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Effectiveness of Aerobic Exercise and Cognitive Behavioral Therapy on BMI and Hip Waist Ratio in Obese Students of Parul University - A Pilot Study

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ABSTRACT

OBJECTIVES: Obesity is abnormal or excessive fat deposition that provides a risk to health. Young adults' sedentary lifestyles, bad diets, irregular sleep patterns, and stress are the main contributors to obesity. CBT is aid in the treatment of obesity by influencing beliefs about behaviour change, such as a low-energy diet, an active lifestyle, and reasonable expectations. Aerobic exercise and physical activity are crucial components of treating obesity, and studies have shown that engaging in regular physical activity can reduce the severity of obesity.

METHODS:20 subjects who were meeting inclusion criteria are taken and randomly assigned into two group. Group A underwent Aerobic Exercises whereas Group B underwent Cognitive Behavioral Therapy for 8 weeks. Outcome measure was BMI and Hip waist Ratio.

RESULT: The results of the BMI and Hip waist Ratio are reported in mean and standard deviation. On comparison of pre and post intervention of mean difference and standard deviation of Aerobic Exercises (Group A) vs Cognitive Behavioral Therapy (Group B) show significant improvement in BMI (1.654±0.2186) and (0.841±0.3449), Hip waist Ratio (0.0282±0.00863 and 0.0131± 0.0066) respectively.

CONCLUSION: This study concludes that both groups show improvement in BMI and Hip waist Ratio but there is more significant improvement in group A with aerobic exercises.

KEYWORDS: Obesity, Aerobic Exercise, CBT, BMI, Hip Waist Ratio

I. INTRODUCTION

The World Health Organization defines obesity as "abnormal or excessive fat deposition that provides a risk to health." Over the past few decades, obesity has become much more common place around the world. [1] In 2016, there were 39% of adults worldwide who were overweight (BMI 25 kg/m2) and 13% who were classified obese (BMI 30 kg/m2). By 2030, nearly half of all adults worldwide will be overweight or obese if current trend persists. [2]

Epidemiological research and statistics from life insurance companies confirm that increasing levels of overweight and obesity are key indicators of a shorter life span. People who are obese and have intra-abdominal fat depots are especially at risk for adverse health effects. [3]

Obesity as a medical problem

Deep alterations in physiological function occur along with an increase in body fat. The anatomical distribution of fatty tissue has some bearing on these alterations. [3]

Risk factors of Obesity are Type 2 DM,Cardiovascular disease,Cerebrovascular disease, Musculoskeletal problems (osteoarthritis),Some cancers[1][2]

A variety of illnesses, such as disordered eating, obesity, anxiety, phobias, melancholy, addiction, and maladaptive behaviour, have been treated with cognitive behavioural therapy. [1] CBT is a type of psychotherapy that aims to alter

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the dysfunctional ideas that cause unfavourable mood states and unhelpful behaviours. [4] As a result, CBT may aid in the treatment of obesity by influencing beliefs about behaviour change, such as a low-energy diet, an active lifestyle, and reasonable expectations. [2] CBT combines cognitive strategies aimed to recognise, assess, and then reorganize problematic thought patterns and beliefs with behavioural therapy procedures in an effort to change behaviours by altering antecedents and consequences. [5]Cbt have also proven effective in helping a variety of people lose the weight. [4] One of CBT's main benefits is that treatment teaches patients coping mechanisms that they can use both now and in the long term. [1]

Exercise has numerous positive effects on health, and the majority of studies indicates that it can aid in weight loss and maintenance over the long and short terms. However, patients frequently find it challenging to start and maintain a regular exercise regimen. [6] By definition, physical activity is "any physiological movement induced by the contraction of skeletal muscles that results in a substantial increase above resting energy expenditure," according to ACSM and the Centers for Disease Control and Prevention (CDC). [7] Exercise and physical activity are crucial components of treating obesity, and studies have shown that engaging in regular physical activity can reduce the severity of obesity-related comorbidities. [8] Both physical health and symptoms can benefit from exercise. [9]

