

# Knowledge, Attitude and Practice among Mothers towards Childhood Obesity: A Cross-sectional Study

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## ABSTRACT

**Introduction:** Obesity is on the increasing trend among children, which leads to many co-morbidities. Obesity which was once a health problem of developed countries has now swept developing countries like India. As the home environment has a powerful influence on the health of a child it is very essential to intervene early in childhood and adolescence to prevent obesity/overweight.

**Aim:** To assess the Knowledge, Attitude and Practice (KAP) among mothers regarding obesity in children.

**Materials and Methods:** This was a cross-sectional descriptive study conducted from October 2019 to March 2020. The sample size included 220 mothers with children aged between 6 to 14 years, who have attended the Paediatric Outpatient Department, Sree Balaji Medical College and Hospital in Tamil Nadu, India. After obtaining ethical clearance from the Institutional Ethics Committee, a predesigned questionnaire was used to collect the socio-demographic variables which included mother's education and occupation, residence, family income, and the total number of family members, and

for assessing KAP among mothers. Statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS, version 22.0).

**Results:** The prevalence of childhood overweight and obesity was 52 (23.63%), with overweight representing 23 (10.45%) and obesity 29 (13.18%). There was a statistical significance difference when comparing mother's knowledge of children with overweight/obesity versus normal weight regarding physical inactivity ( $p=0.01$ ) and eating unhealthy foods ( $p=0.01$ ), an attitude that a child being obese was not a problem ( $p=0.03$ ), the practice of mothers who allowed seeing television while eating ( $p=0.001$ ), not restricting media usage ( $p=0.01$ ), not allowing children to play outdoors every day ( $p=0.001$ ), and allowed children to eat junk foods ( $p=0.001$ ).

**Conclusion:** Overweight and obesity were significant in children whose mothers were unaware of the risk factors like eating unhealthy foods and physical inactivity. Health education and interventional programs have to be planned to educate mothers as they play a major role in preventing obesity in children.

**Keywords:** Awareness, Children, Health education, Prevention, Risk factors

## INTRODUCTION

The childhood obesity epidemic is becoming a major concern all over the world because of its significant impact on physical and psychosocial health [1]. According to the World Health Organisation (WHO;2021), childhood obesity which was once considered as the health problem of high-income countries is now showing an upward trend in low and middle-income countries, especially in urban settings. The WHO has estimated that the prevalence of obesity and overweight has risen irrespective of sex, from just 4% in 1975 to over 18% in 2016 among children and adolescents aged 5-19 years. A basic explanation of obesity and overweight in children is due to an energy imbalance between calorie consumption and expenditure, which is related to environmental and societal changes affecting the children's dietary and physical activity patterns [2].

Childhood obesity leads to several co-morbidities that can have both short and long-term complications. Obesity can cause breathing difficulties, obstructive sleep apnea, asthma, musculoskeletal problems, insulin resistance, hypertension, and psychological issues in children [3]. Many of these childhood obesity-related problems can be tracked into adulthood and they will lead to a higher risk of type 2 diabetes, heart disease, and middle-age mortality [4]. As the child's dietary habits, physical activity, the accessibility and availability of foods, and food-related processes are under parental control, it is easy to understand that their influence is a key risk factor for childhood weight gain and obesity. As the parents provide the contextual environment, addressing them is of prime importance and also it is not easy to reverse childhood obesity only through

individual interventions [5]. Primary prevention might play a major role in reducing the prevalence of obesity and overweight if started in early childhood with parental involvement [6].

There are many studies that have estimated the prevalence of obesity and overweight in children but only a few studies could be traced in the literature that assessed KAP of mothers towards childhood obesity. This study throws light on the potential risk factors for childhood obesity and provides useful information for curbing this emerging epidemic in children. Health education to mothers plays a vital role in preventing childhood obesity [7]. This study was carried out with the main aim of assessing KAP of mothers regarding childhood obesity. The data obtained may be useful in developing programs for childhood obesity prevention.

