RELATIONSHIP OF BMI WITH SELF-ESTEEM AND ACADEMIC PERFORMANCE IN PRE & MIDDLE ADOLESCENCE OVERWEIGHT CHILDREN- AN OBSERVATIONAL STUDY

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ABSTRACT

BACKGROUND: National health and nutrition examination analysis reveals that the possibility of getting overweight of children from 2 to 19 years is more than 13%. In addition to the mental complications, these obese children have some psychological complications like social disgrace, unhappiness, peer group bullying and lower self-esteem.

OBJECTIVE: To establish the relationship of BMI with self-esteem and academic performance in pre & middle adolescence overweight children aged between 11 and 15 years in Tamil Nadu, India.

METHODOLOGY: The study was Non-Experimental design, Observational study. From two higher secondary schools in India of 1300 children, 130 children of overweight category were selected. Overweight children, BMI- 85 to 95 percentile of their age and sex, 11–15 years of age were included in the study.

OUTCOME MEASURES: Assessment of self-esteem was done by Standardized Children’s Self Concept Scale. Academic Performance was calculated by totaling of summative exam marks in all subjects.

RESULTS: The study results shows that there is no correlation between BMI and Self Esteem. The mean and S.D value of 130 samples are 57.48,5.08 respectively. It also shows that there is no correlation between BMI and academic performance. The mean and S.D value of 130 samples are 230.7,8.82 respectively which is low academic scores (95% confidence interval and P <0.05).

CONCLUSION: The study concluded that overweight children have less impact on self-esteem and academic performance. Providing them proper-oriented physical performance and intervention may prevent them from secondary complications which saves the future of budding young adults from diseases.

KEYWORDS: Self Esteem, academic performance, overweight, BMI, pre & middle adolescence, Standardized Children’s Self Concept Scale.

I. INTRODUCTION

The major health problem faced by adolescents and childhood in these 21st century is obesity. Obesity in children now became a global epidemic and it affects the children’s current health and also lead to future health problems. Around the world, over 41 million people below 5 years of children and adolescents over 340 million are declared as overweight and obese worldwide. Children’s of school age requires a balanced nutrition for their strenuous growth. School going children nowadays became obese due to the lifestyle changes, dietary patterns and also by spending most of their time in inactivity like video games, computer and social media instead of engaging them with the physical activities. The center of disease control and prevention defines “The children with body mass index at or above the 95 percentile” as obesity.

Obesity is generally defined as the accumulation of excess adipose tissue which leads to the lots of health problems like coronary heart diseases, glucose intolerance, stroke, malignancy and also results in decrease in life
span. The recent studies done by the researchers suggests that adiposity has a strong relationship with neural function which is referred as the processing, integration, storage and retrieval of information.

National health and nutrition examination analysis reveals that the possibility of getting overweight of children from 2 to 19 years is more than 13%. In addition to the mental complications, these obese children have some psychological complications like social stigma, peer group teasing, depression and lower self-esteem. Self-esteem in general is defined as an individual’s evaluation of their own worth and this has now become the important consequences of the pediatric overweight. Low self-esteem in childhood obesity leads to complications like behavioral disorder, negative mood and other emotional concerns. Finally, pediatric overweight was negatively related with self-esteem.

Most of the evident based studies show that children those who are obese have poor self-esteem when compared with non-obese children. Pediatric obesity leads to the high morbidity and mortality in adulthood. The most recent studies reveal that children those who are obese shows significantly low mathematical knowledge and readability scores in academics as correlated to the non-obese children. However some other studies say that there will be no difference in mathematical performance between the obese and non-obese children. It clearly reveals us that the relationship between pediatric obese and student educational execution always remains contested.

Some studies say that the association between pediatric obesity and IQ is controversial. Few studies concluded that obese children were low at math skill and also in reading test. At the same time, another study says there is no significant variation in mathematical performance between the obese and non-obese children. Also children who are obese in preschool show better performance in mathematics skill at primary school. This clearly makes us to reveal that the relationship between pediatric obese and their educational execution remains disputed. Due to children obesity, they exhibit poor motor skills, cognitive function including memory and attentiveness which lead them to a poor academic performance and in turn it lowdowns their self-esteem. To become a successful prognosticator of occupational and social life in adulthood, a well accomplished academic execution is needed. Children with obesity are correlated with the academic performance but it doesn’t correlate with problem solving skills.

It is also found that the obese children are socially isolated, and has poor academic performance and poor job prospects. The major cause for the poor academicals performance of the children with obesity is due to mental and emotional problem such as depression, social consequences and low self-concept. The reasons for this association between obesity and educational execution are stimulation of negative attitude of teachers towards the obese children which makes the teachers to give them a poorer grade. All the studies discussed above shows that there is no direct link between the child obesity academics in turn it affects unobserved individual characteristics like personal discipline, low self-esteem, time devoted to studies, effort of allocation of studies and physical health.

Scholastic conduct which is related to the memory and intellectual functions has an inverse relationship of obesity and various cerebral functions which affect their educational performance. Executive functioning skills are a set of cognitive process which helps in shaping the behavioral outcomes ranging from specific academic skills and overall academic performance. Working memory is the important executive functioning skills which helps the children to be successful in school and a noted as a predictor of math skills. A study reveals that children with poor working memory lead to a lower mathematical ability. The study reveals that comparing to non-obese peers, an obese student shows poor math skills and reading test.

But in India, very limited literatures are available in relationship of BMI with self-esteem and academic performance in pre & middle adolescence overweight children. Hence, the objective of this study is to establish the relationship of BMI with self-esteem and academic performance in pre & middle adolescence overweight children aged between 11 and 15 years in Tamil Nadu, India.

