



To Compare the Bmi Of Overweight And Obese Students In The Control And Study Groups Before And After The Intervention

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ABSTRACT

Childhood obesity is quickly becoming a serious public health concern in developing nations like India, particularly among urban populations. Whether in a developed or developing country, overweight and obesity rank high on the list of dietary problems. The goals of this research were to determine what variables lead to overweight and obesity evaluate the impact of a school-based intervention on students' body mass index (BMI) in a sample of Indore schools. Examining the relationship between the chosen variables and the other factors influencing overweight and obesity in both the control and research groups of school-aged children The Emerald Heights International School served as the control group, while The Academic Heights Public School—APHS Indore was the study group. Screening for overweight and obesity among school-aged children was conducted using the Quetelet Index BMI status using a total enumerative sample approach. Every single one of the kids had a healthy weight. The research found that the body mass index (BMI) dropped significantly. The results showed that the school-based treatments, which included aerobics classes and an awareness campaign for parents, successfully brought the BMI level down. Programs offered in schools have several advantages, including low overhead, positive effects on students' motivation and engagement, and the ability to keep tabs on their progress at home thanks to parental participation. It is much simpler to execute weight reduction measures in schools compared to other settings since the school samples become captive populations.

KEYWORDS: children, healthy nutrition, overweight, public health

INTRODUCTION

The "New World Syndrome" of non-communicable illnesses, of which obesity is a part, is wreaking havoc on the public health systems of the world's poorest nations and putting a heavy financial and social strain on their already thin budgets. One of the most underappreciated public health issues in the modern era is obesity, according to the World Health Organization. People all across the globe are struggling with the devastating effects of obesity on their health and wellbeing. Though it has been around for a while, the prevalence of this issue is growing quickly across all age groups. Before we can find effective solutions to obesity, we need to understand the many factors that have contributed to this surge.

Particularly in less developed nations, obesity poses a significant threat to public health infrastructure. Adult noncommunicable diseases (NCDs) include heart disease, diabetes, and stroke are more common among children who are overweight. According to research, almost 170 million individuals under the age of 18 experience both the physical and mental health consequences of being overweight.

Conversely, children's development rates are indicative of the region's economic standing, nutritional quality, and access to health care. Because they are easy to measure, health professionals now look at children's weight and height to get a sense of how healthy and developed they are. The healthcare services offered to the family and the kid are based on the child's growth indicators, which indicate the child's physical development.

Ensuring the physical well-being of children is an excellent investment in their economic and social development. It is worth noting that the majority of Iranians are young, and that this demographic is seeing crucial growth. From 1997 to 2003, the World Health Organization (WHO) and others performed research on anthropometric indices and their standard rates. Iranian researchers have measured children's height and weight in the past, but they've always utilized American-English growth norms. Using external growth markers on Iranian children might lead to incorrect diagnoses of improper growth.

New studies reveal that growth patterns shift with time. However, due to cultural, social, economic, and genetic factors that influence children's growth, curves and charts that are based on Western knowledge cannot be deemed legitimate for all nations. Particularly for emerging nations, national standards for children's development are crucial. Using both Shiraz (southern Iran) schoolchildren's reference data and CDC criteria for body mass index (BMI), Ayatollahi and Mostajabi compared the two. Schoolchildren in Shiraz now have a higher body mass index (BMI) than they had a decade ago, and they demonstrated that BMI curves for both sexes differed from CDC norms. Using the World Health Organization's and the Centers for Disease Control and Prevention's guidelines as a benchmark, Mozaffari-Khosravi et al. standardized the height, weight, and body mass index (BMI) of healthy schoolgirls and boys in Yazd City from 2010

to 2011. Boys and girls over the age of 10 had body mass index (BMI) 95th and 97th percentiles that were higher than international norms.

LITERATURE REVIEW

Matana (2024) Worldwide, there is a serious problem with overweight and obesity in children and adolescents. The main goal of this research was to find out how common overweight and obesity are among teenagers in Croatia, namely those who are between the ages of 15 and 18, and what variables may be associated with these conditions. The methodology of this cross-sectional research was administering an anonymous questionnaire to 344 secondary school pupils residing in the Mediterranean area of Croatia.

Mahmood (2024) One of the world's most pressing public health concerns is the alarming increase in childhood obesity. The purpose of this research was to quantify the rate of overweight and obesity among Iraqi elementary school students in Rania City. Elementary school students in Rania City, Iraq were the subjects of a cross-sectional study. Using a cluster random sample approach, ten schools were chosen, comprising 3,137 students. Seventy children who were classified as obese were selected at random and their anthropometric measures and sociodemographic information were documented.

