

A peer reviewed international journal ISSN: 2457-0362 www.ijarst.in

EXAMINING RELATIONSHIP BETWEEN ACADEMIC PERFORMANCE AND OBESITY AMONG COLLEGE GIRLS

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ABSTRACT

The current sample of female participants (n=105) was selected. It was determined that all of the chosen teens were from socio-economic backgrounds classified as medium and uppermiddle. A noteworthy inverse relationship was observed between body mass index (BMI) and the academic performance of female students. The present research investigates the correlation between obesity and academic achievement among female individuals. This study investigates the potential effects of obesity on cognitive functioning, student involvement in the classroom, and academic achievements. The results of this study provide insight into the complex relationship between health and academic achievement in adolescent girls, which may have important consequences for educational policy and treatments.

Keywords: - Obesity, Girls, Academic, College, Student.

I. INTRODUCTION

Obesity is a critical global health issue that affects millions of individuals, both young and old. It is a condition characterized by excessive accumulation of body fat, resulting from an imbalance between calorie intake and calorie expenditure. This multifaceted health concern has far-reaching consequences, not only on physical health but also on various aspects of individuals' lives, including their academic performance. The prevalence of obesity has increased dramatically over the past few decades, making it a significant public health concern. While both boys and girls are affected by obesity, research indicates that girls may experience unique challenges and consequences associated with their weight. The World Health Organization (WHO) estimates that approximately 340 million children and adolescents between the ages of 5-19 were overweight or obese by 2016. This issue is particularly pressing for girls, as societal and gender-related factors can contribute to their vulnerability to obesity. These factors include body image concerns, societal expectations, and a higher likelihood of engaging in sedentary activities. As obesity rates continue to rise among girls, it is crucial to understand how this condition impacts their academic performance. Academic performance is a multifaceted concept that encompasses various elements, including cognitive abilities, educational attainment, and overall achievement in college. There is a growing body of research examining the link between obesity and academic performance in children and adolescents. While the relationship between obesity and academic performance is complex and multifactorial, it is vital to understand how obesity



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may influence the cognitive and educational outcomes of girls specifically. One of the primary mechanisms through which obesity may impact academic performance is the influence on cognitive functioning. Obesity has been associated with cognitive deficits in various areas, such as attention, memory, and executive function. Research has shown that excessive body fat can lead to inflammation and insulin resistance, both of which can negatively affect brain function. This is particularly concerning for girls as cognitive development during childhood and adolescence plays a significant role in academic success. Moreover, obesity is often accompanied by comorbid conditions, such as sleep apnea and depression, which can further impair cognitive function and hinder academic progress. Sleep disturbances, which are common in individuals with obesity, can disrupt the consolidation of memory and impair attention, making it challenging for students to concentrate and learn effectively. Similarly, the emotional and psychological impact of obesity, including low selfesteem and depressive symptoms, can affect girls' motivation and engagement in the learning process. Obesity can also exert a direct influence on academic performance by affecting girls' physical health. It is well-documented that obesity is associated with a higher risk of developing various health problems, including type 2 diabetes, cardiovascular disease, and musculoskeletal issues. These health conditions can result in frequent college absences, reduced participation in physical activities, and an overall decreased quality of life for girls. Such physical health problems can lead to a lack of energy and motivation, making it difficult for girls to excel academically. In addition to cognitive and physical health impacts, obesity can have a significant psychosocial effect on girls, which, in turn, can affect their academic performance. Girls with obesity may experience discrimination, stigmatization, and bullying, leading to social isolation and reduced self-confidence. These negative experiences can contribute to emotional distress and a diminished sense of self-worth, further hindering their ability to concentrate on their studies and achieve their academic potential. The social and cultural aspects of obesity are crucial to consider when examining its impact on academic performance in girls. Society often places undue emphasis on appearance, particularly for girls, which can exacerbate body image concerns and feelings of self-worth. Girls who struggle with obesity may face societal pressures and unrealistic beauty standards that can contribute to their vulnerability to emotional and psychological distress. As a result, the stigma associated with obesity may create additional barriers to academic success by affecting girls' mental well-being.

