

Health Challenges among Adolescent Girls in Odisha: A Cross-Sectional Study on Nutritional Status, Menstrual Health, and Psychological Well-being

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Received: 26 Aug 2024 / Revised: 25 Oct 2024 / Accepted: 28 Dec 2024

ABSTRACT

Background: Adolescence is a critical phase marked by rapid growth and development, significantly influencing health behaviors and outcomes. In India, adolescent girls, often vulnerable, face various health challenges, including malnutrition, menstrual disorders, and psychological issues, exacerbated by socioeconomic factors.

Methods: This cross-sectional hospital-based study was conducted on 480 school-going adolescent girls aged 10-17 years at the Paediatric OPD, PRM Medical College and Hospital, Odisha. Data were collected through a pre-designed proforma, clinical examinations, and anthropometric measurements. Nutritional status was assessed using BMI, and data were analyzed using R Software.

Results: The mean age of participants was 14.01±1.42 years. Most were from low socioeconomic backgrounds, with the largest group from the upper lower-middle class (38.2%). The nutritional assessment showed 69% had normal BMI, 24.2% were underweight, 8.9% overweight, and 4.1% obese. Menarche was reached by 70.2%, with a mean age of 13.5±0.22 years. Dysmenorrhea was reported by 29.1% of participants. Psychological issues were present in 2.7%, and 20.1% exhibited pallor. Significant associations were found between nutritional status and socioeconomic status, mothers' occupations, family type, and diet.

Conclusion: Malnutrition, menstrual irregularities, and psychological issues are prevalent among adolescent girls in Odisha, influenced by socioeconomic and environmental factors. There is a pressing need for community-based health programs to improve the overall well-being of this vulnerable population.

Key-words: Adolescent girls, Nutritional status, Menstrual health, Psychological issues, Socioeconomic factors, Odisha, Cross-sectional study, Health interventions

INTRODUCTION

Adolescence, a critical phase between childhood and adulthood, spans from ages 10 to 19 years and is marked by significant physical, cognitive, and psychosocial development. This stage lays the foundation for good health, influencing how adolescents think, feel, and interact with the world. Despite its importance, adolescence is associated with preventable and treatable illnesses and injuries. During this period,

How to cite this article

Panda D, Sastry AS, Ludam RK, Padhy SK, Pradhan PC. Health Challenges Among Adolescent Girls in Odisha: A Cross-Sectional Study on Nutritional Status, Menstrual Health, and Psychological Well-being. SSR Inst Int J Life Sci., 2025; 11(1): 6655-6659.



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adolescents develop behaviors related to diet, substance use, physical activity, and sexual activity that can either protect or jeopardize their health and the health of those around them^[1].

Adolescents make up about 21% of India's population, with girls often being more vulnerable than boys. The onset of puberty in females, marked by menarche, signifies the transition to womanhood and can be stressful for many. The mean age at menarche varies across populations and serves as an indicator of environmental conditions, nutritional status, geographical location, and socioeconomic inequalities. Abnormal menstrual cycles may involve deviations in frequency, duration, or flow. A healthy adolescent population can act as a catalyst for promoting a healthy lifestyle. Menstrual disorders are common among teenage girls, especially in the early years after menarche, including irregular, painful, or heavy cycles, and abnormal uterine bleeding^[2].

Adolescent girls face various health challenges beyond gynecological issues, including psychological problems, refractive defects, eating disorders, and weight fluctuations. Dysmenorrhea and pallor are common, and often linked to broader social and economic factors. Malnutrition is a significant issue among adolescent girls, with limited information available at local and national levels. Adolescents undergo significant growth and developmental changes during puberty, necessitating increased nutritional needs. As future parents, their nutritional status requires close monitoring^[3].

Educating adolescent girls about general health, menstrual hygiene, mental health, and proper diet is crucial. They should be encouraged to recognize health issues and seek help when needed. Awareness and counseling on bodily changes and coping strategies are essential. This study aims to determine the prevalence of malnutrition, gynecological problems, and psychological issues among adolescent girls, providing insights for education and counseling interventions^[4].

MATERIALS AND METHODS

Place of study- A cross-sectional hospital-based study was conducted on 480 school-going adolescent girls aged 10-17 years over one year, from October 2022 to December 2022, at the Paediatric OPD in PRM Medical College and Hospital in Odisha, India.

Inclusion and Exclusion criteria- The study included adolescent girls willing to participate, while those younger than 10 or older than 17 years, or with chronic illnesses or genetic diseases, were excluded. After obtaining parental consent, participants completed a pre-designed proforma, followed by clinical examinations and the recording of weight and height.

BMI was calculated using the standard formula:

$$\text{BMI (kg/m}^2\text{)} = \text{Weight (kg)} / \text{Height}^2 \text{ (m}^2\text{)}$$

Nutritional status was categorized using the Revised Indian Academy of Pediatrics 2015 growth charts for 5-18-year-old Indian girls.

Statistical analysis- Data were collected through a pre-designed proforma, clinical examinations, and anthropometric measurements. Nutritional status was assessed using BMI, and data were analyzed using R Software and Microsoft Excel was used to generate tables.

