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THE IMPACT OF DIETARY BEHAVIOR ON THE PREVALENCE OF OBESITY AMONG ADOLESCENT GIRLS

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ABSTRACT
Unhealthy eating habits are a major contribution to the growing problem of overweight and obese adolescent girls in India. College-aged adolescent females, aged 13 to 15, were the subjects of a cross-sectional study using validated research instruments and standardized anthropometric measurements. The Z scores were determined using the WHO approved AnthroPlus. According to the findings, a wide variety of unhealthy eating habits are quite common. Only 26.3 percent of the population had excellent eating habits, while 54.3 percent had average diets, and 19.3 percent had bad diets. The mean BMI for age Z score was found to be 0.87 and 0.02 in poor and fair dietary habits. Poor eaters had a significantly higher risk of being overweight or obese (1.82 [1.20-2.78]).

Keywords: - Girls, Behavior, obesity, Overweight, Dietary.

INTRODUCTION
Adolescent girl's obesity is a global public health concern, and India is no exception to this worrisome trend. The rise in obesity rates among Indian Adolescent girls is a multifaceted issue with complex underpinnings, including socio-cultural, economic, and dietary factors. The prevalence of adverse eating behavior in this population is a critical aspect of the obesity epidemic, as it contributes to the imbalance between calorie intake and expenditure. Understanding the association between adverse eating behavior and obesity in Indian Adolescent girls is of paramount importance, as it has substantial implications for the well-being of this demographic group and the broader healthcare system. This study aims to shed light on this issue by focusing on a nonmetropolitan city in India, where research on Adolescent girl's health and nutrition is often limited. By examining the relationship between adverse eating behavior and obesity within this specific context, we can gain insights that are essential for tailoring effective interventions and policies to combat the growing problem of Adolescent girl's obesity in India. India, a country renowned for its diverse culture, rich traditions, and varied cuisines, is currently grappling with the complex challenge of Adolescent girl's obesity. Traditionally, India has been associated with undernutrition and malnourishment; however, recent decades have witnessed a significant shift in dietary patterns and lifestyle. This transition has brought about a rapid increase in the prevalence of obesity, affecting various age groups, including Adolescent girls. As India progresses economically and urbanizes at a swift pace, dietary habits have evolved, with a

greater reliance on processed foods, high-calorie diets, and sedentary lifestyles. This shift in behavior has given rise to a concerning increase in obesity rates among Adolescent girls, posing substantial risks to their health and well-being.

The issue of Adolescent girl's obesity is particularly alarming because it is associated with a wide range of adverse health consequences. Obesity during adolescence can lead to immediate health problems, such as hypertension, type 2 diabetes, and orthopedic issues, while also significantly elevating the risk of obesity-related conditions in adulthood. These include cardiovascular diseases, certain types of cancer, and psychological disorders. Additionally, the social and psychological consequences of Adolescent girl's obesity can be profound, including stigmatization, discrimination, and reduced quality of life. Furthermore, obesity imposes a significant economic burden on the healthcare system, as the costs associated with treating obesity-related illnesses are substantial. Given these detrimental effects, understanding the factors contributing to Adolescent girls obesity in India, including adverse eating behavior, is of utmost importance for public health professionals, policymakers, and the broader society. Adverse eating behavior, defined as the consumption of unhealthy or excessive food, plays a central role in the development of obesity. In the context of India, where diverse culinary traditions coexist with the globalization of fast food culture, it is essential to investigate the role of eating behaviors in Adolescent girl's obesity. This study focuses on a nonmetropolitan city in India to examine the specific challenges and nuances faced by Adolescent girls in such settings, where access to healthcare and nutrition resources may be limited compared to larger urban areas. Nonmetropolitan cities often experience unique socio-economic, cultural, and dietary dynamics, making it crucial to explore how adverse eating behaviors manifest in this context and their impact on Adolescent girls obesity. This research endeavors to address several critical questions: What are the prevailing patterns of adverse eating behavior among Indian Adolescent girls in a nonmetropolitan city? To what extent are these behaviors contributing to the obesity epidemic in this population? What socio-cultural, economic, and environmental factors are influencing these behaviors, and how can this knowledge inform targeted interventions to combat Adolescent girl's obesity? By employing a mixed-methods approach, including surveys, interviews, and data analysis, this research aims to provide a holistic understanding of the complex interplay of factors contributing to Adolescent girl's obesity in a nonmetropolitan Indian context. This approach allows us to gain insights from the perspectives of both Adolescent girls and their families, as well as healthcare providers and policymakers, to ensure a comprehensive view of the issue.

