



IMPACT OF HIGH INTENSITY INTERVAL TRAINING ON SELECTED MOTOR FITNESS AND PERFORMANCE VARIABLES AMONG BADMINTON PLAYERS

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ABSTRACT

Context: High intensity interval training, or HIIT, challenges this barrier by incorporating an effective workout in half that time. In our time-pressured culture, HIIT has claimed a spot in the top 10 fitness trends since 2014 as surveyed by the American College of Sports Medicine (Thompson WR).

Objective: The motive of this study was to investigate impact of high intensity interval training (HIIT) training on selected motor fitness and performance variables among badminton players.

Study design: Experimental research.

Participation: Thirty school badminton players (boys) selected from various badminton academy, Coimbatore. Selected badminton players were assigned randomly to two groups namely High Intensity Interval Training Group (HIITG) and the control group (CG) consists of fifteen participants in each group.

Main Outcomes Measures: The participants trained 6 weeks training session's period involving the HIIT of selected motor fitness and performance variables namely agility, speed and fore hand smash. The HIIT was performed pre and post training sessions.

Results: The results indicate that there is a significant difference between the High Intensity Interval Training Group and control group on selected motor fitness and performance variables of badminton players (boys) due to the impact of six weeks of High Intensity Interval Training Group.

Conclusion: Our research findings suggest that high intensity interval training (HIIT) may be an effective exercise program for school badminton players (boys). HIITG has been shown to improve selected physical and physiological variables such as agility, speed, and fore hand smash. Thus, HIIT may be an appropriate exercise program for badminton players (boys) to improve their motor fitness and performance variables.

Key words: High intensity interval training, motor fitness and performance variables and Badminton players.

INTRODUCTION

High-intensity interval training (HIIT) is a form of interval training, a cardiovascular exercise strategy alternating short periods of intense anaerobic exercise with less intense recovery periods, until too exhausted to continue. The method is not just restricted to cardio and frequently includes weights for the short periods as well. Though there is no universal HIIT session duration, these intense workouts typically last under 30 minutes as it uses the anaerobic energy systems which are typically used for short and sharp bursts. The times vary, based on a participant's current fitness level. Furthermore, traditional HIIT was designed to be no longer than 20 seconds on with no more than 10 seconds off. This would bring in the anaerobic energy system. The intensity of HIIT also depends on the duration of the session. The purpose of the study was to find out the effect of high intensity interval training on agility among inter collegiate badminton players. Thirty badminton players were selected as subjects. The selected subjects were divided into two groups of fifteen each (n=15). The result of the study was high intensity interval training group was significant improvement in compared to the control group. (*V Sarath Chandu-2021*). Badminton requires both aerobic fitness and anaerobic ability for high performance. High intensity interval training (HIIT) is a traditional training method for improving fitness. In this study, we investigated whether short-term Wingate-based HIIT is effective for improving anaerobic activity in youth badminton players. Participants included 32 total badminton players in middle school and high school. Both groups improved in terms of isokinetic knee muscle function at 60°/s with no differences. However, at 240°/s, the HIIT group showed a statistically significant improvement ($p = 0.035$). Therefore, HIIT for 4 weeks improved the athletes' performance and physical strength. (*Yong-Chul Choi-2021*). Effects of Specific Badminton Training on Aerobic and Anaerobic Capacity, Leg Strength Qualities and Agility Among College Players. (*Hui Yin Ler-2019*). High intensity interval circuit training leads to a substantial increase in specific endurance to performance some of essential skills in youth badminton players. However, it is unclear whether high intensity interval training by circle style is sufficient to improve specific endurance (strength and speed) and some basic skills, for example, (Forehand and backhand shot). The paper provides information on the past status of the urban policy in Iraq and illustrate the new attitude that appeared after 2004 represented with the new principles of spatial planning . In conclusion, this research suggests a group of Proposals that could help to improve the urban policy to achieve urban development goals. (*Sarhang A. Abdullah-2014*). The purpose of this study was to determine the development of physiological aspects of increasing aerobic and anaerobic performance in students who become badminton athletes through optimizing footwork exercises using the high-intensity interval method (HITT). In this concept, footwork training using the HIIT method effectively develops aerobic and anaerobic metabolism in response to energy requirements during total energy production in training maximum. (*Donie Donie-2013*)

