Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
April 2024 5(4), 1564–1568

IMPACT OF TENNIS TRAINING WITH GADGETS ON FORCED VITAL CAPACITY AND MAXIMUM VOLUNTARY VENTILATION OF MEN TENNIS PLAYERS

P. Vijayakumar[1], Dr.E.Amudhan[2]

[1] Ph D Scholar, SRMV Maruthi College of Physical Education, Coimbatore, Tamilnadu, India.
[2] Associate Professor, SRMV Maruthi College of Physical Education, Coimbatore, Tamilnadu, India.

DOI
10.29121/shodhkosh.v5.i4.2024.4632

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

This study aimed to examine the impact of training with gadgets on forced vital capacity (FVC) and maximum voluntary ventilation (MVV) among male tennis players. A total of 30 male tennis players from Sri Ramakrishna Mission Vidyalaya Maruthi College of Physical Education and the Faculty of General & Adapted Physical Education and Yoga, Ramakrishna Mission Vivekananda Educational and Research Institute, Periyanaickenpalayam, Coimbatore, Tamil Nadu, were randomly assigned to either a training with gadgets group (TWGG) or a control group (CG), with 15 participants in each group. The experimental group underwent an eight-week tennis training programme incorporating gadgets, while the control group followed their regular routine without any specialized intervention. Forced vital capacity and maximum voluntary ventilation were assessed as dependent variables, with tennis training using gadgets serving as the independent variable. A paired t-test was employed to analyze the pre- and post-test differences, with statistical significance set at $p < 0.05$. The findings revealed a significant improvement in forced vital capacity and maximum voluntary ventilation among the participants in the training with gadgets group, highlighting the effectiveness of gadget-assisted training in enhancing respiratory function in male tennis players.

Keywords: Training with gadgets, physiological variables.

1. INTRODUCTION

Tennis is a globally popular sport, played by millions of recreational athletes and followed by a vast audience as a competitive spectacle. Among its most prestigious events are the four Grand Slam tournaments, commonly referred to as the Majors: the Australian Open, played on hard courts; the French Open, played on red clay courts; Wimbledon, played on grass courts; and the US Open, also played on hard courts. These tournaments have shaped the history and evolution of modern tennis, attracting elite players and worldwide attention. The origins of professional tennis can be traced back to the Wimbledon Championships, the world's oldest tennis tournament, first held in London in 1877. The establishment of standardized rules was a key milestone in the sport's development, leading to the formation of the International Lawn Tennis Federation (ILTF) in 1924, now known as the International Tennis Federation (ITF). The ITF has played a crucial role in maintaining the integrity of the sport, with the rules remaining largely stable over the past century, aside from notable innovations such as the introduction of the tiebreak system.

Tennis has also had a dynamic history within the Olympic Games. Following its removal after the 1924 Paris Olympics, the sport was reintroduced as a demonstration event in the 1984 Los Angeles Olympics for players under 21 years of age. Due to the overwhelming success of this event and the efforts of ITF officials, tennis regained full Olympic status at the 1988 Seoul Games. This reinstatement marked a significant moment in tennis history, reinforcing its global appeal and competitive prominence. Given the sport's long-standing tradition and continuous evolution, ongoing research is essential to understanding various aspects of tennis, including performance, training methodologies, and physiological adaptations. This study seeks to explore the impact of training with gadgets on forced vital capacity (FVC) and maximum voluntary ventilation (MVV) among male tennis players, contributing to the broader body of knowledge in tennis science and sports performance.

2. METHODOLOGY

This study was conducted on 30 male tennis players selected from Sri Ramakrishna Mission Vidyalaya Maruthi College of Physical Education and Ramakrishna Mission Vivekananda Educational and Research Institute, Periyanaickenpalayam, Coimbatore. The selected participating subjects were randomly assigned to one of two groups such as the Training with Gadgets Group (TWGG) and the Control Group (CG), with each group comprising 15 players.

EXPERIMENTAL DESIGN

The study followed a pre-test and post-test experimental design. The TWGG underwent a structured training programme incorporating gadgets for a duration of eight weeks, while the CG followed their regular training routine without any additional intervention.

TRAINING PROTOCOL

Participants in the TWGG engaged in a specialized gadget-assisted training programme designed to enhance tennis performance and respiratory parameter function. The training regimen was conducted under controlled conditions and supervised by the investigator, who is also a tennis coach. The CG did not receive any special training apart from their routine practice.

DATA COLLECTION AND STATISTICAL ANALYSIS

Baseline (pre-test) and post-intervention (post-test) measurements were taken for both dependent variables in all participants. To determine the significance of differences between pre- and post-test values within each group, the paired t-test was applied. The level of significance was set at $p < 0.05$ for statistical interpretation.

