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Anthropometric and Socioeconomic indicators of malnutrition among primary school children: A cross-sectional study in rural Lahore.

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Abstract

Background: *Nutrition being an important indicator for assessing quality of life determines mother and child's health among the same socioeconomic class. Assessment of growth and nutrition is considered as one of the indicators of life quality of entire population. Primary school age is a dynamic period of growth and neutral development for children.*

Material and Method: *A cross sectional, descriptive study was conducted in two schools of Baddoki, Lahore in 2025 to assess the nutritional status of children aged between 7-11 years. Non-probability convenient sampling technique was used to select the children for study. Before collecting data, ethical approval from school authorities were taken. Anthropometric measurements were taken according to WHO recommended standardized procedures. A structured questionnaire was used to collect information through face to face interviews with children. Socio-demographic information and dietary habits were recorded on questionnaire.*

Result*: A total of 194 primary school children were included in the study, among them 110 were male and 84 were female. The majority of the children had normal weight (70.6%) height (68%), whereas 25.3% children were underweight and 30.4% were short heighted. Around 46% male children and 33.5% female children had BMI in normal range while 9.8% male children and 6.8% female children had below normal BMI. The statistical analysis indicated no significant association between nutritional status and gender of children, nutritional status socio-demographic characteristics. No statistically significant difference was observed between urban and rural children in terms of weight and their BMI. However, height showed a statistically significant difference (p=0.041) between children residing in urban and rural areas.*

Conclusion: *The present study demonstrates that undernutrition remains a critical public health concern among primary school children aged 7–11 years in rural setting Lahore. The prevalence of underweight (25.3%), stunting (30.4%), and thinness (18.6%) highlights the persistent burden of malnutrition. These findings reflect the ongoing impact of chronic nutritional deficiencies and socioeconomic inequalities on child growth in resource-constrained environments.*

Key words: *Nutritional status, underweight, stunted, thinness, undernourished, school children*

Introduction

Owning to deficiency, surplus, or imbalance of vital nutrients, malnutrition is a term that continues to raise concern for public health, especially for children that suffer from this condition[1]. As per WHO and UNICEF, in the year 2014, 161 million children had stunted growth, 51 million had wasting disease, and 99 million were underweight[2].The Challenge of malnutrition is a huge one for the whole world, but especially for developing countries such as Pakistan. Children in developing countries, who are under the age of five, lose their lives due to malnutrition, which accounts for 4% [1] in this stratum, and indirectly or directly leads to more than 60% of the 10 million children that die every year [3]. Earlier studies have pinpointed Asia to be the region with the highest rates of childhood malnutrition[2], and child mortality due to malnutrition is more than one-third worldwide[2].

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Lack of adequate and proper nutrition not only stunts development, but also nurtures negative health outcomes later in life due to restricted growth and development in the early years. The impacts of malnutrition in childhood are beyond just short-term health problems, childhood malnutrition puts individual at risk for long-term, severe chronic illnesses as adults[2] such as infectious diseases, bone deformities, cardiovascular disorders and many more. Additionally, recent studies have found that children who have stunted growth as a result of malnutrition have decreased beta-cell function, which suggests a higher risk of type 2 diabetes mellitus in later life[2]. In addition to promoting growth and development, adequate nutrition is necessary for healthy reproduction, cognitive and physical function, and a functioning immune system, which includes infection resistance[1]. A pulsating time of both physical and neurodevelopmental maturation is the primary school years[3]. School children who are malnourished frequently show delayed bone age, which can be remedied with proper nutritional interventions[4]. These children also show learning difficulties and slow learning curves that imply mental sluggishness[4].

Low socioeconomic status has a strong correlation with the prevalence of undernutrition[5]. Factors that help categorize the socioeconomic status, such as poverty, suboptimal infant and young child feeding practices, large family size, and household food insecurity, significantly influence dietary intake and health outcomes[5].

Given that fathers are usually the main breadwinners in a household, paternal education is also a determining factor[6]. A study conducted in Malir, Karachi, demonstrated that the highest prevalence of underweight (62.63%) and stunting (48.99%) was observed among children whose parents had low educational attainment; malnutrition was most common in children whose fathers possessed only basic literacy skills[6].