METHODOLOGY

Design: The purpose of the study was to determine the impact of high intensity interval training (HIIT) training on selected motor fitness and performance variables in badminton players. To reach the goal of the study, thirty badminton players were chosen from the various badminton academy, Coimbatore. Their age ranged between 15 and 18 years and they were divided into two equal group's experimental group and control group consists of 15 each. The experimental group underwent the HIIT and the control group was not given any sort of training except their routine work. Training was conducted in the experimental group for 3 days per week for the 6-week period. The selected variables namely, agility was measured by 4x10 shuttle run , speed was measured by 50m dash and fore hand smas has measured by badminton smash test. **Statistical Methods;** The collected data before and after training period of six weeks on the above said variables due to the effects of HIIT training was statistically analysed with 't' test to find out the significant improvement between pre and post-test. In all cases the criterion for statistical significance was set at 0.05 level of confidence. ($P < 0.05$). **Procedure:** The information was collected before and after HIIT

programs for six weeks. When collecting data. The evaluation of respective HIIT programs was done by researcher.

Criterion Measures: It is evaluate motor fitness and performance variables where chosen as the criterion measures to this study for testing.

Table 1

Criterion measures

S.No	Criterion variables	Test items	Unit of measurements
MOTOR FITNESS VARIABLES			
1	Speed	50m dash	In seconds
2	Agility	4x10m shuttle run	In seconds
Skil performance VARIABLES			
1	Fore hand smash	Badminton smash test	In numbers

RESULT

Mean standard deviation and t-value were calculated for each outcomes measure can be found in **Table-IIresult** shows that the pre-test mean values of experimental group and control group(8.43,8.58) and (10.62 , 10.65) respectively and the post test mean values are(8.1, 8.49)and (9.93, 10.63) respectively. The obtained dependent t-test value on speed (t=8.4) and agility (t=8.43) of experimental group respectively. The table value required for significant difference with degrees of freedom 10 at 0.05 level of confidence is 2.14. The obtained 't' test value of experimental group was greater than the table value. The results clearly indicated that the speed and agility of the experimental group improved due to impact of HIIT on badminton players.

Table 2 The t- ratio for speed and agility.

Variable	Groups	Pre mean	Post mean	Std deviation	Std error	t
Speed	Experimental	8.43	8.1	0.12	0.39	8.4*
	Control	8.58	8.49	0.18	0.59	1.53
Agility	Experimental	10.59	9.93	0.52	0.16	9.0*
	Control	10.65	10.63	0.63	0.10	2.09

Note: (Significance at 0.05 level of confidence for df of 14 is 2.14)

Table 3 result Mean standard deviation and t-value were calculated for each outcomes measure can be found the pre-test mean values of experimental group and control group(11.42 and 10.95) respectively and the post test mean values are (13.00 and 11.07) respectively. The obtained dependent t-test value on fore hand smash (t=11.2*) of experimental group respectively. The table value required for significant difference with degrees of freedom 10 at 0.05 level of confidence is 2.14. The obtained't' test value of experimental group was greater than the table value. The results clearly indicated that the fore hand smash of the experimental group improved due to impact of HIIT on badminton players.

Table 3 The t- ratio for cardio respiratory endurance ($VO_2\max$)

Variables	Group	Test	Mean	SD	SEM	t-ratio
Fore hand smash test	Experimental Group	Pre test	11.42	1.32	0.34	11.2*
		Post test	13.00			
	Control Group	Pre test	10.95	0.73	0.35	2.1
		Post test	11.07			

Note: (Significance at 0.05 level of confidence for df of 14 is 2.14)

