EFFECT OF AEROBIC EXERCISE ON ANXIETY, BODY IMAGE DISTORTION, EMOTIONAL INTELLIGENCE IN CLASS-2 OBESE ADOLESCENT- A RANDOMISED CLINICAL TRIAL

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Abstract: BACKGROUND: Obesity is accumulation of excessive fat and decrease in energy expenditure. Individual with BMI greater common around the world which has an impact on sustainable fitness of human beings for prolonged period of time. Obese individual has risk of developing neurodegenerative disease. Increased weight is associated with deficit in learning, memory, and executive functioning and potential intelligence atrophy. Obesity is risk factor for anxiety which is intellectual health hassle in direction of adolescent that has impact on modern and future functioning. Emotional intelligence was defined as the capacity to observe one's own emotions and those of others, manipulate data for controlling one's thoughts and actions, control one's own and others' emotions, and use appropriate emotions to actively and successfully overcome challenges and obstacles in daily life. Body image is a multidimensional construct that encompasses perceptions, actions, thoughts, and feelings about one's own body, as well as how satisfied one is with it and how accurately their perceptions of their own bodies are also connected to the degree of one's own body image satisfaction and perceptual accuracy. In addition, it has been shown that emotional intelligence deficiencies are positively correlated with body weight, and body shape issues, indicating a possible indirect relationship between emotion processing and body perception/image.

Keywords: Class 2 obese, Anxiety, Body image distortion, Emotional intelligence, Treadmill training.

AIMS: To study the effect of aerobic exercise on Anxiety, Body image distortion and Emotional intelligence.

METHODS: 40 Obese adolescent were included for study. Information of study and intervention were briefed to participants. This was single group study, hence participants were selected on basis of criteria. Treadmill training was given for 8 weeks session for 30 minutes. The Pre and post outcome measures are Hamilton Anxiety Scale (HAM-S), Body self-image questionnaire (BSIQ), and Wong & Law emotional intelligence scale (WLES).

RESULTS: The result showed significant change statistically with p-value (<0.05) for all outcome measures in difference between pre and post intervention. Therefore, there is improvement seen in pre and post score after the treadmill training session in Anxiety, Body image distortion and emotional intelligence**.**

CONCLUSION: This study concluded that 8 week intervention of treadmill training reduced anxiety, improved body image distortion and emotional intelligence of class 2 obese adolescent.

KEYWORDS: Class 2 obese, Anxiety, Body image distortion, Emotional intelligence, Treadmill training.

INTRODUCTION

Obesity is accumulation of excessive fat and decrease in energy expenditure. Individual with BMI greater common around the world which has an impact on sustainable fitness of human beings for prolonged period of time. According to 2015-2016 National Family Health Survey the prevalence of obesity among women was 20.6% and for men it was 18.9% of the 15-49 year age group. Obese individual has risk of developing neurodegenerative disease. Increased weight is associated with deficit in learning, memory, and executive functioning and potential intelligence atrophy.

CLASS OF OBESITY: According to WHO

BODY MASS INDEX IN kg/m^2	INTERPRETATION
30.0 to 34.9 kg/m^2	Class 1 OBESITY
35.0 to 39.9 kg/m^2	Class 2 OBESITY
40 or higher	Class 3 OBESITY

Obesity is risk factor for anxiety which is intellectual health hassle in direction of adolescent that has impact on modern and future functioning. Reduced physical activity and overeating, particularly comfort foods rich in fats and sugars to improve mood, are "atypical features" commonly found in depressed and anxious patients. Anxiety may be marked by excessive worry, fear, apprehension, and physical symptoms. Emotional intelligence also play role in social anxiety. As a subset of social intelligence, emotional intelligence was defined as the capacity to observe one's own emotions and those of others, manipulate data for controlling one's thoughts and actions, control one's own and others' emotions, and use appropriate emotions to actively and successfully overcome challenges and obstacles in daily life. Emotional intelligence also has impact on obese individual along with anxiety.

