

# Effectiveness of Long Interval VS Medium Interval High-Intensity Interval Training on Cardio-Respiratory Fitness among the Obese Collegiate – Comparative Study

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**Abstract** The prevalence of overweight and its related diseases has increased worldwide in the recent population. In contrast with the accumulation of peripheral subcutaneous fat, excessive fat accumulation in the abdominal viscera is strongly associated with obesity-related complications. College is a transitional period from adolescence to adulthood and also a crucial period for the development of healthy lifestyles and the formation of healthy behaviors. High-intensity interval training could be beneficial for the enhancement of cardiovascular endurance among collegiate obese. **AIMS:** The purpose of this study is to compare the effect of long-interval and medium-interval HIIT training on BMI, Rate of perceived exertion (RPE), and 6- min walk test distance (6MWT) on obese collegiate. **METHODS:** A Quasi-experimental study design with 30 Students of SRMIST, Kattankulathur, aged 18-30 years and BMI > 25 Kg/m<sup>2</sup> (Asian criteria-based) who were divided into two groups (Group A- HIIT long interval × 3/week n=15, Group B- medium interval × 3/week n=15) for 8 weeks was employed. **OUTCOME MEASURES:** The study was conducted by using the Body mass index, and Borg scale and measuring distance by using a 6-min walk test. **RESULTS:** The study concluded that there is no significant difference between the long and medium intervals of High interval intensity training.

However aerobic capacity and level of rate of perceived exertion moderately improved in both groups ( $p < 0.05$ ), and the body mass index somewhat decreased after 8 weeks of intervention. **CONCLUSION:** These new findings show that exercising three times with HIIT per week improves cardiorespiratory fitness, body mass index, and rate of perceived exertion in overweight/obese college students, but there is no significant difference between the intervals (long and medium). The interval of HIIT may be a viable and effective method for prescribing an initial fitness program overweight collegiate.

**Keywords** Obesity, RPE, Aerobic Capacity, Long Interval HIIT, Medium Interval HIIT

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## 1. Introduction

Obesity is common among 40.3% of Indians. The south had the highest zonal variation of 46.51 percentage, while the east had the lowest 32.96 percentage [1]. Obesity and its related illnesses have improved dramatically. Contrary to the development of peripheral subcutaneous fat, extreme abdominal visceral fat accumulation is strongly associated

with obesity-related issues such as type 2 diabetes mellitus and cardiovascular disease [2]. While BMI 25 was linked to an acceptance of overweight of 19.8 percentage, BMI 23 was linked to a frequency of overweight of 27.7 percentage in overweight/obese women [3-4]. It has been demonstrated that having a higher socioeconomic status, eating junk food and high-cholesterol food, and sleeping between 7 and 9 hours are all substantially associated with being overweight or obese. BMI is the most reliable method to examine the level of obesity in medical practice. The transition from adolescence to adulthood that occurs throughout the college period is also a vital period for the development of healthy habits and lifestyles. College students' levels of physical exercise have significantly decreased recently [5].

The cardiovascular training method also known as HIIT includes brief intervals of vigorous anaerobic exertion with slower, more restorative intervals. HIIT exercises are used to increase glucose metabolism as well as cardiac endurance and capability [6]. Additionally, it has a great impact on body fat mass reduction. In general terms, the current exercise guidelines indicate that to improve physical fitness and health immensely, the medium-to-vigorous at least three days of cardiovascular exercise each week are required [7]. The significant amount of information indicates that high-intensity practicing exercise may be a better training method than traditional moderate-intensity continuous training for enhancing cardiorespiratory fitness. Both prediabetic and untrained persons improve with HIIT in terms of glucose tolerance [8]. Although HIIT has the potential to improve cardiovascular risk health indices, it is unclear how much HIIT exercise is necessary to achieve these improvements. However, many people fail to complete "traditional training programs" because of a lack of time, and metabolic-related diseases caused by a sedentary lifestyle have become a major and growing health concern in modern society [9]. Throughout extensive training, HIIT induces marked improvement in aerobic capacity and skeletal muscle oxidative capacity. Previous research has demonstrated that performing one session of HIIT every five days improved lower limb muscular strength and aerobic capacity in inactive older men. In addition, twelve weeks of HIIT done once a week has been shown to increase cardiorespiratory fitness and cardiometabolic reactivity in healthy young people [10].

There are three major classifications of HIIT used in the exercise protocol that range in both time and activity severity that is long interval(three minutes), medium interval(two minutes), and short interval(one minute). Each interval of the HIIT protocol elicits a distinct set of physiological effects. Whereas the long interval of HIIT is a widely used protocol for the development of cardiovascular performance [11].

