



Research Article

Volume 10 Issue 2 - July 2020
DOI: 10.19080/BBOAJ.2020.10.555781

Biostat Biom Open Access J
Copyright © All rights are by Muhammad Faisal Fahim

Nutritional Status of School Going Children of 5-15 Years of Age: Urban Slums Scenario in Karachi, Pakistan



Shahid Ahsan¹, Zahida Saleh², Sikander Ali Sheikh³, Muhammad Faisal Fahim⁴, Muhammad Saleh Memon⁵, Sidra Shakil⁶

¹Department of Biochemistry, Jinnah Medical & Dental College, Pakistan

²Department of Pediatrics, Al-Ibrahim Eye Hospital, Isra Postgraduate Institute of Ophthalmology, Pakistan

³Department of Community Projects, Al-Ibrahim Eye Hospital, Isra Postgraduate Institute of Ophthalmology, Pakistan

⁴Department of Physical Therapy, Bahria University Medical & Dental College, Pakistan

⁵Department of Research, Al-Ibrahim Eye Hospital, Isra Postgraduate Institute of Ophthalmology, Pakistan

⁶Department of Vitreo Retina, Al-Ibrahim Eye Hospital, Isra Postgraduate Institute of Ophthalmology, Pakistan

Submission: May 18, 2020; **Published:** July 09, 2020

***Corresponding author:** Muhammad Faisal Fahim, M.Sc. (Statistics)

Researcher & Senior Lecturer Biostatistics

Department of Physical Therapy

Institute: Bahria University Medical & Dental College, Karachi

Email: faisalfahim88@hotmail.com

Phone: 0346-3160827

Abstract

Objective: To explore the nutritional status of school going children, aged 5 to 15 years, living in urban slums of Karachi.

Methodology: This observational, cross sectional study was conducted in 2016 urban slums area of Karachi. After ethical approval, students of 5-15 years were selected from three public schools located in urban slums. Demographic information along with weight and height of the selected children were taken and plotted to gender specific, CDC 2000 growth charts. Nutritional status was evaluated as per Waterlow's classification. A value within ± 2 SD in these charts were considered as normal. Statistical package, SPSS 20.0 was used for data analysis.

Results: Of the total 571 children, 348 (56.4%) were boys and 223 (43.6%) were girls. Nearly 89 (15.5%) children including 52 (10.5%) boys and 37 (6.4%) girls had normal anthropometric indices. Stunting was the most frequent anthropometric failure (n=219, 38.3%) followed by wasting (n= 163, 28.51%) and underweight (n=100, 17.5%) respectively. Gender disparity was observed in the distribution of malnutrition with boys had higher frequency of stunting, wasting and underweight than girls.

Conclusion: Frequency of malnutrition among school going children living in urban slums were found to be 38.3% (stunting), 28.5% (wasting) and 17.5% (underweight), accordingly to the standard laid by CDC 2000 standard. This study showed higher frequency of malnutrition in male gender.

Keywords: Malnutrition; Urban slums; School children; CDC 2000

Introduction

Rapid migration to the urban areas in the twentieth century has been accompanied by the development of slums [1]. These are unorganized settlement in urban areas with run down housings, overcrowding, poor water and sanitation, poverty and social disorganization [2]. According to an estimate, nearly 1/3rd of the world's population lived in slums. Whereas in the least developed countries more than 60% of urban populations lived in slums [3]. With this current trend, it is anticipated that number of slum dwellers may reach to 2 billion by 2030 that in next twenty years

(2050) may reach to 3 billion [4]. In Karachi, one of the largest cities and economic hub of Pakistan, there are more than 600 slum areas accommodating nearly 65 percent of the Karachi population [5]. The presence of slums has global and regional implications, affecting health, education and child mortality [6].

People living in slum areas are influenced from their surrounding environment [7]. Especially children living in these areas are more susceptible to acquire infections and vulnerable to nutritional ailments. These ailments may adversely affect the child's intellectual development and productivity in later life.

Numerous studies delineate the situation of malnutrition in children living in slum areas targeted specifically the children in their first five years of life [8]. Little information is available on the situation of malnutrition among school going, children and adolescents, of 5–15 years age living in these areas. This paucity of data makes it difficult to develop policies and strategies on why and how nutritional situation of these children and adolescents can be improved. Present study thus designed to explore the nutritional status of school going children aged 5 to 15 years living in urban slums in Karachi.