Furthermore, girls with obesity may be less likely to engage in physical activities or extracurricular programs, which can have both physical and social benefits. This reduced participation in sports and other extracurricular activities can limit opportunities for developing important life skills such as teamwork, leadership, and time management. These skills are not only valuable in an academic context but also in preparing individuals for success in their future careers. It is essential to recognize that the impact of obesity on academic performance in girls is not solely determined by the physiological and psychological consequences of obesity itself. There is a complex interplay of numerous factors that influence this relationship. Socioeconomic status, for example, plays a crucial role. Low-income families may have limited access to nutritious foods and opportunities for physical activity, which can increase the risk of obesity. Additionally, they may face



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educational disparities that further affect academic performance. Furthermore, the college environment itself can either exacerbate or mitigate the impact of obesity on academic performance. College that promote a culture of physical activity, provide nutritious meals, and have comprehensive health and wellness programs can help mitigate the negative effects of obesity. Conversely, college that lack these resources and are less supportive of students with obesity may inadvertently contribute to poor academic outcomes. The support and intervention of parents and caregivers are also instrumental in addressing the complex relationship between obesity and academic performance in girls. Parents play a vital role in creating a home environment that promotes healthy eating habits, physical activity, and emotional well-being. When parents are actively involved in their child's education and health, it can positively influence academic performance, regardless of weight status. Additionally, the timing of obesity onset may have differential effects on academic performance in girls. Childhood and adolescence are critical periods for cognitive development, and obesity that begins at a young age may have more profound and lasting impacts on academic outcomes. Understanding when and how obesity develops in girls can help educators and healthcare professionals implement effective interventions and support systems. In light of the multifaceted nature of the relationship between obesity and academic performance in girls, it is essential to consider the potential long-term consequences of this issue. Academic achievement in childhood and adolescence significantly influences future opportunities, including access to higher education and career prospects. If obesity adversely affects girls' academic performance during these crucial formative years, it could have farreaching consequences for their adult lives, perpetuating a cycle of limited educational and economic opportunities.

The implications of this complex issue extend beyond the individual level and have broader societal and public health implications. As the prevalence of obesity continues to rise, it places a substantial burden on healthcare systems, resulting in increased healthcare costs and decreased quality of life. Additionally, the economic implications of reduced academic performance among girls with obesity are substantial, potentially resulting in lower earning potential and increased reliance on social support programs. The existing body of research on the relationship between obesity and academic performance in girls provides valuable insights, but there are still several gaps and areas that warrant further investigation. Longitudinal studies that track girls' academic trajectories from childhood through adolescence and into adulthood are needed to better understand the lasting effects of obesity on academic outcomes. Additionally, research should focus on the specific mechanisms through which obesity influences cognitive function, as this can inform targeted interventions. Furthermore, examining the role of gender-specific factors, such as societal expectations and body image concerns, in the relationship between obesity and academic performance in girls is essential. Such factors may require specialized interventions and support structures to mitigate their impact. Moreover, interventions that promote healthy behaviors and emotional well-being should be developed and tested to determine their effectiveness in improving academic performance in girls with obesity. In conclusion, the complex interplay between obesity and academic performance in girls is a critical area of research and public health concern. Obesity can have far-reaching consequences on girls'



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cognitive function, physical health, and psychosocial well-being, all of which can affect their ability to succeed academically. It is crucial to recognize the multifaceted nature of this issue, considering physiological, psychological, social, and environmental factors. Understanding how obesity impacts academic performance in girls is not only important for individual well-being but also for the broader society and public health. Addressing this issue requires a comprehensive approach that includes interventions at the individual, family, and societal levels. By identifying and addressing the unique challenges that girls with obesity face, we can work towards ensuring that they have an equal opportunity to excel academically and reach their full potential, regardless of their weight status.

II. REVIEW OF LITERATURE

Nithlavarnan, Ananthamyl & Sayeejan, Poornima. (2020). The prevalence of obesity among school-age children is a global concern. The Jaffna peninsula has shown a significant surge in the prevalence of teenage obesity. Recent research findings suggest that there is a correlation between obesity and the impairment of memory functions and cognitive capacities in youngsters. The objective of the research was to investigate the impact of obesity and overweight status on the academic achievement of teenage females residing in the Jaffna Municipal Area. The research used a cross-sectional descriptive survey approach. A cohort of 761 female adolescents in the tenth grade was purposefully sampled from four educational institutions catering only to females under the jurisdiction of the Jaffna Municipal Council. The academic performance of overweight and obese students was compared to that of normal weight students by analyzing the first term marks for six core subjects. This analysis was conducted using the Minitab18 statistical software, employing the Mann-Whitney U test and two sample t-tests. The purpose of this analysis was to determine the relationship between academic performance and weight status. A questionnaire was used to evaluate the perceptions, attitudes, and obstacles encountered by students who are fat or overweight. The prevalence of overweight and obesity was found to be 17%. The academic performance of pupils within the normal weight range exhibited better scores in the subjects of Science, Tamil language, English language, and History. However, there was no discernible disparity in the scores obtained in Mathematics and Religion. A significant majority of students, over 80%, demonstrated awareness on the implications associated with obesity. Approximately 68% of kids who are classified as obese or overweight reported experiencing bullying related to their body type from both classmates and family members. A significant proportion, namely 64%, of girls who are classified as obese or overweight have comorbidities associated with obesity. Fifty percent of the participants expressed dissatisfaction with both their physical appearance and intellectual achievements. Within the cohort of females classified as overweight or obese, a significant proportion of 60% acknowledged that daily sleepiness had a detrimental impact on their ability to study. Additionally, 55% of these individuals reported experiencing memory deficits, while 10% reported experiencing regular weariness. Nevertheless, they had a high degree of sociability and demonstrated strong leadership attributes. Moreover, individuals have the capacity to effectively address their own issues and confrontations with a sense of self-assurance. Additionally, it was discovered that a significant majority of individuals, namely 79%, actively participated in various endeavors aimed at decreasing their surplus body mass. The participants adhered to a regulated dietary