ETHICAL CONSIDERATIONS

Prior to participation, all subjects were informed about the objectives and procedures of the study, and written consent was obtained. The study adhered to ethical guidelines for research involving human participants.

3. RESULTS OF THE STUDY

TABLE-I

PAIRED 'T'-TEST ANALYSIS OF FORCED VITAL CAPACITY IN EXPERIMENTAL AND CONTROL GROUPS

Group	Test	M	SD	σ DM	DM	t-ratio	'p' value
Experimental	Pre-Test	3.42	0.71	0.08	0.24	2.98*	0.01
	Post Test	3.66	0.72				
Control	Pre-Test	3.65	0.31	0.01	0.01	1.14	0.28
	Post Test	3.63	0.29				

*** Significance at 0.05 level.**

Table 1 presents the impact of training with gadgets on forced vital capacity (FVC). The analysis indicates a significant improvement in FVC among participants in the experimental group. The obtained t-ratio of 2.98 demonstrated a statistically significant difference, as the corresponding p-value (0.01) was lower than the predetermined significance level of 0.05. This finding suggests that the training intervention had a measurable impact on FVC. In contrast, the control group exhibited no significant change in FVC between the pre- and post-test measurements. These results confirm that the observed improvements in forced vital capacity were attributable solely to the training with gadgets intervention.

FIGURE- I
MEAN DIFFERENCE OF PRE- AND POST-TEST SCORES ON FORCED VITAL CAPACITY IN EXPERIMENTAL AND CONTROL GROUPS

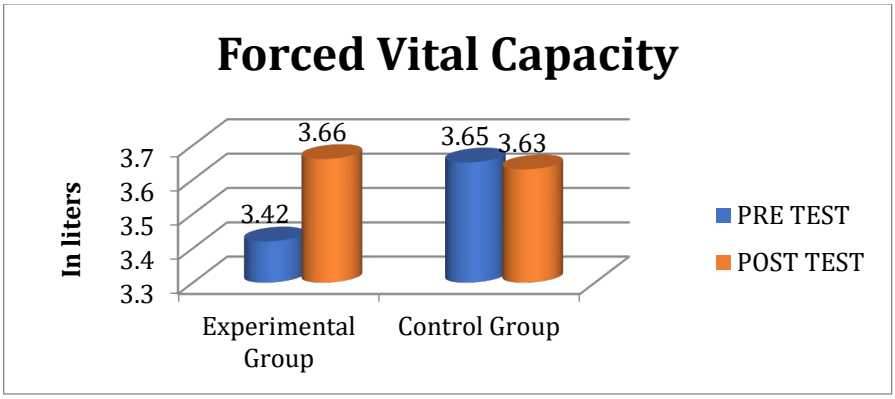


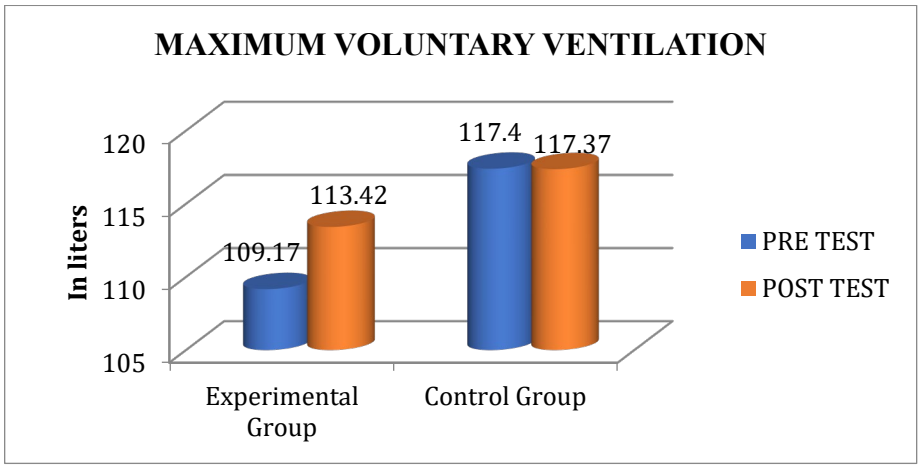
TABLE-II
COMPARISON OF PRE- AND POST-TEST 'T'-RATIOS FOR MAXIMUM VOLUNTARY VENTILATION IN EXPERIMENTAL AND CONTROL GROUPS

Group	Test	M	SD	σ DM	DM	t-ratio	'p' value
Experimental	**Pre-Test**	109.17	13.69	0.75	4.25	5.69*	0.01
	Post Test	113.42	13.66				
Control	**Pre-Test**	117.40	6.12	0.08	0.02	0.23	0.82
	Post Test	117.37	6.05				

*** Significance at 0.05 level.**

Table II presents the effect of training with gadgets on maximum voluntary ventilation (MVV). The analysis indicates a significant improvement in MVV among participants in the experimental group. The obtained t-ratio of 5.69 demonstrated a statistically significant difference, as the corresponding p-value (0.01) was lower than the set significance level of 0.05. This result confirms that the training intervention led to a measurable enhancement in MVV. In contrast, the control group exhibited no significant change in MVV between the pre- and post-test measurements. These findings suggest that the observed improvements in maximum voluntary ventilation were solely attributed to the training with gadgets intervention.