Methodology

This observational, cross sectional study was conducted in two urban slums located in Gadap town and Sadar town of Karachi, Pakistan in 2016. A total of 571 students of 5-15 years of three public schools, a government girl's primary school and a government boy's primary/secondary school located in Sadar town and a government primary school (co-education), in Gadap town, were selected. From these schools, children of 5-15 years of age were inducted in the study. After obtaining the demographic information, weight and height of the selected children were taken according to standard protocol and recorded.

Values of height and weight of every child were plotted on gender specific CDC 2000 anthropometric charts. These gender specific charts were used for identifying the anthropometric failure like underweight (percentage of expected weight for age), stunting (percentage of expected height for age) and wasting (percentage of expected weight for height). A child was categorized as normal if his height and weight falls within ± 2 SD of the growth curve. Ethical approval was obtained from the institutional review board of Al-Ibharim Eye Hospital, Karachi. Data entered and analyzed by the Statistical package for Social Sciences, SPSS 20.0. The descriptive data was presented as frequency (%) and mean \pm SD (standard deviation). Student's t test or chi-square test was

used for the analytic assessment where appropriate.

Results

A total of 571 students were examined. Demographic and anthropometric measurement of the study participants were shown in Table 1. With increasing age, increase in mean \pm SD height and weight of the study participants were observed, however both variables were found to be decreased compared to the standard laid by Centre for Disease Control and Prevention (Figure 1). Age and sex wise distribution of nutritional status of the study participants were shown in Table 2 & 3. Out of total 571 participants, only 89 (15.5%) had normal anthropometric indices. Highest frequency of participants with normal anthropometric indices were found in 9 – 10 years of age (n= 27, 30.34%) whereas age group 11 – 12 years (n=11, 12.36 %) had least number of participants with normal anthropometric indices. Stunting was the most frequent anthropometric failure (n=219, 38.3%) followed by wasting (n= 163, 28.51%) and underweight (n=100, 17.5%) respectively.

Age wise distribution of various anthropometric failure revealed stunting as most frequently occurred failure in 9 – 10 years age group (n=67, 30.59%) with wasting (n=75, 46.01%) and underweight (n=36, 36%) in 11- 12 years of age. Least frequency of stunting (n=9, 4.11%) and underweight (n=10, 10%) was found in 13 – 15 years of age where as wasting was observed in least frequency (n=5, 3.07%) in 5 – 6 years of age. Gender wise comparison revealed mean height and weight of the boys were higher compared to girls. Nearly 14.9% of boys and 16.5% of girls had normal anthropometric indices. Stunting, wasting and underweight are observed in decreasing order of frequency in both boys and girls. Gender disparity was observed in the distribution of stunting, wasting and underweight with boys had higher frequency than girls.

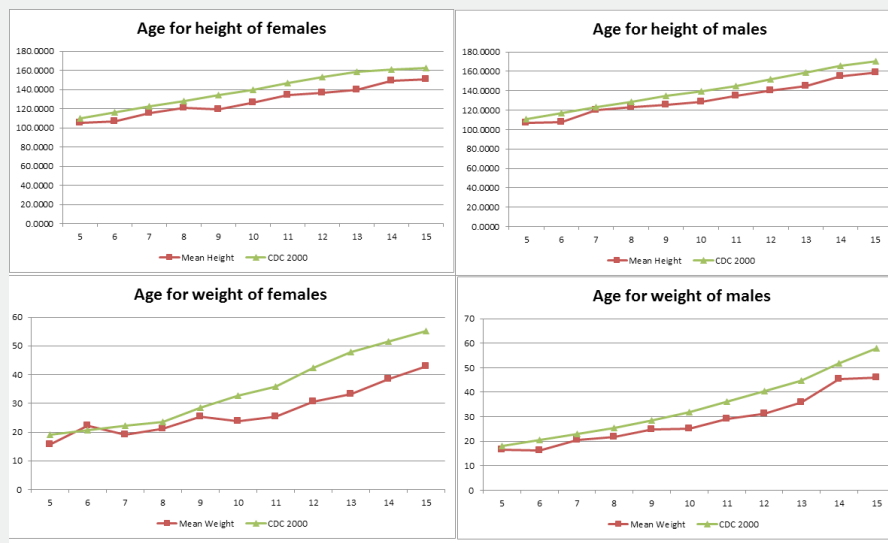


Figure 1: Age for Height & Age for weight distribution.

Table 1: Demographic and anthropometric characteristics of school going children living in urban slum (n=571).

