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Research Article

Prevalence of Malnutrition Among Adolescents in a Selected School of New Delhi: A Descriptive Study

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A B S T R A C T

Background: Adolescence is a critical period characterized by rapid physical, psychological, and social development. Adequate nutrition during this stage is essential for optimal growth and long-term health. Malnutrition among adolescents remains a major public health concern in India, affecting educational achievement, productivity, and future health outcomes.

Objectives: To evaluate the prevalence of malnutrition among adolescents in a selected school of New Delhi and to disseminate informational pamphlets regarding adolescent malnutrition and healthy nutritional practices.

Methodology: A quantitative, non-experimental descriptive research design was adopted. The study was conducted among 200 adolescents aged 10–19 years studying in JN International School, Ali Vihar, New Delhi. Data were collected using a structured questionnaire and anthropometric measurements. Body Mass Index (BMI) was calculated to determine nutritional status. Data were analyzed using descriptive statistics including frequency and percentage.

Results: Among the 200 participants, 61.5% were underweight, 33% had normal BMI, 4% were overweight, and 1.5% were obese. Most participants belonged to the 10–13 years age group (59.5%) and were male (62.5%). Poor dietary habits were observed among 23% of adolescents, while 24% reported no physical activity.

Conclusion: The study revealed a high prevalence of undernutrition among adolescents. Nutritional awareness and school-based health education interventions are urgently needed to improve adolescent nutritional status.

Keywords: Adolescents, Malnutrition, BMI, Nutritional Status, School Health, Health Education

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Introduction

Adolescence, defined by the World Health Organization (WHO) as the age group between 10 and 19 years, is a critical period of rapid physical growth, psychological maturation, and social development. During this stage, nutritional requirements increase substantially to support growth spurts, sexual maturation, cognitive development, and overall health. Adequate nutrition during adolescence contributes to optimal growth, improved academic performance, enhanced immunity, and reduced risk of chronic diseases later in life.[1]

Malnutrition remains a major public health challenge worldwide and is particularly prevalent in low- and middle-income countries. India faces a dual burden of malnutrition, where undernutrition coexists with overweight and obesity among adolescents. Findings from the Comprehensive National Nutrition Survey (CNNS) revealed that a considerable proportion of Indian adolescents suffer from underweight, anemia, and micronutrient deficiencies, while the prevalence of overweight and obesity is steadily increasing because of changing dietary patterns and sedentary lifestyles.[2]

Nutritional status during adolescence is influenced by several factors including dietary habits, physical activity, socioeconomic status, parental education, family income, and access to healthcare services. Das et al. reported that poor dietary diversity, inadequate nutrient intake, and unhealthy lifestyle practices significantly contribute to nutritional deficiencies among adolescents.[3] Similarly, Christian and Smith emphasized that adolescent undernutrition adversely affects physical growth, cognitive function, educational attainment, reproductive health, and future economic productivity.[4]

Background of the study

Adolescents constitute nearly one-fifth of India's population and represent the future workforce and future parents of the nation. Improving adolescent nutrition is therefore essential for national development and achieving Sustainable Development Goals related to health, education, and well-being.[5] Despite several national nutrition initiatives, undernutrition continues to affect a substantial proportion of adolescents, particularly those belonging to socioeconomically disadvantaged families.

Previous studies have reported a high prevalence of malnutrition among school-going adolescents. Bansal found that undernutrition was highly prevalent among adolescents aged 11–16 years and highlighted the need for school-based nutritional interventions.[6] Likewise, a systematic review by Madjdian et al. identified socioeconomic inequalities, poor dietary practices, and limited nutritional knowledge as major determinants of adolescent malnutrition in developing countries.[7]

Schools provide an ideal setting for health promotion activities because adolescents spend a significant portion of their time in educational institutions. School health services, including nutritional screening and health education, can play a vital role in the early identification and prevention of malnutrition. Nurses are uniquely positioned to conduct nutritional assessments, provide counseling, and implement evidence-based interventions to improve adolescent health outcomes.