## MATERIALS AND METHODS

A cross-sectional descriptive study was done over a period of six months (from October 2019 to March 2020), among mothers with children aged between 6 to 14 years, at Sree Balaji Medical College and Hospital in Chennai, Tamil Nadu, India. Ethical clearance was obtained from the Institutional Ethics Committee (IEC) (002/SBMC/IHEC/2019/1261). After obtaining the informed consent, the subjects answered the sheets containing the restructured and predesigned questionnaire which was framed in two languages, English and Tamil. The volunteers interviewed the illiterate mothers and their responses were filled up in the questionnaire.

**Inclusion criteria:** Mothers who gave consent and were able to understand English or Tamil were included in the study.

**Exclusion criteria:** Mothers of children who were on steroid treatment, undergoing treatment for chronic diseases, syndromic children, children with congenital anomalies, mothers who do not understand Tamil or English, and who did not consent to participate were excluded from this study.

**Sample size calculation:** The sample size was estimated as 220, which was calculated with an estimated prevalence of overweight and obesity among school-going adolescents of 27.8% [8], an allowable error of 7%. A total of 220 mothers attending the Paediatrics Outpatient Department were randomly selected.

**Study questionnaire:** The questionnaire had five sections and it was derived from the previous literature [9-11].

**Section 1:** Information was obtained on their socio-demographic variables which included the mother's age, education and occupation, residence, family income, the total number of family members, age, and sex of the child. Modified BG Prasad scale 2020, was used to classify the socioeconomic status of participants, which included five classes namely class I with per capita income Rs. 7533 and above, class II with per capita income Rs. 3766-7532, class III with per capita income Rs. 2260-3765, class IV with per capita income Rs. 1130-2259, class V with per capita income Rs. 1129 and below [12].

**Section 2:** This section included the height, weight, and Body Mass Index (BMI) of the children. The height of the children was measured using a stadiometer and weight was measured using an electronic weighing scale. The BMI was calculated as weight (in kilograms) divided by height (in meter square). The BMI number was plotted on the Revised Indian Academy of Paediatrics (IAP) growth charts for 5-18 years Indian children and the adult equivalent of 23 cut-off lines was used for defining overweight and for obesity the adult equivalent of 27 cut-off lines was used [13].

**Section 3:** This part included three questions regarding the knowledge of mothers towards childhood obesity. The questions discussed the causes and complications of childhood obesity. The answers were set as 'yes' or 'no'.

**Section 4:** This part included four questions for assessing the attitude of mothers towards childhood obesity. The questions used for assessing were, "An obese child is perceived as healthy, Being obese is not a problem to children, Obese children should be brought to seek doctor's advice, Parents play a major role in preventing childhood obesity by promoting healthy lifestyles" and the responses were recorded as 'agree' or 'disagree'.

**Section 5:** This part included five questions about the practice of mothers towards children like "Allowing children to eat seeing television programs, restricting television/video game/computer/media time to 1-2 hours/day, allowing your children to play outdoors every day, allowing your children to eat junk foods (chocolates/cakes/soft-drink/chips) daily, encouraging children to eat fresh fruits and vegetables daily." The answers were given as 'yes' or 'no'.

A pilot study with 25 participants was conducted and those participants were not included in the main study. It was done to validate the questionnaire and the content was checked by the experts in our department and university. Face validity was established by giving the questionnaire to 10 mothers.

## STATISTICAL ANALYSIS

Demographic variables in categorical/dichotomous were presented in frequencies with their percentages. Association between demographic variables and KAP was analysed using chi-square test and odds ratio was given with 95% confidence interval. Statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS, version 22.0). A p-value of <0.05 was considered statistically significant.