Age (years)	Frequency n=571	Mean Height (cm)	Mean Weight (kg)
5-6	57 (9.98%)	106.8±14.6	18.3±5.6
7-8	113 (19.79%)	119.6±6.2	20.7±2.86
9-10	179 (31.35%)	125.7±11.1	24.9±4.3
11-12	138 (24.17%)	136.6±8.3	30.9±5.9
13-15	84 (14.71%)	148.8±13.7	41.1±10.0
Gender			
Boys	348 (56.39%)	131.3±15.3	27.8±9.5
Girls	223 (43.61%)	125.25±15.9	26.6±9.9

Table 2: Nutritional status of school children (5-15years) by age.

Age	Normal n=89	Stunted (height for age) n=219	Wasted (weight for height) n=163	Underweight (weight for age) n=100
5-6	9 (10.11%)	38 (17.35%)	5 (3.07%)	14 (14%)
7-8	16 (17.98%)	65 (29.68%)	32 (19.63%)	16 (16%)
9-10	27 (30.34%)	67 (30.59%)	35 (21.47%)	24 (24%)
11-12	11 (12.36%)	40 (18.26%)	75 (46.01%)	36 (36%)
13-15	26 (29.21%)	9 (4.11%)	16 (9.82%)	10 (10%)
Total	89 (15.5%)	219 (38.3%)	163 (28.5%)	100 (17.5%)

Table 3: Nutritional status of school children (5-15years) by Gender.

Gender	Normal n=89	Stunted (height for age) n=219	Wasted (weight for height) n=163	Underweight (weight for age) n=100
Boys	52 (9.1%)	139 (24.3%)	95 (16.6%)	62 (10.8%)
Girls	37 (6.4%)	80 (14.0%)	68 (11.9%)	38 (6.6%)
Total	89 (15.5%)	219 (38.3%)	163 (28.5%)	100 (17.5%)

Discussion

Present study focused the school going children of 5-15 years of age, living in urban slums of Karachi. Study observed growth lag in height and weight of studied children compared to the reference standards laid down by CDC 2000 [9]. Similarly, frequency of stunting, wasting and underweight in the present study was found to be higher than the frequency reported by UNICEF. According to a report published by UNICEF, globally rate of stunting, wasting and underweight are 23%, 7% and 16% respectively [10]. The prevalence of all types of malnutrition in the present study was found to be higher than the global threshold values. In the present study stunting, wasting and underweight was found to be 38.3%, 28.5% and 17.5% respectively. Though the frequency in the present study did not reflect the country wide situation of malnutrition [11], higher occurrence of malnutrition in the children of selected urban slums demands exploration of its

determinants. At various stages of age, different levels of food and health care are needed thus nutritional status of child may vary by age. In the present study frequency of malnutrition (stunting, wasting and underweight) increases with increase in age of the child. Highest frequency of stunting was found in children of 9-10 years whereas wasting and underweight in 11-12 years of age. Literatures provide contrast relationship between child age and nutritional status. According to some, risk of being malnourished increases with age [12] whereas others failed to find out the relation between child age and malnutrition [13]. Increased frequency of malnutrition with increasing age in our study may plausibly be linked to less attention and care of the parents to their older children as more attention is diverted to younger ones. Additionally, with increase in age, children are more likely to expose to outdoor environment thus prone to come in contact with contaminated environment including food. All these may lead to increased probability of malnutrition with increase in age.

Gender is an important indicator of child malnutrition. Articles from South East Asia and Africa frequently reported increased prevalence of malnutrition among girls compared to boys [14]. For instance, a study from Bangladesh reported higher frequency of malnutrition among girls (54%) and a greater risk (1.44 times) to be malnourished than males [15]. This greater risk may probably be incurred because of inequalities in distribution of foods within a family. Girls in such situations succumbed victim to malnutrition than boys. These vulnerable girls are prone to develop the complications of malnutrition thus died at a younger age or if survived, in later stages, can set up an intergeneration cycle of malnutrition [15]. Not infrequently these conditions are seen in some of the communities in South Asia and Africa, where boys are culturally given preferences to selected and eat more nutritive foods. Whereas other studies from these regions published contradictory reports with higher rate of malnutrition among boys compared to girls [16]. In the present study, malnutrition was found in increased frequency among boys. Our result is in accordance with data from other parts of the world documenting higher prevalence of malnutrition in male than female children. This finding of present study is contrary to the prevalent belief that female children face discriminatory attitude in South East Asia thus subjected to be malnourished compared to male children. Some studies from Pakistan also reported no significant difference in stunting and wasting in male and female children [17-20]. Whereas, Laghari et al [21]; reported presence of severe malnutrition in higher frequency among female than male children of less than five years of age. Ansari et al. [10], also reported similar findings in children living in urban slums. Girls in his study were three times more prone to be stunted compared to boys, however targeted population in this study was children of 6-18 months of age. Batool [22] and Khuwaja also pointed out increased likelihood of stunting among female compared to male children, thus reaffirm the findings of above studies [21,22]. In contrast to the reported studies, presence of higher frequency of malnutrition among boys in the present study may be attributed to the difference in study setting. Present study was conducted in school going children. Thus, it can be assumed that parents who sent their daughters to the schools perhaps have more caring and less discriminatory attitude towards their female children. Their affection to daughters may result in better access of female child to food. It can be further presumed that these families may have better awareness about good health practices. Whatever may be the reason, higher frequency of malnutrition among boys in the present study and diverse results in the literatures make it difficult to conclude the impact of gender on malnutrition. This diversity may be the result of difference in study design, study area, sampling technique and method for assessment of malnutrition, however according to the Pakistan demographic and health survey boys has slightly higher prevalence of stunting (51%) than girls [23].

