

Relationship Between Eating Behavior and Body Mass Index in Children of Age 8 To 12 Years: A Correlational Study

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ABSTRACT

Background: Childhood obesity is a growing concern, with eating behaviors playing a key role in body weight regulation. Children aged 8 to 10 years are at a critical stage in developing eating habits that can affect their Body Mass Index (BMI). This study aims to explore the relationship between eating behaviors, such as meal patterns and food preferences, and BMI in children of this age group, providing insights for obesity prevention and healthier lifestyle interventions.

Study Design: A Correlational study.

Aim: -To identify the relationship between eating behaviour and body mass index in children aged 8-12 years.

Objectives of the study:

- To evaluate the Body Mass Index of the children of age 8 to 12 years.
- To assess the eating Behaviour (food approaching and food avoiding behaviour) of the children of age 8 to 12 years.
- To find the association between Body Mass Index and food approaching behaviour of the children of age 8 to 12 years.
- To find the association between Body Mass Index and food avoiding behaviour of the children of age 8 to 12 years.

Participants: The study included children aged 8 to 12 years, both male and female. The sample consisted of 91 children, selected through convenience sampling.

Method: Children's BMI was calculated by measuring their weight and height. BMI was determined using the formula: $BMI = \text{weight (in kgs)} / \text{height}^2 (\text{in metres})$. The Child eating Behaviour Questionnaire was used to assess two key aspects of eating behaviour: food-approaching and food-avoiding. A Kendall's tau-b correlation analysis was used to explore the relationship between BMI and these two eating behaviours.

Result: The study found a moderate positive correlation of 0.539 between BMI and food-approaching behaviour, with a significance level of less than 0.001. This suggests that children with higher BMI scores are more likely to engage in food-approaching behaviours. In contrast, the correlation between BMI and food-avoiding behaviours was -0.507, indicating a moderate negative correlation. This suggests that children with lower BMI tend to exhibit food-avoiding behaviours. Both correlations were statistically significant with a p-value less than 0.001.

Conclusion: This study demonstrates a positive correlation between BMI and food-approaching behaviour, and a negative correlation with food-avoiding behaviour in children aged 8 to 12 years. These findings emphasize the need for targeted interventions that encourage healthier eating habits and address the factors contributing to obesity in children.

Key words: CEBQ, Children eating behaviour questionnaire, BMI, Body Mass Index, Food approaching eating behaviour, Food avoiding eating behaviour.

INTRODUCTION

Obesity refers to the abnormal build-up of body fat due to a positive energy balance, which occurs when the energy (calories) consumed through food and drinks exceeds the energy expended by the body during metabolism and physical activity. This excess energy is stored as fat, leading to obesity over time¹. Cultural elements like food attitudes and dietary customs are evolving, which eventually affect the impact of eating behaviors². School-age children's rapid changes in body mass index may be caused by their eating habits¹. Therefore, determining the specific contributions of various food types and eating patterns will help in developing methods to address the obesity and overweight seen in the school-age population³. Establishing healthy eating habits in childhood is essential, as these habits affect health later in life⁴. Adolescence is the time to preserve healthy eating habits that have been formed in childhood, and children should be taught enough about good food choices and eating habits from an early age. There is not enough information about children's eating habits in India, and there is little information about the different types of food that children eat in relation to the food pyramid, which defines and identifies a child's balanced diet and associated nutritional status⁵. A significant public health concern in recent decades has been the sharp rise in the frequency of childhood overweight and obesity on a global scale. Early childhood intervention is crucial to addressing this public health issue since childhood obesity is a substantial predictor of adult obesity⁴. Unhealthy eating habits, such as consuming high-fat foods, overeating, and eating while watching TV, are risk factors for obesity. Identifying poor eating habits early and implementing timely interventions can help prevent related diseases^{5, 6}.

Adolescence shapes healthy dietary and lifestyle patterns that last a lifetime and are essential for maintaining, promoting, and safeguarding health. Research on parental feeding styles may help reduce paediatric obesity rates, as ages 8 to 12 are critical for developing lifelong healthy eating habits⁷. A healthy diet during childhood and adolescence is crucial for healthy growth and development and can help avoid health issues like osteoporosis, obesity, dental cavities, and iron deficiency⁸.