A standard outcome of functional exercise capacity is the 6MWT which is commonly used to assess therapy response in pulmonary and cardiac illness. Many studies have shown

links between 6MWT distance and physiological measurements like maximal oxygen capacity, but limited research has looked at how it links to health outcomes or psychological variables. Because functional exercise capacity is related to many aspects of physical function, it is a significant yet underutilized outcome. The 6MWT is low-burden, safe, and simple to perform functional exercise capacity evaluation. In the elderly and people with morbid obesity, the 6MWT appears to be related to Health-related quality of life. In both healthy and unhealthy adults, the 6MWT distance is linked with many socio-demographics (sex, age), anthropometric (weight, height, BMI), and physiological characteristics (physical fitness and ability, comorbidities, cognitive deficiency, resting heart rate, smoking status) [12]. With HIIT intervals, exercise intensity is very important. Traditional exercise intensity training improved by physiological factors like HR, consumption of O<sub>2</sub> (VO<sub>2</sub>), HRmax and the maximum O<sub>2</sub> consumption during exercise (VO<sub>2 max</sub>) [13]. Even though, because these results are difficult to understand, they cannot be confirmed without the use of costly equipment and professional supervision. So, the RPE scale is used to monitor people's exercise intensity. The term RPE refers to a person's perception of their actual exercise intensity level. RPE is an abbreviation for the rate of perceived exertion, which contains the numbers for describing the exertion level while doing exercise. The Borg scale was first used to produce the score and has shown to be a useful method for this assessment. The Borg scale has already been extensively used in the healthcare practice for about long years and is continuously used nowadays. The scale is used by exercise physiologists and clinicians to engage patients during assessment of exercise, and the participants may simply define their exertion level [14].

## 2. Materials and Methods

### 2.1. Participant

30 young obese collegiate students participated in the present study. Before commencing the experiment, the participants were randomly divided into two HIIT groups: group A, long interval (n=15, mean age: 23.6 years, mean body mass: 30.54kg), group B (n=15, mean age: 24.02 years, mean body mass: 30.65kg). Prior to the study, an Institutional Ethics Clearance (IEC) number. 8342/IEC/2022 was obtained from Institutional Ethical Committee. The Clinical Trial Registry India (CTRI) registration number REF/2022/10/058995 was obtained. The obese individuals who agreed to be included were chosen using inclusion and exclusion criteria. The study's procedures were described to the participants. All subjects provided informed consent. By simple random sampling, participants were selected for the study.

## 2.2. Procedure

Participants were allocated to two groups: Group A (Long interval high-intensity training) and Group B (Medium interval high-intensity training) each containing 15 participants. Group A & Group B were scheduled for 8 weeks before which 1 week was held for education regarding the exercises prescribed. The exercise contains 45-minute exercises including warm up and cool down (per

session) for **long interval high-intensity exercises** & 43-minute exercises including warm up and cool down (per session) for **medium interval high-intensity exercises** thrice a week. The exercise protocol was set according to the FIIT principle which is given in Table 1 for Group A and Table 2 for Group B. The procedure of the study is explained by the consort Flow chart (Figure 1). The exercise protocol was set according to the FIIT principle.

**Table 1.** FITT principle for group A

<b>GROUP-A</b>
<b>Frequency-</b> 3 sessions per week × 8 weeks
<b>Intensity-</b> Rate of perceived exertion (RPE) at 15-18 (BORG SCALE), Active recovery at RPE at 11-13 [20].
<b>Type-</b> Long Interval Training includes 4 sessions of high-intensity exercises, all exercise lasting 4 minutes with 3 sets of rest for 3min per session. The exercises are - High knees, Butt kicks, Side leg raise, Chest expansion, jumping jacks, raised arm circles, alternate arm/leg raise, raised leg swing, and Knee extension. Each exercise will take 27 seconds.
<b>Time-</b> 45-minute exercises including warm up and cool down (per session).

**Table 2.** FITT principle for group B

<b>GROUP-B</b>
<b>Frequency-</b> 3 sessions per week × 8 weeks
<b>Intensity-</b> Rate of perceived exertion (RPE) at 15-18 (BORG SCALE), Active recovery at RPE at 11-13 [20].
<b>Type-</b> Medium Interval Training/Active rest HIIT includes 5 sessions of high-intensity exercises, each exercise lasting 3 minutes with 4 sets of rest for 2min per session. High knees, Butt kicks, Side leg raise, Chest expansion, jumping jacks, raised arm circles, alternate arm/leg raise, raised leg swing and Knee extension. Each exercise will take 20 seconds.
<b>Time-</b> 43-minute exercises including warm up and cool down (per session).