Body image is a multidimensional construct that encompasses perceptions, actions, thoughts, and feelings about one's own body, as well as how satisfied one is with it and how accurately their perceptions of their own bodies are also connected to the degree of one's own body image satisfaction and perceptual accuracy. In addition, it has been shown that emotional intelligence deficiencies are positively correlated with body weight, and body shape issues, indicating a possible indirect relationship between emotion processing and body perception/image. Hence, Body image distortion also has impact on obese adolescent where individual feels low for being overweight. Body image distortion is a distressing problem that is a precipitating factor in obesity. Body image distortion has two components:
1] Body perception (individual's estimate of their body size)
2] Individual attitude towards their body.

Body image should be replaced with the more complex construct of body experience, which encompasses cognitive responses (what they think they really look like), affective responses (what they feel they look like) and optative responses (what they want to look like). Overweight and obesity rates continue to increase among the pediatric population, as well as in adults. An appropriate definition for obesity: 95th percentile (Grade 2 obese), a body mass index (BMI). 10.2 ± 2.6 years (range: 7–16.5 years). Obesity (BMISDS>+2) was defined according to the reference ranges of Cole, 2002. Individual with obesity goes under various treatment protocol such as dieting, bariatric surgery, physical exercise program. Bariatric surgery is effective but also as few side effects such as weight regain, nutrient deficiency, there is suboptimal weight loss it can be more effective if individual does physical exercise training.

Aerobic exercise (AE), either voluntary or prescribed, has multifaceted effects on physiological and psychological well-being throughout the life-span, i.e., from childhood to older adults. There are ample of evidence which shows that aerobic exercise can improve mood, ranging from more general states of positive mood and increased stress resistance. ·Aerobic exercise helps in increase in caloric output which in turns decreases adipose fat tissue. Treadmill exercise leads to improvement in cognition and emotional regulation and also helps in decreasing the over production of pro-inflammatory cytokine.

METHODOLOGY:

A randomised, non-blinded, experimental clinical study was conducted on 40 individuals with class 2 obese who were adolescent by age. Institutional ethical committee approved the research. A written informed consent was obtained from participants, those who met the inclusion and exclusion requirements. All the subjects were assessed at baseline as well as after treatment period of 8 weeks.Subjects above 15 years of age, who were having above 29 BMI were included with moderate anxiety score i.e 18-24 on HAM-S, emotional intelligence score above 45, and body self-image questionnaire score above 65 – 70 were included in the study.
Subjects with presence of any neurological impairments, hormonal disorders, metabolic disorders, or significant cardiopulmonary disorders or musculoskeletal injuries, Obesity due to endocrine abnormalities, Pregnant females, Subjects on any medications were excluded based on medical history and documentation from the study.

INTERVENTION:
Treadmill Exercise training programs:
Exercise prescription: 3 days/week for 8 weeks, with goal of completing 24 exercise session.
Require minimum 20 session of exercise to complete training program.
Starting with 5 min warmup.
30 mins of treadmill walking and then progressively increase to 45 mins
Ending with 10 min cool down.
Exercise will start with 40-59% of heart rate (moderate intensity) at first week Increase by 5% every 2 weeks to 80% of heart rate (heavy intensity)
till 6 week.
Treadmill ramp inclination should be increased progressively.

OUTCOME MEASURES:
Hamilton anxiety rating scale Score above 18 were included. It is a psychological questionnaire used by clinicians to rate the severity of patients anxiety
Interpretation :
A score of 17 or less indicate mild anxiety severity
A score of 18-24 indicate mild to moderate anxiety severity
A score of 25-30 indicate moderate to severe anxiety severity [7]

EMOTIONAL INTELLIGENCE (WONG AND LAW EMOTIONAL INTELLIGENCE SCALE) Scoring were given according to 7-point likert's scoring i.e totally disagree to totally agree.
In-total above 45 score were include for study.

The WONG and Law emotional intelligence scale is based on the ability model of emotional intelligence

Scoring:
Total Emotional intelligence = Average items 1-16.
Total self – emotions appraisals= Average items 1-4.
Total regulation of emotions = Average items 5-8.