Rural, urban disparity in the prevalence of child malnutrition is well proven across the world. There are evidences in the literature that children from low socioeconomic background more prone to develop malnutrition due to poor living standards,

unhygienic eating habits, unsafe drinking water and poor sanitary conditions. It is therefore commonly assumed that urban slum dwellers are better off than rural residents because of their close physical proximity to urban areas thus assumed to have better access to health care services. However, these squatter settlers, compared to urban populations, have worse health status. A few studies however, showed contradictory results [24]. In Bangladesh for example nutritional status of under-five children in slums was relatively lower than that of rural, non-slum, and urban children. Similarly, in Kenya, resident of Nairobi slums had higher prevalence of childhood illnesses than rural and urban areas. In contrast, in Egypt mortality rate of under-five children in slums was significantly higher compared to all urban. However, it was found to be lower than rural and national figures. A finding similar to this was also originated from India that showed higher frequency of childhood malnutrition in rural areas compared to slums and urban areas. As the comparable data about health status of school going children of similar age group living in slums was not available from these countries, it is judicious to assume that children of this age group in these countries more likely to have similar health status. Stunting, wasting and underweight in the present study was found to be 38.3%, 28.5% and 17.5% respectively. There is dearth of literature in Pakistan addressing the nutritional status of this segment of the society. An urban-rural comparative study on nutritional status was conducted by Anwar et al; in Faisalabad, Pakistan reported significantly higher difference in prevalence of stunting (33% urban vs 40.9% rural), wasting (32.7% urban vs 33.3% rural); and underweight (32.3% urban vs 64.7% rural) in rural areas [10]. When findings of our study were compared with study by Asim M et al [10]; frequency of stunting in the present study was found to be lower (38%) than frequency in rural areas (40.9%) but higher than urban areas (33%). Whereas frequencies of both wasting and underweight was found to be lower in slum areas compared to urban and rural areas.

Conclusion

Frequency of stunting, wasting and underweight among school going children of 5-15 years of age, in urban slums areas, was found to be 38.3%, 28.5% and 17.5% respectively. Study observed higher frequency of malnutrition in males.

Limitations of study

Findings of the present study demands care interpretation. Malnutrition in the present study was assessed by plotting height and weight on gender specific CDC 2000 charts. This may result in under or overestimation of malnutrition if assessed by other reference standards. Moreover, participant's age was not ascertained by birth certificates. This may misclassify a child on the basis of age. Present study focused on school going children studying in public sector schools. This may not represent the nutrition status of students in private schools, madrasah (religious) schools or children not attending any school. It is thus recommended to conduct similar studies at community level.

Acknowledgement

We are thankful to Sightsavers for their support in conduction of survey. We also thankful to Tauseef Mahmood (Statistician AIEH), Kanwal Parveen (Senior Lecturer, ISO) for contribution at different stages of research.

