A Cross-sectional Study on Assessment of Nutritional Status of Adolescents in Government High Schools of Kurnool City, Andhra Pradesh, India

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ABSTRACT

Background: Adolescents are an important resource of any country. Adolescence is the significant period of human growth and maturation.[1] Due to rapid acceleration of new growth and wide spread developmental changes, nutritional needs are also more during this period. However, inadequate diet and unfavorable environments in developing countries may adversely influence the nutrition and growth of adolescents. This poor nutrition in adolescents may lead to future adverse health outcomes.[1] The objective of this study is to evaluate the nutritional status among adolescents in the Kurnool city.

Materials and Methods: A cross-sectional study was carried out among 440 school children in the age group of 10–18 years from urban area of Kurnool city, Andhra Pradesh, from January 2020 to March 2020. The sampling method used was simple random sampling, the study was a pre-tested and semi-structured questionnaire. Data analysis was performed with the help of SPSS20 version.

Results: Mean age of the participants is 13.34±1.5 years. Underweight was found to be 79.3% and stunting was found in 59.3%. Education of the mother, occupation of the father, and increased family size had significant association with undernutrition. Type of family, birth order, education of the father, and occupation of the mother did not have significant association.

Key words: Adolescents, stunting, undernutrition

INTRODUCTION

The WHO defines adolescents between age group 10 and 19 years old. They are about 1.2 billion among world population (constituting 1/5th of world population) and 243 million in India. Adolescence refers to the developmental period between childhood and adult hood. Adolescence is the second most critical period after 1st year of life. It is a time of enormous physiological, cognitive psychological changes, mainly dependent on hormonal and environmental influences. About 25% of adult height and 50% of adult weight are mainly due to adolescent period. It is also time of increase in fat in girls, muscle mass in boys especially.

The demands of normal physical growth and maturation lead to increased need of nutrients and micro nutrients. This places extra nutritional demand on adolescents. The combination of energy demands and inadequate dietary intake will contribute to poor weight status of adolescents. In addition to this, adolescents suffer from a range of health problems such as poor nutritional status, substance abuse, and sexual behavior which often go unnoticed. Measurement of weight status is also not considered a priority in adolescence as it is in children.

Further, studies revealed that undernutrition during adolescence has more detrimental effects on the ability to learn, sexual maturity, and identified as a risk factor for underweight in adult hood. Furthermore, it increases the adult morbidity and mortality by leading to adverse health outcomes.

Hence, the present study was taken up to assess the nutritional status among adolescents.

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Aim and Objective of the Study

The objective of this study was to assess the nutritional status among adolescents.

METHODS

This cross-sectional study was carried out in three randomly selected government high schools in Kurnool city to assess the nutritional status of adolescents (boys and girls). Thereafter, by simple random sampling 440 students were selected from these schools. Sample size was calculated using formula $4pr/L^2$ and prevalence 48.75% was taken from previous study (Pal et al. study). The study was conducted from January 2020 to March 2020. Data collection was done by interview (pre-tested and semi-structured questionnaire) and examination. Informed consent was taken from the parents of all the participants who are willing and permission was taken from the school authorities for conduction of study.

Procedure Done in the Field

We sought permission from the school authorities for conducting the study. In our initial visit in each school, we got ourselves familiarized with the students, teachers, and authorities and explained the purpose of the study, children were asked to bring filled in consent form from their parents. Students were explained about the measures to stay healthy by having balanced diet, doing regular exercise, avoiding junk foods, and to participate in sports and games. Questionnaire was admitted and all the queries were explained in person while filling the form. After completion of the filling of questionnaire height and weight of the participant was recorded.

Statistical Analysis

Data entry and statistical analysis were performed with the help of Microsoft Excel 2016, SPSS 20. The Chi-square test was used as test of significance.

RESULTS

Table 1 shows that the majority of children are in the age group 13 years (22.2%) and minimum age is 10 years (1.8%) and maximum age is 18 years (0.7%). Mean age of the participants is 13.34±1.5 years. Out of 440 students, 247 were boys and 193 girls. More than half (58.6%) were Hindu. Nearly 3/4th are from nuclear families. Most (46.5%) of them belong to social Class III according to modified B.G. Prasad classification 2018. 3/4th of the students live in a family size of 4 members. Nearly two-third of the fathers are semiskilled workers and majority (91%) are having less than secondary level education. Nearly half of the mothers (47.3%) are illiterate and majority (94%) were daily wage laborers and homemakers.

