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Effect Of 10 Weeks Aerobics Training Protocol On Muscular Endurance Of Jimma University Fitness Centre Trainees

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ABSTRACT

Background: Aerobic exercise is any exercise that designed to increase muscular endurance performance an individuals. Performing health-related fitness decreases the risk of cardiovascular and other diseases.

Objectives: This project was to investigate effect of 10 weeks aerobics training Protocol on muscular endurance of Jimma university fitness center trainees

Methods: The study was conducted both in Jimma University fitness centre. Ethiopia sport Experimental design research method was used. During the study representative samples were selected by stratified random sampling technique. Accordingly, control group (30) and experimental groups (30) were selected from fitness center on the basis inclusion and exclusion criteria. Standardized aerobic exercise training protocol was used. Muscular endurance was considered as dependent variable, whereas 10-weeks aerobic exercise was independent variables. Data collected from participants were processed by STATA, Version 14.Then mean, standard deviations and paired t- test were applied to find out the presence of differences between the effects of 10 weeks aerobics training on the studied variables.

Results: The null hypotheses were rejected at $p < 0.05$; there was significant difference between pre-test and post-test of result of muscular endurance performance.

Conclusion: The finding of the study reported that 10 weeks aerobics training Protocol improved the performance of gymnasium user's muscular endurance.

Keywords: Aerobic exercise, muscular endurance, performance, 10-weeks training program

1. Introduction

Regular aerobic exercise produces beneficial effects for any age group, provided that the exercise is specific and appropriately exercised to the level of fitness (Almeida & Araujo, 2003). Appropriate regular daily physical activity is a major component in preventing chronic disease, along with a healthy diet and not smoking. For individuals, it is a powerful way of preventing chronic diseases; and for nations, it can be considered as a cost-effective way of improving public health across the population. Available experience and scientific evidence show that regular physical activities provide both males and females including disabilities with a wide range of physical, social and mental health benefits (WHO, 2003).

Aerobic exercises can improve mobility and functioning of body muscles of poor health and very old adults. Progressive and correctly performed aerobic exercise; increases the level of fitness and improve health (Rosser, 2001). Regular aerobic exercises are highly beneficial for health, physical and psychological well-being of humans (Ranasingle, 2016).

Physical inactivity is considered as the fourth leading cause of death worldwide (Ezzati, Lopez, Rodgers & Murray, 2004e). Research findings indicated that physically inactive people spend on average 38% days more in hospitals , make 5.5% more medical Visits , access 13% more specialist Services and 12% more nurse visits compared to physically active individual (Zhang & Chaaban, 2012). According to cross-sectional research studies conducted in South Africa confirmed that physical inactivity was significantly related to the determinant cause of cardiovascular disease. The American College Health Association reported that on average, 35% of students in colleges are overweight or obese (ACSM, 2010). A further 46% of students are attempting to lose weight, suggesting false perceptions regarding personal body weight and body image. Only one- third of these students were received education regarding physical activity, healthy weight management and weight loss guidelines in college or university (NASPE, 2007).

A study conducted on the effect of exercise on the management of diabetes. It was observed that aerobic exercise had effect on the physiology and metabolic control in Type 1 (T1D) and Type 2 diabetes (T2D). Diabetes is a common chronic disease, and has continued to increase at a shocking rate in the last decades all over the world. It kills one person every seven seconds. The findings of the studies showed that regular exercise, at moderate intensity for 6 weeks could be physiologically beneficial for diabetics (American Council on Exercise, 2015).

Several research studies indicated that physical exercise is important for the development of all physical fitness. Now a day, physical exercise is the best therapy to treat diseases without giving medication. However, limited research has been conducted Ethiopia on the effects of physical excesses on health-related components and in particular, no study has been conducted in Jimma town, Ethiopia. Therefore, this project was to investigate effect of 10 weeks aerobics training Protocol on muscular endurance of Jimma university fitness center trainees

2. Materials and Methods

2.1. The study Area

The study was conducted at Jimma city; Jimma University fitness Centre, which is located at 353 km in southwest from Addis Ababa, Ethiopia.