Understanding the specific challenges faced by Adolescent girls' in nonmetropolitan cities can help tailor interventions that are contextually relevant and effective. By identifying the key drivers of adverse eating behavior, such as the influence of advertising, peer pressure, and cultural norms, interventions can be designed to target these factors and promote healthier choices. Moreover, the study can shed light on the barriers to accessing healthcare services and nutrition education, which are vital components of any comprehensive obesity prevention strategy. The urgency of addressing Adolescent girl's obesity in India is underscored by the demographic makeup of the country, where a significant portion of the

population is comprised of young individuals. India has one of the largest Adolescent girl's populations globally, and their health and well-being are critical for the nation's future. As such, it is imperative to take proactive measures to curb the obesity epidemic and its associated health, economic, and social consequences. This study investigates the relationship between adverse eating behavior and obesity among Indian Adolescent girls in a nonmetropolitan city. The rise in Adolescent girls obesity in India is a growing concern with multifaceted causes, and understanding the role of adverse eating behavior within this context is pivotal for effective interventions. By focusing on a nonmetropolitan setting, we aim to uncover the unique challenges faced by Adolescent girls in such areas and provide insights that can be utilized for tailored strategies to combat obesity in this demographic group. This research is not only academically significant but also holds substantial implications for public health, policy development, and the overall well-being of Indian Adolescent girls.

REVIEW OF LITERATURE

Latif, Mona et al., (2021) Overweight and obesity in adolescents have become a public health problem. Adverse health outcomes associated with being overweight or obese begin to manifest throughout the teenage years and persist into adulthood. Unhealthy eating habits and a lack of physical activity are modifiable risk factors for obesity and overweight. Planning for preventative interventions at the population level requires an assessment of the prevalence of overweight and obesity and poor eating practices. The researchers in this study set out to determine how commonplace poor eating habits and excess weight were among high school students in Dubai. The Adolescents Risk Behavior Survey (ARBS) is a two-phase cluster-stratified research design. 1,683 adolescents in grades 8-12 from 28 private and government schools participated in the study. In the first stage, schools were selected at random with a probability proportional to size. In the second stage, classes were selected at random, and all students in the selected classes were invited to participate. Students completed a self-administrated computerized questionnaire. A certified school nurse took students' anthropometric measurements, which included their height and weight. The World Health Organization's (WHO) growth tables for age and gender were used to determine BMI categories. Weighting, the main sample unit, and stratification were used in the analysis of the data. The prevalence of overweight was 25.3% (95% CI: 22.7-28.2) and the prevalence of obesity was 15% (95% CI: 13.0-18.9) among teenagers in Dubai schools enrolled in grades 8-12. Students of both sexes were overweight, but males were more likely to be obese (19.9%; 95% CI; 15.4-25.1) than females (11.8 %; 9.5% CI; 8.7-15.6) ($p = 0.0261$). No correlations were seen between age or grade and being overweight or obese. Unhealthy eating habits were widely practiced. When asked about their eating habits in the 30 days preceding to the survey, 21.3% of teenagers (95% CI: 17.2-26.1) said they did not consume fruits, and 19.7% said the same about vegetables (95% CI: 15.7-24.4). While 31% of adolescents (95% CI: 26.8-35.5) drank a carbonated drink daily, 3.3% of adolescents (95% CI: 10.9-16.1) did not eat breakfast every day for the week prior to the survey, and 18.4% did not drink milk at all. Adolescents ate fast food at a high rate, with 78.9% saying they had

eaten fast food on at least one occasion in the week before to the study. There is a need to fortify and broaden school-based initiatives to combat obesity and overweight.