Aerobic Exercise Program consist of Warm-Up Period: From a physiological perspective, there is a lag between the start of activity as well as the modifications that the body needs to make to satisfy its physical demands.
Aerobic Exercise Period: The conditioning phase of the fitness regimen is the aerobic exercise phase. Pay close attention to the factors that affect the program's frequency, intensity, time, and type.
Cool-Down Period: The cool-down session will last about 5 to 10 minutes and include total-body motions and static stretching, much like the warm-up period did. [7]

There are various methodsof Evaluation of Body Composition[10]
Body mass index, or BMI, is a statistical measure that estimates a person's body fat in both men and women of any age based on their height and weight. By dividing a person's weight in kilogrammes by their height in metres squared, or BMI = weight (in kg)/height (in m2), one may get their BMI.[11]The epidemiological and clinical metric of BMI is useful for determining and tracking the prevalence of obesity at the national level.[12]
A further indicator of how evenly body fat is distributed is the waist-hip ratio (WHR), which is calculated by dividing the waist circumference by the hip circumference.[13]

II. METHOD OF COLLECTION OF DATA

Duration of intervention for each group was 8 weeks.20 subjects were chosen based on inclusion and exclusion criteria and randomly assigned to two groups using the chit method. Following that, the individuals were evaluated by looking at their BMI and hip to waist ratio on day one and eight weeks later.
Group A and Group B were divided into two groups. Aerobic exercise was given to Group A, and cognitive behaviour therapy was given to Group B. This study can provide valuable insights into the effectiveness of the interventions being compared.

INCLUSION CRITERIA:
Age of student was between 18-25 years, BMI was >= 25 and those who were willing to participate.

EXCLUSION CRITERIA:
Subjects who were already engaged in yoga, gym activities and physical fitness training, any serious orthopaedic disorders like fracture and any Co morbidities like hypertension, Diabetes.

OUTCOME MEASURE:
BMI
Hip Waist Ratio

MATERIAL USED:
Pen
Paper
Chair

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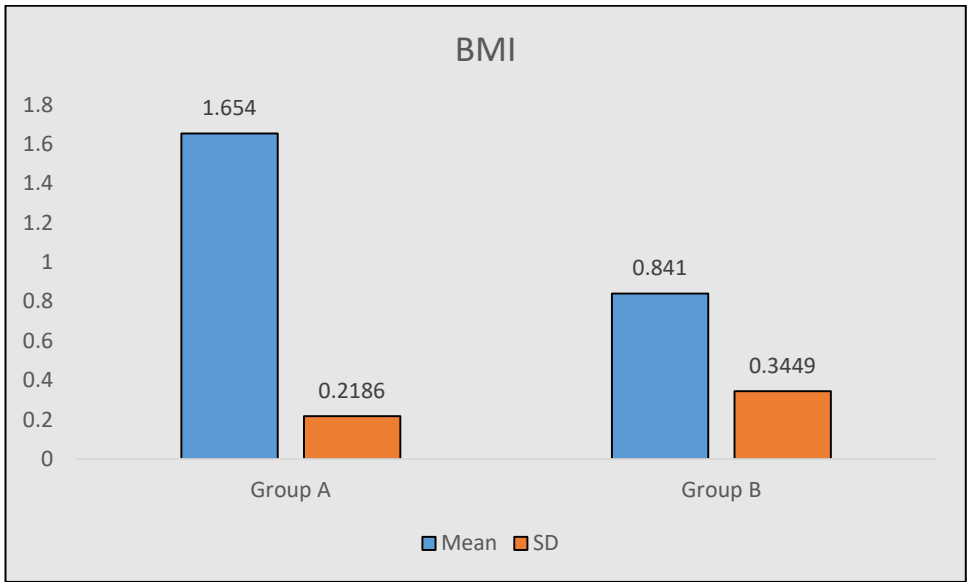
EVALUATION TOOL:
BMI calculator
Weighing machine
Height measuring tape
Measuring tape

Participants who want to participate and match inclusion criteria willingly were included in this study. Subjects were randomly assigned into two groups Aerobic exercise (Group A) and cognitive behaviour therapy (Group B). Total of 24 sessions were conducted for 8 weeks, for Group A and total of 8 sessions were conducted for 8 weeks, for Group B.

