

EFFECT OF LOW VOLUME HIGH INTENSITY TRAINING ON SELECTED PHYSICAL FITNESS VARIABLES AMONG HEALTHY INDIVIDUALS

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Abstract

Background: It is well known that exercise training has positive effects low volume high intensity training is a famous form of therapeutic and purposeful exercise. Despite their popularity, few empirical researches have investigated the advantages of low volume high intensity training in relation to sports activities performance. Which make it challenging to compare protocols with different intensities and volumes. In addition, previous studies have not reported adherence to their protocols, which could have an important clinical impact on designing exercise protocol for sedentary healthy individuals. **Method:** Therefore the purpose of the study was to investigate the effect of low volume high intensity training on physical fitness variables such as speed, muscular endurance, and flexibility of healthy individuals. In this study thirty (30) subjects, of healthy individuals were randomly selected in Low Volume High Intensity training group and in non low volume high intensity group, fifteen (15) in each group. (n=30; age 18 ± 3.04 ; height 1.70 ± 6.71 cm; weight= 59 ± 7.38 kg). **Timeline:** The low volume high intensity training consisted of 45-60 min/day, 3 days in a week till eight weeks from the srmist playground in and around the kattankulathur campus in chennai. Physical fitness variables completed of the both groups at zero time and after eight weeks of low volume high intensity training in experimental group and in non low volume high intensity control group. **Results:** In present study, Speed (10.22), Muscular endurance (11.17) and Flexibility (18.71) were changed significantly. **Conclusion:** The results show that's LVHIT protocol was more efficient for improving physical fitness variables than the control group after eight weeks of training. Increasingly, changes in some further studies should elaborate on the link between physical fitness adaptations as after LVHIT covered in this study are beneficial for the healthy individuals.

Keywords: Tennis Player, Paired 't' test, Physical Fitness, Low Volume High Intensity.

INTRODUCTION

Regular physical activity is essential for the prevention of cardiovascular and metabolic diseases (Fealy et al., 2018) and high-intensity interval training (HIIT) is an effective training method to elicit rapid improvements in cardiorespiratory fitness (CRF; expressed as maximal oxygen consumption (VO_{2max}))

(Astorino et al., 2012; Daussin et al., 2008; Gist et al., 2014b). Recent data suggests that repeated maximal to supramaximal exercise bouts have a similar, or even greater influence on CRF and metabolic adaptations than traditional moderate-intensity continuous training (MICT) (Gist et al., 2014b). Indeed, Tabata et al. (1996) demonstrated that short duration (7-8 sets of 20 s exercise, interspersed

with 10 s rest; the “Tabata protocol”) high-intensity intermittent exercise caused the same, or even greater improvements in aerobic (VO₂max) and anaerobic power as moderate-intensity endurance training (60 min; intensity 70% of VO₂max). These data indicated that short duration exercise, which is of a sufficiently high intensity, is capable of inducing favorable training adaptations. Considering adherence to classic MICT is typically low, HIIT is a more time-efficient training modality and may therefore be the method of choice for increased encouragement in exercise participation (McRae et al., 2012).

Physical activity, including structured ‘exercise,’ is considered a cornerstone therapy for the management of cardio metabolic health (Pérez-Martínez et al. 2017). Although the effect of exercise, independent of dietary change, on weight loss remains equivocal (Shaw et al. 2006; Swift et al. 2014), undertaking regular exercise has been shown to improve an array of cardio metabolic risk factors such as excess abdominal adiposity (Sabag et al. 2017), dyslipidemia (Mann et al. 2014), hypertension (Cornelissen & Smart, 2013), hyperglycemia (Umpierre et al. 2013), and especially low cardiorespiratory fitness (Lin et al. 2015). In fact, low cardiorespiratory fitness has emerged as a key risk factor for obesity-related diseases such as the metabolic syndrome, type 2 diabetes, and cardiovascular disease (Wei et al. 1999; LaMonte et al. 2005; Ross et al. 2016). Furthermore, it has been argued that cardiorespiratory fitness may even be considered clinical vital sign, as increases in maximal oxygen consumption (VO₂max) between 3.5 ml/kg/min to 7 ml/kg/min have been reported to considerably lower the incidence of adverse cardiovascular events by ~10% to 30% (Ross et al. 2016).