References

- Unger A (2013) Children's health in slum settings. Archives of disease in childhood 98(10): 799-805.
- United Nations Human Settlements Programme (UN-Habitat) (2003) The challenge of slums; Global report on human settlement.
- Nolan LB (2015) Slum definitions in urban India: implications for the measurement of health inequalities. Popul Dev Rev 41(1): 59-84.
- UN-Habitat, 2010 UN-Habitat (2010) State of the cities 2010-11 - cities for all: Bridging the urban divide. UN-Habitat, Nairobi, Kenya.
- Fellows E (2019) 10 Facts About Poverty in Karachi.
- UN-Habitat, 2003 UN-Habitat (2003) The challenge of slums - global report on human settlements 2003. London, UK: United Nations Human Settlements Programme.
- Shanti Ghosh, Dheeraj Shah (2004) Nutritional problems in urban slum children. Indian pediatri 41(7): 682-696.
- Adnan M S Fakir, M Wasiqur Rahman Khan (2015) Determinants of malnutrition among urban slum children in Bangladesh. Health Econ Rev 5(1): 59.
- CDC (2019). Overview of the CDC Growth Charts.
- Muhammad Asim, Yasir Nawaz (2018) Child malnutrition in Pakistan: evidence from literature. Children (Basel) 5(5): 60.
- Bhutta ZA, Hafeez A, Rizvi A, Ali N, Khan A, et al. (2013) Reproductive, maternal, newborn, and child health in Pakistan: challenges and opportunities. The Lancet 381(9884): 2207-2218.
- Mozumder AB, Barkat-E-Khuda, Kane TT, Levin A, Ahmed S (2000) The effect of birth interval on malnutrition in Bangladesh: Infants and young children. J Biosoc Sci 32(4): 289-300.
- Mbuya MNN, Chidem M, Chasekwa B, Mishra V (2019) Biological, Social, and Environmental Determinants of Low Birth Weight and Stunting among Infants and Young Children in Zimbabwe.
- Christian P, Smith ER (2018) Adolescent undernutrition: Global burden, physiology, and nutritional risks. Annals of Nutrition and Metabolism 72(4): 316-328.
- FAO (2020) Women, Men and Nutrition.
- Srivastava A, Mahmood SE, Srivastava PM, Shrotriya VP, Kumar B (2012) Nutritional status of school-age children-A scenario of urban slums in India. Arch public health 70(1): 8.
- Khattak K, Shah JS (2010) Malnutrition and associated risk factors in pre-school children (2-5 years) in district Swabi (NWFP)-Pakistan. J Med Sci 10: 34-39.
- Khan GN, Turab A, Khan MI, Rizvi A, Shaheen F, et al. (2016) Prevalence and associated factors of malnutrition among children under-five years in Sindh, Pakistan: A cross-sectional study. BMC Nutr 2: 69. doi: 10.1186/s40795-016-0112-4
- Mushtaq MU, Gull S, Khurshid U, Shahid U, Shad MA, Siddiqui AM (2011) Prevalence and socio-demographic correlates of stunting and thinness among Pakistani primary school children. BMC Public Health 11: 790.
- Ahsan S, Mansoori N, Mohiuddin SM, Mubeen SM, Saleem R, et al. (2017) Frequency and determinants of malnutrition in children aged between 6 to 59 months in district Tharparkar, a rural area of Sindh. J Pak Med Assoc 67(9): 1369-1373.
- Laghari ZA, Soomro AM, Tunio SA, Lashari K, Baloach FG, et al. (2015) Malnutrition among children under five years in district Sanghar, Sindh, Pakistan. Gomal J Med Sci 13: 314-318.
- Baig Ansari N, Rahbar MH, Bhutta ZA, Badruddin SH (2006) Child's gender and household food insecurity are associated with stunting among young Pakistani children residing in urban squatter settlements. Food Nutr Bull 27(2): 114-127.
- National Institute of Population Studies (2013) Pakistan Demographic and Health Survey 2012-2013. National Institute of Population Studies and ICF International; Islamabad, Pakistan; Calverton, MA, USA.
- African Population and Health Research Center (2002) Population and health dynamics in Nairobi's informal settlements. Nairobi, Kenya: African Population Health Research Center. UNICEF Bangladesh (2010). Understanding urban inequalities in Bangladesh: a prerequisite for achieving Vision 2021. Dhaka, Bangladesh: UNICEF Bangladesh.



This work is licensed under Creative Commons Attribution 4.0 License
DOI: [10.19080/BBOAJ.2020.10.555781](https://doi.org/10.19080/BBOAJ.2020.10.555781)

Your next submission with Juniper Publishers will reach you the below assets

- Quality Editorial service
- Swift Peer Review
- Reprints availability
- E-prints Service
- Manuscript Podcast for convenient understanding
- Global attainment for your research
- Manuscript accessibility in different formats
(Pdf, E-pub, Full Text, Audio)
- Unceasing customer service

Track the below URL for one-step submission

<https://juniperpublishers.com/online-submission.php>