Ethical Approval- Approval for this study was obtained from the relevant ethical committee, ensuring that all research procedures adhered to ethical standards and guidelines for protecting participants' rights and confidentiality.

RESULTS

The age distribution showed that most adolescents were aged 14 years (22.3%), followed by 13 years (20.0%). The 17-year-old group had the fewest participants (2.1%). The mean age of participants was 14.01±1.42 years (Table 1).

Table 1: Distribution of participants by age (n=480).

Age (years)	N	%
10	22	4.6
11	86	17.9
12	73	15.2
13	96	20.0
14	107	22.3
15	57	11.9
16	29	6.0
17	10	2.1

A majority of participants came from low socioeconomic backgrounds, with the largest proportion from the upper lower-middle class (38.2%), followed by the lower middle class (30.1%), and the smallest from the upper class (3.1%). The predominant family structure was nuclear (87.5%), with the remainder in joint families

(9.1%). Most fathers worked in semi-skilled occupations (40.3%), while many mothers were engaged in clerical jobs, shop ownership, or farming (18.1%). Clinical examination indicated that nearly all participants had normal pulse rates, except for 4.2% with rates above 100 beats per minute.

Table 2: Association of nutritional status with SES among adolescent girls.

Nutritional Status	Upper Class (N)	Upper Middle Class (N)	Lower Middle Class (N)	Upper Lower Middle Class (N)	Lower Class (N)	Chi-square Test
Underweight	13	50	77	139	19	139.399 (df=7), p<0.001
Normal	0	50	14	49	8	
Overweight and Obese	0	0	60	1	0	

Anthropometric data showed the mean height was 1.312 meters, the mean weight was 26.38 kg, and the mean BMI was 18.12. BMI analysis revealed 59% had normal BMI, 24.2% were underweight, 8.9% overweight, and 4.1% obese. Pallor was observed in 20.1% of participants. Menstrual history indicated that 70.2% had reached menarche, with a mean menarche age of 13.5±0.22 years. Most had menstrual cycles lasting 6 to 7 days (63.5%). Irregular cycles were reported by 54.8%, and scanty flow by 43.6%. Health assessments revealed

24.9% had refractive defects, 3.1% reported headaches, and 2.7% had psychological issues. Dysmenorrhea affected 29.1%. A mixed diet was common (84.7%), with 15.1% following a vegetarian diet. Nutritional analysis showed 63.1% were well-nourished, while 37% were malnourished. A significant correlation existed between SES and nutritional status (p<0.001) (Table 2). There were also significant associations between nutritional status and mothers' occupations (p=0.007), family type (p<0.001), and diet (p=0.001) (Table 3).

Table 3: Association of nutritional status with mothers' occupations, family type, and diet among adolescent girls.

Parameters	Mother Working (N)	Homemaker (N)	Chi-square Test
Nutritional status and mother's occupation			
Normal	212	86	8.672 (df=3), p-value 0.007
Underweight	78	42	
Overweight and Obese	30	32	
Nutritional status and family type			
	Joint Family (N)	Nuclear Family (N)	22.246 (df=3), p-value <0.001
Normal	26	272	
Underweight	4	116	
Overweight and Obese	18	44	
Nutritional status and diet			
	Mixed Diet (N)	Vegetarian Diet (N)	13.528 (df=3), p-value <0.001



Normal	258	40	
Underweight	92	28	
Overweight and Obese	62	0	

Respiratory rates were between 13 to 15/min in 60.1% and 13 to 21/min in 41.1% of participants. Systolic blood pressure was below 110 mmHg in 85.1%, with 16.1% above 110 mmHg. Diastolic blood pressure was within normal limits for all participants.

DISCUSSION

This study focused on adolescent females aged 10 to 17 years, with early adolescence being the most represented age group. This age distribution is consistent with the findings of Nair *et al.* and Phuljhele *et al.*, who also noted a predominance of early adolescence in their research [4,5]. The majority of participants were from low socioeconomic backgrounds, with the largest proportion belonging to the upper-lower-middle class. The prevalence of nuclear family types aligns with the studies conducted by Kumar *et al.* [6] and Patanwar *et al.* [7].

The mean age of menarche in this study was 13.5±0.22 years, which is slightly younger than the previously reported mean age of 14.01±1.42 years. Approximately 71.1% of the adolescents had reached menarche, a finding that corresponds with the research of Omidvar *et al.* and Singh *et al.*, who reported mean menarcheal ages of 13±1.1 years and 12.5±1.52 years, respectively [8,9]. Similarly, Tarannum *et al.* reported a 69.7% menarche attainment at a mean age of 12.52±1.415 years [10].

Dysmenorrhea was observed in 28.6% of the study participants, a prevalence that is similar to the 33% reported by Sharma *et al.* [11] but lower than the 71.5% noted by Jampana *et al.* [12]. The presence of pallor, an indicator of clinical anemia, was found in 19.5% of the adolescents, which aligns closely with the 21% prevalence reported by Siva *et al.* [13]. Psychological issues were reported by 2.4% of the participants, consistent with findings from a study in Trivandrum, where severe and extreme depression was observed in 2.6% and 0.2% of adolescents, respectively [14].