Understanding the relationship between eating behaviour and body mass index (BMI) in children aged 8 to 12 years is crucial for addressing the growing concern of childhood obesity and related health issues. This period is critical as children develop habits and preferences that can influence their long-term health. Research indicates that various factors, including parental influence, socio-economic status, and psychological aspects, play significant roles in shaping children's eating behaviours. By examining the eating behaviours in relation to BMI, studies can identify key patterns and potential interventions to promote healthier lifestyles. This exploration aims to shed light on the complexities of eating behaviour and its impact on BMI, providing a foundation for effective strategies to combat childhood obesity and promote overall well-being among young children.

METHODOLOGY

This study was reviewed, discussed, and approved by the relevant ethical committee. A total of 91 participants were recruited from the community areas of Central Delhi as per the inclusion and exclusion criteria. Prior to participation, the purpose and details of the study were explained to the participants and their guardians. Written consent was obtained from the parents or legal guardians of the children. As per the inclusion criteria, children aged between 8 and 12 years were included in the study. The study focused on Indian school-going children, both male and female, who resided in urban areas of Central Delhi. According to the exclusion criteria, children diagnosed with any eating disorders, metabolic disorders, or psychiatric disorders were excluded from the study. Additionally, children with a family history of obesity or those outside the age range of 8 to 12 years were not considered eligible for participation.

Outcome Measure:

The Child Eating Behaviour Questionnaire (CEBQ): It is an 8-subscale, 35-item parent-report questionnaire assessing children's eating styles.

The reliability of the questionnaire is high, with values close to 1, an average of 0.66, and good internal consistency (Cronbach's alpha values above 0.7), establishing a high level of reliability between the items in each scale. Its reliability and validity are considered acceptable⁹.

Body Mass Index (BMI):

Body Mass Index (BMI) is a measure that uses a person's weight and height to estimate body fat. It is calculated using the formula:

$$\text{BMI} = \text{weight (in kgs)} / \text{height}^2 (\text{in metres})^1.$$

DATA COLLECTION

Data for this study were collected from 91 children aged 8-12 years, who were selected from the community of Patel Nagar in Central Delhi. Informed consent was obtained from the parents or guardians of each child prior to participation. This study mainly focused on two key aspects: BMI and eating behaviors. BMI was calculated by measuring the children's height and weight, using the formula:

$\text{BMI} = \text{weight (in kgs)} / \text{height}^2 (\text{in metres})$. Eating behaviors were assessed using the Children's Eating Behavior Questionnaire, which evaluates food-approaching and food-avoiding behaviors.

DATA ANALYSIS

After completing the evaluations, the data were collected and entered into a master chart. Data analysis was conducted using Kendall's tau-b correlation coefficient to assess the relationship between BMI and eating behaviors (food-approaching and food-avoiding).

RESULT

The study examined the relationship between Body Mass Index (BMI) and eating behaviour (food-approaching and food-avoiding behaviours). Kendall's tau-b correlation analysis revealed that BMI was positively correlated with food-approaching behaviour ($r = 0.539$, $p < 0.001$) and negatively correlated with food-avoiding behaviour ($r = -0.507$, $p < 0.001$). These findings suggest that children with higher BMI are more likely to engage in food-approaching behaviours, while children with lower BMI tend to avoid food more frequently.

Descriptive statistics indicated that BMI had the highest variance (3.71), showing greater variability, while food-approaching and food-avoiding behaviours exhibited lower variances (0.13 and 0.057, respectively). These results highlight the significant relationship between eating behaviours and BMI in children aged 8-12, emphasizing the importance of addressing eating behaviours to prevent obesity.

