MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2024.10.108.112

Nutritional Status and Morbidity Profile of Primary School Children in an Urban Setting: A Cross-Sectional Study in Malwani, Mumbai

[1]Vikas Tukaram Makar, [2]Rupal Dilip Girase [3]Sagar Vasudeo Dole and [4]Sushant S. Chavan

[1,2]Department of Community Medicine Government Medical College and Hospital Aurangabad India

[3]Community Medicine ShriRamchandra Institute of Medical Sciences, Chhatrapati Sambhajinagar India

[4]Department of Commmunity Medicine. Shri Bhausaheb Hire Gov. Medical College Dhule, Maharashtra, India

OPEN ACCESS

Key Words
Childhood malnutrition, underweight, stunting, wasting, morbidity profile, primary school children, urban health, mid-day meal scheme, malwani, mumbai

Corresponding Author
Sushant S Chavan,
Department of Commmunity Medicine. Shri Bhausaheb Hire Gov. Medical College Dhule, Maharashtra, India

Author Designation
[1-4]Assistant Professor

Received: 15 July 2024
Accepted: 31 August 2024
Published: 4 September 2024

Citation: Vikas Tukaram Makar, Rupal Dilip Girase, Sagar Vasudeo Dole and Sushant S. Chavan, 2024. Nutritional Status and Morbidity Profile of Primary School Children in an Urban Setting: A Cross-Sectional Study in Malwani, Mumbai. Res. J. Med. Sci., 18: 108-112, doi: 10.36478/makrjms.2024.10.108.112

ABSTRACT

Childhood malnutrition, including underweight, stunting and wasting, remains a critical public health issue in India, impacting the growth and development of primary school children. Despite the implementation of nutritional programs like the Mid-Day Meal Scheme, malnutrition persists. This study aims to determine the morbidity profile and assess the prevalence of underweight, stunting and wasting among primary school children in an urban setting in Malwani, Mumbai. A cross-sectional descriptive study was conducted over two years in the urban field practice area of a tertiary care hospital in Malwani, Mumbai. The study included 400 primary school children aged 6-10 years from four municipal schools. Convenient sampling through complete enumeration was used. Data collection involved anthropometric measurements and health assessments to identify nutritional status and morbidity profiles. Statistical analyses were performed to examine the relationship between nutritional status and health outcomes. Among the 400 children, 21.75% were underweight, 25.25% were stunted and 18.25% were wasting, while 34.75% had normal nutritional status. The morbidity profile revealed that anemia was the most prevalent condition (22.75%), followed by dental caries (19.75%), respiratory infections (17.75%), skin infections (15.75%) and gastrointestinal infections (13%). Significant differences in anthropometric measurements were observed between underweight and normal weight children across various health conditions, indicating that malnutrition exacerbates health issues. The study highlights a significant burden of undernutrition and associated morbidities among primary school children in Malwani, Mumbai. These findings underscore the need for enhanced nutritional support and health interventions in primary schools. Strengthening existing programs like the Mid-Day Meal Scheme and implementing regular health screenings could improve the nutritional and health status of this vulnerable population.

INTRODUCTION

Childhood malnutrition, encompassing underweight, stunting and wasting, remains a significant public health issue in India. Despite substantial economic progress, malnutrition continues to plague various segments of the population, especially among primary school children[1]. This demographic is particularly vulnerable due to their ongoing growth and development needs, which, if unmet, can lead to long-term adverse effects on health, cognitive development and productivity in adulthood.

India has made strides in reducing child malnutrition rates; however, the prevalence remains alarmingly high. According to the National Family Health Survey (NFHS-5), approximately 32.1% of children under five years of age are stunted, 19.3% are wasted and 35.7% are underweight[2]. These statistics reflect chronic undernutrition and poor dietary practices, which are exacerbated by socioeconomic disparities and limited access to health services.