Maternal education is the single most imperative factor in determining the physical well-being of children within comparable socioeconomic brackets[5]. By raising awareness of hygienic habits and healthy behaviors and facilitating more efficient use of household resources, maternal education is especially important[5]. Kerala, India, is a prime example of this, with a female literacy rate of 87.86% compared to the national average of 54.16%; this is linked to a significantly lower birth rate (14/1000 versus 57/1000 for India as a whole)[7]. Maternal health is vital for provision of appropriate nutrition to the children[5].

An established indicator for indirectly gauging a population's quality of life is the evaluation of growth and nutritional status[6] and it can be helpful with significant accuracy in determining the quality of life in such populations. For assessing growth, development, and health, anthropometric indices offer a sensitive, practical, and globally applicable approach[1.] These indices are low-cost, non-invasive growth monitoring instruments[1]. For assessing the nutritional status of school-aged children, the World Health Organization suggests a number of anthropometric indices such as weight for age, height for age, Body Mass Index (BMI), and mid-upper arm circumference. Out of these, the Body Mass Index (BMI) is the most suitable variable for evaluation [1]. A person's ability to withstand periods of nutritional deficiency and illness is determined by their protein and fat reserves, which are accurately indicated by their BMI[5].

The main objectives of this study are to assess the nutritional status of primary school children, to find the association between nutritional status of children and socio demographic characteristics, and to evaluate the association between nutritional status of children and dietary intake.

Methodology

This is a cross-sectional study carried out to assess nutritional status of primary school children. Two schools, one public and one private, were randomly selected located in a rural area Budduki, Lahore to collect data from primary school children. All otherwise healthy-looking school children 7-11-year-old studying in the selected Primary section of these schools, regardless of gender, grade or background, i.e. both male and female students, who were willing to participate, were included in the study. The sample comprised of 194 children. Chronic ill children, non-responsive children and those children who did not want to participate in the study, were excluded from the data collection. Non-probability convenient sampling technique was used to select these children. This study used a semi-structured questionnaire to collect socio-demographic and dietary information from the selected children. Dietary assessment of the participants' children was done by using a check list for dietary recall. Anthropometric measurements of the participants' children were measured right away and recorded.

Weight was recorded in kilograms using a calibrated digital weight machine. Height was measured in centimetres using a height meter. BMI Calculation was done using WHO BMI calculator from the height and weight of each child.

Data collection team was briefed and trained on how to collect information from the children after attaining their informed consent, using the questionnaire and how to take anthropometric measurements of the participants. Face to face interview was conducted with the selected school children to collect socio-demographic and dietary information from the children and recorded on the questionnaire by the trained team. The data collected from participant's children was entered, cleaned and analysed using SPSS version 26, and presented in form of frequency tables, graphs and charts. Chi-square test was applied to analyze and to find identifiable association between the variables. The level of significance was set at< 0.05.

Some operational definitions used in this study are discussed here. A child is considered to be stunted or being too short when his height-for-age is below -2 standard deviations (-2 SD) from median of the WHO Child Growth Standards. A child is considered to be underweight when his weight-for-age is below -2 standard deviation (-2SD) from the WHO Child Growth Standards. A child or adolescent is deemed to be overweight when their BMI-for-age is greater than

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+1 Standard Deviation (the 85th percentile) and less than or equal to +2 standard deviation (the 97th percentile) of the WHO growth reference median. Thinness in a child or adolescent is defined in terms of his/her body mass index as children or adolescents with a body mass index (BMI) less than - 2 standard deviation (-2 SD) below the median of the WHO reference standards for children and adolescents aged 5– 19 years, based on the measured height in centimetres and weight in kilograms.

Results

This study evaluated the nutritional status of primary school children aged 7 to 11 years in a rural area of Lahore. A total of 194 primary school children were included in the study, among them 110 were male and 84 were female children.

Table-1 Socio-demographic Characteristic of Participants Children

Characteristic	Frequency	Percentage
Gender		
Male	110	56.7
Female	84	43.4
Locality		
Urban	42	21.6
Rural	152	78.4
Family size		
<4	17	8.8
5-7	130	67.0
>7	47	24.2
Total	194	100.0

Most of the children 152 (78.4%) belonged to rural areas while 42 (21.6%) were from urban areas. Most (67%) of the participants children had a family size of 5-7 members (table-1).

