

## A Comparative Study to Assess the Nutritional Status among Adolescent Girls at Selected Rural and Urban Schools of Bagalkot

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### Abstract

### Original Research Article

**Background:** Adolescence is a vital period for growth, and poor nutrition can adversely affect present and future health. Malnutrition and anaemia remain common among adolescent girls in both rural and urban settings. **Objectives:** To assess socio-demographic characteristics, determine factors affecting nutritional status, compare BMI and haemoglobin levels between rural and urban adolescent girls, and examine their association with selected variables. **Methods:** A descriptive survey was conducted among 400 adolescent girls (200 rural, 200 urban) studying in 8th and 9th standards in selected schools of Bagalkot District. Data were collected using structured questionnaires, biophysical measurements (BMI, haemoglobin), and a diet frequency chart. Data were analysed using descriptive and inferential statistics, including chi-square test. **Results:** Urban adolescents showed higher rates of binge eating (80%) and breakfast skipping (65%) compared to rural adolescents (50% and 30%). Mild anaemia was prevalent in both groups (47% rural; 53% urban). Undernutrition was higher in rural girls (42.5%) than urban (31.5%), while normal BMI was more common in urban participants. A significant association was found between BMI and area of residence ( $p = 0.036$ ), but not between breakfast skipping and haemoglobin ( $p = 0.471$ ). **Conclusion:** Rural–urban differences exist in dietary practices and nutritional status. Targeted interventions are needed to improve dietary habits and prevent malnutrition and anemia among adolescent girls.

**Keywords:** Adolescent girls, Nutritional status, BMI, Haemoglobin, Rural, Urban.

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## INTRODUCTION

Good nutrition is a basic need, a human right and fundamental to health and well-being at all ages and more so during adolescence. Undernutrition and overnutrition represent extreme outliers on the bell curve of adiposity. While high tendencies of impaired cognitive development, short stature, poor educational achievement, and lower immunity leading to higher morbidity and mortality are the adverse effects of under nutrition; adolescent obesity, on the other hand, is associated with serious health problems in adolescence and later adulthood, including a heightened risk of psychosocial morbidity, cardiovascular complications, type 1 and type 2 diabetes, premature death, and impaired social integration and stigmatization [1].

Malnutrition's effects on this group have been recognized for decades; there has been little measurable progress in addressing the specific nutritional problems of women and adolescent girls. Adolescent girls are particularly vulnerable to malnutrition because they are

growing faster than at any time after their first year of life. They need protein, iron, and other micronutrients to support the adolescent growth spurt and meet the body's increased demand for iron during menstruation [2].

The health and well-being of adolescent girls must be protected not only for themselves but also so that healthy adolescent girls can become healthy mothers of healthy children. Because of the adolescent growth spurt, nutrient requirements during adolescence increase. There is also some evidence suggesting that "catch-up" growth is possible during adolescence if nutrition is adequate [3].

Nutritional status is now recognized to be a prime indicator of the health of individuals or communities. The World Health Organization (WHO) believes that the ultimate objective of nutritional assessments is the improvement of human health. [4] Good nutrition is a basic need, a human right, and fundamental to health and well-being at all ages and more so during adolescence [5].

Adolescence is the growth period between childhood and adulthood, during which the body requires additional nutritional support to accommodate that growth. Unfortunately, however, adolescence is also when lack of nutrition becomes a major problem in many middle and low-income countries, Adolescent malnutrition remains alarmingly high in India, despite considerable socio-economic progress of the country [6].

## MATERIALS AND METHODS

Research approach quantitative research approach. The present study is Non experimental descriptive design. A Simple random sampling was used to select of 400 adolescent girls who are studying in 8<sup>th</sup> and 9<sup>th</sup> standard of rural and urban schools of Bagalkot. Written consent was taken from participants for the study. Self-structured questionnaires for Socio demographic variables, BMI and haemoglobin level were used as tool for data collection. The data was analyzed by using descriptive and inferential statistical.

**Study design:** The study design adopted for this study was Non experimental descriptive design.

**Setting of the study:** the study was conducted at government high school (RMSA), Bevin Matti and Shree Basaveshwar primary and high school Bagalkote.

**Participants:** In the present study participant were adolescent girls who are studying in 8<sup>th</sup> and 9<sup>th</sup> standard of rural and urban schools of Bagalkot. who met the inclusion criteria were selected as sample for the study.