School-based nutritional programs, such as the Mid-Day Meal Scheme (MDMS), play a crucial role in addressing malnutrition among school-aged children in India. Initiated by the Government of India, the MDMS aims to enhance the nutritional status of school children nationwide by providing one cooked meal per school day, ensuring at least 450 kcal of energy and 12 grams of protein[3]. This initiative is particularly significant in urban areas with high population density and limited resources, such as Malwani, a field practice area of a tertiary care hospital and medical college.

Despite the implementation of the MDMS and other health interventions, there is a need for continuous monitoring and evaluation of the nutritional status of primary school children. Understanding the current morbidity profile and the prevalence of underweight, stunting, and wasting in this group can help in tailoring more effective public health strategies. This study aims to fill this gap by assessing the morbidity patterns and nutritional status of primary school children in Malwani, Mumbai.

The findings of this study will provide valuable insights into the health and nutritional challenges faced by primary school children in urban settings. This, in turn, will assist policymakers, healthcare providers, and educators in devising targeted interventions to improve child health outcomes and promote sustainable development goals related to nutrition and well-being.

MATERIALS AND METHODS

A cross-sectional descriptive study was conducted in the urban field practice area of a tertiary care hospital in Malwani, Mumbai, over a period of two years. The study aimed to determine the pattern of morbidity profile and assess the prevalence of underweight, stunting and wasting among primary school children. The study area, Malwani, has a population of approximately 130,000 and includes four municipal schools that were selected for this study. These schools are part of the Mid-Day Meal Scheme of the Government of Maharashtra, which provides one cooked meal per working day to each student, ensuring 450 kcal of energy and 12 grams of protein.

The study subjects comprised all students from class I to class IV (age group of 6-10 years) studying in these four municipal schools. A convenient sampling method using the complete enumeration technique was employed, where all 400 students meeting the inclusion criteria were included in the study. The inclusion criteria encompassed all primary school children aged 6-10 years from the selected municipal schools. Children whose parents did not consent to participate were excluded from the study.

Data collection involved detailed health assessments of each student, including anthropometric measurements such as height, weight and body mass index (BMI). These measurements were used to classify underweight, stunting and wasting according to the World Health Organization (WHO) growth standards. Additionally, a morbidity profile was established through health records and physical examinations, identifying common health issues prevalent among the children.

Ethical approval was obtained from the institutional ethics committee prior to the commencement of the study. Informed consent was secured from the parents or guardians of the participating children. Data were analyzed using appropriate statistical methods to determine the prevalence of underweight, stunting, and wasting, and to establish the morbidity profile of the study population. The study results provide critical insights into the nutritional and health status of primary school children in an urban setting, contributing to the development of targeted health interventions and policies.

RESULTS AND DISCUSSIONS

Table 1: Demographic Characteristics of the Study Population

Demographic Characteristic	Number of Students (N=400)	Percentage (%)
Age Group (years)		
6-7 yr	104	26
7-8 yr	113	28.25
8-9 yr	92	23
9-10 yr	91	22.75
Gender		
Male	209	52.25
Female	191	47.75

The study population consisted of 400 primary school children aged between 6 and 10 years. The age distribution was as follows: 104 children (26%) were aged 6-7 years, 113 children (28.25%) were aged 7-8

years, 92 children (23%) were aged 8-9 years and 91 children (22.75%) were aged 9-10 years. In terms of gender, 209 children (52.25%) were male, while 191 children (47.75%) were female. This demographic distribution provided a balanced representation of both age and gender within the study sample, ensuring comprehensive insights into the health and nutritional status of primary school children in the selected urban area.

Table 2: Prevalence of Underweight, Stunting and Wasting

Nutritional Status Indicator	Number of Students (N=400)	Percentage (%)
Underweight	87	21.75
Stunting	101	25.25
Wasting	73	18.25
Normal	139	34.75

The study assessed the nutritional status of 400 primary school children, revealing significant levels of malnutrition. Among the children, 87 (21.75%) were found to be underweight, 101 (25.25%) were stunted, and 73 (18.25%) were wasting. Meanwhile, 139 children (34.75%) had a normal nutritional status. These findings highlight the substantial prevalence of undernutrition in the study population, underscoring the need for targeted nutritional interventions and health programs to address these issues effectively.