Despite the beneficial effect of exercise on cardio-metabolic health being well-known in the scientific community and amongst the general public, exercise adoption and adherence continues to be a challenge for many people. In fact, over 35% of adults from high-income countries are considered physically inactive (i.e., not meeting the recommended physical activity guidelines) (Guthold et al.

2018). While individual perceived benefits and barriers to exercise serve as strong predictors of exercise-adoption (Chao et al. 2000), ‘lack of time’ is an often-cited perceived barrier to exercise adoption (Booth et al. 1997). As such, alternate exercise therapies, which are

Thus, the aim of the present study was to scientific investigation into the effect of low volume high intensity training on physical fitness performance of healthy individuals.

Methodology:

A sample of male junior healthy individuals (n=30; age 18 ± 3.04 ; height 1.70 ± 6.71 cm; weight 59 ± 7.38 kg) was evaluated. For the purpose of the present study, the healthy individuals age ranged on 14-16 years categories healthy individuals. Randomized controlled pre and posttest design was used for the study. Subjects divided two groups as Low Volume High Intensity training group (n=15), and control group (n=15). Subjects separated two groups randomly method. From 2019 to 2020, a sample of the 30 healthy individuals in srinagar kottanakulathur, tamilnadu was evaluated using a physical fitness variables speed was measured by 50 meters run test (Allanstell, 1980) unit of measurement in seconds, muscular endurance was measured by sit-ups test (Allanstell, 1980) unit of measurement in points and flexibility was measured by sit and reach test (w. Earle, 2008) unit of measurement in centimeters. The low volume high intensity training consisted of 45-60 min/day, 3 days in a week till eight weeks from the srinagar, ground in and around the kottanakulathur campus in Tamilnadu. Physical fitness variables completed of the both groups at zero time and after eight weeks of low volume high intensity training in experimental group and except low volume high intensity training intervention in non low volume high intensity group.

Statistical analysis:

The data were analysed using statistical package for social sciences (SPSS) for windows version 16.1. Paired t-test was carried

out between low volume high intensity training and control groups. To find out significance difference between the means of pre and post

test of the groups and are presented in table I & II.

Table-I *TABLE SHOWING COMPARISON OF DIFFERENCE IN PRE TREATMENT AND POST TREATMENT SCORES AMONG LOW VOLUME HIGH INTENSITY TRAINING.*

Variable	Test	Mean	Mean Difference	Std. Error of the mean	DF	‘t’	Table value
Physical Fitness Variables							2.145
Speed	Pre test	7.05	0.96	0.96	14	10.22*	
	Post test	6.09					
Muscular Endurance	Pre test	31.20	10.66	0.77	14	11.17*	
	Post test	41.86					
Flexibility	Pre test	20.33	9.47	0.81	14	18.71*	
	Post test	29.80					

* Significant at 0.05 level for the degrees of freedom 1 and 14, 2.145

Table I suggests the obtained 't' values of the low volume high intensity training group on criterion measure of 10.22 (speed), 11.17 (muscular endurance), 18.71 (flexibility). The obtained 't' values to be significant at 0.05 level for degree of freedom 1, 14 the required critical value was once 2.145. Hence the obtained 't' values on the selected criterion variables greater than the required critical value, it was concluded that the low volume high intensity training programme produced enormous improvement mean difference.

Figure 1: Bar diagram showing the pre, post means values of Low Volume High Intensity training group (SBTG) on Speed, Muscular endurance and Flexibility.