Table-2 Socio-demographic Characteristic of Participants' Parents

Characteristic	Frequency	Percentage
Father's Education		
No formal education	48	24.7
Primary	100	51.5
Secondary	38	19.6
Graduation//Higher	8	4.1
Mother's Education		
No formal education	74	38.1
Primary	90	46.4
Secondary	26	13.4
Graduation//Higher	4	2.0
Family income		
< 25,000 Rs	144	74.2
25,000 – 50,000 Rs	42	21.6
50,000 – 100,000 Rs	8	4.1
Total	194	100.0

Table-2 depicts parents' educational level; around half of mothers and fathers had primary education, some fathers (19.6) and mothers (13.4%) had secondary education, whereas 38% mothers & 24% fathers had no formal education. Most (74.2%) of the participants children's families had < Rs. 25000 monthly family income, 21.6% had between Rs 25000-Rs 50000 monthly family income, whereas only 4% had more than Rs. 50,000 monthly family income.

Table-3 Anthropometric Measurements of the Participants Children

Characteristic	Male	Female	Total
Weight			
Under-weight (under nutrition)	34(17.53%)	15 (7.73%)	**49 (25.3%)**
Normal weight	69(35.57%)	68(35.05%)	**137 (70.6%)**
Over-weight (over nutrition)	7(3.61)	1(0.5%)	**8 (4.1%)**
Height			
Short Heighted (stunted)	29(14.43%)	31(15.98%)	**59 (30.4%)**
Normal Height	79(40.7%)	53(27.3%)	**132 (68.0%)**
Tall Heighted	3(1.8%)	-	**3 (1.5%)**
BMI			
Below Normal (thinness)	19(9.79%)	17(8.76%)	**36(18.6%)**
Normal	89(45.68%)	65(33.51%)	**154 (79.4%)**
Above normal (over-weight/obese)	2(1.03%)	2(1.03%)	**4 (2.1%)**
Total	**110 (56.7%)**	**84 (78.4%)**	**194(100.0)**

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Table-3 illustrates the distribution of the participant's children according to their anthropometric measurements. The majority of the children (70.6%) had normal weight, indicating that most of the children have a healthy weight status. However, **25.3% children were underweight**, reflecting a significant proportion of children experiencing under nutrition. This suggests that one in four children may not be receiving adequate nutrition, whereas few children (4%) were found overweight.

This study results depicts that majority (68%) children had normal height, **30.4 % children** were **short heighted (stunted),** whereas few (1.5%) children were tall. (table-3). The table-3 also illustrates BMI status of the participants' children; BMI of most (79.4%) of the children fell in normal range, some (18.6%) children had below normal BMI (thinness) while few had above normal BMI (overweight/obese).

Figure 1: Distribution of participants' children according to their weight

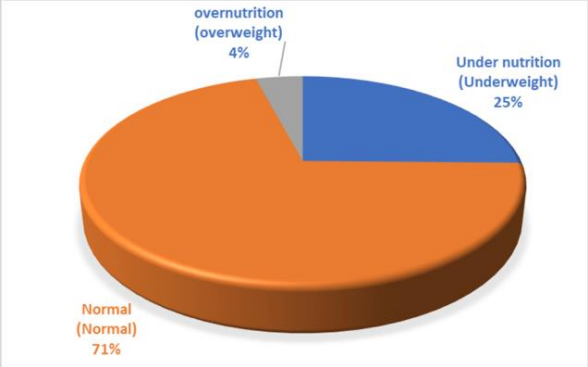

Figure:2 Gender-wise Distribution of Participants Children's Nutritional Status `

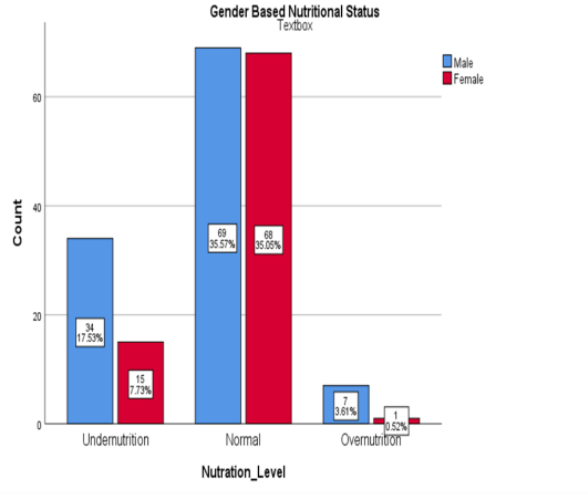

Figure-2. The bar chart shows the gender-wise nutritional status of children categorized as underweight (under nutrition), normal, and overweight (over nutrition). The majority of both male and female children has "normal weight", with more male children (17.5%) are underweight and overweight (7%) compared to female children.

