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# Effect of Circuit Training and Aerobic Training on Reaction Time

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**Abstract**

Reaction time is duration between applications of a stimulus to onset of response. VRT is time required to response to visual stimuli. The subjects were ages ranged between 16-20 years selected from Polytechnic CollegeRk Nagar, Chennai-81. Subjects were divided into three equal groups namely Group –A acted as Control , Group - B acted as Circuit training Group C- aerobic training Groups were underwent to do their own schedule as trainingthe subjects were tested in ordered to findout the Reaction Time.The data were collected before and after the training schedule period. The level of significance for the study is chosen as 0.05 level-the pre-test, post-test and adjusted post-test were analyzed by using Analysis of Covariance (ANCOVA).In this study results were showed significant results among within groups howsoever favor to Circuit training comparatively reaction time was improved other than two groups.

**Keywords:** Circuit training, Aerobic training, Reaction Time

## Introduction

Reaction time is duration between applications of a stimulus to onset of response. VRT is time required to response to visual stimuli. SRT is time required to response to sound stimuli. ViRT is time required to response to tactile stimuli. (Jayesh.Solanki. et al, 2012) reaction time acts as a reliable indicator of rate of processing of sensory stimuli by central nervous system and its execution in the shape of motor response

## Methods

The selected subjects were divided in to three groups underwent according to their fixed schedule training Group- A acted as under control group, Group- B acted as Circuit training underwentAerobic training, Group –C working employee acted as Physical training for eight weeks practice programme ages ranged between 16-20 year. the subjects were tested data were scored before and after training, the subjects were tested in order to find out on cardio respiratory endurance . the data were collected before and after the training period and

 

the pre test, post test and adjusted post test were analyzed by using Analysis of Covariance (ANCOVA). The level of significance for the study is chosen as 0.05.

**Discussion**

Shasikanth Varmawith his team.,2011 study 20 male and 20 female, young medical students practiced exercise (15 min sessions) for 3 months on alternate day basis. Outcomeof assessments of auditory reaction time (ART) and visual reaction time (VRT) were performed at baseline and after the 3 month of exercise training.Reactiome is of applied value in situations requiring faster reactivity regarding serious safety concern such as in day today driving to avoid road traffic accidents, in sports for recommendation of safety limits, machine operations and in specialized surgery. So they suggested that the physical exercise is a lifestyle factor that might lead to increased physical and mental health and performance that can be used as an effective means of training people involving such tasks.

Bahramalli, Misra, Adam their teams in various years also found that ART and VRT was more in females than in males, which is in conformity with previous studies This probably attributed to the differences in processing strategy in males and females14. Also the auditory reaction time was faster than the visual reaction time both in males and females that is in line with previous studies

Stephen RLordPhD[ab]SallyCastellDip RG&RT[b]1994 Physical activity program for older persons: Effect on balance, strength, neuromuscular control, and reaction time Regular exercise has been recommended to improve balance, strength, and coordination in older persons. In this study, 44 persons, aged 50 to 75 years the subjects showed improved performance in the tests of reaction time.

TülinAtan and PelinAkyol 2014examined the reaction times of athletes engaged with different sports branches and to find out the correlation between auditory, visual and multiple reaction time parameters. In the study 215 male athletes in different sport branches and 44 non-athlete males participated. They concluded non-athletes' reaction time parameters were found worse than the most branch athletes. Reaction time parameters of athletes don't change between sports branches except judokas. The 15 years old athletes have proved the worst reaction times than 16, 17 and 18 years old athletes. A significant correlation between the visual, auditory and multiple reaction time parameters was determined.

TülinAtan and PelinAkyol 2014All athletes who are involved in team sports should have some advantages in their motor skills as well. These skills are to be developed by

 

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Vol-5-Issue-6-November-December-2019

training. It is a fact that strength, agility, endurance, flexibility, and balance all of which are the factors used consecutively in aerobics and anaerobic systems which affect the performance of both team sports and individual sports –Tamer 2000. In order to be successful in sport events, an athlete must show a high performance with regard to physical and motor skills. One of the parameters that access an athlete to have such performance is reaction time -Koç and Kaya, 2006.

Zemkova et.al (2004) made a study which deals with the agility test as a diagnostic method for the assessment of the multi choice reaction time of the lower limbs. 236 subjects cross sectional tests' revealed that competitors in table tennis, fencing, karate, ice hockey, soccer, basketball, volleyball, and aikido performed significantly better than physical education students, judokas and wrestlers.

Menevşe, 2011 Hand-eye coordination plays an important role especially in individual sports that require high motor hand skills such as handball, volleyball, basketball and racket sports. Fox and his fellows stated that athletes with better performances also have better reaction time than the others.Attention is responsible for allocating the necessary cognitive resources to a specific task, while also dealing with other environmental stimuli -Yogev-Seligmann et al., 2008. Divided attention has been studied extensively and is tested with the dual-task paradigm, during which two tasks are performed concurrently and compete for limited attentional resources -Verhaeghen et al., 2003. Have shown of Dual-task experiments involving simultaneous balance and cognitive tasks a greater cost of dual tasks in older than in young persons, suggesting that there is an increase in the cognitive resources required for postural control with age.

Inhibition is the ability to selectively attend to relevant stimuli and suppress dominant behavioral responses, and ithas been associated with an increased risk of falls in older people (Anstey et al., 2009). people with poor inhibition have reduced ability to react appropriately to changes in the environment, or react to task-irrelevant stimuli which could increase their fall risk and also has been suggested (Nagamatsu et al., 2013). Set shifting, the ability to switch between tasks by changing the allocation of attention, is important for many daily life activities, and has been shown to decline with age and difference between fallers and non-fallers (Kearney et al., 2013). set-shifting ability as well as slower processing speed have Reduced, especially during more complex tasks, can impact other cognitive processes and also subsequently delay motor responses necessary related for successful task completion (Maki et al., 2001).