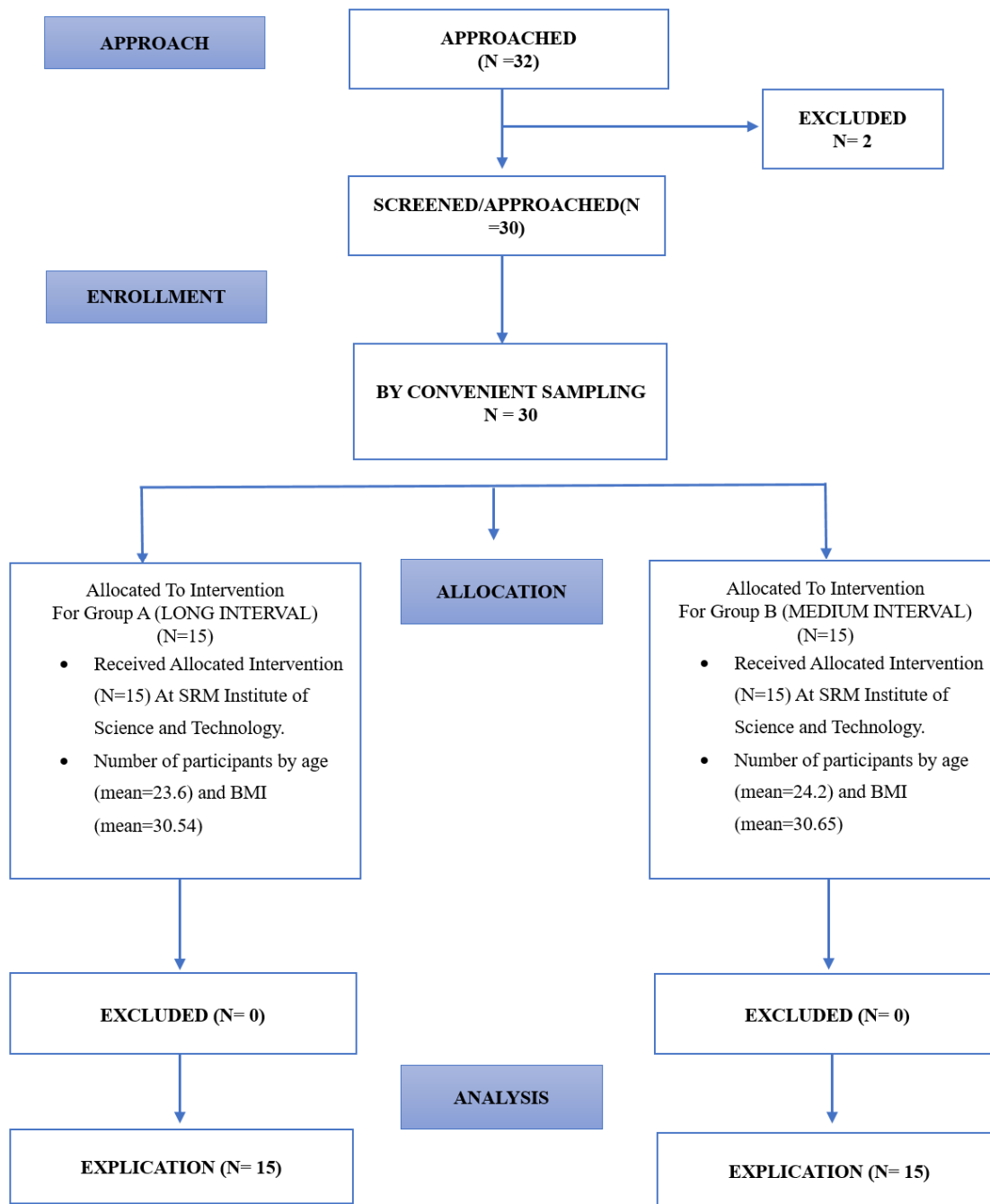


Figure 1. Consort of the study procedure

Before the exercise training, demographic data was collected. Pre-test all the vitals like Blood pressure, pulse rate, and oxygen saturation by using a digital sphygmomanometer and pulse oximeter was taken. RPE before the 6MWT was taken. The BMI was determined by dividing by weight (in kilogrammes) by height in squared (in metres), as per the Asian criteria-based BMI of more than 25 [16].

**6-Min walk test** – This is the submaximal test used to estimate endurance and aerobic capacity. The test area was marked and the appropriate warm-up was performed. The walking course was laid out in a 30-meter perpendicular

with cones placed at regular intervals to signify the distance walked. The test aimed to walk as quickly as possible for six minutes at the participant's own pace and they were advised to stop anytime if they felt uncomfortable. A preparatory test for each individual was done before the study [15].

Each individual performed the 6MWT and the length was measured after each lap. After completing the 6 min walk test the post-exercise vitals and RPE(Borg scale) were taken immediately [17].

The exercise protocol was well explained to the participants through video presentation and doubts were

clarified and education about measuring their rate of perceived exertion (RPE) level.

The RPE uses the scale containing 6 to 20 in which 6 indicates very light and the score 20 indicates very hard.