Total use of Emotion = Average items 9-12.
Total Others-emotion Appraisal= Average items 13-16. [6]

BODY SELF IMAGE QUESTIONAIRRE
Likert-5 point score used for scoring sub-item. There are 7 sub-item with 3 question in each.

Each sub-item has minimum score of 3 and maximum score of 15 in-total of 7 sub-item scoring above 65 were included.

Not at true score = 1
Slightly true score = 2
About halfway true = 3
Mostly true score = 4
Completely true score = 5

STATISTICAL ANALYSIS:

Mathematical evaluation for the present study was performed by using Statistical Product to authenticate the results found. The data was filled manually into an excel sheet and then tabulated which was then subjected for evaluation for the same. Various mathematical evaluations such as mean, standard deviation were employed. The test for Normality for the data set was done using Shapiro wilk test . Wilcoxon test to assess pre-post changes in the data.

RESULTS

Descriptive Statistics:

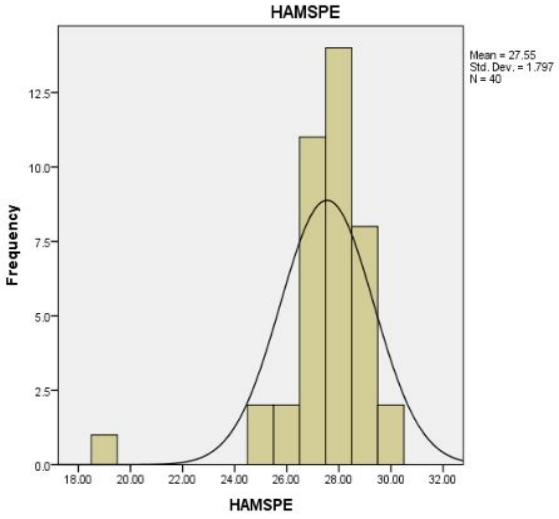
Table 1: PRE and POST test value and probable value of variable

Variable	Time Frame	z-value	p-value
HAM-S	Pre	0.731	0.000
	Post	0.677	0.000
WONG AND LAW	Pre	0.605	0.000

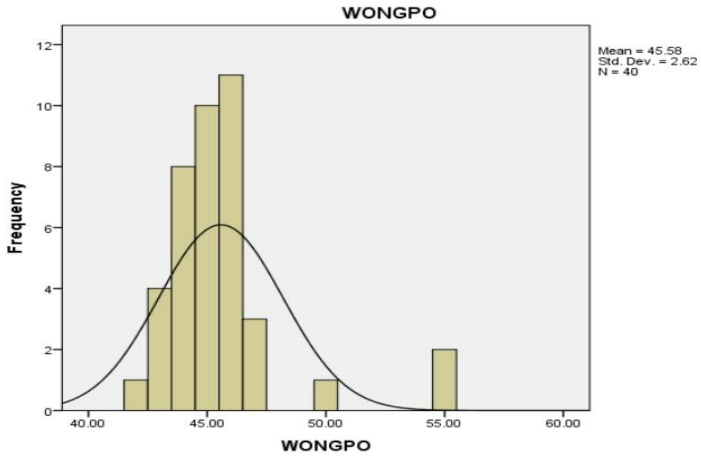
	Post	0.724	0.000
BODY IMAGE PERCEPTION	Pre	0.742	0.000
	Post	0.819	0.000