Figure.1. Kendall's tau-b Correlation Between Body Mass Index (BMI) and Food Approaching Eating Behavior

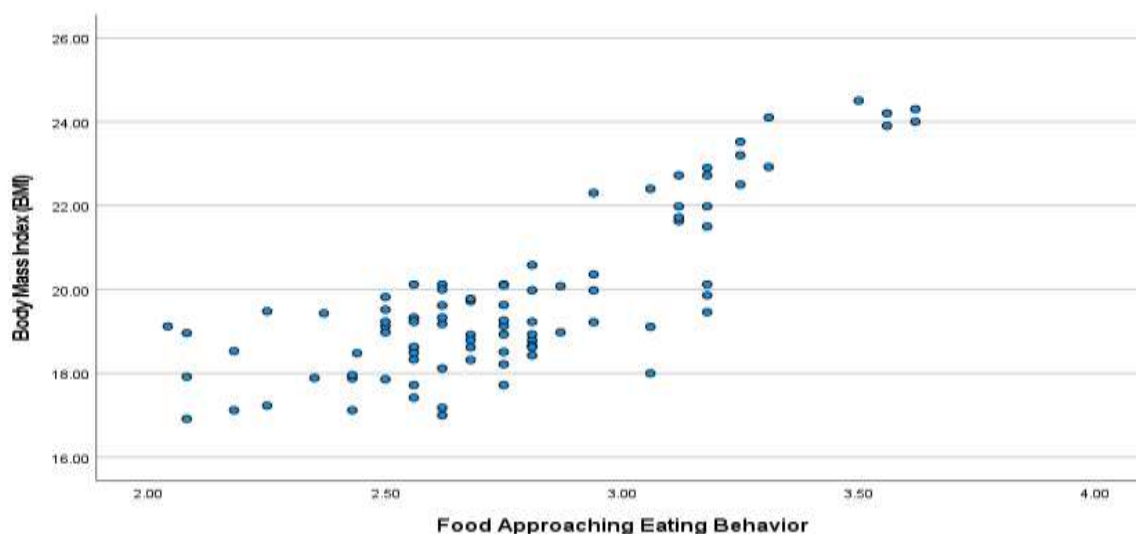
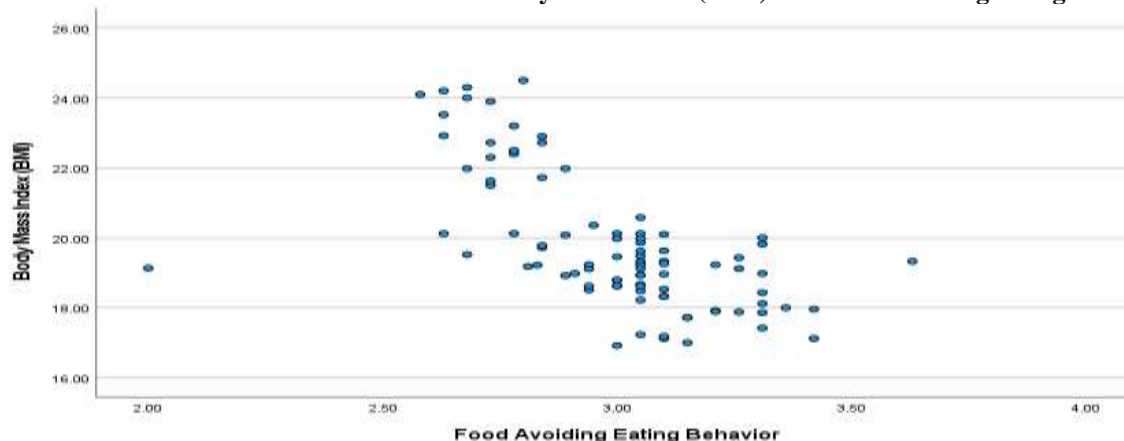


Figure.2. Kendall's tau-b Correlation Between Body Mass Index (BMI) and Food Avoiding eating Behavior



DISCUSSION

This research investigates the connection between eating habits and BMI in children aged 8 to 12 years, revealing significant links between both food-seeking and food-avoiding behaviours with BMI. The positive relationship identified between food-seeking behaviour and BMI indicates that children with higher BMIs tend to partake in actions that encourage food consumption, such as eating larger portions or dining more frequently. In contrast, the negative relationship between food-avoiding behaviour and BMI suggests that children with lower BMIs are more inclined to shun food, implying a potential lack of appetite or interest that might lead to lower weight or challenges in achieving and maintaining a healthy body weight.