2.2. Research design

Here in this study, experimental research design was employed in which one group of gymnasium users were control group and other group was exposed to 10 week aerobic training protocol. The use of the control group was helpful to ensure that measurements taken from experimental groups were free from biases and random errors or to ensure accurate and precise results (Kothari, 2004).

2.3. Sampling techniques and Selection of Subjects

Jimma university fitness center consists of gymnasium user's 180 (120 males and 60 females) trainees have been registered in 2019/20. From these populations, samples containing control group (N = 60) and experimental groups (N = 60), i.e., 15 male and 15 females control groups as well as 15 males and 15 females' experimental groups were selected using stratified random sampling technique from Jimma University fitness center.

2.4. Inclusion and exclusion criteria.

To be considered in the study, the age of candidate was ≥ 18 years old. In addition, candidates who had recent physical injury and medical condition such as mental problem, pregnancy, surgery cases as well as those who dropout training for 10 weeks or more were excluded from the study.

After sampling, training was given to both groups about the study which was conducted. Then, after additional aerobic exercises was given to experimental groups, to identify effect of exercises on health related physical fitness components. The training was given three days per week and the health related physical fitness

components mainly muscular endurance were measured at the beginning and end of training protocol.

2.5. Selection of Variables

2.5.1. Independent variables

The independent variable was 10 weeks aerobic training protocol (Mycpack, 2013).

2.5.2. Dependent variables

Dependent variable was muscular endurance. Muscular endurance was measured by Sit-up test. The candidates lie on back by bending their knees approximately right angle, with feet flat on the ground. A partner may help in holding the feet at its position, and then the candidate will performs as many sit up as possible in one minute. In the up position the individual should touch elbows to knee and return to a fully lying position before starting the next sit-up. Score is the total number of correcting sit up

3.8. Data Analysis

Data collected from participants were entered into STATA, Version#14, and then descriptive statistics such as mean, standard deviations and paired t- test was used to examine the effects of 10 weeks aerobic exercise on health-related physical fitness components between pre-test and post-test muscular endurance.

3. Results

3.1. Muscular endurance

Table 1 Sit-up test result of subjects

S.n.	Variables	Obs.	Mean	Std. Dev.	SEM	Paired t-test			
						T-value	df	Sign	95%; CI
1	Sit-up Pretest of male EG	15	22.5	1.77	2.01	2.65	29	0. 00	.37-.1.8
2	Sit-up Posttest of male EG	15	27.5	2.73					
3	Sit-up Pretest of male CG	15	22.2	1.75	0.98	1.49	29	0.07	0.72-2.2
4	Sit-up Posttest of male CG	15	21.93	1.78					
5	Sit-up Pretest of female EG	15	17.5	1.73	0.03	4.02	29	O.00	0.09- 0.36
6	Sit-up Posttest of female EG	15	22.5	1.93					
7	Sit-up Pretest of female CG	15	17.5	1.73	1.2	2.65	29	0.06	0.00- 099
8	Sit-up Posttest of female CG	15	17.9	1.83					

A paired t-test was run on a sample of gymnasium users to determine whether there was a statistically significant mean difference between male subjects who tested muscular endurance test (EG) particularly sit-up test pre-test and post-test. As you can see, posttest result of gymnasium users who trained for 10-weeks aerobic training had higher muscular endurance than sit-up test pre-test result. A standard error of the mean of 2.01 (Std. Err.), and 95% confidence intervals of .27 to.1.8 (95% Conf. interval), df = 29; t = 2.65, $p < .05$, it can be concluded that there is a statistically significant difference between sit-up pre-test and post-test.

In other words, the difference between the sit-up pre-test and post-test of male EG is not equal to zero.