## RESULTS

**Socio-demographic characteristics:** In the present study, the prevalence of obesity/overweight in children was 52 (23.63%) with obesity representing 29 (13.18%) and overweight 23 (10.45%). The mean age of children of study participants was 9.56±2.61 years and obesity/overweight was statistically significant in the 11 to 14 years age group (p=0.04). Among the 220 mothers who participated in this study, 143 (65%) of them were housewives and 77 (35%) of them were working. There was no significant association between mother's occupation and obesity/overweight in children (p=0.09). Regarding education, 6 (2.73%) were illiterate, 69 (31.36%) had education until high school and 145 (65.91%) have completed a degree and there was no statistical significance (p=0.21). The majority of the participants were from urban settings 173 (78.64%) and overweight/obesity was statistically significant in the urban population when compared to the rural population (46 (26.59%) versus 6 (12.77%), p=0.04, respectively). According to the BG Prasad scale, 2020 socio-economic was divided into five classes and the majority 101 (45.91%) belonged to class I, and obesity/overweight was statistically significant (p=0.03) in class I group of the population when compared to other classes. The above results are summarised in [Table/Fig-1].

| Demographic variables                                       | Nutritional status   |                               | p-value* |
|---|----------------------|-------------------------------|----------|
|   | Normal n (%) (n=168) | Overweight/Obese n (%) (n=52) |          |
| <b>Mother's occupation</b>                                  |                      |                               |          |
| Housewife   | 104 (72.73)          | 39 (27.27)                    | 0.09     |
| Working   | 64 (83.12)           | 13 (16.88)                    |          |
| <b>Mothers education</b>                                    |                      |                               |          |
| Illiterate  | 4 (66.67)            | 2 (33.33)                     | 0.21     |
| School-level  | 48 (69.57)           | 21 (30.43)                    |          |
| College-level   | 116 (80.00)          | 29 (20.00)                    |          |
| <b>Residence</b>  |                      |                               |          |
| Rural   | 41 (87.23)           | 6 (12.77)                     | 0.04*    |
| Urban   | 127 (73.41)          | 46 (26.59)                    |          |
| <b>Socioeconomic status (Modified BG Prasad scale 2020)</b> |                      |                               |          |
| Class I   | 67 (39.9)            | 34 (65.38)                    | 0.03*    |
| Class II  | 45 (26.8)            | 10 (19.23)                    |          |
| Class III   | 33 (19.6)            | 5 (9.62)                      |          |
| Class IV  | 17 (10.1)            | 2 (3.85)                      |          |
| Class V   | 6 (3.6)              | 1 (1.92)                      |          |
| <b>Child age (years)</b>                                    |                      |                               |          |
| 6-10  | 92 (82.14)           | 20 (17.86)                    | 0.04*    |
| 11-14   | 76 (70.37)           | 32 (29.63)                    |          |
| <b>Sex of child</b>   |                      |                               |          |
| Male  | 74 (80.43)           | 18 (19.57)                    | 0.23     |
| Female  | 94 (73.44)           | 34 (26.56)                    |          |

**[Table/Fig-1]:** Socio-demographic characteristics and obesity/overweight in children. \*A p-value of <0.05 was considered statistically significant

**Knowledge of mothers towards childhood obesity:** The complications of obesity were known to 115 (52.27%) of participants and 105 (47.72%) were unaware of the complications of obesity and this was not statistically significant (p=0.95). The majority of mothers 173 (78.63%) had knowledge that physical inactivity leads to obesity in children and this was statistically significant (p=0.01). The knowledge of mothers regarding childhood obesity caused by eating unhealthy foods was statistically significant (p=0.01). The children of mothers who were unaware that physical inactivity and eating unhealthy foods could lead to obesity have a high risk for obesity, with an odds ratio (95% confidence interval ) of 2.88 (1.44-5.76) and 3.07 (1.40-6.72),

respectively. The knowledge of mothers towards childhood obesity is shown in [Table/Fig-2].