Grace, Angeline et al., (2021) Obesity is a significant public health concern and is on the increase among teenagers in industrialized and developing countries. The purpose of this case-control research was to examine the relationship between teenage obesity and dietary variables. Adolescent children (aged 10–17) were used for this investigation, with 110 cases and 110 controls being age-matched. Interviewer-administered, standardized questionnaires were used to gather the data, which was then analyzed using descriptive and analytic statistics. Children between the ages of 13 and 15 made up around 52.7% of the total. In contrast, just 60% of normal-weight teenagers and 42.7% of those who are overweight or obese reported eating enough fruit. Twenty-nine percent of patients and twenty-four percent of healthy people were found to eat enough veggies. Increased intake of fast food, consumption of sweets, insufficient intake of fruit, and parental freedom in snack shopping were shown to be statistically linked with teenage obesity. Schools, families, and communities all have a role to play in combating the epidemic of childhood obesity by addressing its root cause: poor nutrition. Children's health should be regularly monitored and lessons on healthy eating should be a part of the school's health services. To reduce their children's risk of developing chronic illnesses at a young age, parents should emphasize the value of a healthy, well-rounded diet rich in fruits and vegetables and discourage the use of processed foods.

Smetanina, Natalija et al., (2015) Until lately rising incidence of overweight and obesity among juvenile population in Europe and globally adds to substantial well-known hazards for metabolic repercussions in later life. This research set out to answer the question, "How common is overweight and obesity among children and adolescents in Lithuania?" by looking at how often these conditions occur and what variables, such as energy balance-related behaviors and family demographic and socioeconomic status, are associated with them. Methods 3990 students aged 7-17 from 40 schools in the Kaunas area of Lithuania participated in this cross-sectional survey. Participants were measured using anthropometric data. International Obesity Task Force (IOTF) guidelines for children and adolescents were used to determine body mass index (BMI). Adolescents and their parents participated out surveys on the parents' demographics, eating habits, TV viewing habits, and socioeconomic level. In comparison to females, 6.9% of boys were underweight (P 0.05), 11.7% of boys were overweight (P > 0.05), and 4.9% of boys were obese (P 0.05). The prevalence of obesity increased dramatically between the ages of 6 and 9, with 6.7% of boys and 4.8% of girls being overweight or obese (P 0.05 for both). Skipping breakfast and eating less often were both significantly related with overweight and obesity (P 0.05), although lack of exercise had no effect on BMI. There was a significant correlation between fathers' lack of education and their children's overweight/obesity (odds ratio [OR] 1.30; P = 0.013 and OR 1.56; P = 0.003, respectively). Younger children and adolescents in Lithuania have a higher incidence of overweight and obesity, although the rate is still one of the lowest in Europe. Children's and teenagers' overweight/obesity was linked to factors such as meal frequency,

missing breakfast, father's educational and work status, and a family history of arterial hypertension.

Tiwari, Priyanka & Sankhala, Aarti. (2007). The purpose of this research was to examine the obesity rate, how students at a university in Udaipur, Rajasthan, feel about their bodies, and their eating habits.One thousand females, aged 18 to 24 years old, were tested for obesity using measurements of height, weight, and body mass index. As a second step, 30 girls were chosen to represent each of the three weight status groups (normal, overweight, and obese) so that their thoughts on food and their eating habits could be analyzed. College-aged women had a 5.6% and 4.4% prevalence of overweight and obesity, respectively. Fifty-five percent of the people surveyed in the research underestimated their true weight. Overweight and obese women were most likely to report a preference for high-fat, high-calorie meals. Overweight and obese people also tended to consume more often processed foods including cheese, butter, jam, jelly, and soft drinks.