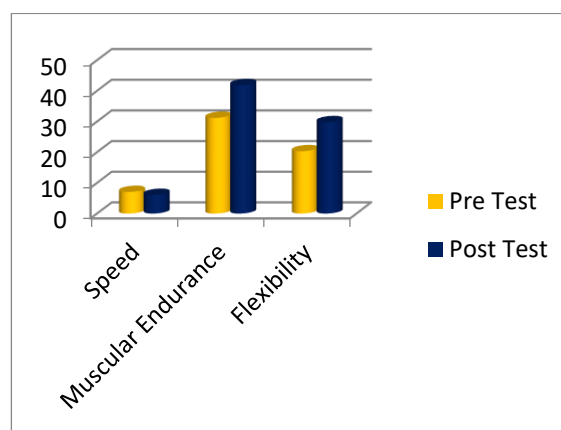


Table-II *TABLE SHOWING COMPARISON OF DIFFERENCE IN PRE TREATMENT AND POST TREATMENT SCORES AMONG CONTROL GROUP*

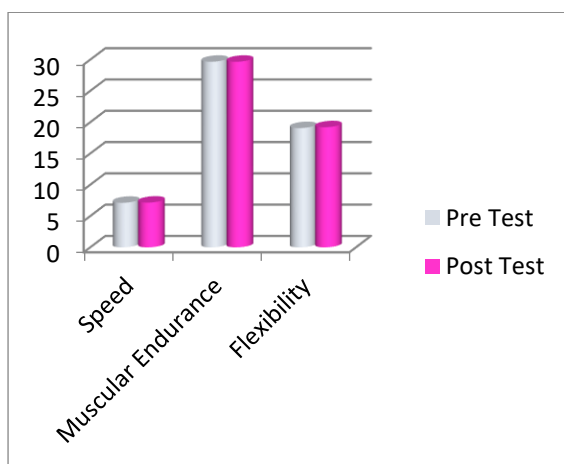
Variable	Test	Mean	Mean Difference	Std. Error of the mean	DF	‘t’	Table value
Physical Fitness Variables							2.145
Speed	Pre test	7.12	0.03	0.096	14	2.02	
	Post test	7.15					
Muscular	Pre test	29.66	0.00	1.06	14	1.87	

endurance	Post test	29.66					
Flexibility	Pre test	19.06	0.14	0.52	14	0.45	
	Post test	19.20					

* Significant at 0.05 level for the degrees of freedom 1 and 14, 2.145

Table II suggests the obtained 't' values of the control group on criterion measure of 2.02 (speed), 1.87 (muscular endurance), 0.45 (flexibility). The obtained 't' values to be significant at 0.05 level for degree of freedom 1, 14 the required critical value was once 2.145. Hence the obtained 't' values on the selected criterion variables less than the required critical value, it was concluded that the control group no differences.

Figure 2: Bar diagram showing the pre, post means values of control group (CG) on Speed, Muscular Endurance and Flexibility.



Discussion:

The LVHIT protocol used in this study aimed at providing the co activation of global and local muscles of the core. The results of the 8-week LVHIT training exercise protocol showed significant improvements in speed, strength endurance and flexibility of the upper back, lower back and abdominals. Based on the studies in the literature that suggest that exercises such as sit ups, double leg lowering, and push-ups performed on a Swiss-ball increase the level of muscular activity of the abdominals and obliques more than curl-ups, double leg lowering, and push-up performed on a stable surface (Vera Garcia et al., 2000), these

findings seem congruent. Despite the used in these studies merely assessed the activity of the superficial global muscle groups, the authors suggested that the motor control system required the activation of the global and local muscles to stabilize the spine to maintain balance and prevent the threat of falling off the low volume high intensity training.

Conclusion:

Low volume high intensity training has significant effect on physical fitness parameters such as speed, muscular endurance and flexibility. It means that low volume high intensity training increase speed and muscular endurance also increase flexibility therefore increase the low volume high intensity training to given the healthy individuals.

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