The warm-up exercises performed about 10 minutes included an active JROM of the cervical, upper extremity, and lower extremity, forward and backward bending and trunk rotation exercises 5 times each, stretching of cervical muscles, upper extremity, and lower extremity muscles 10-second hold for each stretching and static jogging. The cooldown exercises were for about 10 min including static jogging and stretching of the upper and lower extremity followed by deep breathing exercises. The interval exercises included light jogging and walking for about 3 minutes for Group A and 2 min for Group B. Participants went for the exercise session. At the end of every week, feedback about the exercises and exertion level was taken. Within the period, all the participants finished the exercise protocol without any complications. After 8 weeks again the post-exercise data like the pulse rate, blood pressure, SpO<sub>2</sub>, BMI, RPE by using the pulse oximeter and digital sphygmomanometer and distance of 6-min walk test were taken.

### 2.3. Statistical Analysis

The acquired data were tabulated, and data analysis was performed using the International Business Machine (IBM) Statistical Program for Social Science (SPSS) version 20 for Windows. The Kolmogorov-Smirnov test was used to determine the normality of the obtained demographic and outcome data (KS test) for Equality of Variances. The tabulated data has diverged from normality; therefore, the

descriptive statistics have been demonstrated in median (95% confidence interval) and IQR. The Wilcoxon signed-ranked test was used for inferential statistics to interpret the variables within the groups. Non - parametric test, Mann - Whitney test has been used to demonstrate statistical significance in two Groups.

## 3. Results

Table 3 and Figure 2 indicate the demographic data showing the distribution of subjects based on age and gender. The mean age for Group A subjects is 23.6 years and for Group B subjects is 24.2 years. In both the groups, the number of males is 8 and that of female is 7. Whereas the pre-mean BMI in group A is 30.54 with SD 5.448 and the post-test mean is 27.18 and SD 5.331. Similarly, the pre-mean BMI in group B is 30.65 with SD 4.842 and the post-test mean is 27.886 and SD 4.726.

Table 3. DEMOGRAPHIC DATA OF PARTICIPANTS

Characteristics	Group A (Mean)	Group B (Mean)
Age	23.6 (1.54)	24.2(1.61)
Gender		
Male	8(53.3)	8(53.3)
Female	7(46.7)	7(46.7)
	<b>Pre-Test</b>	
	<b>MEAN</b>	<b>SD</b>
<b>BMI GROUP A</b>	30.54	5.448
<b>BMI GROUP B</b>	30.65	4.842

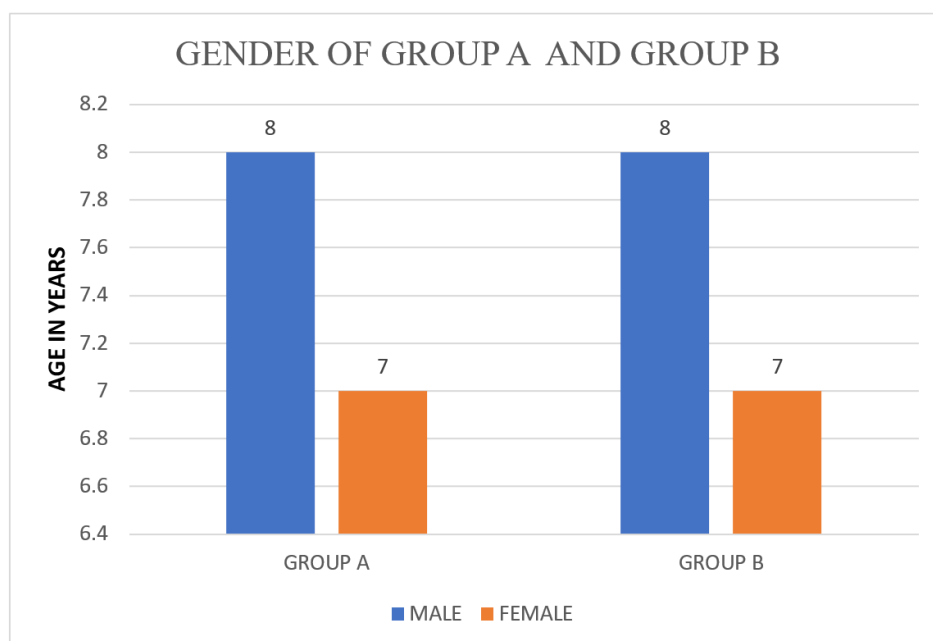


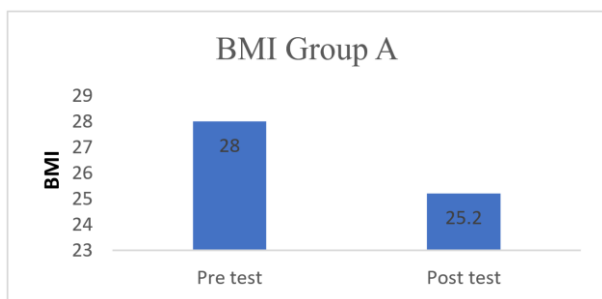
Figure 2. DEMOGRAPHIC DATA OF PARTICIPANTS