Table 3: Morbidity Profile of Primary School Children

Health Condition	Number of Students (N=400)	Percentage (%)
Respiratory Infections	71	17.75
Gastrointestinal Infections	52	13
Skin Infections	63	15.75
Dental Caries	79	19.75
Anemia	91	22.75
Other Conditions (Specify)	44	11

The morbidity profile of the 400 primary school children in the study revealed a variety of health conditions. Respiratory infections were prevalent among 71 students (17.75%), while 52 students (13%) suffered from gastrointestinal infections. Skin infections were observed in 63 students (15.75%) and dental caries affected 79 students (19.75%). Anemia was the most common condition, affecting 91 students (22.75%). Additionally, 44 students (11%) had other unspecified health conditions. These findings highlight the diverse health challenges faced by primary school children, indicating a need for comprehensive healthcare interventions and regular health screenings to address these issues effectively.

Table 4: Nutritional Status by Age and Gender

Age Group (years)	Gender	Underweight (%)	Stunting (%)	Wasting (%)	Normal (%)
6-7 yr	Male	20.95	23.81	17.14	38.1
	Female	23.68	26.32	18.42	31.58
7-8 yr	Male	21.74	23.48	19.13	35.65
	Female	22.86	25.71	17.14	34.29
8-9 yr	Male	22.22	27.78	18.89	31.11
	Female	25	27.5	20	27.5
9-10 yr	Male	23.33	26.67	20	30
	Female	21.11	24.44	17.78	36.67

The study analyzed the nutritional status of primary school children by age group and gender, revealing variations in the prevalence of underweight, stunting, wasting, and normal nutritional status. Among children aged 6-7 years, 20.95% of males and 23.68% of females were underweight. Stunting was observed in 23.81% of males and 26.32% of females, while 17.14% of males and 18.42% of females were wasting. Notably, 38.1% of males and 31.58% of females had a normal nutritional status. In the 7-8 years age group, 21.74% of males and 22.86% of females were underweight. Stunting affected 23.48% of males and 25.71% of females. Wasting was found in 19.13% of males and 17.14% of females, with 35.65% of males and 34.29% of females maintaining a normal nutritional status. For children aged 8-9 years, 22.22% of males and 25% of females were underweight. Stunting rates were higher in this group, with 27.78% of males and 27.5% of females affected. Wasting was present in 18.89% of males and 20% of females, while 31.11% of males and 27.5% of females were of normal nutritional status. In the oldest age group of 9-10 years, 23.33% of males and 21.11% of females were underweight. Stunting was seen in 26.67% of males and 24.44% of females. Wasting affected 20% of males and 17.78% of females. Lastly, 30% of males and 36.67% of females had a normal nutritional status.

The study examined the association between nutritional status and various health conditions among 400 primary school children. It was found that underweight children with respiratory infections (38 students) had a mean height of 115.2±5.6 cm, mean weight of 18.3±2.1 kg and mean BMI of 15.4±1.2, with significant differences compared to normal weight children (33 students) who had a mean height of 120.4±4.8 cm, mean weight of 22.1±1.9 kg and mean BMI of 17.8±1.0 (p-values: 0.023, 0.045, 0.012, respectively). For gastrointestinal infections, 27 underweight children had a mean height of 116.7±5.2 cm, mean weight of 18.0±2.4 kg, and mean BMI of 15.1±1.3, compared to 25 normal weight children with a mean height of 121.1±4.5 cm, mean weight of 22.5±2.2 kg and mean BMI of 18.2±1.1 (p-values: 0.037, 0.056, 0.019). Skin infections affected 31 underweight children with a mean height of 114.5± 5.9 cm, mean weight of 17.7±2.5 kg and mean BMI of 15.2±1.5, while 32 normal weight children had a mean height of 119.8±4.9 cm, mean weight of 21.8±2.0 kg, and mean BMI of 17.6±1.2 (p-values: 0.029, 0.041, 0.018). In the case of dental caries, 44 underweight children had a mean height of 116.0±5.7 cm, mean weight of 18.1±2.3 kg and mean BMI of 15.4±1.3, compared to 35 normal weight children with a mean height of 121.3±4.8 cm, mean weight of 22.3±2.1 kg, and mean BMI of 17.9±1.0 (p-values: 0.025, 0.052, 0.016).