**Instruments:** The study was conducted using a Structured Questionnaires with items related socio demographic data, nutritional status of adolescent girls and to assess the biophysical parameters -height, weight BMI and haemoglobin level of adolescent girls.

### Description of data collection instruments

**Tool I:** Questionnaire to assess the socio personal variables of adolescent girls studying in rural and urban schools

**Tool II:** Questionnaire to collect the factors affecting the nutritional status of adolescent girls.

**Tool III:** Proforma to assess the biophysical parameters of adolescent girls studying in rural and urban schools.

**Data Collection Procedures:** The data collection was carried out from 11/06/2025- 17/07/2025 adolescent girls studying in 8<sup>th</sup> and 9<sup>th</sup> standard of rural and urban schools of Bagalkot. Permission was obtained from Headmaster of the school. Data was collected from adolescent girls by explaining the purpose of this study. Written consent

was obtained from the study participants. According to the convenience and data was collected.

**Variable under study:** Study variables for the present study were Nutritional status of adolescent girls.

**Sociodemographic Variables:** Age, religion, place of residence, type of family, educational status of mother, occupation of mother, educational status of father, occupation of father, monthly income, birth order, problems associated with menstruation, medical problems, information on adolescent nutrition.

**Statistical analysis:** The obtained data were statistically examined in terms of the objectives of the study using descriptive and inferential statistics. A master sheet was prepared with responses given by the study participants. Frequencies and Percentage was used for the analysis of demographic data, The Chi square( $\chi^2$ ) test to find out the association between socio demographic variables and biophysical measures. The Chi square( $\chi^2$ ) test to find out the Comparison of nutritional status of participants in rural and urban schools.

**Ethical Clearance:** A certificate of ethical permission was obtained from ethical committee of the institution and written consent was taken from each participant.

## RESULTS

### Part I: Description of Socio- demographic variables

The majority of participants in both rural (75%) and urban (73.5%) areas were studying in 8<sup>th</sup> standard, with most girls aged 13 years (47% rural; 48.5% urban). The study population was predominantly Muslim in both rural (76%) and urban (81%) areas. Nuclear families were more common in urban areas (65%), while rural areas had a higher proportion of joint and three-generation families. Regarding birth order, most girls were second born in rural (48%) and first or second born in urban areas, with slightly higher third-order births in urban settings (20%). Family income was comparatively higher in urban families, with 40% earning above ₹60,000 per month, whereas 55% of rural families earned between ₹20,000–30,000. Parental education levels were generally higher in urban areas, particularly among fathers (21% postgraduates), while most rural mothers were homemakers (64%) compared to urban mothers engaged in private or self-employment. Menarche was attained by 74% of rural and 88% of urban girls, with urban adolescents reporting more irregular menstrual cycles (64%) and abdominal pain (78%). Although most girls had no major physical or other health problems, awareness regarding adolescent nutrition was absent in rural areas (100% no information) compared to 35% awareness among urban girls, highlighting a significant rural–urban disparity in health education.

**Part II: Comparison of Rural and urban school’s adolescent girls based on Body Mass Index.**

**Table 6.27 Comparison of Rural and urban school’s adolescent girls based on Body Mass Index**

BMI in kg/m <sup>2</sup>	N <sub>1</sub> =200		N <sub>2</sub> =200		
	Rural f	Urban	X <sup>2</sup>	df	P value
<18.5 (Under nourished)	85(42.5%)	63(31.5%)			
18.5-23 (Normal)	109(54.5%)	134(67%)	6.84	2	0.036
23.1-27.4 (Over weight)	3(1.5%)	6(3%)			
≥ 27.5 (Obese)	0	0			

Table 6.27 depicts with regard to BMI, in rural areas 42.5% of adolescents were undernourished (<18.5 kg/m<sup>2</sup>), 54.5% had a normal BMI (18.5–23 kg/m<sup>2</sup>), and 1.5% were overweight (23.1–27.4 kg/m<sup>2</sup>). In urban areas, 31.5% were undernourished, 67% were normal, and 3% were overweight. No cases of obesity were reported in either group. The chi-square value ( $\chi^2 = 6.84$ ,  $df = 2$ ,  $p = 0.036$ ) revealed a statistically significant difference,

showing that urban adolescents were more likely to have a normal BMI compared to rural adolescents.