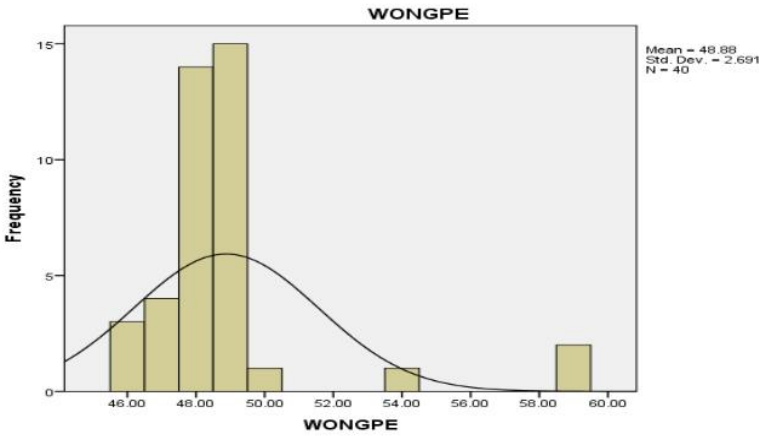
Data set is not normally distributed as all the variables have not indicated p-value greater than 0.05 in the observation. The researcher shall use non-parametric test for data analysis purpose in the following sections.