RESEARCH METHODOLOGY

Study design and settings

This study is cross-sectional in design and uses the modified Global student-based school health survey (GSHS) extended questionnaire to measure nutritional status at a single point in time. The cross-sectional analysis used data collected from January 1, 2019, to June 30, 2020. The school administration approved the cross-sectional research in advance, and parental agreement was sought beforehand. Students aged 13 to 15 were enrolled in the survey, which followed the same procedures as the World Health Organization's Global School Health Survey and the Global Youth Tobacco Survey. All currently enrolled college students who were available to provide informed consent were included.

Study tools

The dietary questions in the pro forma survey followed the style of the WHO GSHS questionnaire but were modified to ensure a higher response rate and more accurate scoring. Vegetable, fruit, soft drink, junk food, and breakfast consumption frequencies, as well as overall dietary habits, were all asked about in the survey's accompanying questionnaire. For each kind of cuisine, there were two separate questions: Question 1: In a typical week, how often do you have it? Question 2: In the last week, how often did the responder have this? The intake frequency for each variable was determined by answering Q1 + Q2 and dividing by 2.

Data management and statistics

The research made use of WHO AnthroPlus, a program approved by the World Health Organization. Data from the day of the visit, including weight and height, were entered into WHO AnthroPlus. AnthroPlus was used to calculate age- and gender-specific Z-scores using the WHO MGRS 2007. Students with excessive scores or those who’s BMI for age Zscore values were identified by WHO AnthroPlus upon data submission were seen again for anthropometry within 2 days. Later, the information was imported into IBM SPSS Statistics version 20.0 (IBM Corp., Armonk, NY, USA) to analyze the frequency with which individuals engaged in risky eating behaviors and the likelihood that they were overweight or

obese. The correlations were analyzed using the Chi-square test for categorical variables and the analysis of variance (ANOVA) for continuous variables.

Ethics

The research was given the go light by the institutions interdisciplinary Ethics and Research Advisory Committee. After the study was finished, appropriate counseling sessions were held to impact health education, including but not limited to advice on healthy eating practices, information on the risks of adverse dietary behavior, and the long-term health effects and avoidable economic burden of these behaviors.

DATA ANALYSIS AND INTERPRETATION

Prevalence of adverse eating behavior

Forty percent of the sampled population reported eating vegetables once per day, while another 27.5 percent did so more than twice. About a third of the people surveyed (32.6%) seldom or never ate vegetables. The effects were somewhat worse for those who consumed fruit often. Only around 21.5 percent of the students ate fruits twice or more every day, while 41.7 percent never ate fruits at all. When asked how often they drank soft drinks, 11.4% said twice a day or more, 23.2% said once a day, and only 39.1% said never. Only 25.1% of the people surveyed did not eat junk food at least once per week, whereas 15.0% ate it four times or more per week, 26.5% once per week, and 33.4% once per week. Sixty-eight percent of the sampled population reported eating breakfast six or seven days per week, 14.6 percent ate breakfast four to five days per week, 13.1 percent ate breakfast two to three times per week, and 6.2 percent ate breakfast once or less each week.

Overall, the sample group had an acceptable dietary behavior score (54.4%), an excellent score (26.3%), and a bad score (19.3%). The prevalence of various eating habits is broken out in Table 1. There was no discernible difference between men's and women's eating habits.

Association of adverse eating behavior with nutritional status (overweight/obesity)

The correlation between unhealthy eating habits and obesity rates is shown in Table 2. Compared to those who ate vegetables once per day, the incidence of overweight or obesity was 29.2% higher among those who did not eat vegetables everyday, at 7.8%. Also, the percentage of those who were overweight or obese was 23.8% greater among those who didn't eat fruits every day, compared to 14.1% among those who did. The prevalence of overweight and obesity was also significantly higher among those who drank soft drinks more frequently: 22.8% among those who drank soft drinks twice or more per day, compared to 12.4% among those who did not drink soft drinks every day and 9.7% among those who did not drink soft drinks at all. Those who consumed junk food more than four times per week had a 19.3% higher prevalence of overweight or obesity compared to those who did not consume junk food, who had a prevalence of 8.7%.