Table 4 and Figures 3, 4, 5, indicate the before and after comparison of BMI, 6MWT, and RPE for Group A participants. The median value for BMI (before test) in Group A subjects is 28 with an interquartile range: of 25.8 – 36.3 and the median value for BMI (after test) in Group A subjects is 25.2 with an interquartile range: of 22.8-33.1. However, the probability value is 0.001. As a result, the relevant testing technique indicated that there is an improvement in the BMI Before and After test in Group A. The median value for the 6-min walk test (before test) in Group A subjects is 435 meters with an interquartile range: of 405-465 meters and the median value for the 6-min walk test (after-test) in Group. A subjects is 466 meters with an interquartile range: of 437-523. However, the p-value is less than 0.005, As a result, the relevant testing technique indicated that there is an improvement in the 6-MWT Before and After-test in Group A. The median value for the Borg scale (before-test) in Group A subjects is 11 with an interquartile range: of 9-11 and the median value for the Borg scale (after-test) in Group A subjects is 7 with an interquartile range: of 6-9. However, the p-value is 0.001. As a result, the relevant testing technique indicated that there is an improvement in the RPE Before and After test in Group A.

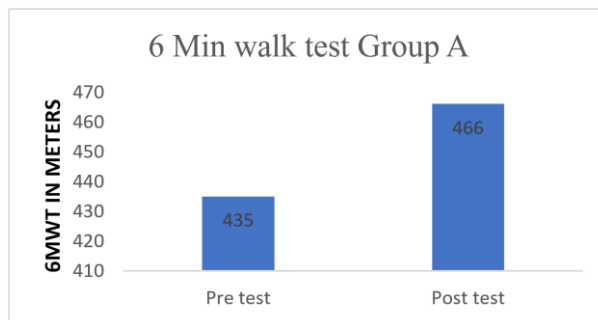
**Table 4.** COMPARISON OF THE MEDIAN PRE AND POST TEST VALUES OF BMI, SMWT (METRES) & RPE IN GROUP A

Group A	Pre-test		Post-test		P value
	Median	IQR	Median	IQR	
<b>BMI</b>	28	25.8, 36.3	25.2	22.8, 33.1	0.001
<b>SMWT (metres)</b>	435	405,465	466	437,523	0.001
<b>BORG scale(RPE)</b>	11	9,11	7	6,9	0.001

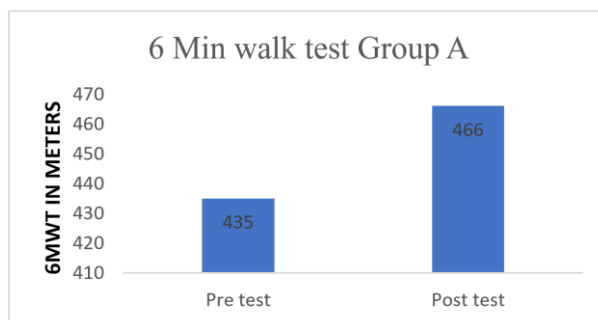
Bmi-body mass index, smwt-6 minute walk test, rpe-rate of perceived exertion