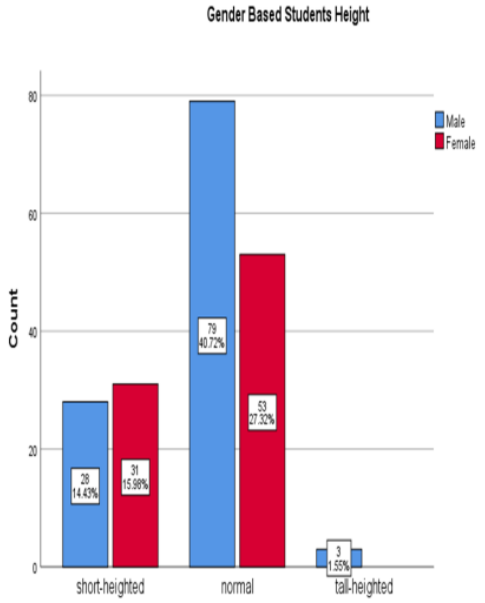

Figure:3 Gender-wise Distribution of Participants Children's Height

This bar chart compares the male/female participants' children's height, depicting 40.7% male children, and 27.3% female children has normal height whereas no much gender-based difference found among short heighted children.

Figure:4. Gender Based Distribution of Participants Children's BMI

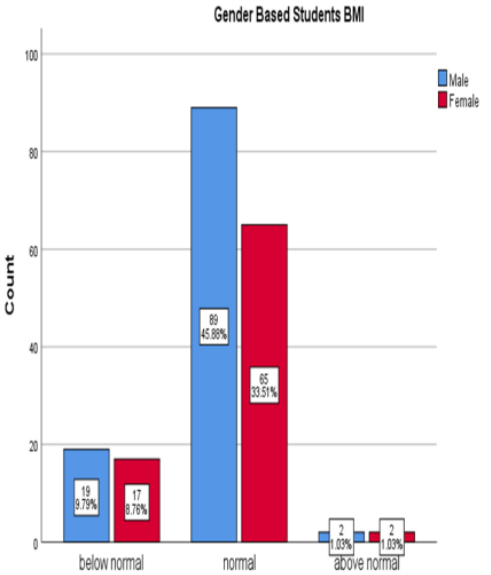

Figure-4; The bar chart compares the male/female participants children's BMI, depicting that BMI of 46% male children and 33.5% female children has normal range while 9.8% male children and 6.8% female children has below normal BMI.

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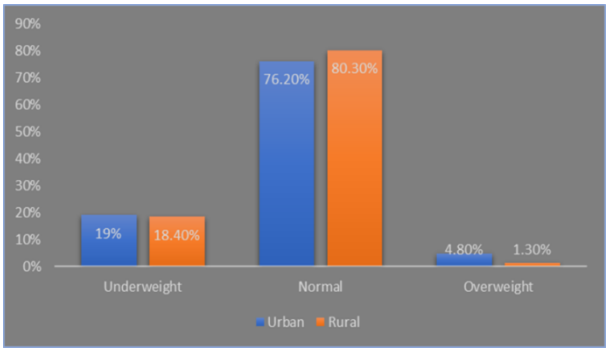
Table-4. Relationship of Nutritional Status of Studied Children with their Socio-demographic Characteristics