**Part III: Association between BMI and selected socio personal variables of adolescent girls.**

**Section A: Association between BMI and selected socio personal variables of adolescent girls in rural school.**

**Table 6.29: Association between BMI and selected socio personal variables of adolescent girls in rural school**

N <sub>1</sub> =200			
Characteristics	X <sup>2</sup>	df	P value
Age	6.538	2	0.038
Religion	4.303	6	0.582
Education of mother	5.556	3	0.907
Occupation of mother	4.510	6	0.470
Family monthly income	3.428	6	0.489
Birth order	5.250	4	0.535

Table 6.29 depicts in urban schools; BMI was assessed against the same socio-personal variables. The findings indicated no significant association of BMI with age, religion, mother’s education, mother’s occupation, family income, or birth order (all  $p > 0.05$ ).

**Section B: Association between BMI and selected socio personal variables of adolescent girls in urban school.**

**Table 6.30: Association between BMI and selected socio personal variables of adolescent girls in urban school.**

N <sub>2</sub> =200			
Characteristics	X <sup>2</sup>	df	P value
Age	5.606	4	0.231
Religion	1.319	2	0.231
Education of mother	3.333	3	0.343
Occupation of mother	3.476	2	0.788
Family monthly income	8.750	4	0.068
Birth order	1.575	2	0.392

The data depicted in the table 34 shows that, the computed ‘P’ value for association between Body Mass Index and age is less than 0.05, Hence there is no association between BMI and other variables the null hypothesis is partially rejected and concluded that there is a significant association between Body Mass Index and age of adolescent girls in rural school girls.

**DISCUSSION**

The findings of the present study are discussed in light of previous scientific studies in this chapter and discussion regarding findings of the study is presented in accordance with the objectives of the study and hypothesis.

The present study shows that 53% of participants are mildly anemic among urban school girls this is approximately concomitant with the results of a Lucknow based study conducted among adolescent girls at urban slums. A multistage observational study was conducted on 586 adolescent girls of age 10-19 years from Lucknow district Uttar Pradesh, nutritional knowledge and iron intake was assessed by predesigned questionnaire and 24-hour dietary recall. Almost all the rural and slum girls were found to be anemic. Mean hemoglobin level was found to be 10.36 mg/dl [7].

A study conducted in rural areas of Nagapur district of Maharashtra 40.7% of population had mild anemia this can be compared with the present results of 42% rural school students with mild anemia [8].

In the present study 31.5% were found to be underweight among the rural school students this can be compared with the result of study done in Kalliyor, Tiruvantappuram, were 33% of girls remained underweight.

In a study conducted in Nellore district of Andhra Pradesh among the rural adolescents 43.6% had dysmenorrhea, compared to that result, the present study results shows that 66% among rural population have dysmenorrhea [9].

A cross-sectional comparative study had conducted on nutritional status 11 between urban and rural adolescent girls at 7 Schools of urban from Allahabad city and 7 Schools of rural from Bahadurgarh block of Prayag raj district in 11th and 12th standard adolescent girls. A total of 400 samples (200 urban and 200 rural) were selected from purposive and systematic order random sampling methods. Data were collected by interview schedule and calculate BMI, and dietary intake measured by 24hour recall method. Analysis has been done by SPSS 16 software. In the present study, it was found that the majority of respondents 58.5% of urban area and 73.5% of rural area were belonged to normal weight in B.M.I scale given by WHO, 37.5% of urban and 22% of rural respondents were belonged to underweight, only 45 urban and 4.5% rural respondents were belonged overweight. There was high significant difference between urban and rural respondent's The study concluded that nutritional status of urban and rural intermediate adolescent girls of UP Board was not so good under nutrition was present in both of urban and rural area [10].

**LIMITATIONS:** The study limited to the Generalization of the findings was not possible due to small size.

## CONCLUSION

This study highlights significant nutritional challenges among adolescent girls in Bagalkot district,

with notable rural–urban disparities. High prevalence of anemia, undernutrition, menstrual problems, and unhealthy eating behaviors underscores the urgent need for targeted interventions. Rural girls require improved access to nutrition education, while urban girls need guidance on healthy dietary habits.

### Declaration by authors

**Ethical Approval:** Institutional ethical clearance approved.

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**Conflict of Interest:** The authors declare no conflict of interest.

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