Graph 1 : subjects frequency for HAM-S

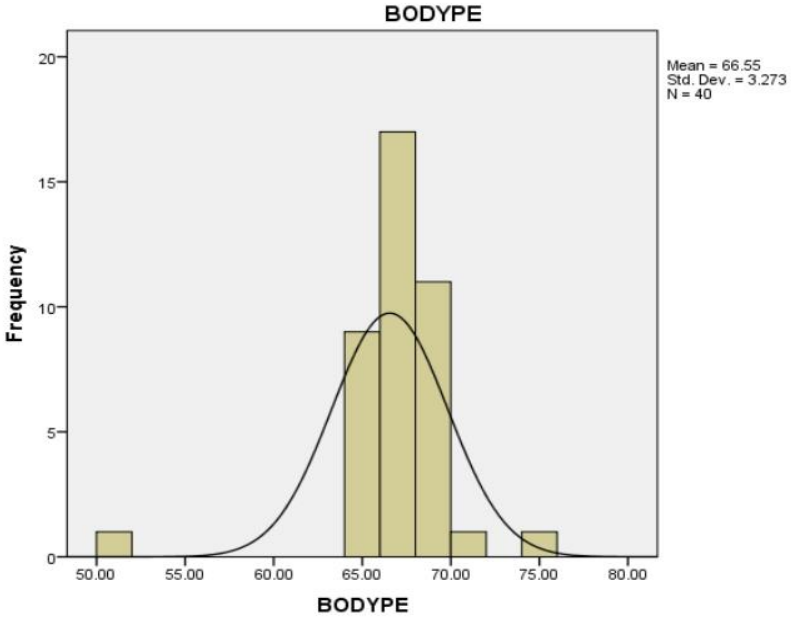


GRAPH 2: Frequency of subjects under emotional intelligence





GRAPH 3: Frequency of subject under Body image distortion effects



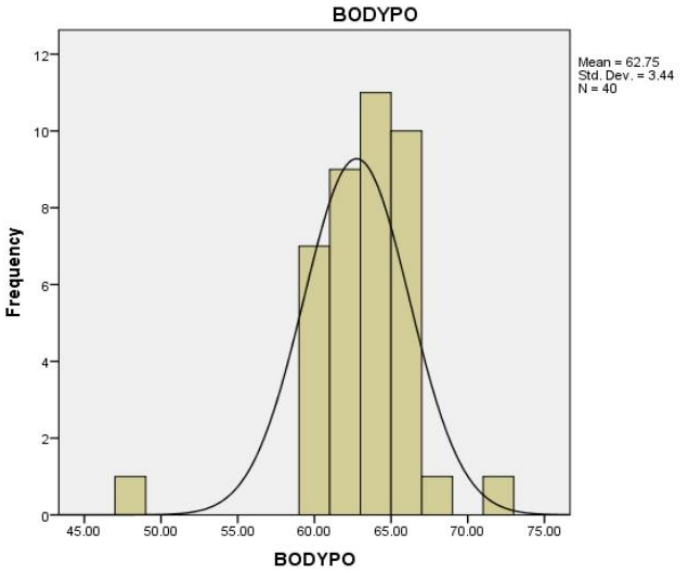
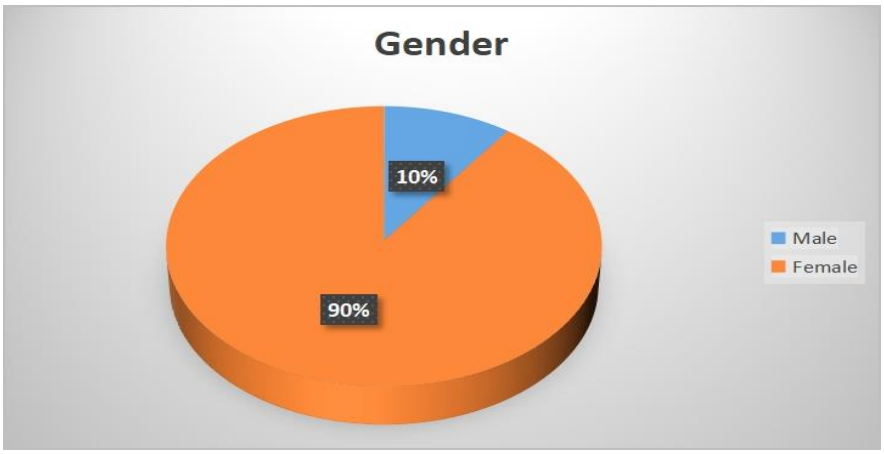


TABLE 2: Gender frequency distribution table:

Gender	Frequency	Percent
Male	4	10
Female	36	90
Total	40	100



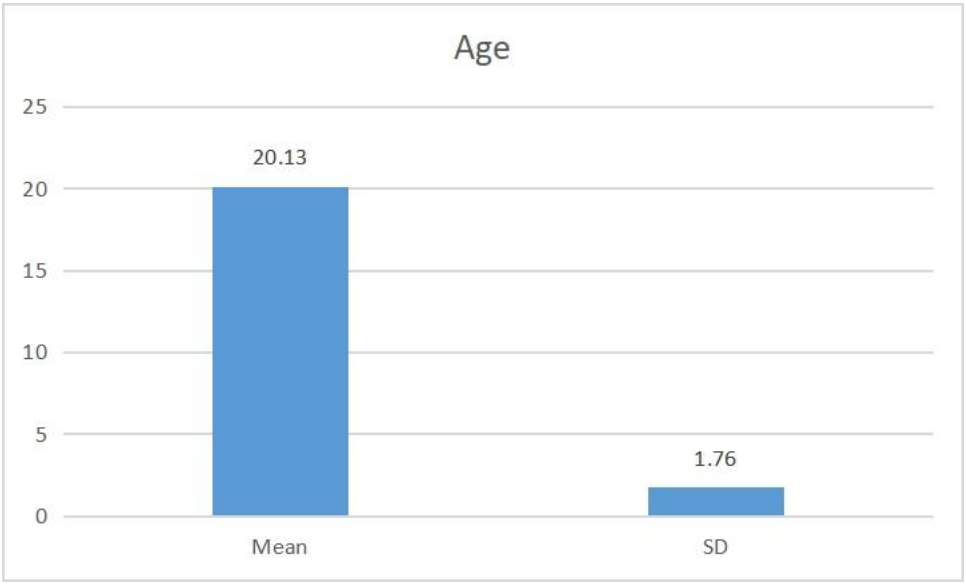
GRAPH 4: Graph shows gender distribution for study

Descriptive Statistics

Table 3 : Descriptive table for age distribution:

Particular	Minimum	Maximum	Mean	SD
Age	16.00	23.00	20.13	1.76

GRAPH 5 : Graph shows Age distribution for study



Pre and post test

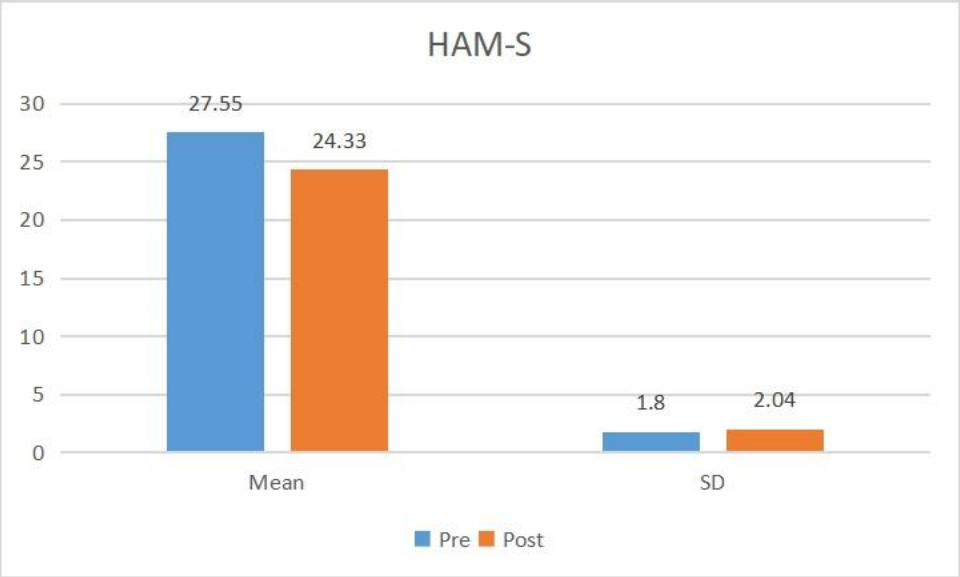
Comparison of pre-test and post-test scores of HAM-S by paired sample Wilcoxon test

TABLE 4: Table shows pre and post scores of HAM-S

Times	Mean	SD	Mean Diff.	SD Diff.	Effect size	z-value	p-value
Pre	27.55	1.80	3.23	0.86	3.74	5.614	0.001*
Post	24.33	2.04					

The mean value indicated changes post treatment and lower values are recorded for post treatment outcome and also the standard deviation shows the limited consistency with post treatment value which is more than pre value. The effect size or Cohen's D indicates 3.74 value which is to be very high in effect size as per the standard parameters of reference. Based on the results of the test analysis at 5% significance level, there is a significant statistical reliable difference between the pre & post treatment values with p-value is less than the 5% significance level (i.e. $0.001 < 0.05$) in the study and therefore assumed it justifies the improvements in health outcome post intervention.

GRAPH 6: Graph shows pre and post score difference for HAM-S



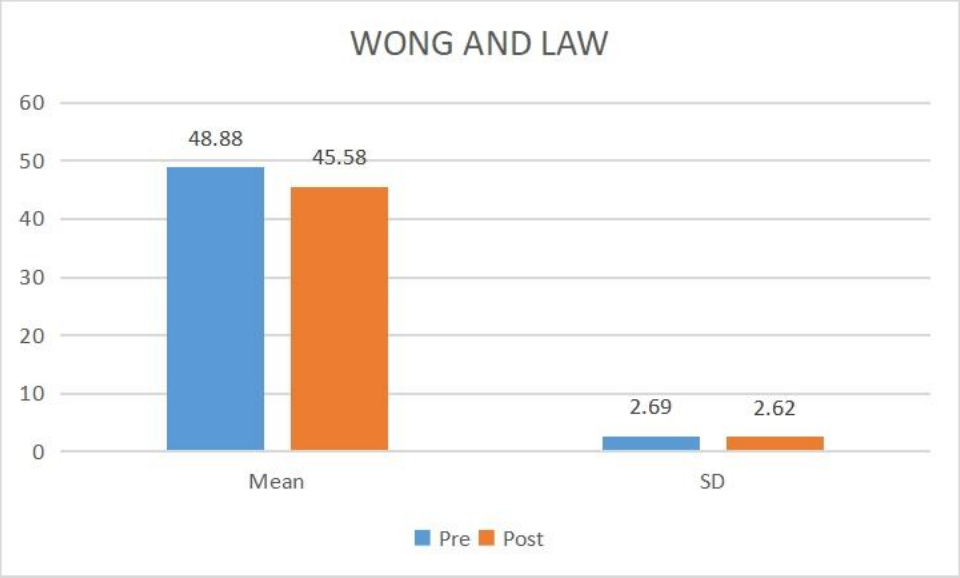
Comparison of pre-test and post-test scores of WONG AND LAW by paired sample Wilcoxon test