	Normal (137)	**Underweight (49)**	**Overweight (8)**	**Total (194)**	**P-value**
Sex					
Male	69(35.57)	34 (17.53%)	7 (3.6%)	**110 (56.7. %)**	**.830**
Female	68(35.05)	15 (7.73)	1(0.5)	**84 (43.3%)**	
Locality					
Urban	27 (64.3%)	12 (28.6%)	3 (7.1%)	**42 (21.6%)**	**0.423**
Rural	110 (72.4%)	37 (24.3%)	5 (3.3%)	**152 (78.4%)**	
Mothers Educational Status					
no formal education	48(24.74%)	22(11. 0%)	4(2.06%)	**74**	**0.781**
primary	64(33%)	22(11.34%)	4(2.06%)	**90**	
secondary	21(10.82%)	5(2.6%)	0	**26**	
graduation & higher	0	3(1.55%)	1(0.52%)	**4**	
Fathers Educational Status					
no formal education	32(16.5%)	15(17.7)	01(.52)	**48**	**0.467**
primary	67(35.5%)	26((13.40%)	7(15.98%)	**100**	
secondary	31(15.98%)	7(3.61%)	3.(61%)	**38**	
graduation & higher	1(.52%)	6(3.5%)	1(.52%)	**8**	
Monthly Family Income					
<Rs 25,000	104	35	5	**144**	**0.705**
Rs25,000-Rs50,000	28	11	3	**42**	
Rs 50,000-Rs100,000	5	3	0	**8**	
Family size					
<4	9	6	2	**17**	**0.331**
5-7	93	33	4	**130**	
>7	35	10	2	**47**	

Table- 4: Socio-demographic characteristics of studied children were compared in relation to their nutritional status. Almost same proportion of male and female children (35%) had their weight in normal range, whereas higher percentage (17.53%) of male children were found underweight, and overweight compared to female children. The statistical analysis (chi-square test) indicated no significant association between nutritional status and gender of children (p = 0.830).

Similarly, no significant statistical association was found between nutritional status of the studied children and their socio-demographic characteristics; father's/ mother's educational status (p= .782), monthly family income (p= .705) and family size (p= >0.331).

Figure 5: BMI Based Distribution of Participants Children according to urban/rural locality



The bar chart compares the nutritional status of participants' children in urban and rural areas, categorized as underweight, normal, and overweight. The majority of individuals in both settings fall within the "Normal" weight category, with rural areas slightly ahead at 80.3% compared to 76.2% in urban areas. The proportion of underweight individuals is nearly the same in both areas, with urban areas at 19% and rural areas at 18.4%. However, there is a noticeable difference in the "Overweight" category, where urban areas report a higher percentage (4.8%) compared to rural areas (1.3%). This suggests that while the general nutritional status in both areas is largely normal, urban populations have a slightly higher prevalence of overweight individuals, possibly due to lifestyle and dietary differences.

Table 5: Comparison of Anthropometric Measurements of Participants' Children in relation to their residence urban or rural

Characteristics	Urban (42)		Rural (152)		Total		Chi-Square	P-value
	No.	%	No.	%	No.	%		
Weight								
Under-weight	12	28.6	37	24.3	**49**	**25.3**	1.722	0.423
Normal	27	64.3	110	72.4	**137**	**70.6**		
Over-weight	3	7.1	5	3.3	**8**	**4.1**		
Height								
Short Heighted	8	19.0	51	33.6	**59**	**30.4**	6.384	**0.041**
Normal	32	76.2	100	65.8	**132**	**68.0**		
Tall Heighted	2	4.8	1	0.7	**3**	**1.5**		
BMI								
Below Normal	8	19.0	28	18.4	**36**	**18.6**	1.971	0.373
Normal	32	76.2	122	80.3	**154**	**79.4**		
Above Normal	2	4.8	2	1.3	**4**	**2.1**		

Table-5 compares the anthropometric measurements of children from urban (n=42) and rural (n=152) areas. Overall, no statistically significant difference was observed between urban and rural children in terms of weight (p=0.423) and their BMI (p=0.373). Most children in both groups had normal weight (70.6%) and normal BMI (79.4%), with some participants children classified as underweight or overweight.

However, height showed a statistically significant difference (p=0.041) between children residing in urban and rural areas. A greater proportion of rural children (33.6%) were short in height compared to urban children (19.0%), indicating possible disparities in growth and nutritional factors between the two settings.

Table 6: Distribution of the studied children according to their dietary habits in relation to residence.