| Knowledge  | Nutritional status |                         | Odds ratio (95% CI) | Chi-square test             |
|--|--------------------|-------------------------|---------------------|-----------------------------|
|  | Normal (n=168)     | Overweight/Obese (n=52) |                     |                             |
|  | n (%)              | n (%)                   |                     |                             |
| 1) Do you know the complications of childhood obesity (diabetes/hypertension)?     |                    |                         |                     |                             |
| Yes  | 88 (76.52)         | 27 (23.48)              | 1.01 (0.55-1.90)    | $\chi^2=0.01$<br>$p=0.95$   |
| No   | 80 (76.19)         | 25 (23.81)              |                     |                             |
| 2) Do you think physical inactivity in children can lead to obesity?               |                    |                         |                     |                             |
| Yes  | 140 (80.92)        | 33 (19.08)              | 2.88 (1.44-5.76)    | $\chi^2=9.33$<br>$p=0.01^*$ |
| No   | 28 (75.68)         | 19 (24.32)              |                     |                             |
| 3) Do you think eating unhealthy foods (junk foods) can cause obesity in children? |                    |                         |                     |                             |
| Yes  | 150 (79.79)        | 38 (20.21)              | 3.07 (1.40-6.72)    | $\chi^2=8.39$<br>$p=0.01^*$ |
| No   | 18 (56.25)         | 14 (43.75)              |                     |                             |

**[Table/Fig-2]:** Knowledge of mothers towards childhood obesity.

\*A p-value of <0.05 was considered statistically significant. Chi-square test was used to find the association between the variables

**Attitude of mother towards childhood obesity:** Only 40 (18.18%) of mothers agreed that an obese child is healthy, the remaining participants disagreed with this attitude and this was not statistically significant ( $p=0.82$ ). Around 41 (18.64%) participants had an attitude that a child being obese is not a problem, but 179 (81.36%) of participants disagreed with this attitude and this was statistically significant ( $p=0.03$ ). The attitude of the participants who agreed that obese children should seek doctor's advice 185 (84.09%) was statistically significant ( $p=0.01$ ). Most of the participants 214 (97.27%) agreed to the attitude that parents play a major role in preventing obesity, and only 6 (2.72%) of participants disagreed with this attitude; this was not statistically significant ( $p=0.16$ ). The children of mothers who do not consider obesity as a problem and who did not find it necessary for an obese child to seek medical advice have a high risk of becoming overweight/obese (odds ratio (95% confidence interval) 2.21 (1.07-4.60) and 2.58 (1.20-5.53) respectively). [Table/Fig-3] represents the attitude of mothers towards childhood obesity.

| Attitude   | Nutritional status |                         | Odds ratio (95% CI) | Chi-square test             |
|--|--------------------|-------------------------|---------------------|-----------------------------|
|  | Normal (n=168)     | Overweight/Obese (n=52) |                     |                             |
|  | n (%)              | n (%)                   |                     |                             |
| 1) An obese child is perceived as healthy.   |                    |                         |                     |                             |
| Disagree   | 138 (76.67)        | 42 (23.33)              | 1.09 (0.49-2.42)    | $\chi^2=0.05$<br>$p=0.82$   |
| Agree  | 30 (75.00)         | 10 (25.00)              |                     |                             |
| 2) Being obese is not a problem to children.   |                    |                         |                     |                             |
| Disagree   | 142 (79.33)        | 37 (20.67)              | 2.21 (1.07-4.60)    | $\chi^2=4.68$<br>$p=0.03^*$ |
| Agree  | 26 (63.41)         | 15 (36.59)              |                     |                             |
| 3) Obese children should be brought to seek doctors advice                                     |                    |                         |                     |                             |
| Agree  | 147 (79.46)        | 38 (20.54)              | 2.58 (1.20-5.53)    | $\chi^2=6.17$<br>$p=0.01^*$ |
| Disagree   | 21 (60.00)         | 14 (40.00)              |                     |                             |
| 4) Parents play a major role in preventing childhood obesity by promoting healthy life styles. |                    |                         |                     |                             |
| Agree  | 165 (77.10)        | 49 (22.90)              | 3.36 (0.65-17.21)   | $\chi^2=1.96$<br>$p=0.16$   |
| Disagree   | 3 (50.00)          | 3 (50.00)               |                     |                             |