FIGURE 1
BAR DIAGRAM SHOWS THE MEAN VALUES OF SPEED AND AGILITY

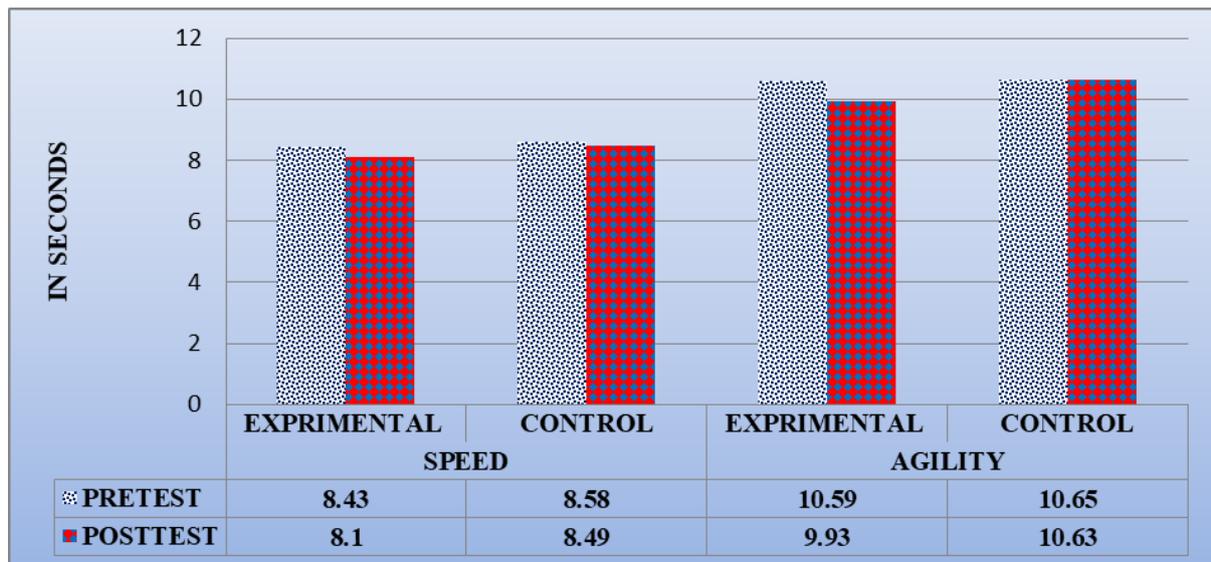


FIGURE 2
BAR DIAGRAM SHOWS THE MEAN VALUES OF FORE HAND SMASH

DISCUSSION FINDINGS

The results of the present study demonstrate that High Intensity Interval Training (HIIT) over six weeks leads to significant improvements in selected motor fitness and performance variables among male badminton players, as compared to a control group. These enhancements are consistent with literature highlighting the effectiveness of HIIT in racket sports. The conducted a study comparing HIIT and speed, agility, quickness (SAQ) training, and found both interventions significantly enhanced speed and agility among badminton players, with HIIT having the greatest impact on agility. Their findings suggest that short-term HIIT protocols not only improve physical attributes crucial for badminton but also exceed gains achieved through traditional or SAQ methods (*Wibowo et al., 2025*). Similarly, study reported significant increases in endurance and reduced risk of injury among badminton players following a HIIT program, emphasizing its role in overall athletic development. The study's outcomes corroborate the current results, affirming HIIT's capacity to enhance performance and physical conditioning effectively (*Setiawan et al., 2024*). Further evidence from (*Sarhang A. Abdullah 2014*) supports the utility of HIIT in improving specific badminton skills and physical performance. The experimental groups in these studies consistently outperformed control groups, confirming the specificity and efficacy of HIIT for racket sports. Therefore, the present findings support the integration of HIIT into badminton training regimens to promote better fitness outcomes, skill execution, and competitive readiness. The observed significant improvements in motor fitness and performance variables align with the growing body of evidence highlighting the practical benefits of HIIT in youth and adult athletes.

CONCLUSION

Playing badminton is a form of high-intensity interval training or HIIT to keep it short, a popular and effective way to burn fat. The game is designed in an unpredictable manner that involves variable intervals of quick action that is guaranteed to give your body the training of a lifetime. The outcome of

this study concludes that HIIT training improves physical and physiological variables such as speed, agility and fore hand smash. HIIT training can be an appropriate exercise program for badminton players.

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