Journal of Positive School Psychology http://journalppw.com
2022, Vol. 6, No. 4, 6315 – 6320

EFFECT OF LOW INTENSITY AND MEDIUM INTENSITY TRAINING ON SELECTED PHYSIOLOGICAL VARIABLES AMONG HEALTHY INDIVIDUALS

[1]Ganeshe Dhayananth. M, [2]D. J. Asath Ali Khan

[1]M.Phil Research Scholar, Department of Physical Education and Sports Sciences, College of Science and Humanities, SRM Institute of Science and Technology, Kattankulathur-603203, Tamilnadu, India.
[2]Assistant Professor, Department of Physical Education and Sports Sciences, College of Science and Humanities, SRM Institute of Science and Technology, Kattankulathur-603203, Tamilnadu, India.

Abstract

Background: It is well known that exercise training has positive effects low intensity and medium intensity training is a famous form of therapeutic and purposeful exercise. Despite their popularity, few empirical researches have investigated the advantages of low intensity and medium 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 medium intensity training on physiological variables such as heart rate and mean arterial blood pressure of healthy individuals. In this study sixty (60) subjects, of healthy individuals were randomly selected in low intensity plyometric (Group I), medium intensity plyometric (Group II), and control (Group III). Each group consisted of twenty people (n=20), (n=60; age 18 ± 3.04; height 1.70 ± 6.71 cm; weight=59 ± 7.38 kg). Timeline: The two experimental groups were given twelve weeks of training. Training on Mondays, Wednesdays, and Fridays. All three groups had before and after testing on the criterion variables. Every day, the training was only done in the evening session, which lasted 90 minutes. Subjects in the experimental groups were given ten minutes of warm-up and ten minutes of cool-down exercises before and after each training session from the srmist playground in and around the kattankulathur campus in chennai. Physiological variables completed of the both groups at zero time and after twelve weeks of low intensity and medium intensity training in experimental group and in non-medium intensity control group. Results: In present study, Heart Rate 'F' (6.63*) were changed significantly. There is no significant difference on mean arterial blood pressure. Conclusion: The results show after 12 weeks of varying intensity plyometric exercise, healthy individuals' heart rate changed significantly. The post hoc analysis showed no significant differences between the control and low intensity plyometric training groups. The results showed that the medium intensity plyometric exercise group changed better heart rate than the control group. Comparing training groups no significant changes found. The findings demonstrated that there were no statistically significant changes in mean arterial blood pressure.

Keywords: Healthy Individuals, ANACOVA, Physiological, Low and Medium Intensity.

INTRODUCTION

Regular physical activity is essential for the prevention of cardiovascular and metabolic diseases (Fealy et al., 2018) and low and medium-intensity interval training (HIIT) is an effective training method to elicit rapid improvements in cardiorespiratory fitness (CRF; expressed as maximal oxygen consumption (VO2max)) (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 adaptions 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") medium-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 medium intensity, is capable of inducing favorable training adaptions. 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 (Umpierreet 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 to7 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 medium-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 (Boothet 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 intensity and medium intensity training on physiological performance of healthy individuals.

Methodology:

The researcher recruited at random sixty (N=60) healthy persons from Chennai, Tamil Nadu, India. Twenty (20) subjects each were assigned to experimental group I, experimental group II, and control group III. The individuals' ages varied from 20 to 25. The experimental groups were trained for 12 weeks. The control group went about their daily routines. Subjects divided three groups at random: low intensity (Group I), medium intensity (Group II), and control group (Group IV). Each group contained 20 people. Sample of the 60 healthy individuals in srmist kattankulathur, tamilnadu was evaluated using physiological variables Heart rate was measured by Stethoscope unit of measurement in numbers, Mean Arterial blood

pressure was measured by Sphygmomanometer unit of measurement in Mm/Hg. The low and medium intensity training consisted of the subjects in groups I and II completed their individual training programmes on time, with the assistance of a researcher who gave motivation, advise, and support to the subjects. Every day, the training was only done in the evening session, which lasted 90 minutes. Individuals in the experimental groups were given ten minutes of warm-up and ten minutes of cool-down exercises before and after each training session.