BMI computed using the formula $\text{BMI} = \frac{\text{weight in kg}}{\text{height in m}^2}$. Nutritional status was assessed using the WHO Indian classification, $<18.5$ as underweight, $18.5–22.5$ as normal, $22.5–24.9$ as overweight, $>25$ as obese.

In the present study, majority (79.3%) of the study population were undernourished (Table 2).
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Stunting was computed using weight for height and weight for age, using Z score given by CDC NCNS standards.

In the present study, more than half (59.3%) of the study participants were stunted in growth (Table 3).

DISCUSSION

The present cross-sectional study was carried out during January to March 2020 among 440 school going children in three government schools of Kurnool city. In this study, nearly equal proportion of study population are taken from these three schools. In the present study, proportion of boys 56.1% was higher than girls 43.9%. Similar results were also observed by Kumawat et al. in Rajasthan\textsuperscript{[3]} 52.78% boys and 47.22% girls, Singh et al.\textsuperscript{[4]} study in Jhansi city 52.98% boys and 47.02% females. Under nutrition was found among 79% of the participants in the study. This finding is similar to studies conducted by Navaneethan et al.\textsuperscript{[5]} Mulugeta et al.\textsuperscript{[6]} and Nitish and Sen.\textsuperscript{[7]} Undernutrition is more prevalent in boys. This observation might be due to in equal proportion of boys and girls. In the present study, stunting was found among 59.3% of the participants, almost similar findings were reported by Nitish and Sen\textsuperscript{[7]} and Osei et al.\textsuperscript{[8]} Prevalence of underweight was found to be 49.5% in the study conducted by Neelu et al.\textsuperscript{[9]} the reason for the difference of having a lower prevalence compared to our study might be due to the difference in the geographical areas, in which the studies have been conducted.

Undernutrition was significantly higher in early adolescents than the late adolescents. $X^2 = 66.6, P < 0.001$ [Figure 1], similar findings reported by Pal et al.\textsuperscript{[2]} and Das et al.\textsuperscript{[10]}

| Table 2: Distribution of the study population according to BMI |
|-----------------|-------------|-------------|
| BMI             | Frequency   | %           |
| Undernutrition  | 349         | 79.3        |
| Normal          | 70          | 15.9        |
| Overweight      | 11          | 2.5         |
| Obese           | 10          | 2.3         |

BMI: Body mass index

![Figure 1: Age versus body mass index. $X^2=66.6, P<0.001$](image1)

Stunting was also significantly higher in early adolescents than late adolescents $X^2 = 25.6, P < 0.001$. Lower educational status

![Figure 2: Mothers education versus body mass index. $X^2=26.29, P<0.03$](image2)

![Figure 3: Fathers occupation versus body mass index: $X^2=22.6, P<0.03$](image3)

![Figure 4: Family size versus body mass index: $X^2=14.1, P<0.02$](image4)

![Figure 5: Socioeconomic status versus body mass index. $X^2=377.39, P<0.001$](image5)
of the mother [Figure 2], occupation of the father [Figure 3], increased family size [Figure 4], and low socioeconomic status have a significant association with undernutrition ($P < 0.001$) (Figure 5). Type of family, place of residence, occupation of the mother, religion, gender, and birth order not significantly associated ($P > 0.05$) with undernutrition and stunting.

CONCLUSION

The present study shows that undernutrition and stunting are highly prevalent among adolescents in urban areas belonging to low social class. There was a significant association between undernutrition and increased family size, low socioeconomic status, low level of literacy of the mother, and low occupational status of the father.

Recommendation

Adolescent health and nutrition is an important issue and their needs to be addressed carefully. Nutritional interventions are necessary to improve the nutritional status among the adolescents.

Better implementation of mid-day meal program is encouraged. Periodical awareness programs regarding health and nutrition should be conducted with emphasis on balanced diet, consumption of seasonally available food, and maintenance of good personal hygiene.

Limitation of our Study

Information regarding dietary patterns could not be studied.

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REFERENCES