Need for the study

Adolescents experience rapid growth and development, leading to increased requirements for energy, protein, calcium, iron, and other micronutrients. Inadequate nutritional intake during this stage may result in underweight, stunting, poor academic achievement, reduced immunity, delayed maturation, and increased susceptibility to infections.[8] WHO reports that nutritional deficiencies during adolescence have long-term consequences that extend into adulthood and may contribute to intergenerational cycles of malnutrition.[9]

Although numerous studies have examined child malnutrition, relatively fewer studies have focused specifically on adolescents, particularly in school settings within Delhi. Furthermore, awareness regarding balanced nutrition and healthy dietary practices remains inadequate among many adolescents and their families. Early assessment of nutritional status is essential for identifying at-risk adolescents and implementing timely interventions. Therefore, the present study was undertaken to assess the prevalence of malnutrition among adolescents in a selected school in New Delhi and to disseminate informational pamphlets aimed at promoting nutritional awareness and healthy dietary behaviors.

Objectives

- To assess the prevalence of malnutrition among adolescents in a selected school of New Delhi.
- To identify dietary, physical activity, and health-related factors associated with malnutrition.
- To disseminate informational pamphlets regarding healthy nutrition among adolescents.

Materials and Methods

A quantitative research approach with a non-experimental descriptive design was adopted to assess the prevalence of malnutrition among adolescents. The study was conducted at JN International School, Ali Vihar, New Delhi. A total of 200 adolescents aged between 10 and 19 years were selected using a purposive sampling technique. The study included students who were enrolled in the selected school and were present on the day of data collection. Students who were absent during the data collection period were excluded from the study. Data were collected using a structured

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questionnaire and anthropometric assessment methods. The questionnaire included sections on demographic characteristics, dietary patterns, physical activity, and health status of the adolescents. Anthropometric measurements such as height and weight were obtained using standard procedures, and Body Mass Index (BMI) was calculated to determine the nutritional status of the participants. The collected data were analysed using descriptive statistics, including frequency and percentage, to assess the prevalence of malnutrition among the study participants.

Results

The demographic analysis of the 200 adolescent participants revealed that the majority, 119 (59.5%), belonged to the age group of 10–13 years, followed by 72 (36%) in the 14–16 years age group and 9 (4.5%) in the 17–19 years age group. Among the participants, 125 (62.5%) were male and 75 (37.5%) were female. With regard to religion, most of the adolescents, 178 (89%), were Hindus. The majority of the participants, 140 (70%), belonged to nuclear families, while most students, 198 (99%), resided in urban areas. In terms of family income, 72 (36%) reported a monthly family income ranging between ₹15,000 and ₹30,000, indicating that a substantial proportion of the participants came from low- to middle-income households. These findings provide an overview of the demographic profile of the study population.

The data presented in table 1 to 5 consist of demographic profile of adolescents, dietary pattern, physical activity, health status and nutritional risk factors.

The assessment of dietary patterns revealed that more than half of the adolescents, 105 (52.5%), followed a non-vegetarian diet, while 75 (37.5%) adhered to a vegetarian diet and 20 (10%) followed a lacto-ovo vegetarian diet. Regarding physical activity, 62 (31%) participants reported engaging in regular exercise, 50 (25%) practiced cycling, and 20 (10%) performed yoga as part of their daily routine. However, a notable proportion of adolescents, 48 (24%), reported not participating in any form of physical activity. These findings indicate variations in dietary preferences and exercise habits among adolescents, which may influence their overall nutritional status and health outcomes.

Assessment of the health status of the adolescents revealed that the majority of participants were generally healthy. Most adolescents, 188 (94%), reported no previous medical history, while only 12 (6%) had a history of medical conditions. Similarly, 193 (96.5%) participants were not taking any medications, and only 7 (3.5%) reported current medication use. Allergies were uncommon among the study population, with 199 (99.5%) adolescents reporting no allergies and only 1 (0.5%) reporting an allergy.

Nutritional status was assessed using Body Mass Index (BMI). The findings showed that 123 (61.5%) adolescents were underweight, indicating a high prevalence of undernutrition. A total of 66 (33%) participants had a normal BMI, while 8 (4%) were classified as overweight and 3 (1.5%) as obese. These results demonstrate that undernutrition is the predominant nutritional problem among adolescents in the selected school, highlighting the need for targeted nutritional interventions and health education programs to improve adolescent health and well-being.

The data presented in Table 6 provides a comprehensive assessment of the participants' physical and physiological attributes.

The Table 7 shows that out of 200 students, the nutritional status of a group of participants. A majority 123 (61.5%) are underweight.

