	4	30min	90min
Tuesday	Abdominal Muscular strength / long service	3/3	15	4	30min	90min
Wednesday	Flexibility / short service	3/3	15	4	30min	90min
Thursday	Speed / Forehand smash	3/3	15	4	30min	90min
Friday	Abdominal Muscular strength / long service	3/3	15	4	30min	90min

## Results of The Study

**Table - 3: Badminton skills training group on speed**

Group	Mean	SD	Std. The error of the mean	't'
Pre test	9.64	0.96	0.28	11.19*
Post-test	8.64	0.93	0.27	

\* Significance at 0.05 level of confidence

The badminton skills training group pretest value was 9.64 and the posttest value was 8.64 respectively. The badminton skills training group obtained 't' ratio was 11.19 was greater than the table value of 2.20. It shows that the badminton skills training group had significant speed improvement.

**Table - 4: Badminton skills training group on a short serve**

Group	Mean	SD	Std. The error of the mean	't'
Pre test	2.75	0.57	0.16	7.59*
Post-test	3.52	0.68	0.20	

\* Significance at 0.05 level of confidence

The badminton skills training group pretest value was 2.75 and the posttest value was 3.52 respectively. The badminton skills training group obtained 't' ratio was 7.59 was greater than the table value of 2.20. It shows that the badminton skills training group had significant improvement on short serve.

**Table - 5: Badminton skills training group on long serve**

Group	Mean	SD	Std. Error of the mean	't'
Pre test	2.75	0.50	0.14	10.65*
Post-test	3.54	0.51	0.15	

\* Significance at 0.05 level of confidence

The badminton skills training group pretest value was 2.75 and the posttest value was 3.54 respectively. The badminton skills training group obtained 't' ratio

was 10.65 was greater than the table value of 2.20. It shows that the badminton skills training group had significant improvement on long serve.

## IV. Discussion and Conclusion

The participants did not have any specific physical activities to improve their speed, due to the limitation of their hearing capacity. At the same time, they did not get any sign language interpreter to help them for increasing their fitness. Physical activities are inherent qualities of the human, subsequently, the participants got suitable opportunities to do some play activities with few adaptations and sign language interpretation. They have been involved in some short stride movements in training regiments. They were evoked to learn the movement patterns in the badminton court. These are all the reasons; the speed performance of the participants was increased significantly.

The participants actively participated in the badminton skills training, because they were new to the game. The instruction was given by the scholar also helped to practice short serve and long serve easily. The scholar prepared a comprehensive badminton skill training protocol to follow systematically. The progression of load, types of drills and exercise were prepared according to their need.

Another research concluded that progressive resistance training increases balance capacity in children with Down syndrome. The results of the current research suggest the importance of increasing muscle strength and improve balance through progressive resistance training<sup>10</sup>. Results indicated that the children with MR significantly improved on selected variables due to 6 weeks of training<sup>11</sup>. Conventional training combined with the ladder training group showed that there was a significant improvement in selected skill performance variables. These improvements occurred because of the planned systematic training program<sup>12,13,14,15,16,17</sup>. Repetitive training significantly improved coordination and increase smash quality<sup>18</sup>. Exercise training increases physical fitness, mental function in people with dementia<sup>19</sup>. There were insubstantial differences

in performance in both ten meter and twenty-meter sprint time and multistage fitness tests<sup>20</sup>.

To my knowledge, the present study is an innovative study that investigated the effect of badminton skills training on selected bio-motor and skill performance variables of college-level students with hearing impairment.

In conclusion, badminton skills training has a positive effect on speed, short serve and long service of students with HI. Because, play is an important activity for everyone, maybe normal or disabled.

### **Acknowledgement:**

Sri Ramakrishna Mission Vidyalaya Maruthi College of Physical Education, SRKV post, Periyanaickenpalayam post, Coimbatore – 641020, Tamil Nadu, India.