These results align with recent research emphasizing the intricate relationship between eating habits and childhood obesity. For instance, a study by Giannotti et al. (2023) demonstrated that both food-seeking and food-avoiding behaviours are robust predictors of BMI in children, with those showing food-seeking tendencies generally having higher BMI values. Similarly, In study (2016), children's eating behaviour scores and BMI. BMI z-ratings have been positively associated with food approaching 'enjoyment of food', 'emotional overeating', 'food responsiveness' and 'desire for drinks' rankings ($P < 0.0001$). In comparison, food-avoidant 'satiety responsiveness', 'slowness in consuming' and 'meals-fussiness' scores had been negatively associated with BMI z-scores ($P < 0.0001$)⁽¹³⁾.

In look at (2011), association between consuming conduct scores and weight problems in Chilean children. eating conduct rankings were calculated the use of the kid ingesting behaviour Questionnaire (CEBQ), consequences display that the ingesting conduct rankings had been strongly related to formative years obesity in Chilean children. adolescence weight problems changed into immediately related to high rankings inside the subscales "entertainment of meals" ($P < 0.0001$), "emotional overeating" ($P < 0.001$) and "meals responsiveness" ($P < 0.0001$). food-avoidant subscales "satiety responsiveness" and "slowness in ingesting" had been inversely associated with early life weight problems ($P < 0.001$)⁽¹⁴⁾.

In examine (2009), eating behaviour and weight in youngsters. frame mass index (BMI) scores were used to categorize participants into underweight, healthy weight, obese and obese agencies, eating behaviour tendencies had been assessed with the child ingesting Behaviour Questionnaire (CEBQ), finished by the dad and mom on behalf in their baby. Satiety Responsiveness/Slowness in ingesting and meals Fussiness confirmed a graded negative affiliation with weight, whereas meals Responsiveness, enjoyment of food, Emotional Overeating and choice to Drink had been positively associated.⁽¹⁵⁾

In previous examine (2008), children's ingesting Behaviour Questionnaire: institutions with BMI in Portuguese youngsters there had been extraordinarily widespread superb associations between all 'meals approach' CEBQ sub-scales and BMI z-rating, extensive poor institutions with BMI z-score were also determined for all 'food avoidant' sub-scales⁽¹⁶⁾,research conducted by Zeller et al. (2023) pointed out that children exhibiting food-avoiding behaviours are often at risk for being underweight or having low BMI, and interventions aimed at modifying eating behaviours can play a significant role in weight management. The outcomes of this study highlight the necessity of grasping the influence of eating behaviours on childhood obesity and undernutrition. Given that food-seeking behaviour is positively correlated with BMI, strategies focused on moderating this behaviour might be effective in preventing childhood obesity. Alternatively, addressing food-avoiding behaviours could be vital in avoiding undernutrition and promoting healthy growth and weight gain, especially for children with reduced BMI levels.

Supporting these observations, a recent systematic review by Rosen et al. (2024) indicates that programs aimed at modifying children's eating behaviours—particularly those that help balance food-seeking and food-avoiding tendencies—could be fundamental in curbing childhood obesity and fostering better eating practices. Such strategies might encompass behavioural therapy, family-oriented nutrition counselling, and school-based initiatives that concentrate on fostering healthy eating habits and positive attitudes toward food¹⁰.

CONCLUSION

This study concluded the relationships between BMI and eating behaviours in children aged 8 to 12 years. It shows a positive correlation between BMI and Food Approaching Behaviour, and a negative correlation with Food Avoiding Behaviour. These findings emphasize the need for targeted interventions to promote healthier eating habits and prevent obesity.

LIMITATION

1. Children's BMI was not tracked over time, so we cannot conclude whether the eating styles assessed by the CEBQ were consequences of weight status.
2. The study did not include data on other variables that might affect children's eating behavior, such as the family environment and parental characteristics.

FUTURE RECOMMENDATION

1. More of this type of study is required in different populations.
2. Increased number of participants for better co-relation between eating behaviors and BMI of the age group studied.
3. Other variable need to be including that can affect BMI.

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