

# Improvement in Attention by the Effect of Low Intensity Aerobic Vs Resistance Exercise in Geriatric Population

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**Abstract:-** This study was aimed to find the effect of low intensity aerobic exercise and resistance training on attention of geriatric population. The objective of the study was to find the difference between pre-test and post-test values of low intensity Aerobic exercise, Resistance training and Both on Attention by using Stroop test (color-word test). 30 Individuals are participated in the study based on the inclusion and exclusion criteria. Individuals were categorized into three groups A, B and C. Group A were given low intensity aerobic exercise which includes walking. Group B were given resistance training which includes strength training using Dumbbells. Group C were given both low intensity aerobic and resistance training. Hence Group A has lower time to complete the Stroop test, Group B has also lower time to complete the Stroop the test and Group C has much lower time to complete the Stroop test. The study shows that individuals who were performed both low intensity aerobic and resistance training has a significant improvement in attention than the aerobic and resistance training given separately.

**Keywords:-** Low Intensity Aerobic Exercise, Resistant Training, Strength Training, Walking, Dumbbells, Stroop Test.

## I. INTRODUCTION

Aging is a growing old process in which morphological, functional, hemodynamic and psychological changes reduce the person's ability of adapting to that environment which they were before. It is a multiple process that involves different variables (e.g genetics, lifestyle factors, chronic diseases).

Attention is one of the important cognitive and behavioral function that is used in day to day activities. If a person wanted to complete any cognitively planned activity, or any of the sequenced action or any thought in which a person requires the use of sustained attention. It is the action of dealing with or taking special care of someone or something. There are two types of attention: Active and Passive. Active attention is a voluntary process involves alertness, concentration, interest and hunger. Passive attention is an involuntary process includes external events such as a bright flash, a strong aroma, or a sudden loud noise [1]. Attention is a process that involves several dimensional cognitive process which includes the ability to select and focus on to which is important at any given

moment, the ability of the mind to consistently maintain the mental efforts of the brain while performing task that requires mental energy and the ability to inhibit actions or thought while previewing in concern of some alternative actions or thoughts. In other words it is a process that involves complexity, and it also includes alertness and walking up consciously and also includes selecting what we should be needed to be attending to, and in contrast it ignores the process or situation that we doesn't want to face or attend to, and maintaining our focus for the exact and right amount of time for establishing based on the needs.

Alertness and arousal is the important and initially using step in the process of attention whenever we are going to do something or listen or speak to someone about the first thing that we need to feel is alertness and arousal of the person. In other way to say our brain or mind is felt to be charged like a battery during attention. Reticular Activating System is the important area in maintaining or in controlling the ability of being alert and arousal of the person. This reticular system is situated in the brain stem that is located at the base of the brain and at the back of the neck. It is the part of the brain that helps and maintains us in feeling alert, bright and aroused whenever we wake up in the morning and in necessary situations.

Selectivity is the next major step in attention process. Because, usually at most of the moment in every situation, there are a multitude of stimuli that are potentially capable of capturing our attention and distracting our thoughts because it is impossible or very difficult to pay attention or select to them all we decided which ones are the most importantly needed ones. For example we can think of when students are in classroom, they have many distractions like their mind may pay attention to what other students are doing or chatting, what is written in the board of the class room, the different color of their friend's new shoe or pencil box, someone talking down the hall or what teacher is saying. We have these much things around us. Our brain must concentrate on each moment to moment and it must select the most important thing in these is to listen to the teacher's class. Further, even when concentrating on a certain task there often parts that are most important than others and must be listened closely. This ability of selecting the most important part of task is called Saliency determination [2]. The part of brain that controls our ability to select the most important or salient information is frontal lobes.