**Figure 3.** COMPARISON OF THE MEDIAN PRE AND POST TEST VALUES OF BMI IN GROUP A



**Figure 4.** COMPARISON OF THE MEDIAN PRE AND POST TEST VALUES OF SMWT (METRES) IN GROUP A

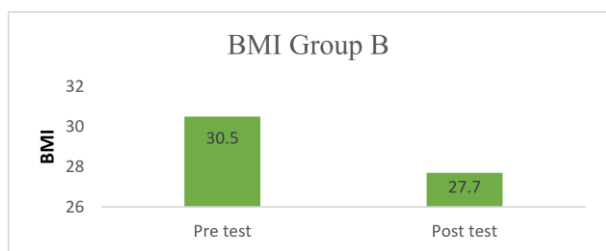


**Figure 5.** COMPARISON OF THE MEDIAN PRE AND POST TEST VALUES OF RPE IN GROUP A

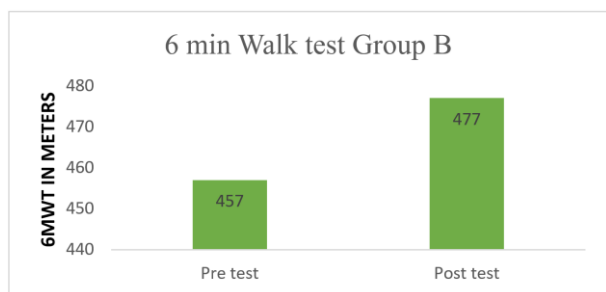
Table 5 and Figures 6, 7, 8, indicate the before and after comparison of BMI, 6MWT, and RPE for Group B participants. The median value for BMI (before-test) in Group B subjects is 30.5 with an interquartile range: of 25.9 – 35.3 and the median value for BMI (after-test) in Group B subjects is 27.7 with an interquartile range: of 23-33.1. However, the probability value is less than 0.005, therefore, a significant testing procedure demonstrated there is a difference in the Before and After test of BMI in Group B. The median value for the 6-min walk test (before-test) in Group B subjects is 457 with an interquartile range: of 395-478 and the median value for the 6-min walk test (after-test) in Group B subjects is 477 with an interquartile range: 419-509. However, the p-value is less than 0.005, therefore, significant testing procedure stated that there is an improvement in Before and After test of the 6-min walk test in Group B. The median value for the Borg scale (before-test) in Group B subjects is 9 with an interquartile range: of 9-11 and the median value for the Borg scale (after-test) in Group B subjects is 7 with an interquartile range: of 7-9. However, the p-value is 0.001, therefore, a significant testing procedure indicated there is an improvement in the Before and After test of the Borg scale in Group B.

**Table 5.** COMPARISON OF THE MEDIAN PRE AND POST TEST VALUES OF BMI, SMWT (METRES) & RPE IN GROUP B

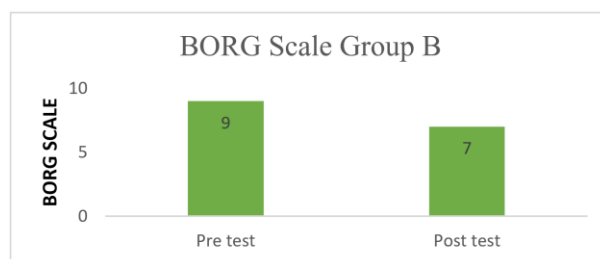
Group B	Pre-test		Post-test		P value
	Median	IQR	Median	IQR	
<b>BMI</b>	30.5	25.9,35.3	27.7	23,33.1	0.001
<b>SMWT (metres)</b>	457	395,478	477	419,509	0.001
<b>BORG scale(RPE)</b>	9	9,11	7	7,9	0.001



**Figure 6.** COMPARISON OF THE MEDIAN PRE AND POST TEST VALUES OF BMI IN GROUP B



**Figure 7.** COMPARISON OF THE MEDIAN PRE AND POST TEST VALUES OF SMWT (METRES) IN GROUP B

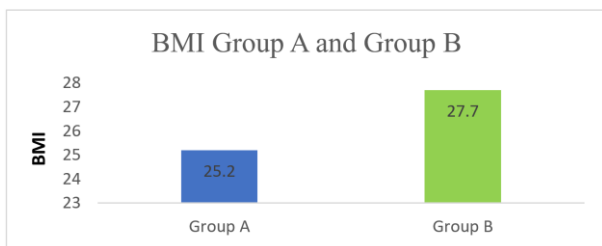


**Figure 8.** COMPARISON OF THE MEDIAN PRE AND POST TEST VALUES OF RPE IN GROUP B

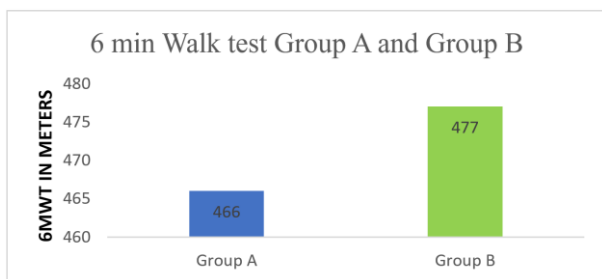
Table 6 and Figures 9, 10, 11, define the analogy of Group A and Group B by using the Mann-Whitney test. The median value for BMI in Group A subjects is 25.2 with an interquartile range: of 22.8 – 33.1 and the median value for BMI in Group B subjects is 27.7 with an interquartile range: of 23 -31.1. However, the p-value is > 0.05, therefore, a significant testing procedure stated that there is no improvement in the Before and After test of BMI as compared to both groups. The median value for the 6-MWT in Group A participants is 466 with an interquartile range: of 437-523 and the median value for the 6-MWT in Group B participants is 477 with an interquartile range: of 419-509. However, the probability value is greater than 0.05 i.e., therefore, a significant testing procedure demonstrated that there is no difference between the Post-tests of the 6-min walk test as compared to both groups. The median value for the Borg scale in Group A participants is 7 with an interquartile range: of 6-9 and the median value for the Borg scale in Group B participants is 7 with an interquartile range: of 7-9. However, the probability value is greater than 0.05 i.e., therefore, a significant testing procedure indicated that there is no difference in the Post-tests of the Borg scale between both groups.