**[Table/Fig-3]:** Attitude of mother towards childhood obesity.

\*A p-value of <0.05 was considered statistically significant. Chi-square test was used to find the association between the variables

**Practice of mothers towards childhood obesity:** Most of the mothers 145 (65.90%) did not allow their children to see TV programs while eating and 75 (3.09%) of mothers allowed their children to see TV programs and this practice was more prevalent

in the overweight/obese group and this was statistically significant ( $p=0.001$ ). The practice of mothers who restricted the use of media time in children to less than two hours per day 165 (75%) was statistically significant ( $p=0.01$ ). Also, the practice of mothers who allowed their children to play outdoors every day 188 (85.45%) and mothers who did not allow their children to eat junk foods daily 180 (81.81%) was statistically significant ( $p=0.001$ ). Although the majority of participants 205 (93.18%) encouraged their children to eat fruits and vegetables daily, this was not statistically significant ( $p=0.77$ ). Children who were allowed to eat while seeing TV programs and to eat junk foods daily have a high risk for being obese, Odds Ratio (95% confidence interval) 3.00 (1.58-5.70) and 3.51 (1.69-7.26), respectively. Also for children whose screen time was not restricted and who were not allowed to play outdoors every day, they have a higher risk of obesity, odds ratio 2.37 (1.21-4.64) and 3.60 (1.65-7.87) respectively. [Table/Fig-4] represents the practice of mothers towards childhood obesity.

| Practice   | Nutritional status |                         | Odds ratio (95% CI) | Chi-square test               |
|--|--------------------|-------------------------|---------------------|-------------------------------|
|  | Normal (n=168)     | Overweight/Obese (n=52) |                     |                               |
|  | n (%)              | n (%)                   |                     |                               |
| 1) Allow children to eat seeing television programs                                |                    |                         |                     |                               |
| No   | 121 (83.45)        | 24 (16.55)              | 3.00 (1.58-5.70)    | $\chi^2=11.83$<br>$p=0.001^*$ |
| Yes  | 47 (62.67)         | 28 (37.33)              |                     |                               |
| 2) Restrict television/video game/computer/media time to 1-2 hours/day             |                    |                         |                     |                               |
| Yes  | 133 (80.61)        | 32 (19.39)              | 2.37 (1.21-4.64)    | $\chi^2=6.58$<br>$p=0.01^*$   |
| No   | 35 (63.64)         | 20 (36.36)              |                     |                               |
| 3) Allow your children to play outdoor every day.                                  |                    |                         |                     |                               |
| Yes  | 151 (80.32)        | 37 (19.68)              | 3.60 (1.65-7.87)    | $\chi^2=11.20$<br>$p=0.001^*$ |
| No   | 17 (53.12)         | 15 (46.88)              |                     |                               |
| 4) Allow your children to eat junk foods (chocolates/cakes/soft drink/chips) daily |                    |                         |                     |                               |
| No   | 146 (81.11)        | 34 (18.89)              | 3.51 (1.69-7.26)    | $\chi^2=12.36$<br>$p=0.001^*$ |
| Yes  | 22 (55.00)         | 18 (45.00)              |                     |                               |
| 5) Encourage your children to eat fresh fruits and vegetables daily.               |                    |                         |                     |                               |
| Yes  | 157 (76.59)        | 48 (23.41)              | 1.19 (0.36-3.90)    | $\chi^2=0.08$<br>$p=0.77$     |
| No   | 11 (73.33)         | 4 (26.67)               |                     |                               |

**[Table/Fig-4]:** Practices of mothers towards childhood obesity.

\*A p-value of <0.05 was considered statistically significant. Chi-square test was used to find the association between the variables

## DISCUSSION

Several recommendations like improving the environment of the children where they live, implementing policies for making a healthy food environment, ensuring an accessible safe environment for promoting physical activity in children, easy access to the health facilities for obesity prevention and treatment services, have been proposed by the WHO Commission on Ending Childhood Obesity (2016) to halt the rapidly growing epidemic worldwide [14]. The present study analysed various risk factors causing childhood obesity by assessing the mother's KAP, as the deepest understanding of these factors are very essential to frame a prevention policy.