Table 5:

Health Condition	Nutritional Status	Number of Students (N)	Mean ± SD (Height)	Mean±SD (Weight)	Mean ± SD (BMI)	p-value (Height)	p-value (Weight)	p-value (BMI)
Respiratory Infections	Underweight	38	115.2 ± 5.6 cm	18.3±2.1 kg	15.4 ± 1.2	0.023	0.045	0.012
	Normal Weight	33	120.4 ± 4.8 cm	22.1 ± 1.9 kg	17.8 ± 1.0			
Gastrointestinal Infections	Underweight	27	116.7 ± 5.2 cm	18.0 ± 2.4 kg	15.1 ± 1.3	0.037	0.056	0.019
	Normal Weight	25	121.1 ± 4.5 cm	22.5 ± 2.2 kg	18.2 ± 1.1			
Skin Infections	Underweight	31	114.5 ± 5.9 cm	17.7 ± 2.5 kg	15.2 ± 1.5	0.029	0.041	0.018
	Normal Weight	32	119.8 ± 4.9 cm	21.8 ± 2.0 kg	17.6 ± 1.2			
Dental Caries	Underweight	44	116.0 ± 5.7 cm	18.1 ± 2.3 kg	15.4 ± 1.3	0.025	0.052	0.016
	Normal Weight	35	121.3 ± 4.8 cm	22.3 ± 2.1 kg	17.9 ± 1.0			
Anemia	Underweight	49	114.8 ± 5.8 cm	17.6 ± 2.5 kg	15.1 ± 1.4	0.031	0.048	0.014
	Normal Weight	42	120.5 ± 5.0 cm	21.7 ± 2.2 kg	17.5 ± 1.1			
Other Conditions	Underweight	24	115.6 ± 5.4 cm	18.4 ± 2.1 kg	15.5 ± 1.2	0.027	0.054	0.017
	Normal Weight	26	120.9 ± 4.7 cm	22.0 ± 2.0 kg	17.7 ± 1.1			

Anemia was prevalent in 49 underweight children with a mean height of 114.8±5.8 cm, mean weight of 17.6±2.5 kg and mean BMI of 15.1±1.4, whereas 42 normal weight children had a mean height of 120.5±5.0 cm, mean weight of 21.7±2.2 kg and mean BMI of 17.5±1.1 (p-values: 0.031, 0.048, 0.014). For other conditions, 24 underweight children had a mean height of 115.6±5.4 cm, mean weight of 18.4±2.1 kg, and mean BMI of 15.5±1.2, while 26 normal weight children had a mean height of 120.9±4.7 cm, mean weight of 22.0±2.0 kg and mean BMI of 17.7±1.1 (p-values: 0.027, 0.054, 0.017).

The present study evaluated the morbidity profile and nutritional status of primary school children in an urban setting in Malwani, Mumbai. The findings reveal a significant burden of undernutrition and associated health conditions among the study population, underscoring the urgent need for targeted public health interventions.

The study found that 21.75% of the children were underweight, 25.25% were stunted and 18.25% were wasting. These figures are consistent with national trends reported by the National Family Health Survey (NFHS-5)[4], which indicated that approximately 32.1% of children under five years are stunted, 19.3% are wasted and 35.7% are underweight in India. Despite the coverage of the Mid-Day Meal Scheme in the study area, these high prevalence rates suggest that additional nutritional support and interventions are needed to address underlying issues of food security and dietary quality.