Statistical analysis:

The data were analysed using statistical package for social sciences (SPSS) for windows version 16.1. ANCOVA was carried out between low and medium intensity training and control groups. To determine if the adjusted post test obtained F ratio was significant, the Scheffe's test was used. 0.05 was used to test significance in all situations. 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 AND MEDIUM INTENSITY TRAINING, CONTROL GROUP ON HEART RATE.*

Means	LOWPTGI	MEDPTG	CG	SV	SS	DF	MS	'F' ratio	P value
Pre test	76.70	76.50	77.85	B	21.233	2	10.617	1.34	0.27
SD	2.92	2.37	3.58	W	451.750	57	7.925		
Post test	76.35	75.40	77.50	B	46.433	2	23.217	3.07	0.06
SD	2.20	1.98	3.72	W	430.300	57	7.549		
Adjusted post test	75.88	76.64	76.77	B	9.098	2	4.549	6.63*	0.00
				W	38.423	56	.686		

* Significant at 0.05 level

Table I suggests the The low intensity training group, the medium intensity group and control group pre-test mean of 76.70, 76.50 and 77.85 respectively. In the pre-test averages of groups, F ratio 1.34 (p>0.05) did not show any difference. In the beginning, there was no big difference in the means of the groups.

The low intensity training group was 76.35, the mean heart rate of the medium intensity plyometric training group was 75.40 and the mean heart rate of the control group was 77.5. The post-test mean 'F' ratio of 3.07 (p>0.05) did not show any differences. The post-test means of the groups did not vary significantly.

Adjusted post test means and analysis of covariance were calculated using the pre and post test means. The adjusted mean heart rate for group I was 75.88, for group II it was 76.64, and for the control group it was 76.77. On adjusted averages, the resultant F value (6.63*, p 0.05) was significant at the 0.05 level. Thus, it was demonstrated that there were substantial disparities in the corrected post-test averages of the groups' heart rates.

Figure 1: *Bar diagram showing the pre, post means values of Low and Medium Intensity training group and control group on Heart Rate.*

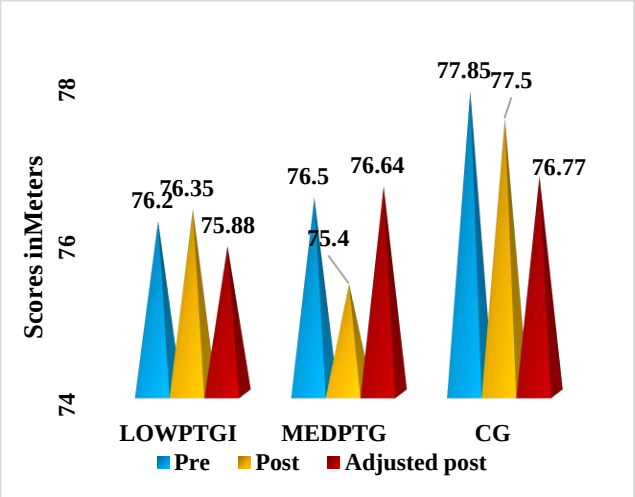


Table-II *TABLE SHOWING COMPARISON OF DIFFERENCE IN PRE TREATMENT AND POST TREATMENT SCORES AMONG LOW AND MEDIUM INTENSITY TRAINING, CONTROL GROUP ON MEAN ARTERIAL BLOOD PRESSURE.*

Means	LOWPTGI	MEDPTG	CG	SV	SS	DF	MS	'F' ratio	P value
Pre test	94.25	93.50	93.85	B	5.633	2	2.817	0.91	.406
SD	1.55	1.93	1.75	W	175.300	57	3.075		
Post test	94.85	93.70	94.35	B	13.300	2	6.650	2.68	0.07
SD	1.69	1.75	1.22	W	141.300	57	2.479		
Adjusted post test	94.62	93.91	94.36	B	5.054	2	2.527	1.72	.28
				W	82.183	56	1.468		