The nutritional assessment revealed that 69% of participants had a normal BMI, while 24.2% were underweight. The significant association between socioeconomic status and nutritional status highlights the impact of economic conditions on health, echoing

the findings of Chandrashekarappa *et al.* who reported a malnourishment prevalence of 36.4% [15]. Srivastav *et al.* found an undernourishment prevalence of 24%, which is consistent with the results of this study [16]. Overweight and obesity were observed in 9.4% and 3.5% of participants, respectively, which is in line with the 12.3% overweight prevalence reported by Chandrashekarappa *et al.* [15]. Padmaja *et al.* also found that adolescents from lower socioeconomic backgrounds were more likely to be undernourished [3].

This study's limitations include its hospital-based design, which may introduce selection bias. Nutritional status was assessed using only BMI, and the relatively small sample size may limit the generalizability of the findings. In conclusion, this study highlights the multifaceted aspects of adolescent health, emphasizing the influence of socioeconomic factors, family structure, and dietary habits on nutritional outcomes. It calls for targeted interventions to address undernutrition and obesity, improve menstrual health management, and enhance vision and mental health services. The findings provide a foundation for policymakers and healthcare providers to design comprehensive adolescent health programs, particularly in economically disadvantaged regions.

CONCLUSIONS

The common health issues observed among adolescent girls included malnutrition, refractive errors, irregular menstruation, psychological conditions, overweight, and obesity. Factors influencing these health issues included low socioeconomic status, nutritional habits, parental occupation, and rural living conditions. Further research with larger, community-based samples is necessary to support these observations and provide more comprehensive insights.

CONTRIBUTION OF AUTHORS

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REFERENCES

- [1] Adolescent health. Available at: http://www.who.int/topics/adolescent_health/en/. Accessed on 21 November 2018.
- [2] Kumari P, Bhanage A, Shinde E. Menstrual irregularities among adolescence girls. *Incid Prev.*, 2020; 2: 21-29.
- [3] Padmaja R, Kavitha K, Pramanik S, Aravazhi S. Prevalence of malnutrition in adolescent girls: a cross-sectional study in the tribal regions of Telangana. 2019; 23: 45-49.
- [4] Nair A, Doibale MK, Kuril BM, Dimple VK. Study of nutritional status of adolescent girls in a rural area of a district of Maharashtra. *Int J Community Med Public Health*, 2017; 4(12): 4617.
- [5] Phuljhele DS, Dewangan DS, Anu DA. Assessment of the nutritional status of adolescent girls aged between 15 to 18 years studying in government high school in Raipur, Chhattisgarh, India. *Pediatr Rev Int J Pediatr Res.*, 2021; 8(2): 100-08.
- [6] Kumar AT. Nutritional status of adolescent girls in rural Tamil Nadu. *Natl J Res Community Med.*, 2012; 1(1): 48-51.
- [7] Patanwar P, Sharma KKN. Nutritional status of Kurmi adolescent girls of Raipur city Chhattisgarh, India. *Int J Sci Res Publ.*, 2013; 3(11): 1-6.
- [8] Omidvar S, Amiri F, Bakhtiari A, Begum K. A study on menstruation of Indian adolescent girls in an urban area of South India. *J Fam Med Prim Care*, 2018; 7(4): 698.
- [9] Singh A, Kiran D, Singh H, Nel B, Singh P, Tiwari P. Prevalence and severity of dysmenorrhea: A problem related to menstruation, among first and second year female medical students. *Indian J Physiol Pharmacol.*, 2008; 52(4): 389-97.
- [10] Tarannum F, Khalique N, Eram U. A community-based study on age of menarche among adolescent girls in Aligarh. *Int J Community Med Public Health*, 2017; 5(1): 395.
- [11] Sharma A, Taneja DK, Sharma P, Saha R. Problems related to menstruation and their effect on the daily routine of students of a medical college in Delhi, India. *Asia Pac J Public Health*, 2008; 20(3): 234-41.
- [12] Jampana KC. Prevalence of dysmenorrhea among adolescent girls: a burning issue. *Asian J Med Res.*, 2019; 8(2): OG04-07.
- [13] Siva PM, Sobha A, Manjula VD. Prevalence of anemia and its associated risk factors among adolescent girls of central Kerala. *J Clin Diagn Res.*, 2016; 10(11): LC19-23.
- [14] Nair MKC, Paul MK, John R. Prevalence of depression among adolescents. *Indian J Pediatr.*, 2004; 71(6): 523-24.
- [15] Chandrashekarappa SM, Ramakrishnaiah NMM, Manjunath R. Nutritional status in adolescent girls: Attempt to determine its prevalence and its association with sociodemographic variables. *Fam Med Community Health*, 2018; 6(4): 184-90.
- [16] Srivastav S, Mahajan H, Grover VL. Nutritional status of the government school children of adolescent age group in urban areas of district Gautambudhnagar, Uttar Pradesh. *Natl J Community Med.*, 2013; 4(1): 100-03.

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