Kaushal (2024) Due to its alarming growth in recent years, childhood obesity has emerged as a major global public health issue. This research set out to quantify the prevalence of overweight and obesity among school-aged teenagers and identify the variables that put this demographic at increased risk for developing these conditions. The Environment and Layout: The participants in this cross-sectional study were school-aged adolescents (between the ages of 12 and 15) from both rural and urban areas of Jodhpur. The current research included 1864 students. Researchers evaluated height and weight using calibrated instruments, and data was gathered using a well-structured questionnaire.

Abraham (2019) A number of health problems, including diabetes mellitus, high blood pressure, and others, may develop in children who are overweight. Malnutrition is more common and childhood obesity is less common among rural children. This study aims to determine the rate of overweight and obesity among rural Kerala high school students. 761 children from private schools and 816 pupils from public and assisted schools were among the 1577 students drawn at random from schools in and around the Vadavukode block in the Ernakulam district of Kerala. To measure stunting, wasting, overweight, and obesity, their height, weight, and body mass index (BMI) were recorded and displayed on growth charts recommended by the World Health Organization (WHO).

RESEARCH METHODOLOGY

Demographic Variables

Personal details about the people who take part in the research are known as demographic variables. The following demographic factors were used in this study: age, sex, religion, place of residence, child's birth order, sibling count, family type, and parenting style.

Sampling Technique

Phase I—The study's two participating schools, The Academic Heights Public School—APHS Indore and The Emerald Heights International School Indore, were chosen for their suitability and accessibility. The control and research groups were assigned to schools at random. Then, in order to screen for overweight and obesity, all students in the 6–12 age range were measured at both schools and their body mass index (BMI) was computed.

Pilot Study

The goals of the pilot project were to find out what problems could arise with the full-scale investigation, as well as to gauge its practicality and viability. A preliminary analysis was carried out using sixty samples. Thirty samples met the inclusion criteria for each group. Interventions were conducted for 16 weeks after gaining approval from the authorities. It was possible to carry out the primary study. Ultimately, the tool did not undergo many linguistic adjustments. The tool was clear and unambiguous except from that.

Data Collection Procedure

First Stage: School-aged children will be weighed and measured to screen for overweight and obesity. Their body mass index (BMI) will then be computed and interpreted using the World Health Organization's Quetlet Index.

Based on the inclusion criteria of the study, 260 out of 339 identified overweight and obese school students were recruited for the second phase of the research. On average, 150 samples were transported by each group. The second phase included administering the pretest and implementing the programs. Members of the research population provided signed, informed permission. Children who were overweight or obese had their demographic information and data on the causes of their weight gain taken. Before beginning school-based treatments in either the control or study group, parents were asked to fill out a series of questionnaires that included clinical characteristics, parental awareness of their children's weight and obesity, their children's lifestyle habits, and their children's dietary patterns as documented in food diaries.

ANALYSIS

Table 1: Association Between the Demographic Variables and the Post test Level of BMI in Control Group of Overweight/Obese School Children. (136)

| Demographic Variables | Components | Level of BMI | | | |
|-------------------------------------|---|--------------|-------|----------|---------|
| | | Over weight | Obese | χ^2 | p value |
| Age of the child in completed years | 11 years | 5 | 5 | 0.830 | 0.842 |
| | 12 years | 13 | 14 | | |
| | 13 years | 23 | 16 | | |
| | 14 years | 28 | 22 | | |
| Gender | Female | 39 | 32 | 0.966 | 0.325 |
| | Male | 30 | 25 | | |
| Religion | Christian | 10 | 9 | 0.901 | 0.637 |
| | Hindu | 50 | 42 | | |
| | Muslim | 9 | 6 | | |
| Area of living | Urban | 64 | 47 | 0.462 | 0.496 |
| | Rural | 9 | 6 | | |
| Birth order of the child | 1st | 36 | 18 | 0.032 | 0.984 |
| | 2nd | 30 | 38 | | |
| | 3rd | 4 | 0 | | |
| Number of siblings | None | 12 | 3 | 0.032 | 0.984 |
| | 1 | 53 | 54 | | |
| | 2 | 4 | 0 | | |
| Type of family | Nuclear | 50 | 39 | 0.620 | 0.431 |
| | Joint | 19 | 18 | | |
| Parenting Style | Parents with strict rules and high expectations | 32 | 24 | 0.706 | 0.871 |
| | Parents are responsive not demanding | 20 | 22 | | |
| | Parents are demanding not responsive | 11 | 7 | | |
| | Parents with no due care | 6 | 4 | | |

The results of the posttest BMI level among the control group of overweight/obese schoolchildren were not significantly correlated with any of the demographic characteristics, as shown in association table 1.