Distractibility is the thing that deviates us from the attention or focus which we must filter out or ignore these things from us when we are concentrating or keeping a complete attention in one particular thing. These distractions may be visual, such as people who are near us or the birds in the tree just outside the window or things which are around us which attract us. They may even be our own bodily feeling such as feeling hungry or may be by our own thoughts [3]. Other distractions include mental distractions, this may be thinking about our future or what thing is going to come next in our life of what is going on happening currently at the present time, and other things such as what we are the plans over this weekend or the test we are going to have tomorrow in the class[4]. The next component in attention is previewing. Impulsivity is the problem in behavioral Self control or emotional activity. It is the disability of the body to stop some behavior or to maintain a behavior by its consequences. The behavior that need to be regulated may be cognitive (thoughts), verbal, emotional or motor [5]. Attention is not only just noticing some of the incoming stimuli. It also involves a number of various processes that includes filtering out some perceptions, balancing multiple perceptions that are received and attaching emotional significance to these perceptions [6].

Aerobic exercise (also known as cardio) are the exercise that include various physical exercises of low level, moderate and high intensity that directly depend on the energy generating process in aerobic state which means in presence of oxygen supply that compensates the needs required or demand during physical activities through active metabolic reaction. Low intensity exercises has the effect of slightly increasing the heart and breathing rate of a person and they are very much appropriate for older adult person who have certain medical conditions that make exertion particularly that cause difficult or dangerous effect. The most commonly used low intensity cardio exercise is walking. Walking is a simplest way to work out and easiest way to get more active, weight loss and become healthier.

A resistance training workout include various activities like, moving limbs against resistance, the resistance may be provided by different resistance products like body weight, gravity band, weighted bars and dumbbells, these resistance products help in increasing the muscle strength and endurance of the individual. Resistance is nothing but any force which makes harder for the individual to perform a movement. Hence the exercise that is performed against resistance is considered as the resistance or strength training for a muscle.

For the older adults likely to have a better quality of life and to live longer they should have been continuously doing certain physical activity and exercise, because physical muscles and attention “muscles” both have a limited amount of strength at any given time for elderly person, so their stamina and power has the chance of either atrophy from inactivity and not doing purposeful exercise and they require rest and recovery after they have been intensely exerted. Usually exercises primarily helps the brain ability to ignore distractions, and making an effort to

focus all our energy on muscle strengthening can also increase attention. It helps in maintaining the focus of the person on single task required without being distracted, and also helps in various different elements required in attention that must be effectively managed.

## II. MATERIAL AND METHODS

- ❖ Study Design:  
Quasi Experimental study.
- ❖ Study Setting:
  - Saveetha college of physiotherapy,
  - Saveetha University, Thandalam,
  - Chennai- 602105
- ❖ Sampling Method:  
Random sampling method
- ❖ Sample Size:  
30 Individuals were selected between the age group of 65-75 years.
- ❖ Inclusion Criteria:
  - Subjects age group- 65-75 years.
  - Subjects involved both the genders.
  - Normotensive.
  - Subjects those who are willing to participate.
- ❖ Exclusion Criteria:
  - Hypertensive patients.
  - Subjects with diabetes mellitus.
  - Subjects who are not willing to participate.
  - Psychological problems.
  - Subjects with cardiovascular problems.
- ❖ Procedure:  
The total of 30 sample of age group of 65-75 years were selected according to inclusion and exclusion criteria. The safety and simplicity of the entirety of the procedure will be explained before handed. All the 30 samples were selected randomly using convenient sampling techniques. The low intensity aerobic exercise was performed by slow walking on Thread mill for 2 min and then for 10 mins of walking with an increased speed and followed by 2 mins of cool down, and the resistance exercise was provided by biceps curls using dumbbell of 5 pounds for 12 repetitions. Then Stroop test is performed using 5 colored words printed in a sequence of 20. The average difference between the pre-test and the post test before and after the test is measured. The main advantage of this test is that a larger group can perform this test easily at once for minimal costs.
  - **Treatment session:** (Stroop test)
  - **Duration of each session:** 15 minutes.
  - **Number of sessions:** 1 session/day.