Table 1.Percentage distribution of demographic data

A. Demographic profile of adolescents				
S.No	**Demographic Variable**		**Frequency**	**Percentage**
1	Age	10 Years - 13 Years	119	59.50%
		14 Years - 16 Years	72	36%
		17 Years - 19 Years	9	4.50%
2	Sex	Male	125	62.50%
		Female	75	37.50%
		Others	0	0%
3	Religion	Hindu	178	89%
		Muslim	17	8.50%
		Christian	3	1.50%
		Sikh	2	1%
		Other	0	0%

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4	Father's Education	10th Pass	76	38%
		12th Pass	58	29%
		Graduated	52	26%
		Illiterate	4	2%
		Other	10	5%
5	Mother's Education	10th Pass	75	37.50%
		12th Pass	60	30%
		Graduated	28	14%
		Illiterate	15	7.50%
		Other	22	11%
6	Father's Occupation	Private Job	154	77%
		Government Job	18	9%
		Unemployed	4	2%
7	Mother's Occupation	Private Job	40	20%
		Government Job	6	3%
		Housewife	148	74%
		Other	6	3%
8	Number of Family Members	3	11	5.50%
		4	96	48%
		5	62	31%
		More than 6	31	15.50%
9	Type of Family	Nuclear Family	140	70%
		Joint Family	50	25%
		Extended	10	5%
10	Income of Family	Rs.15000 – 30000/-	72	36%
		Rs.30,001 – 45000/-	63	31.50%
		Rs. 45001 – 65000/-	42	21%
		Rs. 65,001 and above	23	11.50%
11	Marital Status of parents	Single Mother	4	2%
		Single Father	0	0%
		Divorce	2	1%
		Parents Living Together	194	97%
12	Area of Residence	Rural Area	2	1%
		Urban Area	198	99%
		Semi-Urban Area	0	0%
		Slum Area	0	0%
13	Family Medical History	Yes	19	9.50%
		No	181	90.50%
14	Hormonal Disease in Family	Yes	27	13.50%
		No	173	86.50%

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15	Number of Siblings	1	38	19%
		2	112	56%
		3	40	20%
		More than 4	10	5%
16	Stressor of Adolescent	Academic Pressure	50	25%
		Family Conflict	15	7.50%
		Social Pressure	2	1%

Table 2.Percentage distribution of dietary pattern among adolescents

B. Dietary pattern				
S.No	**Demographic Variable**		**Frequency**	**Percentage**
1	Dietary Pattern	Vegetarian	75	37.50%
		Non-Vegetarian	105	52.50%
		Lacto Ovo Vegetarian	20	10%

Table 3.Percentage distribution of physical activity among adolescents

C. Physical activity				
S.No	**Demographic Variable**		**Frequency**	**Percentage**
1	Type of physical activity	Exercise	62	31%
		Yoga	20	10%
		Cycling	50	25%
		Gym	12	6%
		Any Other	8	4%
		None	48	24%
2	Frequency of physical activity	Once a Day	110	55%
		Twice a Day	42	21%
		None	48	24%
3	Duration of physical activity	15 - 20 mins	55	27.50%
		20 - 30 mins	66	33%
		More than 30 mins	31	15.50%
		None	48	24%

Table 4.Percentage distribution of health status of adolescents

D. Health status				
S.No	**Demographic Variable**		**Frequency**	**Percentage**
1	Medical History	Yes	12	6%
		No	188	94%
2	Medications	Yes	7	3.50%
		No	193	96.50%
3	Allergies	Yes	1	0.50%
		No	199	99.50%

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Table 5.Percentage distribution of nutritional risk factors among adolescents

E. Nutritional risk factors				
S.No	**Demographic Variable**		**Frequency**	**Percentage**
1	Poor Eating Habits	Yes	46	23%
		No	154	77%
2	Other Risk Factors	Yes	0	0%
		No	200	100%

Table 6.Percentage distribution of prevalence of malnutrition with respect to physical examination findings

S.No	Physical Examination	Sub-category	Findings	Frequency	Percentage (%)
1	General Appearance	Grooming	Well groomed	200	100
			Badly groomed	0	0
		Body Build	Good built	95	47.50
			Thin built	83	41.50
			Obese	22	11.00
		Gait	Normal	200	100
			Abnormal	0	0
2	Vital Signs	Temperature	Normal	192	96
			Abnormal	8	4
		Pulse	Normal	198	99
			Abnormal	2	1
		Respiration	Normal	199	99.50
			Abnormal	1	0.50
3	Hair	–	Loss of luster	0	0
			Thinning	29	14.50
			Sparse	0	0
			Discoloured	6	3
			Healthy	165	82.50
4	Eyes	–	Blurred vision	15	7.50
			Dry eyes	3	1.50
			Eye strain	0	0
			Redness	0	0
			Light sensitive	0	0
			Double vision	0	0
			Watering eyes	0	0
			Pain	0	0
			Myopia	0	0
			Hyperopia	0	0
			Night blindness	0	0
			Normal	182	91
			Other	0	0