Characteristics	Urban Children (42)		Rural Children (152)		Total		Chi-Square	P-value
	No.	%	No.	%	No.	%		
No. of meals per day								
One	2	4.8	4	2.6	**6**	**3.1**	0.862	0.650
Two	9	21.4	27	17.8	**36**	**18.6**		
Three	31	73.8	121	79.6	**152**	**78.4**		
Taking Breakfast daily								
Always	30	71.4	115	75.7	**145**	**74.7**	3.987	0.136
Sometimes	7	16.7	31	20.4	**38**	**19.6**		
Never	5	11.9	6	3.9	**11**	**5.7**		
Skipped meal								

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Breakfast	5	11.9	13	8.6	**18**	**9.3**	8.503	0.075
Lunch	9	21.4	43	28.3	**52**	**26.8**		
Dinner	10	23.8	14	9.2	**24**	**12.4**		
Moe than one meal	4	9.5	10	6.6	**14**	**7.2**		
None	14	33.3	72	47.4	**86**	**44.3**		
Taking Snacks								
Always	11	26.2	39	25.7	**50**	**25.8**	4.538	0.209
Sometimes	24	57.1	66	43.4	**90**	**46.4**		
Rarely	7	16.7	40	26.3	**47**	**24.2**		
Never	-	-	7	4.6	**7**	**3.6**		
Types of snacks								
Healthy	17	40.6	50	32.9	**67**	**34.5**	0.837	0.630
Unhealthy	25	59.5	102	67.1	**127**	**65.5**		
Type of disliked food								
Milk	3	7.1	20	13.2	**23**	**11.9**	1.487	0.829
Meat	10	23.8	31	20.4	**41**	**21.1**		
Fish	8	19.0	26	17.1	**34**	**17.5**		
Cooked vegetables	7	16.7	21	13.8	**28**	**14.4**		
Circumstances of eating food								
Eating during studying	-	-	1	0.7	**1**	**0.5**	1.303	0.521
watching TV and computer (alone)	5	11.9	28	18.4	**33**	**17.0**		
With family	37	88.1	123	80.9	**160**	**82.5**		

The present study investigated and compared the eating habits and food preferences of children from urban (n=42) and rural (n=152) community.

The majority of children in both groups (urban and rural) reported consuming three meals per day (urban: 73.8%, rural: 79.6%), and a high proportion took breakfast daily (urban: 71.4%, rural: 75.7%). However, a small number of urban children (11.9%) reported never taking breakfast. In terms of skipped meals, lunch was the most commonly skipped meal overall, particularly among rural children (28.3%), while dinner was more frequently skipped by urban children (23.8%). Still, a notable proportion of children in both settings reported not skipping any meal (urban: 33.3%, rural: 47.4%).

Snack consumption was fairly common, with most children consuming snacks either always or sometimes. However, a slightly higher percentage of rural children consumed snacks rarely or never compared to their urban counterparts. When it came to snack quality, the majority of both urban and rural children preferred unhealthy snacks (urban: 59.5%, rural: 67.1%). Regarding food preferences, meat and fish were the most disliked food items, while milk and cooked vegetables were less commonly disliked.

The majority of children reported eating meals with their families (urban: 88.1%, rural: 80.9%), reflecting strong family meal patterns. Only a few students reported eating alone, while watching TV, or during study time.

The findings revealed that there were no statistically significant differences between the rural and urban children two groups in any of the assessed dietary variables, as all p-values were > 0.05. This indicates a general similarity in dietary behaviours among urban and rural school children.

In conclusion, although minor variations were observed in certain eating behaviours, such as breakfast skipping and dinner omission—none of these differences were statistically significant. These results suggest that children from both urban and rural backgrounds share similar dietary habits, with a strong culture of family meals and comparable patterns in snack consumption and food preferences. Improvements in regular breakfast intake and healthier snack choices could benefit students in both settings.

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Discussion:

The study utilized a cross-sectional design to evaluate the nutritional status of primary school children aged 7 to 11 years in a rural area of Lahore, using anthropometric measurements of weight, height, and BMI. A total of 194 children participated, including 110 males and 84 females. The weight assessment revealed that 70.6% of the children had normal weight, 25.3% were underweight, and 4.1% were overweight. These findings are consistent with results from Ethiopia, where underweight prevalence among school-aged children was reported as 22% due to poor dietary diversity and food insecurity, particularly in rural area[8]. Similarly, malnutrition remains a critical issue in South Africa, where underweight prevalence in rural children stands at approximately 17%, highlighting the persistent global burden of under nutrition in resource- limited settings[9]. Height measurements showed that 68% of the children had normal stature, while 30.4% were stunted and 1.5% were tall. Stunting in this study aligns with findings from rural Sindh, Pakistan, where 16.5% of children were stunted, with a higher prevalence among females[6]. The global prevalence of stunting, as evidenced in Ethiopia (27%), mirrors the chronic malnutrition challenges observed in this study population. Stunting remains a clear indicator of long-term nutritional deficiencies and socioeconomic disparities, as seen in multiple global settings, including South Africa, where persistent malnutrition affects growth and development in children[8,9].