The incidence of overweight and obesity was significantly correlated with how often people ate breakfast, with those who skipped breakfast showing a greater rate. Those who ate breakfast less than once per week were 29.5% more likely to be overweight or obese than those who ate breakfast six or seven times per week, at 10.9%.

Table 1: Prevalence of adverse eating behaviors

Eating behavior	Frequency	Female %	Statistical test results (χ2 , df, P)
Frequency of vegetable intake	Not everyday	34.1	4.76, 2, 0.09
	Once daily	40.9	
	≥2 times daily	25	
Frequency of fruit intake	Not everyday	42.2	0.16, 2, 0.92
	Once daily	36.5	
	≥2 times daily	21.3	
Frequency of soft drink intake	≥2 times daily	11.6	1.82, 3, 0.61
	Once daily	22	
	Not everyday	40.6	
	Don't drink	5.7	
Frequency of junk food intake	≥4 times/week	15.6	3.06, 3, 0.38
	2-3 times/week	25.3	
	Once/week	35.1	

	Don't eat	24	
Frequency of breakfast consumption	≤1/week	6	5.67, 3, 0.13
	2-3 times/week	11.2	
	4-5 times/week	15.6)	
	6-7 times/week	67.2	
Dietary behavior*	Poor	18.9	1.38, 2, 0.50
	Fair	56	
	Good	25.1	

Table 2: Eating behaviors and nutritional status

Eating behavior	**Frequency**	**Nutritional status**		**Total (n)**	**Statistical test results (χ^2, df, P)**
		Overweight/obese %	**Normal %**		
Frequency of vegetable intake	Not everyday	(29.2)	(70.8)	459	115.6, 2, <0.01
	Once daily	(7.8)	(92.2)	567	
	≥2 times daily	(7.4)	(92.6)	390	
Frequency of fruit intake	Not everyday	(23.8)	(76.1)	590	38.3, 2, <0.01
	Once daily	(18.8)	(81.2)	521	
	≥2 times daily	(14.1)	(85.9)	305	
Frequency of soft drink intake	≥2 times daily	(22.8)	(77.2)	162	25.2, 3, <0.01
	Once daily	(19.8)	(80.2)	328	

	Not everyday	(12.4)	(87.5)	554	
	Don't drink	(9.7)	(90.3)	372	
Frequency of junk food intake	≥4 times/week	(19.3)	(80.7)	212	14.9, 3, <0.01
	2-3 times/week	(16.0)	(84.0)	375	
	Once/week	(15.8)	(84.1)	473	
	Don't eat	(8.7)	(91.3)	356	
Frequency of breakfast consumption	≤1/week	(29.5)	(70.4)	88	46.7, 3, <0.01
	2-3 times/week	(26.3)	(73.6)	186	
	4-5 times/week	(14.7)	(85.3)	204	
	6-7 times/week	(10.9)	(89.1)	938	
Dietary behavior*	Poor	(20.9)	(79.1)	273	10.7, 2, <0.01
	Fair	(13.4)	(86.6)	771	
	Good	(12.6)	(87.4)	372	

Overall, food habits were significantly linked to excess weight. People who had poor dietary habits were more likely to be overweight or obese (20.9% vs. 13.4% and 12.6%, respectively), while those who had fair dietary habits and good dietary habits were less likely to be overweight or obese.

CONCLUSION

In conclusion, dietary behavior plays a significant role in influencing the prevalence of obesity among adolescent girls. Poor dietary choices, characterized by excessive consumption of high-calorie, low-nutrient foods, can contribute to weight gain and obesity. Conversely, adopting a balanced and healthy diet, rich in fruits, vegetables, and whole grains, can help mitigate the risk of obesity in this demographic. Encouraging and educating adolescent girls on making nutritious food choices and promoting healthy eating habits are essential steps in addressing the obesity epidemic among this population. It is crucial to consider the complex interplay of various factors, including genetics, physical activity, and environmental influences, in tackling this issue effectively.

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