III. RESULT

SPSS software, version 20, was utilized to conduct a statistical study involving a before-and-after comparison. Descriptive analyses were employed in the study, and the mean and standard variation of the BMI and Hip Waist Ratio outcomes were reported. The Mann-Whitney test was utilized to assess the pre- and post-test parameters, which resulted in a p-value of 0.05. The charts and graphs presented in the study were created using Excel 2019 and Word 2019.



The Pre and Post treatment MEAN difference of BMI for Groups A & B is shown in TABLE 7 and GRAPH 7. Mann-Whitney test was used to analyse the data. Pre- and post-test MEAN±SD values for GROUP A were 1.654±0.2186 and 0.841±0.3449 for GROUP B, respectively. p value was 0.002 discovered. The p value considered was 0.05, indicating that there was a statistically significant difference between GROUP A and GROUP B after the intervention, however GROUP A's results revealed a greater decrease in BMI than GROUP B's.

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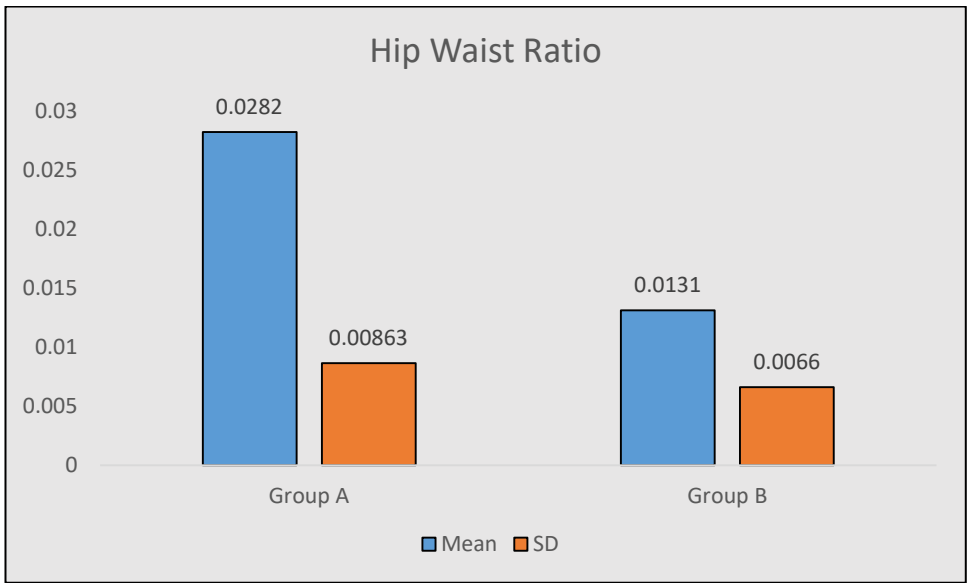

The Pre and Post treatment MEAN difference of Hip Waist Ratio for Groups A & B is shown in TABLE 8 and GRAPH 8. Mann-Whitney test was used to analyse the data. Pre- and post-test MEAN±SD values for GROUP A were 0.0282±0.00863 and 0.0131± 0.0066 for GROUP B, respectively. p value was 0.648 discovered. The p value considered was 0.05, indicating that there was no statistically significant difference between GROUP A and GROUP B after the intervention, however GROUP A's results revealed a greater decrease in Hip Waist Ratio than GROUP B's.

IV. DISCUSSION

The goal of the current study was to compare the effectiveness of aerobic exercise and cognitive behavioural therapy in treating obese Parul University students. By calculating the subjects' BMI and waist to hip ratio, information was gathered from them. Results were obtained after interventions were given.