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plan and participated in various physical activities, including walking, running, practicing yoga, and engaging in dance. The results of this research provide empirical support for the impact of overweight and obesity on the academic achievement of teenage female students, underscoring the need of implementing comprehensive preventative measures on a wide scale throughout the Jaffna peninsula.

Asirvatham, Jebaraj et al., (2019). In addition to its detrimental impact on health, obesity is also shown to be inversely correlated with many socioeconomic outcomes. The potential impact of obesity on academic achievements may be adverse. The correlation between obesity rates and academic achievement warrants scrutiny due to the consistent upward trend in obesity rates seen in recent decades. The primary objective of the majority of prior research endeavors is to evaluate the impact of student obesity on the academic achievements of the students themselves. This research aims to investigate the association within the domain of obesity at the student grade level, so enabling a partial exploration of the impact of stigmatization. The present study focuses on the design and methodology used in the research. The primary factors of focus are to the rates of obesity and academic proficiency. Our research focuses on the examination of public school pupils in Arkansas, including grades K-12. Multilevel methodologies are used to accommodate analogous characteristics at several levels within the educational hierarchy, namely at the grade, school, and school district levels. Findings: There is a positive correlation between the prevalence of obesity and the proportion of pupils who are performing below proficiency levels in both reading and mathematics. Additionally, our research indicates that the link between childhood obesity and negative societal attitudes may be partially explained by the stigmatization faced by fat children. Conclusion: The results support the hypothesis that there may be a correlation between the prevalence of obesity among students and the psychological outcomes experienced by obese individuals in educational environments.

Bagully, Michael. (2006) In addition to giving rise to a multitude of physical health problems, juvenile obesity has been empirically linked to the development of mental and emotional disorders, including anxiety and depression. This research posits that a correlation exists between juvenile obesity and diminished academic achievement, with depression serving as the mediating factor. Based on the use of multivariate analysis, namely ordinary-least squares regression, it is shown that obesity has a detrimental influence on academic performance. This effect is partially attributable to parental obesity and the amount of time spent watching television, which together contribute to the overall impact of obesity. Nevertheless, once accounting for various socioeconomic variables, the adverse impact of obesity loses its statistical significance. It is important to acknowledge, however, that the bivariate analysis conducted in this research demonstrates a significant link between these characteristics and the prevalence of obesity. Policy makers should take heed of the findings of this research, as it indicates that the failure to address the issue of obesity may have detrimental consequences for the job market, namely in terms of the lower academic performance of the next generation in the United States.

Fuxa, Andrew (2011) The objective of this research was to investigate the correlations between obesity in adolescents and their academic performance, as well as their views of the social milieu and safety within the school setting. The data included in this study were



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obtained from the Minnesota Student Survey, which encompassed a total of 87,468 students. This survey was conducted statewide during the spring of 2007. The replies of students about their academic performance, school attendance, future educational aspirations, and views of the social environment and safety inside the school were examined. These responses were then studied in relation to the students' weight status using statistical techniques such as logistic regression and general linear modeling. Adolescents who are overweight or obese exhibited a notable decrease in their inclination to pursue higher education. Additionally, they demonstrated a higher propensity for school absenteeism due to safety concerns, lower academic performance, enrollment in individualized education plans, and negative perceptions regarding the social atmosphere and safety within the educational institution, as compared to their non-overweight counterparts. These findings were statistically significant (p<.001). The results of this study may provide valuable guidance for school and healthcare personnel in developing evaluation and intervention methods aimed at enhancing the overall well-being of overweight and obese adolescents. The present study investigates the impact of the school environment and the role of teachers on adolescent obesity, with a particular focus on safety.