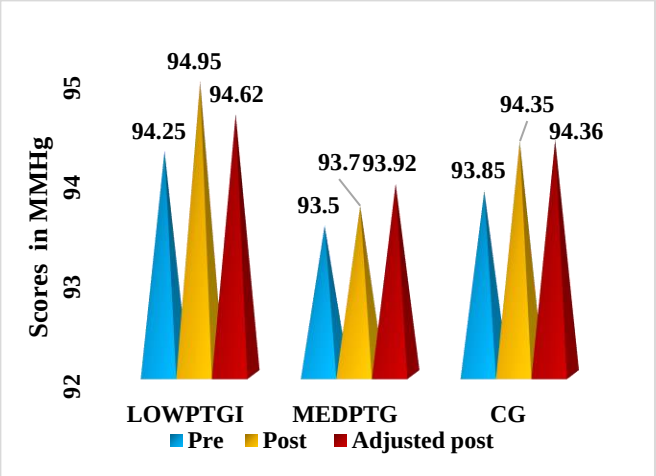
* Significant at 0.05 level

Table II suggests the On average, the low intensity training group had a pre-test mean arterial blood pressure of 94.25, while the medium intensity plyometric training group had 93.50, and the control group had 93.85. For the pre-test averages of the groups, the F ratio was 0.91 (p>0.05). Initially, there was no significant variation in the means of the groups.

On average, low-intensity training groups had mean arterial blood pressures of 94.85, medium-intensity plyometric training groups were 93.70, and control groups were 94.35. F ratio 2.68 (p>0.05) on post test means of groups was not significant. The post test means of the groups did not differ significantly.

The adjusted post test means were calculated using the before and post test means, and the covariance was examined. The corrected mean arterial blood pressures of experimental groups I and II were 94.62, 93.91, and 94.36 respectively. The corrected mean 'F' value (1.72, p > 0.05) was not significant at 0.05 level. The adjusted post test averages for mean arterial blood pressure of the groups showed no significant differences.

Figure 2: *Bar diagram showing the pre, post means values of Low and Medium Intensity training group and control group on Mean Arterial Blood Pressure.*



Discussion:

The results showed that after 12 weeks of varying intensity plyometric exercise, healthy individuals' heart rate changed significantly. The post hoc analysis showed no significant differences between the control and low intensity plyometric training groups. The results showed that the medium intensity plyometric exercise group changed better heart rate than the control group. Comparing training groups no significant changes found.

The findings of the present study were in agreement with the findings of Hamid et al., (2013) and Shunmuganathan. (2018) identified that on heart rate of the plyometric training protocol and resulted significant changes on

heart rate. The findings of the study proved that there was significant changes in heart rate, which is in the agreement with the previous. Long-term plyometric activity affects the parasympathetic nerve, boosting stroke volume and decreasing resting heart rate, minimising cardiovascular illnesses (Riebe et al., 2015). Thus, the theoretical findings based on previous research proved that varied intensities of plyometric training contributed to the change the heart rate of the healthy individuals.

Conclusion:

The results show after 12 weeks of varying intensity plyometric exercise, healthy individuals' heart rate changed significantly. The post hoc analysis showed no significant differences between the control and low intensity plyometric training groups. The results showed that the medium intensity plyometric exercise group changed better heart rate than the control group. Comparing training groups no significant changes found. The findings demonstrated that there were no statistically significant changes in mean arterial blood pressure.

Reference

[1] A Fealy C.E., Nieuwoudt S., Foucher J.A., Scelsi A.R., Malin S.K., Pagadala M., Cruz L.A., Li M., Rocco M., Burguera B., Kirwan J.P. (2018) Functional medium intensity exercise training ameliorates insulin resistance and cardio metabolic risk factors in type 2 diabetes. Experimental Physiology 103, 985-994.