## III. RESULT

From the detailed analysis made with the quantitative data relieved a slight difference between the pre-test and post-test. In the Stroop test, for low intensity aerobic exercise the pre-test mean is 28.01 with a standard

deviation of 1.88 and the post-test mean is 22.10 with a standard deviation of 0.91, For resistance training the pre-test mean is 26.87 with a standard deviation of 1.39, and for the post-test Mean is 21.47 with a standard deviation of 0.94 and for both ( low intensity aerobic exercise and resistance training) the pre-test mean is 25.05 with a standard deviation of 1.36 and the post-test mean is 20 with a standard deviation of 1.1.

#### IV. DISCUSSION

Physical exercise helps to improve the health of the elderly thereby reducing the risk of developing diseases. It also improves mental fitness. However low intensity aerobic exercise are suitable for older adults which also has a beneficial effects on blood pressure, glucose tolerance, depression and quality of life. Resistance training helps to increase the muscle strength and mass.

The aim of this study was to determine the effect of low intensity aerobic exercise and resistance training on attention among geriatric population. 30 individuals fulfilling the inclusion criteria were assigned to his study by randomized technique. Subjects were grouped into three. Group A were given low intensity aerobic exercise, Group B were given resistance training and Group C were given both low intensity aerobic and resistance training. Stroop test is the tool for analyzing the attention and the procedure was explained.

Chang & Etnier, 2009 Concluded that as comparing to the strength training, aerobic exercise is more effectual for improving cognitive functions. Since strength exercise induced improvements in selective attention [7]. Tomporoski et al., found that there is an increase in cognitive functions by giving submaximal (low intensity) aerobic exercise but by giving continuous bouts of extended Strenuous exercise may leads to decline memory cognition [8]. KalaPotharakos et al., differentiated that the muscle strength of elderly individuals doing resistance exercise at different intensities (moderate and high) for 12 week are comparatively less, hence the group that trained with low intensity shows a remarkable improvement [9].

Aerobically fit means that you need to moving large muscles such as leg muscles, trunk, and shoulder while breathing. Aerobic exercise was shown to increase heart rate levels and, also to increase arousal levels [10] and activating specific cortical area in the brain [11]. These changes proves that there is an association between aerobic exercise and cognition [12]. Heart rate levels are increased by giving resistance training [13] in addition to that it is correlated with cognitive improvement [14]

Alves et al. found that both cardio exercise and resistance training improves the speed processing and inhibition control in the Stroop test [15]. These exercise are hard enough to be challenging yet easy enough to be enjoyable. Resistance training given to elderly which increases power, reduce the difficulty performing in daily task, enhancing their energy expenditure, body composition, improving cognitive abilities and promotes participation in spontaneous physical activity.

The present study reveals that the impact of the low intensity aerobic exercise and resistance training shows slight improvement in attention among geriatric population and concluding it with the pre and post-test values of Stroop test.

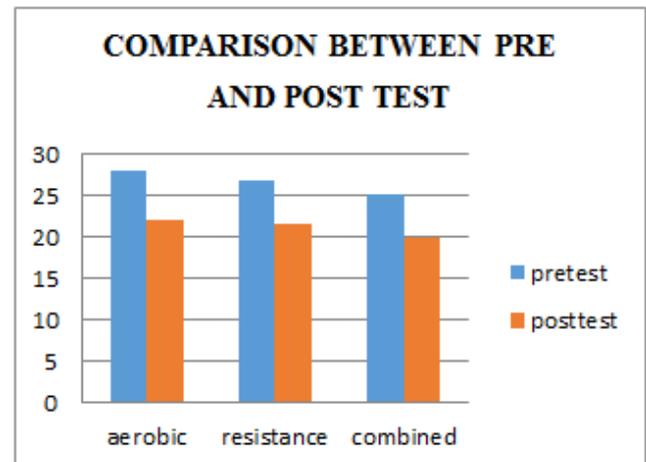


Fig 1

#### V. CONCLUSION

From the results the present study evaluated that individuals received both low intensity aerobic and resistance training shows improvement in attention by following the pre and post-test values of Stroop test.

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#### CONFLICT OF INTEREST

All the authors of the study declared no conflict of interest.

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