In this cross-sectional study, 29 (13.18%) of children were obese and 23 (10.45%) of children were overweight with a total overweight/obesity prevalence of 52 (23.63%). The prevalence of overweight increased from 9.7% before 2001 to 13.9% in studies reported after 2010 which shows an obvious increasing trend in overweight among children and adolescents in India [15]. Compared to other Indian studies, the prevalence of obesity and overweight has significantly increased in the present study. In this study, no association between obesity/overweight and demographic variables like the mother's age, education or

occupation, and also the gender of the children were observed. These findings were in accordance with those from the study conducted by Dasappa H et al., who reported a prevalence of 13.20% overweight and 17.13% obesity among the school children aged 6 to 13 years and there was no association between obesity/overweight and age, gender, parent's education, and family income [16].

The majority of the participants in the present study were from urban settings and obesity/overweight was statistically significantly higher in the urban population when compared to the rural population. According to the BG Prasad scale, 2020 socio-economic status was divided into five classes and the majority belonged to class I, and obesity/overweight was statistically significantly higher in the class I group of the population when compared to other classes. These results were in agreement with the study by Mahajan PB et al., [17]. Thus areas of residence and socio-economic conditions are important contributors to overweight and obesity in our population.

In the present study, authors assessed the mother's knowledge on complications of obesity, and half of the respondents knew about the consequences and complications of childhood obesity like diabetes, hypertension, and heart disease. Present study also found that majority of mothers had knowledge that risk factors, such as physical inactivity and eating unhealthy foods can lead to obesity. Mothers who were unaware of the influence of physical inactivity and eating unhealthy foods had children with a higher risk of obesity. According to a literature review about childhood obesity in North America, the three main factors causing obesity have been mentioned as genetics, overeating, and lack of exercise [18]. Tremblay MS and Wilms JD stated that physical activity in any form like organised sport or unorganised sport reduces the risk of children becoming overweight by 10-24% and obesity by 23-43% [19].

The majority of parents disagreed with the attitude that being obese is not a problem and that an obese child is healthy. Most of the participants agreed that obese children should seek doctors' advice and that parents play a major role in preventing obesity. These results are consistent with Hatta NK et al., which reported that the majority of the study respondents disagreed that obese children mean healthy and accepted that they will pursue physician advice if their children have an increased BMI [9]. This shows the participant's positive attitude towards obesity control.

The majority of the participants did not allow their children to see TV programs while eating, restricted the media time in children to less than two hours per day, did not allow their children to eat junk foods daily, and also encouraged their children to play outdoors every day. The study by Arluk SL et al., showed that children who have spent more hours of sedentary activity like watching computers and television greater than 2.3 hours and 2.8 hours per day respectively have a stronger association with obesity [20]. The results of the present study also emphasise that risk factors like children watching television while eating, and children spending more time on media have a high risk of being obese.

### Limitation(s)

Limitations of the present study include sample size and study design. This study included only participants from a geographically defined area who visited our department and hence the results of this study may not be representative of the entire state or country. As it was a cross-sectional study, it could study only the association but could not prove the cause. Despite these limitations, this study can be used to generate hypotheses for futuristic longitudinal and

experimental studies which could study and establish the causal relationship.

## CONCLUSION(S)

Childhood obesity prevention plans and programs should be strengthened by focusing on periodic screening of children and adolescents, namely assessing the body compositions, along with the health education of mothers regarding eating habits and physical activity. Non-communicable diseases in adult-like type 2 diabetes mellitus and cardiovascular diseases can be curbed by tracking obesity in children. This study emphasises the importance to create awareness among mothers regarding the importance of physical activity, healthy food habits, playing outdoor every day, restricting media time, not seeing television while eating, seeking doctor's advice, and considering obesity to be a problem. All these factors are considered important risk factors for overweight/obesity in children/adolescents.

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