 

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Vol-5-Issue-6-November-December-2019

Older people often present with multiple domain cognitive impairments, either as part of or beyond of normal aging. (Anstey et al., 2009) People with cognitive impairments have twice the risk of falling compared to their cognitively intact peers. In addition, impaired judgment of postural limits may be associated with increased fall risk through overestimating balance ability and poor motor planning (Butler et al., 2011). Sakurai et al. (2013) have suggested that aging is accompanied by a growing disparity between perceived and actual physical ability, which is associated with a concomitant decline in executive function. This is supported by a study of Delbaere et al. who found in (2010) that about one-third of community-living older people did not have a correct perception of their physical abilities, measured by the discrepancy between an actual physiologic fall risk, the perceived fall risk measure as fear of fallingrecent functional Magnetic Resonance Imaging (fMRI) data support this model..

**Table- I**

**ANALYSIS OF COVARIANCE OF DATA ON REACTION TIME BETWEEN PRE AND POST TEST OF CONTROL, CIRCUIT AND AEROBIC TRAINING GROUPS**

| Test | Control Group | Circuit training Group | Aerobic training group | Source of variances | Sum of Squares | df | Mean Squares | Obtained 'F' Ratio |
|---|---|---|---|---|---|---|---|---|
| **Pre test** | | | | | | | | |
| **Mean** | 117.14 | | 116.40 | **Between** | 20.93 | **2** | 10.47 | 1.02 |
| **SD** | 2.64 | 2.59 | 4.15 | **Within** | 433.08 | **42** | 10.31 | |
| **Post test** | | | | | | | | |
| **Mean** | 117.06 | 112.33 | 114.60 | **Between** | 168.13 | **2** | 84.07 | 7.845* |
| **SD** | 2.711 | 3.22 | 3.80 | **Within** | 449.87 | **42** | 10.71 | |
| **Adjusted Post test** | | | | | | | | |
| **Mean** | 116.32 | 113.15 | 114.54 | **Between** | 72.37 | **2** | 36.18 | 21.41* |
| | | | | **Within** | 69.37 | **41** | 1.69 | |

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Vol-5-Issue-6-November-December-2019

*Significant at 0.05 level of confidence.The table value required for significance at 0.05 level with df 2 and 42 & 2 and 41 are 3.222 & 3.226 respectively.

**Results**

The results of the study showed that there was a significant difference among control, Circuit training and Aerobic exercisestraining groups on Reaction time. However the improvement was in favor of Circuit training group .Since three groups were involved the Scheffe's post hoc test was applied to find out the paired mean difference if any, and it is presented in the table -II

**Table- II**

**SCHEFFE'S POST HOC TEST FOR THE DIFFERENCE BETWEEN THREE PAIRED ADJUSTED POST TEST MEANS OF REACTION TIME**

| ADJUSTED POST TEST MEANS | | | MEAN DIFFERENCE | CONFIDENCE INTERVAL |
|---|---|---|---|---|
| CONTROL GROUP | CIRCUIT TRAINING GROUP | AEROBIC TRAINING GROUP | | |
| 116.32 | 113.15 | - | 3.17* | 1.21 |
| 116.32 | - | 114.54 | 1.78* | 1.21 |
| - | 113.15 | 114.54 | 1.39* | 1.21 |

*Significant at 0.05 level of confidence.

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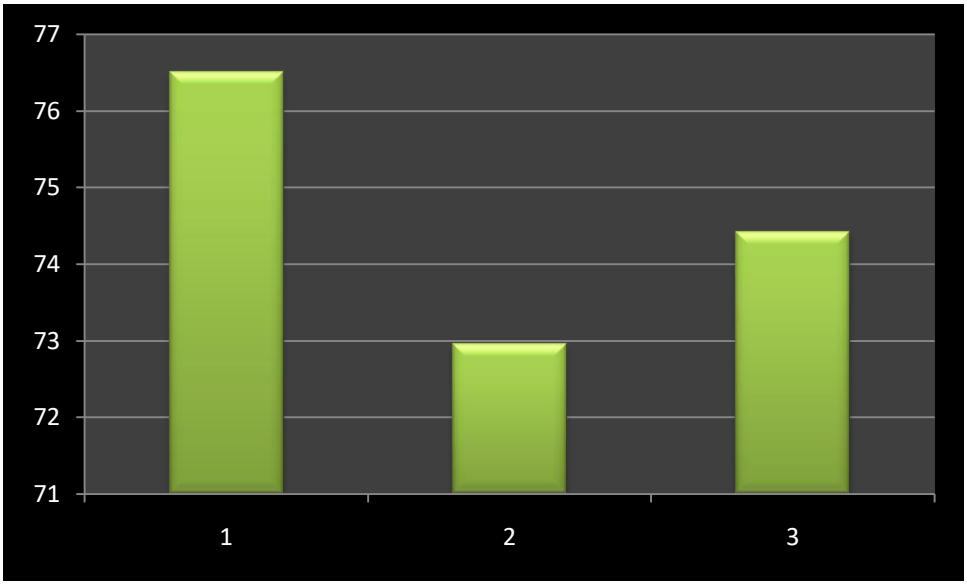
Vol-5-Issue-6-November-December-2019

**FIGURE**

**THE ADJUSTED POST TEST MEAN VALUES ON REACTION TIME FOR CONTROL, CIRCUIT TRAINING AND AEROBIC TRAINING GROUPS ON REACTION TIME**

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