In this study Group A received Aerobic exercise while Group B received Cognitive behavioural therapy. After doing a statistical study, it was discovered that both groups had significantly decreased their BMI and WHR following the intervention.

The results revealed post intervention were made by using the statistical analysis test that is Mann-Whitney Test in Microsoft Excel software and SPSS version 20.

There was reduction in BMI due to reduction of weight in subjects. Hip waist Ratio is also reduced clinically as there was changes in hip circumference and waist circumference. Among group A and group B, post intervention group A was clinically more effective for reduction in BMI and WHR than group B, statically there was significant difference in BMI but not in Hip Waist Ratio as it is a dependent ratio.

For Group A i.e. Aerobic exercise cause favorable changes in lipids and lipoproteins and can provide more prolific results with obese people. It has been proved that the negative effects of sedentary living on individuals are decreased with exercises.

Our study is consistent in finding with Jin Ma that aerobic exercise has positive changes in obese university children. It helps in reduction of weight and BMI, and University professors should perform aerobic training for university students to improve their physical fitness, regulate their physical function, and improve their physical appearance.

In Group A we gave 10 min warm up before aerobic exercise which was effective, it is supported by the study conducted by Husamettin Vatansev evrim Cakmakc, in which overweight individuals received a 10 minute warm-up exercise, followed by 10 minutes of aerobic exercise, which resulted in positive changes in the body fat percentage (BFP), waist to hip ratio (WHR), elasticity (E), and blood lipid parameters.

Mojtaba amini conducted a study on QOL of Healthy Aged Sedentary Men where aerobic exercise protocol three sessions a week for two months and they concluded that 8 Week of aerobic exercise program significantly improves the quality of life.

For Group B i.e. CBT modifying unrealistic weight goals and negative perceptions of body image, and improving psychological skills such as the client’s ability to self-monitor (eg, using diaries), stimulus control through restricting quantities of food, and behavioral modification strategies. psychotherapies work on helping patients in maintaining

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goals that have initially been achieved, preventing possible relapses. CBT is effective for improving diet, physical activity, and body composition in overweight and obese adolescents.
In Group B i.e CBT we gave 8 weeks of protocol which was effective and According to a previous study by Laura G. Cooney, an 8-week programme combining CBT and lifestyle changes has a significant positive impact on treating depression in women, improving weight reduction, short-term QoL ratings, and stress reactivity.
From the above findings it is stated that Aerobic exercise is more effective in reducing BMI and Hip Waist Ratio significantly comparison to CBT.

V. CONCLUSION

The study came to the conclusion that while both aerobic exercise and cognitive behavioural therapy are effective treatments for obesity, aerobic exercise is more effective in reducing BMI and hip-to-waist ratio in obese students.

LIMITATIONS

The study only used a small sample size.
The data was solely gathered from the young adult population and Parul University, and the ratio of men to women was not evenly distributed.

FURTHER RECOMMEDATION

The study can be continued with a different group.
Larger populations and elderly populations can be the subjects of additional research.

SOURCE OF FUNDING

This study was not funded by any public, commercial, or not-for-profit agencies.

ETHICAL APPROVAL

Ethical clearance is obtained from ethical committee of institution and institution where the subjects belongs at Parul University of Physiotherapy, Waghodia, Vadodara.

CONFLICT OF INTEREST

None

CONSENT FOR PUBLICATION

Prior to the study, participants received information about it. After receiving consent, we maintained proper privacy and confidentiality for all of the study's patients.

AUTHORS CONTRIBUTION

MV: conceptualization, project administration, methodology, reviewing, writing, and editing; methodology, formal analysis, and reviewing; MD: writing, and editing; methodology, formal analysis, and reviewing;SS: writing, and editing; methodology, formal analysis, and reviewing;NG: reviewing and editing; MP: reviewing and editing.The final draft of the manuscript has undergone critical review and approval by all authors, who take full responsibility for its content and similarity index.

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