TABLE 5: Table shows pre and post difference of variable wong and law for emotional intelligence

Times	Mean	SD	Mean Diff.	SD Diff.	Effect size	z-value	p-value
Pre	48.88	2.69	3.30	0.97	3.42	5.585	0.001*
Post	45.58	2.62					

The mean value indicated changes post treatment and lower values are recorded for post treatment outcome and also the standard deviation shows the consistency with post treatment value which is less than pre value. The effect size or Cohen's D indicates 3.42 value which is assumed to be very high in effect size as per the standard parameters of reference. Based on the results of the test analysis at 5% significance level, there is a significant statistical reliable difference between the pre & post treatment values with p-value is less than the 5% significance level (i.e. 0.001 < 0.05) in the study and therefore it justifies the improvements in health outcome post intervention

GRAPH 7: Graph shows pre and post scores for emotional intelligence



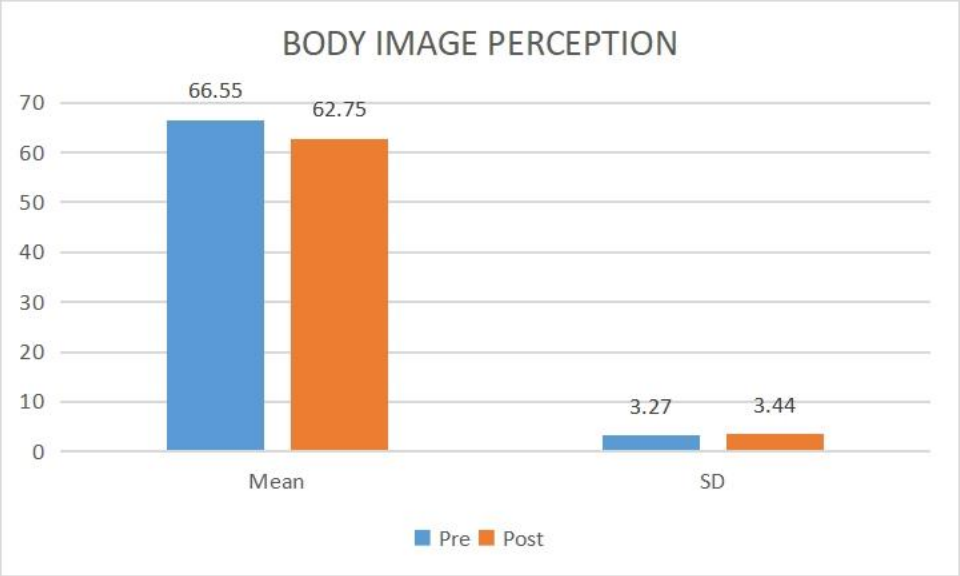
Comparison of pre-test and post-test scores of BODY IMAGE PERCEPTION by paired sample Wilcoxon test

TABLE 6: Table shows pre and post scores for body image questionairre

Times	Mean	SD	Mean Diff.	SD Diff.	Effect size	z-value	p-value
Pre	66.55	3.27	3.80	1.56	2.44	5.567	0.001*
Post	62.75	3.44					

The mean value indicated changes post treatment and lower values are recorded for post treatment outcome and also the standard deviation shows the limited consistency with post treatment value which is more than pre value. The effect size or Cohen's D indicates 2.44 value which is assumed to be very high in effect size as per the standard parameters of reference. Based on the results of the test analysis at 5% significance level, there is a significant statistical reliable difference between the pre & post treatment values with p-value is less than the 5% significance level (i.e. 0.001 < 0.05) in the study and therefore it justifies the improvements in health outcome post intervention