[2] Astorino T.A., Allen R.P., Roberson D.W., Jurancich M. (2012) Effect of medium-intensity interval training on cardiovascular function, VO2max, and muscular force. Journal of Strength and Conditioning Research 26, 138-145.

[3] Daussin F.N., Zoll J., Dufour S.P., Ponsot E., Lonsdorfer-Wolf E., Doutreleau S., Mettauer B., Piquard F., Geny B., Richard R. (2008) Effect of interval versus continuous training on cardiorespiratory and mitochondrial functions: relationship to aerobic performance improvements in sedentary subjects. American Journal of Physiology. Regulatory, Integrative and Comparative Physiology 295, R264-272.

[4] P Kumaravelu, J Anitha, C Lakshmanan, K Govindasamy. Effect of sport loading training on selected physiological variables among the coastal area womens basketball players. International Journal of Health, Physical Education & Computer Science and Sports.2018; 32(1): 47-51.

[5] Gist N.H., Freese E.C., Cureton K.J. (2014b) Comparison of responses to two medium-intensity intermittent exercise protocols. Journal of Strength and Conditioning Research 28, 3033-3040.

[6] J Anitha, P Kumaravelu, C Lakshmanan, K Govindasamy, et al. Effect of plyometric training and circuit training on selected physical and physiological variables among male Volleyball players. International Journal of Yoga, Physiotherapy and Physical Education. 2018; 3(4): 26-32.

[7] Tabata I., Nishimura K., Kouzaki M., Hirai Y., Ogita F., Miyachi M., Yamamoto K. (1996) Effects of moderate-intensity endurance and medium-intensity intermittent training on anaerobic capacity and VO2max. Medicine and Science in Sports and Exercise 28, 1327-1330.

[8] P Kumaravelu and K Govindasamy. Efficacy of SAQ drills on selected bio-motor abilities among inter collegiate athletes. International Journal of Yogic, Human Movement and Sports Sciences. 2018; 3(1): 160-161.

[9] McRae G., Payne A., Zelt J.G., Scribbans T.D., Jung M.E., Little J.P., Gurd B.J. (2012) Extremely , whole-body aerobic-resistance training improves aerobic fitness and muscular endurance in females. Applied Physiology, Nutrition, and Metabolism 37, 1124-1131.

[10] Kumaravelu P, Govindasamy K. Impact of circuit resistance training on leg strength among University players from different discipline. International Journal of Yogic, Human Movement and Sports Sciences. 2018; 3(1):158-159.: https://doi.org/10.22271/yogic.2018.v3.i1c.08

[11] Girard O, Millet GP. Physical determinants of tennis performance in competitive teenage players. J Strength Cond Res 23: 1867–1872, 2009.

[12] Kovacs MS. Tennis physiology: Training the competitive athlete. Sports Med 37: 189–198, 2007.
[13] Kraemer WJ, Hakkinen K, Triplett-Mcbride NT, Fry AC, Koziris LP, Ratamess NA, Bauer JE, Volek JS, McConnell T, Newton RU, Gordon SE, Cummings D, Hauth J, Pullo F, Lynch JM, Fleck SJ, Mazzetti SA, Knuttgen HG. Physiological changes with periodized resistance training in women healthy individuals. Med Sci Sports Exerc 35: 157–168, 2003.
[14] Kumaravelu P and K.Govindasamy. Effect of prescribing and monitoring direct and indirect physical activity on selected health related fitness and cardio respiratory variables among obese school boys. International Journal of Physiology, Nutrition and Physical Education. 2018; 3(1): 707-716.
[15] Murphy A, Duffield R, Kellett A, Reid M. The relationship of training load to physical capacity changes during international tours in medium performance junior healthy individuals. Int J Sports Physiol Perform 10: 253–260, 2015.