The null hypothesis reveals that there is no significant difference among the male subjects who tested muscular endurance test (CG) pre-test and post-test did not show significant difference at standard error of the mean of 0.98 (Std. Err.), and 95% confidence intervals of .37 to.1.8 (95% Conf. interval), df = 29; t = 2.65, p > .05, it can be concluded that there is no statistically significant difference between sit-up test pre-test and post-test. In other words, there no difference between the sit-up test pre-test and post-test of male CG is equal to zero.

A paired t-test was run on a sample of gymnasium users to determine whether there was a statistically significant mean difference between female subjects who tested muscular endurance test (EG) particularly sit-up test pre-test and post-test. As you can see, post-test result of gymnasium users who trained for 10-weeks aerobic training had higher muscular endurance than sit-up test pre-test result. A standard error of the mean of 0.03 (Std. Err.), and 95% confidence intervals of 0.09- 0.36 (95% Conf. interval), df = 29; t = 4.02, p < .05, it can be concluded that there is a statistically significant difference between sit-up test pre-test and post-test. In other words, the difference between the sit-up test pre-test and post-test of female EG is not equal to zero.

The null hypothesis reveals that there is no significant difference among the female subjects who tested muscular endurance test (CG) pre-test and post-test did not show significant difference at standard error of the mean of 0.98 (Std. Err.), and 95% confidence intervals of 0.72-2.2 (95% Conf. interval), df = 29; t = 1.49, p > .05, it can be concluded that there is no statistically significant difference between sit-up test pre-test and post-test. In other words, there no difference between the sit-up test pre-test and post-test of female CG is equal to zero.

4. Discussion

In this context, 10-weeks aerobic training significant improved experimental group muscular endurance. However, other finding indicated that no significant improvement in muscular strength, which was measured by dynamic strength at the end of a 10- and 12-week aerobics period (Koenig et al., 1995). But, other studies indicated significant improvements in dynamic arm and leg strength at the end of 12 weeks of step aerobics respectively (Kraemer et al., 2000).

In congruence with this finding, other meta-analysis study conducted on amputee person shows that combined exercise of muscular endurance and functional physical exercise appear to have greater positive effects on cardiorespiratory fitness, muscular fitness and functionality levels in adult lower limb amputation (Bouzas et al., 2021).

In agreement with this, studies done on the effect of exercise performance by elderly women on muscle function reveals that muscle function significantly improved in the exercise group and showing that the intervention is effective at improving muscle strength, and muscle endurance of elderly women (Lee Hyo-CHeol, Mi-lim, & Seon-Rye, 2015).

Supporting this finding other research output shows that the aerobic endurance exercise group ran for 90 min. The aerobic interval exercise group ran for a total of 90 minutes in 5 minute bouts separated by 2 minute rest periods. The exercise groups ran on a downhill treadmill incline, once every three days, for a total of twenty sessions. The muscle wet weights, the muscle fiber cross-section minor axes, and the tetanus tension results of the aerobic endurance and aerobic interval exercise groups were significantly larger than those of the control group. These results indicate that aerobic interval exercise may be an effective method of inducing hypertrophy and augmenting muscular strength in skeletal muscle (L. Hyo-CHeol, Mi-lim, & Seon-Rye, 2014).

In agreement with this, similar training protocol reveals the exercise group performed aerobic and resistance exercises for 60 minutes per day, 3 times per week for 12 weeks. Physical fitness was examined. After 12 weeks of exercise, weight, waist circumference, cardiorespiratory fitness and muscular strength significantly increased in the exercise group (Seol-Jung, Kwang-Jun, & Un-Hyo, 2016).

5. Conclusion

The finding of this study reveals that 10-weeks aerobic training improved the experimental group muscular endurance strengthen including

rectus abdominals, transverse abdominals and oblique. In addition to your hip flexors, chest, and neck of gymnasium users by far better than compared. The other finding of the study reveals that 12-weeks aerobic training improved the experimental group strength and endurance of the upper body muscle groups of gymnasium users by far better than control group

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