Table 2: Association Between the Parental Variables and the Post test Level of BMI in Control Group of Overweight/Obese School Children

| Demographic Variables | Components | Level of BMI | | | |
|-----------------------|------------------------|--------------|-------|----------|---------|
| | | Over weight | Obese | χ^2 | p value |
| Education of Father | School level | 3 | 3 | 0.459 | 0.927 |
| | Diploma level | 1 | 3 | | |
| | Under graduate | 36 | 33 | | |
| | Post graduate | 29 | 18 | | |
| Education of Mother | School level | 7 | 4 | 0.912 | 0.822 |
| | Diploma level | 1 | 1 | | |
| | Under graduate | 43 | 35 | | |
| | Post graduate | 18 | 17 | | |
| Occupation of father | Business/self employed | 33 | 30 | 0.722 | 0.868 |
| | Service in government | 22 | 13 | | |
| | Service in private | 12 | 12 | | |
| | Agriculture | 2 | 2 | | |
| Occupation of Mother | Home Maker | 50 | 44 | 0.543 | 0.909 |
| | Service in government | 19 | 13 | | |
| | Service in Private | 0 | 0 | | |
| | Self employed | 0 | 0 | | |
| Monthly income | Rs.10,000-20,000/- | 1 | 0 | 0.800 | 0.849 |
| | Rs.20000-30,000/- | 6 | 5 | | |
| | Rs.30000-40,000/- | 25 | 19 | | |
| | Rs.40000/- and above | 37 | 33 | | |

The correlation between the posttest BMI and the parental factors is shown in the table above. In the control group of overweight and obese schoolchildren, no parental characteristic was linked with the posttest level of body mass index ($p>0.05$).

Table 3. Association Between the Clinical Variables and the Post test Level of BMI in Control Group of Overweight/Obese School Children

| Demographic Variables | Components | Level of BMI | | | χ^2 | P value |
|---|---|--------------|-------|-------|----------|---------|
| | | Over weight | Obese | | | |
| History of gestational diabetes | Yes | 2 | 3 | 0.498 | 0.480 | |
| | No | 70 | 51 | | | |
| Nature of Conception | Natural Method | 1 | 2 | 0.450 | 0.502 | |
| | Assisted Method | 71 | 52 | | | |
| Gestational age at birth of the child | Full term | 65 | 48 | 0.716 | 0.699 | |
| | Pre term | 6 | 4 | | | |
| | Post term | 1 | 2 | | | |
| Birth Weight of the child | Low birth weight (below 2.5kg) | 10 | 7 | 0.764 | 0.682 | |
| | Normal (2.5-3.5kg) | 61 | 47 | | | |
| | Increased birth weight (more than 3.5 kg) | 1 | 0 | | | |
| Breast feeding history for the first six months | Breast fed | 28 | 15 | 0.039 | 0.980 | |
| | Bottle fed | 13 | 3 | | | |
| | Both | 31 | 36 | | | |
| Dietary preferences | Vegetarian | 8 | 2 | 0.154 | 0.925 | |
| | Non vegetarian | 62 | 48 | | | |
| | Eggetarian (take egg along with vegetarian) | 2 | 4 | | | |

The results demonstrate that within the control group of overweight and obese students, there was no statistically significant correlation between the clinical factors and their posttest BMI.

Table 4: Association Between the Demographic Variables and the Post test Level of BMI in Study Group of Overweight/Obese School Children (124)