Amjad, Mohammad et al., (2015) Obesity refers to the excessive and undesired accumulation of adipose tissue inside the human body. Overweight refers to an elevated body weight relative to height, taking into consideration the recommended weight range for a certain age. The research was carried out in two districts located in the Punjab region, namely Faisalabad and Rawalpindi. A total of 12 schools were randomly picked from each district, taking into account the different types of schools based on their locality, including Posh Private, Public, and Rural schools. A total of 24 schools were included in the investigation. The participants in this study consisted of male students enrolled in grades 5 to 9 at each respective school. The overall sample size consisted of 600 youngsters, with 300 participants from the Faisalabad area and 300 participants from the Rawalpindi region. A systematic sampling method was used to properly pick a representative sample of 25 responders from each school, resulting in a total sample size of 600. The data was gathered using a meticulously designed and pre-validated interview plan. The calibrated scales were used to measure the height and weight of each participant. The Body Mass Index (BMI), which is derived as weight (kg) divided by height squared (m^2), was computed for every student. The data that was acquired was then subjected to analysis via the use of descriptive statistics, bivariate analysis, and multivariate analysis in order to determine the relative importance of the independent factors in explaining the dependent variable. The findings indicate that various factors, including family types, family size, family history, television viewing habits, internet usage, engagement in sports and exercise, consumption of mutton and beef, consumption of junk food, mother's level of education, family size, and weekly time spent in walking and utilizing school play facilities, significantly influenced the obesity levels of children in Punjab. The impact of obesity on individuals' academic achievement, physical health, and psychological well-being is seen in both rural and urban settings.

Kaestner, Robert (2008) This study aims to examine the correlation between weight and academic performance in children, specifically focusing on their results on the Peabody Individual Achievement Tests in mathematics and reading, as well as their grade attainment.



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The data used in this research was obtained from the 1979 cohort of the National Longitudinal Survey of Youth (NLSY). This particular cohort consists of a substantial and representative sample of children aged 5 to 12, observed between the years 1986 and 2004. Estimates of the relationship between weight and academic success were derived via the use of multiple regression model specifications. These models accounted for various observable features of both the kid and its mother, as well as time-invariant variables of the child. The findings of our study indicate that, on the whole, there is no significant difference in achievement test scores between children who are overweight or obese and those with average weight.

Martin, Anne & Booth et al., (2017) The objectives of this research were the examination of existing information regarding the longitudinal connections between child and teenage obesity and academic success, as well as the exploration of the perspectives held by adolescents with obesity and their parents on this subject matter. The latest discoveries The present analysis encompasses a comprehensive synthesis of 31 research, derived from 17 distinct cohorts. The findings of this synthesis indicate that the associations between obesity and academic success lack substantial empirical support, with the exception of mathematics performance among teenage females. Notably, this link may be influenced by weight-related bullying experiences and the role of executive cognitive processes as possible mediators. The findings from focus groups conducted with teenage females who have obesity have substantiated the presence of psychological distress in the school environment, especially in the context of Physical Education. Adolescents had the perception that there was no direct correlation between obesity and academic success, but rather that it was influenced by their attitude towards school. Interventions are necessary to enhance the psychological well-being and cognitive capacities associated with academic performance in teenage females affected by obesity. Physical Education should be seen as a constructive and beneficial encounter for children and adolescents who are affected by obesity.

Muller, Xonné & Pienaar, Anita. (2021). The correlation between low socio-economic position and undernutrition is a contributing factor to the heightened likelihood of academic underachievement. The objective of this research is to investigate the potential long-term associations between stunting, underweight, and thinness and academic performance among primary school girls aged 6 to 13 in the North West region of South Africa. A study strategy that included randomization and stratification, as well as longitudinal data collection, was used. This design involved conducting baseline measures and two subsequent measurements over a span of seven school years. The study included a sample of female participants ranging in age from 6 to 13 years (N = 198) residing in the North West area of South Africa. The evaluation of academic achievement was based on the results of the June school tests, as well as the national and provincial examinations conducted for students in grades 1, 4, and 7. The study used independent t-tests to assess the disparities in thinness, underweight, and stunting among girls in comparison to a control group without any indicators of undernutrition. The study used a repeated measures analysis of variance (ANOVA) to examine the relationships between variables over many time points. Additionally, a post hoc Bonferroni correction was applied to control for multiple comparisons. There was a statistically significant difference (p < 0.05) in academic performance over time between girls with normal weight and those who



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were stunted. The findings of the study indicate that stunting has had a lasting and substantial detrimental impact on language skills, mathematical abilities, and overall academic performance, as shown by statistical significance at a significance level of p < 0.05. The prompt detection of undernutrition, particularly stunting, is crucial for the implementation of effective intervention and preventive initiatives, particularly in the early years of children.