**TABLE 6.** COMPARISON OF THE MEDIAN POST TEST VALUES OF BMI, SMWT (IN METRES) & RPE BETWEEN GROUP A & GROUP B

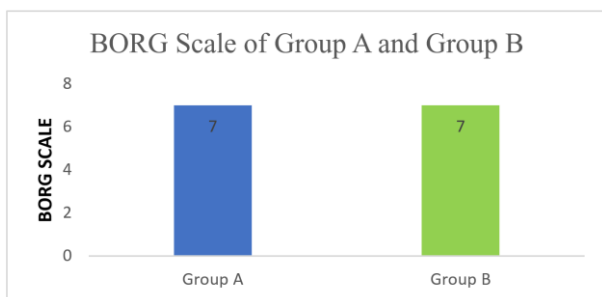
	Group A		Group B		P value
	Median	IQR	Median	IQR	
<b>BMI</b>	25.2	22.8,33.1	27.7	23,31.1	0.678
<b>SMWT( METRES)</b>	466	437,523	477	419,509	0.934
<b>BORG scale(RPE)</b>	7	6,9	7	7,9	0.544



**Figure 9.** COMPARISON OF THE MEDIAN POST TEST VALUES OF BMI BETWEEN GROUP A & GROUP B



**Figure 10.** COMPARISON OF THE MEDIAN POST TEST VALUES OF SMWT (METRES) BETWEEN GROUP A & GROUP B



**Figure 11.** COMPARISON OF THE MEDIAN POST TEST VALUES OF RPE BETWEEN GROUP A & GROUP B

## 4. Discussions

The focus of this study was to examine the impact of various HIIT intervals. (Long interval and medium interval) and to relate the effects of 8 weeks of HIIT (Long interval vs medium interval) on aerobic capacity, BMI, and RPE using Borg scale in collegiate who have more body fat. The study's major findings presented early evidence of the unique impact of long and medium interval HIIT in a variety of contexts. First, the high-interval and medium-interval HIIT groups showed greater aerobic capacity while decreased body fatness. Second, the rate of perceived effort decreased across all HIIT exercise frequencies. Third, while both long and medium intervals improved aerobic capacity and reduced body fat, long intervals outperformed medium intervals in terms of aerobic capacity training effectiveness. Overall, the results demonstrated that long interval training can be a more effective aerobic physical training strategy than medium interval training, with HIIT, performed thrice a week for 8 weeks boosting oxygen

consumption and lowering muscle mass in collegiate who have excessive fat accumulation in the body.

In HIIT, the duration of exercise interval is varied. This study was conducted to verify the impact of long and medium-interval exercise training on cardiorespiratory fitness in obese individuals. The period and proportion of HIT to Low-intensity cycles are critical factors that distinguish HIIT from MICT and impart improved physiologic sensitivity and health advantages. The considerable period in HIIT is the frequently performed training criteria for patients suffering from chronic CVD, and the performed exercises involve four sets of four-minute vigorous exercise interspersed with three sets of three-minute low-level exercise intervals [17-18]. Medium-interval HIITs, like 8 minutes of strenuous exercise with 2 minutes of intervals alternated with 7 minutes of moderate exercise with 2 minutes of intervals, have also been employed in older patients with chronic CVD, but to less strongly. Short-interval, such as 10 min of vigorous exercises with intervals alternated with 9 min of exercises with 2-minute low-intensity intervals, has been employed. All these training exercises are risk-free and put up to considerable increases in peak VO<sub>2</sub> with QoL [19-20]. This study tries to find the different duration of intervals that may improve the exercise outcome in obese participants. But this study's findings stated there is no significant difference between the long and medium intervals because of the smaller sample size.

The current physical activity guidelines described with 150 minutes of weekly moderate physical training or 75 minutes of weekly vigorous physical training may provide a variety of health outcomes, encompassing aerobic capacity, health in lipid metabolism, and neuromuscular physical health, among others [21]. Daily strenuous exercises suggestion demonstrates that committing to vigorous-intensity physical activity for half of the time yields health benefits comparable to moderate-intensity physical activity. In this study, accumulating 45 minutes of three times long-interval HIIT and 43 minutes of three times of medium-interval HIIT every alternative day had larger favorable effects on increasing the consumption of O<sub>2</sub> capacity and increased level of fitness and physical health (i.e., reduced body mass). However, three sessions of both long and medium-interval HIIT provided the same positive RPE (rate of perceived effort) across the group. But while comparing with both of the interval groups there is no difference as such.