| Demographic Variables | Components | Level of BMI | | | χ^2 | p value |
|-------------------------------------|---|--------------|-------------|-------|----------|---------|
| | | Normal | Over weight | Obese | | |
| Age of the child in completed years | 11 years | 4 | 4 | 0 | 0.295 | 0.999 |
| | 12 years | 13 | 9 | 0 | | |
| | 13 years | 14 | 24 | 1 | | |
| | 14 years | 17 | 39 | 0 | | |
| Gender | Female | 32 | 47 | 0 | 3.438 | 0.179 |
| | Male | 14 | 30 | 1 | | |
| Religion | Christian | 8 | 6 | 1 | 0.020 | 0.999 |
| | Hindu | 39 | 65 | 0 | | |
| | Muslim | 0 | 5 | 0 | | |
| Area of living | Urban | 45 | 70 | 1 | 0.849 | 0.654 |
| | Rural | 5 | 1 | 0 | | |
| Birth order of the child | 1 st | 27 | 32 | 1 | 5.797 | 0.214 |
| | 2 nd | 22 | 35 | 0 | | |
| | 3 rd | 0 | 7 | 0 | | |
| | None | 4 | 7 | 1 | | |
| Number of siblings | 1 | 48 | 57 | 0 | 0.006 | 0.999 |
| | 2 | 0 | 7 | 0 | | |
| Type of family | Nuclear | 35 | 57 | 1 | 0.889 | 0.641 |
| | Joint | 13 | 18 | 0 | | |
| Parenting Style | Parents with strict rules and high expectations | 14 | 29 | 1 | 0.879 | 0.989 |
| | Parents are responsive not demanding | 19 | 29 | 0 | | |
| | Parents are demanding not responsive | 9 | 15 | 0 | | |
| | Parents with no due care | 2 | 6 | 0 | | |

Results from the posttest BMI level among the overweight and obese students in the research group were not significantly correlated with any of the demographic characteristics.

Table 5: Association Between the Parental Variables and the Post test Level of BMI in Study Group of Overweight/Obese School Children (126)

| Demographic Variables | Components | Level of BMI | | | χ^2 | p value |
|-----------------------|------------------------|--------------|-------------|-------|----------|---------|
| | | Normal | Over weight | Obese | | |
| Education of Father | School level | 2 | 3 | 0 | 0.983 | 0.986 |
| | Diploma level | 1 | 2 | 0 | | |
| | Under graduate | 30 | 43 | 1 | | |
| | Post graduate | 15 | 27 | 0 | | |
| Education of Mother | School level | 5 | 6 | 0 | 0.978 | 0.986 |
| | Diploma level | 3 | 3 | 0 | | |
| | Under graduate | 32 | 55 | 1 | | |
| | Post graduate | 99 | 10 | 0 | | |
| Occupation of father | Business/self employed | 18 | 21 | 0 | 0.261 | 0.999 |
| | Service in government | 7 | 13 | 1 | | |
| | Service in private | 14 | 31 | 0 | | |
| | Agriculture | 9 | 10 | 0 | | |
| Occupation of Mother | Home Maker | 32 | 50 | 0 | 0.100 | 0.999 |
| | Service in government | 10 | 8 | 0 | | |
| | Service in Private | 5 | 11 | 1 | | |
| | Self employed | 1 | 6 | 0 | | |
| Monthly income | Rs.10,000-20,000/- | 0 | 0 | 0 | 0.030 | 0.999 |
| | Rs.20000-30,000/- | 3 | 9 | 1 | | |
| | Rs.30000-40,000/- | 15 | 28 | 0 | | |
| | Rs.40000/- and above | 26 | 42 | 0 | | |

Among the research group's overweight and obese schoolchildren, this table shows that no significant connection existed between the parental factors and the posttest level of body mass index (BMI).

CONCLUSION

Parental factors in this research include father's education level, mother's education level, father's occupation, mother's occupation, and family income on a monthly basis. The study's clinical variables include a range of factors, including dietary preferences, history of breastfeeding, gestational age, nature of conception, birth weight, and history of gestational diabetes.

variables including physical activity, sedentary behavior, diet, eating habits, environmental variables, familial factors, and psychological factors were identified using a structured questionnaire as contributing to overweight and obesity. The structured questionnaire was used to evaluate parental knowledge. The article provides broad information on obesity and overweight, including causes, effects, and ways to reduce the condition by changes in food and lifestyle. A structured practice questionnaire was used to evaluate the lifestyle practices of children who were overweight or obese. This questionnaire included topics such as food, sleeping, eating habits, exercise, and other everyday activities.

The children's eating habits were tracked for a week using a food diary. A clear picture of a child's eating habits may be gleaned by observing their food intake for a week and conducting a seven-day diet assessment. If you keep track of your child's food intake in a food diary, you may compare their daily calorie, protein, and fat intake to the recommended daily allowance. The directions for filling up the diary were included in the tool.

The study found that school-based treatments successfully reduced the body mass index (BMI) of overweight and obese students. Involvement of parents in school-based health promotion programs encourages children to maintain their active lifestyles, which in turn reduces the incidence of obesity. The kids have a great time and do well in the group program. In addition, we should encourage youngsters to be active and discourage them from being too sedentary. Dietary tastes are strongly influenced by family, thus it's crucial for parents to provide a good example for their children. Identifying risk variables to adjust and affect energy intake and expenditure is crucial in an era of rapid environmental change.

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