III. RESEARCH METHODOLOGY

A total of 105 female participants were selected as the sample for this investigation. The height (in centimeters) and weight (in kilograms) of each participant were assessed, and subsequently, the Body Mass Index (BMI) was computed for each individual. The participants were categorized into 'normal-weight' and 'obesity' groups based on their BMI for age. Females with body mass index (BMI) values ranging from 27.5 to 40 and above were categorized as obese, while those with BMI values ranging from 18.5 to 22.9 were classed as having a normal weight. It was determined that all the females who were chosen for the study belonged to the medium and upper-middle socio-economic strata, as determined by the Socio-economic Status Scale developed by Bharadwaj (1971). The evaluation of academic achievement was conducted by calculating the cumulative percentage of marks attained by female students in the most recent college test.

IV. DATA ANALYSIS AND INTERPRETATION

Table 1 presents a comprehensive depiction of the frequency distribution pertaining to females categorized as obese and normal-weight across all levels of academic achievement, namely 'Very good,' 'Good,' 'Average,' and 'Below average.' It was observed that there was no substantial variation in the frequency distribution across all levels of academic achievement. There was no statistically significant disparity identified in the proportion of obese and normal-weight females in relation to their academic achievement categorized as 'Good'. The proportion of females with normal weight who had a 'Very excellent' academic score (50%) was much higher than that of their obese peers (0%). There was no occurrence of below average academic performance among normal-weight females, but 25% of obese girls were found to fall into this category. This disparity was determined to be statistically significant. There was a notable prevalence of obese girls (47.5%) in the performance grade categorized as 'Average', whereas the proportion of normal-weight girls in this grade was just 12.5%. The aforementioned data suggest that there were notable disparities in academic achievement, especially among female students, with normal-weight females exhibiting more favorable outcomes. A higher proportion (72.5%) of girls classified as obese demonstrated academic performance that fell below the average or below average range. In contrast, 87.5% of girls categorized as having a normal weight achieved grades that were classified as either 'Good' or 'Very good'. Therefore, it can be seen that there is a correlation between obesity and the academic achievement of female students.

S.NO	Category/Score	Obese girls	Normal weight	Z Value
		(n=50)	girls (n=50)	
1	Very good (>70)	0	25 (50%)	5.16 [*]
2	Good (62-70)	14 (27.5%)	19 (37.5%)	0.96
3	Average(54-62)	24 (47.5%)	6 (12.5%)	3.42*



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4	Below	average	12 (25%)	0	3.38*
	(<54)				

Table 2 presents the observed disparities in average academic performance scores between females classified as obese and those categorized as having a normal weight. The group of girls with normal weight had the greatest mean percent score of 69.29, while both obese girls earned the lowest mean percent scores of 57.12 and 57.53, respectively. However, the difference in scores between the two groups was not statistically significant. The mean percentage score for obesity was discovered to be 60.77%, which was shown to be substantially greater among females compared to their obese counterparts. The scholastic performance of females with normal weight was found to be superior to that of all other groups under consideration, as shown by their higher mean scores.

S.	Girls	Mean percent	F-ratio
No.		$score \pm SD$	25.85
1.	Obese girls (n=50)	57.53±4.83	
2.	Normal-weight girls	69.26±6.62	

A significant inverse relationship was observed between body mass index (BMI) and the academic performance of female students, with a correlation coefficient of -0.65*. This finding unequivocally demonstrates a negative correlation between girls' academic performance and an increase in their body mass index (BMI). The negative correlation coefficient demonstrates a more significant impact on academic achievement among females, suggesting that their weight status has a bigger influence.

V. CONCLUSION

In conclusion, the relationship between obesity and academic performance in girls is a complex and multifaceted issue. Obesity can negatively impact cognitive function, physical health, and psychosocial well-being, all of which have the potential to hinder academic success. Understanding this connection is vital for both individual well-being and broader public health. To address this issue effectively, we need comprehensive interventions at various levels, including individual, family, college and societal, to ensure that girls with obesity have the opportunity to excel academically and reach their full potential, regardless of their weight status. Further research and targeted interventions are essential to mitigate the consequences of obesity on girls' academic outcomes and promote their overall well-being.

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