FIGURE- II
MEAN DIFFERENCE IN MAXIMUM VOLUNTARY VENTILATION BETWEEN PRE- AND POST-TESTS FOR EXPERIMENTAL AND CONTROL GROUPS



4. DISCUSSION ON FINDINGS

The findings of this study provide compelling evidence of the effectiveness of an eight-week training with gadgets programme in influencing forced vital capacity (FVC) and maximum voluntary ventilation (MVV) in male tennis players. The results indicate a statistically significant decrease in FVC among participants in the experimental group, as demonstrated by the t-ratio of 2.98 and a p-value of 0.01, which is well below the 0.05 level of significance. This decrease suggests that the training intervention had a measurable impact on FVC. In contrast, the control group, which did not undergo any specialized training, exhibited no significant changes in FVC, reinforcing the conclusion that the observed reduction was a direct outcome of the training with gadgets intervention. The structured training programme likely facilitated adaptations in respiratory function and overall physiological efficiency, contributing to these changes.

Similarly, the study results demonstrate a significant improvement in MVV following the training intervention. The experimental group showed a marked enhancement in MVV, as indicated by a t-ratio of 5.69 and a p-value of 0.01. These findings confirm that the training programme effectively increased MVV, highlighting its role in optimizing pulmonary function. Given that MVV is a critical marker of respiratory efficiency and overall metabolic health, these results suggest that training with gadgets can be a valuable strategy for enhancing lung function. The control group, which did not receive the training intervention, displayed no significant changes in MVV, further emphasizing the effectiveness of the gadget-assisted training programme. The improvements in MVV observed in this study align with previous research findings, which suggest that structured and targeted exercise programmes can enhance respiratory function. The physiological mechanisms underlying these improvements may be attributed to enhanced neuromuscular coordination, increased respiratory muscle strength, and improved oxygen utilization efficiency. Furthermore, the integration of gadgets in training might have provided additional stimulus, leading to greater respiratory adaptations compared to conventional training methods.

The study's findings have important implications for both sports performance and public health. Improving MVV and FVC is essential for enhancing athletic endurance and overall health. Structured training programmes incorporating gadgets can serve as an effective approach for optimizing pulmonary function, particularly among sportsmen who require superior respiratory efficiency. These findings align with previous research by Miller and Gabbard (2013), Miller and Gabbard (1988), and Douvis (2005), further supporting the efficacy of structured exercise interventions in improving lung function. Overall, this study underscores the significance of incorporating training with gadgets as a strategic component in athletic training and fitness programmes. The observed improvements in respiratory function highlight the potential of such training methodologies in enhancing overall health and performance. Future research may explore the long-term effects of gadget-assisted training on various physiological parameters to further validate these findings.

5. CONCLUSIONS

The study concludes that training with gadgets is an effective training strategy for significantly enhancing both forced vital capacity and maximum voluntary ventilation. This training approach has demonstrated its ability to improve respiratory function, ultimately contributing to overall tennis performance and physiological efficiency.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

Brian & Kenny, Ian. (2015). The effect of strength training on body composition in distance runners. 10.13140/2.1.1113.1208.

Douvis, SJ. (2005) Variable practice in learning the forehand drive in tennis. Perceptual and Motor Skills, 101(2):531-45.Beattie, K. & Lyons, Mark & Carson,

Eklund, Daniela & Häkkinen, Arja & Laukkanen, Jari & Balandzic, Milica & Nyman, Kai & Häkkinen, Keijo. (2016). Fitness, body composition and blood lipids following three concurrent strength and endurance training modes. 41. 10.1139/apnm-2015–0621.

Genevois, C., et al. (2013) Effects of two training protocols on the forehand drive performance in tennis. Journal of Strength Conditioning Research, 27(3):677-82.

Messick, JA. (1991) Research quarterly for Exercise and Sport, 62(3):249-56.

Miller, G., & Gabbard, C. (1988) Effects of visual aids on acquisition of selected tennis skills, Perceptual and Motor Skills. 67(2):603-6.