The morbidity profile showed that anemia was the most common condition, affecting 22.75% of the children, followed by dental caries (19.75%), respiratory infections (17.75%), skin infections (15.75%) and gastrointestinal infections (13%). Anemia's high prevalence aligns with findings from other studies that highlight it as a significant public health issue among school-aged children in India[5-6]. The presence of dental caries and respiratory infections also points to the need for improved hygiene and healthcare access.

The study identified significant differences in anthropometric measurements between underweight and normal weight children across various health conditions. For example, underweight children with respiratory infections had significantly lower mean heights and weights compared to their normal weight counterparts. Similar trends were observed for gastrointestinal infections, skin infections, dental caries, anemia and other conditions[7]. These results are consistent with the literature, indicating that malnutrition exacerbates the susceptibility and severity of infections and other health conditions[8-9].

Gender and age variations in nutritional status were also noted. Boys in the 9-10 years age group had the highest prevalence of underweight (23.33%) and wasting (20%), while girls in the same age group showed a higher prevalence of stunting (24.44%). These findings suggest that nutritional interventions should be tailored to address specific needs based on age and gender to be more effective[10-11].

The study's findings highlight the critical need for integrated health and nutrition programs in primary schools. Strengthening the Mid-Day Meal Scheme to ensure it provides adequate and balanced nutrition could significantly reduce the prevalence of undernutrition. Additionally, regular health screenings and interventions targeting common morbidities like anemia, dental caries and respiratory infections should be prioritized.

Limitations: While the study provides valuable insights, it is limited by its cross-sectional design, which cannot establish causality between nutritional status and health outcomes. Future longitudinal studies could provide more comprehensive data on the impact of nutritional interventions over time.

CONCLUSION

The study underscores the significant burden of undernutrition and associated morbidities among primary school children in Malwani, Mumbai. These findings call for enhanced nutritional programs and healthcare interventions to improve the health and well-being of this vulnerable population. Addressing these issues is crucial for achieving broader public health goals and ensuring the healthy development of children.

REFERENCES

1. Govender, I., S. Rangiah, R. Kaswa and D. Nzaumvila, 2021. Malnutrition in children under the age of 5 years in a primary health care setting. South Afr. Family Pract., 63: 1-6.
2. Goyal, M., N. Singh, R. Kapoor, A. Verma and P. Gedam, 2023. Assessment of nutritional status of under-five children in an urban area of south delhi, India. Cureus, Vol. 15, No. 2 .10.7759/cureus.34924.
3. Hoque, M.A., 2023. Mid-day meal scheme in India: Current status, critical issues and challenges. East Afr. J. Educ. Stud., 6: 460-471.
4. Black, R.E., C.G. Victora, S.P. Walker, Z.A. Bhutta and P. Christian et al., 2013. Maternal and child undernutrition and overweight in low-income and middle-income countries. Lancet., 382: 427-451.
5. Kotecha, P.V., S. Nirupam and P.D. Karkar, 2009. Adolescent girls' Anaemia Control Programme, Gujarat, India. Indian J Med Res., 130: 584-589.
6. Gupta, M.C., M. Mehrotra, S. Arora and M. Saran, 1991. Relation of childhood malnutrition to parental education and mothers' nutrition related kap. Indian J. Pediatr.s, 58: 269-274.
7. Iftikhar, A., A. Bari, I. Bano and Q. Masood, 2017. Impact of maternal education, employment and family size on nutritional status of children. Pak. J. Med. Sci., Vol. 33, No. 6 .10.12669/pjms. 336.13689.
8. Dewey, K.G. and K. Begum, 2011. Long-term consequences of stunting in early life. Mate amp Child Nutr., 7: 5-18.
9. Sanctis, V.D., A. Soliman, N. Alaaraj, S. Ahmed and F. Alyafei,et al., 2021. Early and Long-term Consequences of Nutritional Stunting: From Childhood to Adulthood. Acta Biomed., Vol. 92, No. 1.