**Ethical Clearance:** Taken from Research Advisory Committee, SRKV MCPE.

**Source of Funding:** I have not received any funding for this research.

**Conflict of Interest:** The researchers claim no conflicts of interest.

### **References**

1. Developmental Disorders Series. Hearing impairment. Retrieved from [https://www.dhcas.gov.hk/english/public\\_edu/files/SeriesI\\_HearingImpairment\\_Eng.pdf](https://www.dhcas.gov.hk/english/public_edu/files/SeriesI_HearingImpairment_Eng.pdf)
2. Danermark, B., Granberg, S., Kramer, S.E., Selb, M., & Moller, C. (2013). The creation of a comprehensive and brief core set for hearing loss using the International Classification of Functioning. Disability and Health. *American Journal of Audiology*, 22(2), 323-328.
3. Reich, L. (2007). Accommodating the unique needs of individuals who are specifically hard



- of hearing during physical education, sport, and exercise training. *Master's Thesis, California State University, Long Beach*.
4. Vicen, J.A., Del Coso, J., Millan, C.G., Salinero, J.J., & Abian, P. (2012). Analysis of dehydration and strength in elite badminton players. *PLoS ONE*, 7, e37821.
5. Tang, Z. (2012). Research on the effect of badminton game on improving physique in the perspective of the golden mean. *Contemp. Sports Technol*, 16, 502–506.
6. Available online: <http://www.bwfbadminton.org/page.aspx?id=15367> (accessed on 23 July 2017).
7. Phomsoupha, M., & Laffaye, G. (2015). The science of badminton: game characteristics, anthropometry, physiology, visual fitness and biomechanics. *Sports Med*, 45 (4), 473-95.
8. Laffaye, G., Phomsoupha, M., & Dor, F. (2015). Changes in the Game Characteristics of a Badminton Match: A Longitudinal Study through the Olympic Game Finals Analysis in Men's Singles. *J Sports Sci Med*, 14 (3), 584-90.
9. Adapting Badminton Instruction: Including Students with Disabilities In Physical Education. Retrieved from <http://ww2.manchester.edu/docs/default-source/academic-departments/ess/apbadminton.pdf?sfvrsn=2>
10. Sayadinezhad, T., Abdolvahab, M., Akbarfahimi, M., Jalili, M., Rafiee, S.H., Baghestani, A.R. (2013). The study of the effect of progressive resistance training on functional balance of 8-12 years old children with Down syndrome (Persian). *Journal of Modern Rehabilitation*. 7 (1), 29-34.
11. Ahmadi Rahmat., & Daneshmandi Hasan. (2013). The effect of core stabilization exercises on factors physical fitness to mental retardation. *Medicina Sportiva*, 9 (1), 2058 – 2062.
12. Srinivasan, M., et al. (2012). Influence of Conventional Training Programme Combined with Ladder Training on Selected Physical Fitness And Skill Performance Variables of College Level Badminton Players. *THE SHIELD, International journal of physical education & sports sciences*, 7, 69- 82.
13. Srinivasan. (2011). Effects of two different badminton training packages on selected physiological and psychological variables of college badminton players. *International Journal of Physical Education, Sports Management and Yogic Sciences*, 1 (1), 20-24.
14. Srinivasan. (2012). Influence of video analysis on the selected skill performance variables of school level badminton players. *International Journal of Health, Physical Education & Computer Science in Sports*, 8 (3), 12-14.
15. Srinivasan. (2014). Effect of adapted physical activities on selected psychomotor variables of children with intellectual disability. *International journal of recent research and applied studies*, 2 (6), 11-14.
16. Srinivasan. (2017). Effect of yogic practice on selected life skills of children with visual impairment. *International Journal of Adapted Physical Education & Yoga*, 2(11), 16-22.
17. Srinivasan. (2018). Effect of yogic practice and SAQ training on selected physiological variables of students with hearing impairment. *International Journal of Adapted Physical Education & Yoga*, 3 (2), 16-25.
18. Shiming Li., Zhao Zhang., Bingjun Wan., Brandie Wilde., & Gongbing Shan. (2016). The relevance of body positioning and its training effect on badminton smash. *Journal of Sports Sciences*, 35 (4):310-316.
19. Heyn P1, Abreu BC, Ottenbacher KJ. (2004). The effects of exercise training on elderly persons

- with cognitive impairment and dementia: a meta-analysis. *Arch Phys Med Rehabil*, 85(10):1694-704.
20. Benjamin M. Walklate., Brendan j. O'brien., Carl D. Paton., & Warren Young. (2009). Supplementing regular training with Short-duration sprint-agility training leads to a substantial increase in repeated sprint-agility performance with national level badminton players. *Journal of Strength and Conditioning Research*, 23(5):1477–1481.