**II. METHODOLOGY**

The study was Non-Experimental design, Observational study, the protocol was presented and approved by the members of Ethical Committee of SRM Institute of Science and Technology. From two higher secondary schools in India of 1300 children, 130 children of overweight category was selected after getting authorization from the school. Prior to the recruitment, an oration to the students and parents was conducted and the benefits and objectives of the study were explained.
The informed consent and data sheet was received from the students and parents. The inclusion criteria were children under overweight category, BMI of 85-95 percentile of their age and sex, Age 11-15 years. The exclusion criteria were those with any cardio respiratory insufficiency such as asthma, bronchiectasis, congenital heart deficits or those on long-term medication. A brief explanation on the benefits and objectives of the study was given to them. Pre-evaluation was done to the selected children and their height and weight was measured in centimeters and kilograms respectively.

Assessment of self-esteem

Assessment of self-esteem was done by Standardized Children’s Self Concept Scale. It has 80 items in all with positive or negative responses. Six subscales were Behavior, Intellectual and social status, External appearance and attributes, Anxiety, Popularity and happiness and Satisfaction. By totaling the scores, the sum of scores for each subscale arrived. Final score self-concept was 80 as maximum and minimum score is zero. Higher the score shows favorable self-esteem13.

Academic Performance

Academic Performance was calculated by totaling of summative exam marks in all subjects.

III. RESULTS

In this study, 130 school-going overweight students aged 11–15 years have been recruited. All data were analyzed using SPSS-20. About 95% confidence interval and P <0.05 were advised to be statistically significant. The correlation between data were made by Pearson correlation tests for Body Mass Index with Self Esteem and Academic Performance.

<table>
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<th>Mean</th>
<th>SD</th>
<th>N</th>
<th>r - Value</th>
<th>p – Value</th>
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</thead>
<tbody>
<tr>
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<td>1.217</td>
<td>130</td>
<td>-0.011</td>
<td>0.905</td>
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<tr>
<td>Self Esteem</td>
<td>57.48</td>
<td>5.087</td>
<td>130</td>
<td>0.905</td>
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Graph 1: Scatter Plots Chart Shows the Correlation of Body Mass Index And self-esteem
The table 1 and graph 1 scatter diagram shows that there is no correlation between BMI and Self Esteem.

### Table 2: Relationship between the BMI and Total Academic Marks

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
<th>r - Value</th>
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<td>1.21710</td>
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<td>Total Academic Marks</td>
<td>230.73</td>
<td>8.820</td>
<td>130</td>
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</table>

Graph 2: Scatter Plots Chart Shows the Correlation of Body Mass Index And Academic Performance

The Table 2 and Scatter diagram 2 shows no correlation between BMI and academic performance with non-significant p-value 0.291.

### IV. DISCUSSION

The study results show that there is no correlation between BMI and Self Esteem. The mean and S.D value of 130 samples are 57.48 and 5.08 respectively which is average level of self-esteem. Increase in rate of childhood obesity results in an undesirable influence on self-esteem and intellectual growth. If overweight persist for longer duration it may have severe impact on self-esteem and psychological aspect of children.

Self-esteem is an essential component of intellectual development and self-growth. When this self-esteem becomes low it hampers the societal and intellectual development in children thus leading to an unhealthy adulthood. As a result of poor cognitive development, there is a limited educational attainment, socioeconomic status with decreased likelihood of healthy life. Wang Fet al in his study, considering the relation between body weight, self-esteem and performance at school clearly shows that children's having higher body mass index had a lower self-esteem with less scores among secondary education students.

Weight bias and body image disturbances is the most major negative consequences of the child obesity. An individual suffering from disturbance due to body image gets body dissatisfaction which in term lowers the self-esteem and makes the children to be depressed.

The study results show there is no relationship between BMI and the academic performance. The mean and S.D value of 130 samples are 230.7, 8.82 respectively which is average level of academic scores. If overweight continued for years together it may have strong impact on academic performance and other learning abilities of children.
BMI and academic performance correlation are, a new way of evaluation among overweight children, as children spend most of their time in academic phase, the body structure influencing academics, this study results don’t show any correlation but there are few studies, concluding consumption of fast foods has significant relation which low grades especially in maths and reading.\textsuperscript{12,14}

Jaswal R et al, concluded that children with obesity experiences discrimination which influences self-esteem by behavioral problems which in term influences moderating children academic experiences\textsuperscript{16}.

Usually, academic performance is considered for cognitive and memory capacity of child but then obese or overweight children might have impact on academic achievement. Due to poor academic grade, there may be development of low self-esteem, lack of confidence and even change in emotions.

V. CONCLUSION

The study concluded that overweight children have less impact on self-esteem and academic performance. Even then, providing them proper-oriented physical performance and intervention may prevent them from secondary complications which saves the future of budding young adults from diseases.

The limitations of the study are, the researchers had little control over the behaviour and motivation levels of the subjects, the data were not collected from a wide area across the state. It was very difficult to get permission from schools to use children for research studies. While the previous studies have found, school-based and community-based activity will benefit the overall population.\textsuperscript{17} Incorporating healthy behaviors and healthy life style in the curricula of adolescents to promote their mental health is mandatory. Family, involvement in intervention program is also an essential component for periodic observation of weight and overall health of the child.

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REFERENCES

15. Harriger JA, Thompson JK. Psychological consequences of obesity: weight bias and body image in overweight and obese youth.

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