Specifically, HIIT has been found to be as effective, if not superior, as MICT with respect to improving clinical outcomes for older patients with CVD, including quality of life (QoL), heart rate (HR) response to exercise, and myocardial function. Importantly, HIIT also seems to be as safe as MICT for older patients with Cardiac rehabilitation. In that study the authors discuss the advantages and disadvantages of these objective and subjective methods for prescribing exercise intensity during HIIT in older patients with CR. In addition, they propose a guide for



prescribing intensity for HIIT in older patients with CR. This Study of Aerobic Interval Exercise Training in CAD patients (SAINTEX-CAD, mean age: 58-9 years) and the Study of Myocardial Recovery after Exercise Training in Heart Failure (SMARTEX-HF, age range: 58–68 years), used percentage of peak HR (i.e., 90%–95% peak HR) to prescribe exercise intensity for HIIT. These studies found that although HIIT resulted in improved peak VO<sub>2</sub> (w23%), not all patients were able to maintain the prescribed exercise intensity (ie, 51% of the patients in the HIIT group exercised at a lower intensity than prescribed). As a result, supplementary strategies may be advantageous to optimize exercise intensity prescription during HIIT in the CR setting particularly in older adults who may present with additional comorbidities and/or musculoskeletal concerns [36].

The findings of this study support the H<sub>0</sub> hypothesis that there is no significant distinction in aerobic capacity compared to long interval HIIT and MIIT training among obese collegiate. The HIIT intervention's interval strategy improved aerobic fitness. The American College of Sports Medicine has set procedures for endurance and interval training that exercising less than two days each week may not result in a significant gain in cardiorespiratory fitness [22]. In comparison to these guidelines, it was discovered that there is a remarkable gain in cardiorespiratory endurance following 8 weeks of HIT with both long and medium intervals three times per week. A study found that healthy males who did three sets of interval training at a maximal exertion once a week for 12 weeks improved their cardiac endurance much more than participants who did not receive any exercise intervention [23]. Another research found that 6 weeks of low-level HIT training enhanced cardiovascular health in both inactive and those who are very active in their daily activities, although the results were not related to non-exercised participants [24]. Individual with a low cardiac capacity is a strong determinant of cardiac related disorders [25], cardiovascular related mortality [26], and all-cause mortality [27]. The results of improved cardiac endurance in HIIT 3 times per week may provide a novel time-efficient and practicable exercise technique for improving cardiorespiratory fitness and lowering the risk of cardiac related disease and associated mortality. To confirm the therapeutic benefits of HIIT in improving cardiometabolic health and decreasing the morbidity and death associated with cardiac disease, large-scale randomized controlled studies with the appropriate protocol are required [28].

The current study's the other goal was to compare training effectiveness on Body fat. In terms of body composition, two previous meta-analyses revealed that HIIT and MICT had similar impact on reducing body fat [29-30]. But this study described the two-different intervals where both reduced the percent body fat and had little difference between each other. Moderate-intensity exercise was shown to have a larger ratio of free fatty acid oxidation than high-intensity exercise [31]. Due to different intervals

of HIIT, the energy consumption is marginally increasing in the long interval. The study explains that medium intervals have a negligible effect on the reduction of obesity. Even though a comparison of long and medium intervals gives comparable outcomes on obesity reduction in the obese collegiate. This study revealed that those who have more fat might participate 3 times HIIT sessions per week while still obtaining advantages.

It should be noted that being overweight or obese may raise the chance of acquiring chronic illnesses related to cardiorespiratory diseases. This study findings suggest that both the interval of HIIT may be an optimal utilization of time technique for reducing the level of body fat mass in obese individuals. According to these preliminary findings, long-term exercises with large-scale study to confirm the favorable effects of low-frequency HIIT on person having more body fat is required [32].

Several studies conducted over the previous decade have linked the distance completed in the 6MWT to demographic and anthropometric factors. One study provides a series of studies in which the 6MWT distance is associated with age, height, weight, and BMI in both significant and non-significant ways. There was a significant improvement in the 6MWT distance from the standard to 8 weeks who completed both in the interval group. However, individuals in the previous research of obese participants (mean BMI = 40) were on average younger (mean age = 47) than those in the current study, which may explain the longer distance reached [33-34]. The assumption asserted that there was no substantial difference in the group when compared to both groups.

This study shows that obese collegiate students' RPE significantly decreases in both groups after putting in the standardized effort. I used the Category Ratio Borg scale in this study, especially when working with obese collegiate. It is simpler and easier for them to understand. This study demonstrated that all students who were thoroughly educated and conditioned to the test could correctly assess their perceived exertion on the Borg scale from 6 to 20. In contrast to Inselma et al., they found no statistically significant variations in lung function measures across the study groups(1993). This is because they investigated adolescents with exceptionally high levels of obesity - the optimum body weight equal to lung functions in their cases [35].

The absolute metabolic cost of exercise in the examined population is greater in each of the obese groups. But the efficiency measured in post-intervention did not differ between the groups.

## 5. Conclusions

This analysis concluded that there are no remarkable findings as compared to the long and medium intervals of High Interval Intensity Training on overweight college students.

However, there is a significant difference in body mass index reduction, increased aerobic capacity, and the rate of perceived exertion in both groups ( long interval and medium interval). Physiotherapists can use HIIT in both the long and medium intervals according to the participant comfort. From the study the interval does not influence the improvement in physiological factors ( BMI, RPE, Aerobic capacity).

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