GRAPH 8: Graph shows difference in pre and post scores of body image questionnaire for body image distortion



Discussion

Obesity is accumulation of excessive fat and decrease in energy expenditure. Individual with BMI greater common around the world which has an impact on sustainable fitness of human beings for prolonged period of time. According to 2015-2016 National Family Health Survey the prevalence of obesity among women was 20.6% and for men it was 18.9% of the 15-49 year age group.The purpose of this study was to find out the effect of treadmill exercise in obese class 2 adolescent with anxiety, emotional intelligence and body image perception issue. It was an experimental study. The study's main variables were changes in anxiety, emotional intelligence and body image perception. This study was conducted on 40 subjects. In which there are 4 males and 36 females.
We have included both male and female but the prevalence says that maximally females with obesity develop anxiety, emotional intelligence and body image perception as more than males female are more concern about their shape of body and mostly in adolescent age. All the subjects were within 16-22 age groups. So in these study we have maximum females i.e. 90% and minimum males i.e. 10%. In this study maximum subject were from age group 18-22 years.

The study includes subject with >35 kg/m2, as per WHO criteria for obesity > 30 kg/m2 Subject with BMI 30-34.9 kg/m2 are class 1 obese, BMI > 35.0-39.9 kg/m2 are class 2 obese and BMI > 40 kg/m2 are class 3 obese. In this study maximum subject have BMI 37-38 kg/m2, minimum have 39-41 kg/m2 and others 35-36 kg/m2.

All subjects were screened according to inclusion criteria they were evaluated for anxiety, emotional intelligence and body image perception using HAM-Scale for Anxiety, Wong & Law scale for emotional intelligence and Body self-image questionnaire for Body image perception. Subjects were given treadmill exercise training for 3days/week for 8 weeks each session. 30 mins of treadmill walking at beginning and then progressively increase to 45 mins. Treadmill ramp inclination increased progressively.

The present study demonstrates that anxiety, emotional intelligence, and body image perception were significantly improve after 8 weeks of treadmill training.

The study shows significant improvement in HAM-S post intervention with a P value of less than significant level (i.e.0.001<0.05). The mean value before intervention is 27.55 and after intervention is 24.33 and difference between mean value of pre and post intervention is 3.23.The probable result can be due increase in physical activity. **ELIANA V.CARRACA** has done study in effect of exercise training on psychological outcomes in adults with obesity, in this study along with some physical activity resistive exercise were included. The study showed more effects with aerobic and resistive exercise together.

The effect size or Cohen's D indicates 3.42 value which is assumed to be very high in effect size as per the standard parameters of reference. Based on the results of the test analysis at 5% significance level, there is a significant statistical reliable difference between the pre & post treatment values with p-value is less than the 5% significance level (i.e. 0.001 < 0.05) in the study and therefore it justifies the improvements In health outcome post intervention for wong and law emotional intelligence. As Mean value for Wong and Law pre value 48.88 and post value 45.58 and mean difference between pre and post value 3.30.Wijerathne T study that physical activity helps in improving emotional intelligence, there were weak negative correlation between physical activity and emotional intelligence.

The study shows improvement in body image perception. The mean value indicated changes post treatment and lower values are recorded for post treatment outcome and also the standard deviation shows the limited consistency with post treatment value which is more than pre value. The effect size or Cohen's D indicates 2.44 value which is assumed to be very high in effect size as per the standard parameters of reference. Based on the results of the test analysis at 5% significance level, there is a significant statistical reliable difference between the pre & post treatment values with p-value is less than the 5% significance level (i.e. 0.001 < 0.05) in the study and therefore it justifies the improvements in health outcome post intervention. ANGELIKA MAURER studies effect of exercise to improve body image distortion the study concludes that aerobic exercise helps in improvement in body image distortion.

CONCLUSION

In conclusion, the study suggests that treadmill training helps in improvement in anxiety, emotional intelligence and body image distortion.

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