BMI analysis indicated that 79.4% of children had a normal BMI, while 18.6% were classified as thin and 2.1% as overweight or obese. These findings resonate with national data from Pakistan, where thinness is prevalent among rural children due to limited access to diverse, calorie-rich diets. Overweight and obesity were rare in this study population, consistent with global trends where rural environments characterized by high physical activity and low- calorie diets provide a protective effect against over nutrition. Similar observations were reported in South Africa, where overweight and obesity are more prominent in urban settings compared to rural areas due to changing dietary patterns and sedentary lifestyles[9,10].

Table 5 revealed a significant association between height and residence ($p = 0.041$), showing that rural children were more stunted. However, the analysis failed to form a significant association between gender and weight as was suggested by Paned et all[11], who reported higher rates of undernutrition among boys in South India, challenging the common belief that girls are more vulnerable to poor nutrition. In both contexts, boys may face greater energy demands or nutritional neglect despite a general cultural preference for male children (Pande, 1999)[11].

In contrast to this, parental education—often highlighted as a major determinant of child health—did not show a significant association with undernutrition in our study. However, global evidence from Vollmer (2017)[12] shows that both maternal and paternal education are strongly associated with reduced undernutrition risk across low- and middle-income countries. Their findings underscore that educated parents are more likely to ensure adequate nutrition, better hygiene, and timely healthcare for their children, suggesting that while our study showed no link, parental education remains a widely recognized protective factor (Vollmer, 2017)[12].

Similarly, our study found no statistically significant differences in dietary habits between urban and rural children (Table 7), and these habits were not associated with undernutrition (all $p > 0.05$). This contrasts with findings from Potempa-Jeziorowska et al.[13], who observed a significant relationship between children's nutritional status and dietary practices such as breakfast intake and consumption of fruits and vegetables in Poland. Their study emphasizes that eating behaviours can influence child nutrition outcomes, suggesting that while dietary habits were not a determining factor in our population, they may play a critical role in different cultural or socioeconomic settings[13].

Overall, the study highlights significant under nutrition challenges among rural children, emphasizing the need for targeted interventions. Efforts to enhance dietary diversity, improve maternal education, and strengthen healthcare access are essential to addressing the malnutrition burden effectively and ensuring healthy growth and development in vulnerable populations.

This study is limited by its cross-sectional design as it fails to establish causality. The use of non-probability convenience sampling from only 2 schools limits the generalizability of these findings. The dietary assessment method used was prone to recall bias. Furthermore, confounding variables like food security and healthcare access was not explored.

Conclusion:

The present study highlights that undernutrition remains a significant concern among primary school children in rural Lahore, with notable proportions of underweight and stunted children despite the majority maintaining normal anthropometric indicators. The findings are consistent with national and international evidence, reaffirming that chronic nutritional deficiencies and socioeconomic disparities continue to hinder optimal child growth in resource-limited settings. Although no significant associations were observed with parental education or dietary habits in this study, existing literature emphasizes their protective role, indicating the need for further exploration of contextual determinants. These results underscore the importance of targeted, multi- sectorial interventions aimed at improving dietary diversity, enhancing maternal education, and strengthening healthcare access. School-based nutrition programs and community-driven strategies should be prioritized to address the underlying causes of malnutrition and promote sustainable improvements in child health. Addressing these challenges is essential to ensure the healthy growth and development of children and to mitigate the long-term consequences of undernutrition in vulnerable populations.

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Recommendations:

1. Enhance dietary diversity through school meal programs, kitchen gardening, and community awareness.
2. Strengthen maternal and parental education on nutrition, hygiene, and child health.
3. Develop gender-sensitive interventions to address higher undernutrition among rural male children.
4. Improve healthcare access in rural areas via primary healthcare strengthening and mobile health clinics.
5. Implement school-based nutrition programs including growth monitoring, deworming, and supplementation.
6. Address socioeconomic determinants by integrating nutrition into agriculture, social protection, and rural development.
7. Promote further research through longitudinal studies to explore causal factors of undernutrition.

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