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5	Ear	Ear discharge	Present	2	1
			Absent	198	99
		Hearing ability	Normal	198	99
			Abnormal	2	1
6	Nose	Crust/discharge	Present	2	1
			Absent	198	99
		Nasal septum	Normal	200	100
			Perforated	0	0
			Deviated	0	0
		Identifies smell	Yes	200	100
			No	0	0
7	Mouth	Breath	Normal	190	95
			Halitosis	10	5
		Gum	Normal	182	91
			Bleeding gums	17	8.50
			Gingivitis	1	0.50
		Teeth	Healthy	162	81
			Poor aligned	24	12
			Missing teeth	7	3.50
			Dental caries	7	3.50
			Plaque	0	0
		Oral mucosa	Pale	8	4
			Dry	28	14
8	Tongue	–	Moist	160	80
			Ulcers	4	2
			Coated	0	0
			Other	0	0
9	Lips	–	Angular stomatitis	0	0
			Cheilosis	0	0
			Ulceration	4	2
			Normal	195	97.50
			Dry	1	0.50
10	Neck	Range of motion	Flexion	0	0
			Extension	0	0
			Rotation	198	99
			Rigidity	2	1
11	Glands	–	Goiter	0	0
			Specify	0	0
			Normal	200	100

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12	Skin	–	Follicular hyperkeratosis	0	0
			Mosaic dermatosis	0	0
			Pellagrous dermatosis	0	0
			Crazy-pavement dermatosis	0	0
			Skin dryness	5	2.50
			Normal	195	97.50
			Other	0	0
13	Nails	–	Normal	200	100
			Clubbing of nails	0	0
			Specify	0	0
			Numbness & tingling	0	0
			Burning feet	0	0
			Tenderness of calf muscles	0	0
14	Nervous System	–	Loss of knee ankle jerks	0	0
			Normal	200	100

Table 7.Percentage distribution of degree of malnutrition

Degree of Malnutrition	No. of Students	Percentage
Under-Weight	123	61.50%
Normal	66	33.00%
Over-Weight	08	04.00%
Obese	03	01.50%

Discussion

The study identified a high prevalence of undernutrition among adolescents, with more than half of the participants categorized as underweight. Similar findings have been reported in previous studies conducted among school-going adolescents in developing countries.

The findings of our study show that 123 (61.5%) adolescents were underweight, indicating a high prevalence of undernutrition. A total of 66 (33%) participants had a normal BMI, while 8 (4%) were classified as overweight and 3 (1.5%) as obese. A study conducted by Wagasker SA was contrary to our study; the study shows that a total of 144 (28.9%) boys and 355 (71.1%) girls were included in the study (N = 499). The prevalence of malnutrition was 46.8%. The prevalence of undernutrition was 33.3% (stunting [21.6%] and thinness [15%]). The prevalence of overweight and obesity was 10.2% and 5.87%.

Several factors may contribute to this situation, including inadequate dietary intake, irregular eating habits, low physical activity levels, and socioeconomic limitations. Although most students belonged to urban families, nutritional deficiencies remained common, highlighting the need for targeted health promotion programs.

The results emphasize the importance of school health services, nutritional counseling, and regular growth monitoring to address malnutrition during adolescence.

Conclusion

The study concludes that malnutrition, particularly undernutrition, remains highly prevalent among adolescents in the selected school. More than 60% of students were underweight according to BMI assessment. Early identification, nutritional education, and school-based interventions are essential to improve adolescent health and prevent long-term consequences of malnutrition.

Limitations

The study was conducted in a single school in New Delhi, which limits the generalizability of the findings. Additionally, the use of self-reported data may have introduced response bias. The study focused primarily on physical aspects of malnutrition and did not explore psychological or social factors that may influence adolescents' nutritional status.

Recommendations

Future studies should be conducted with larger and more diverse populations to improve the generalizability of findings. Further research is needed to explore the

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relationship between socioeconomic status and nutritional outcomes among adolescents. Comparative studies involving urban and rural populations may help identify regional differences in nutritional status. Additionally, evaluating the effectiveness of nutritional education and health promotion programs can provide evidence for developing targeted interventions to improve adolescent nutrition and overall health.

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