Original Article

The Prevalence of Obesity and Stunting Among Students in Primary Schools

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ABSTRACT

Objective: To find out how common stunting is among Nawab Shah Sindh's elementary school students
Study Design: A Cross sectional study
Place and Duration of Study: This study was conducted at the Department of Pediatrics Medicine, university of medical and health sciences for women Nawabshah Sindh from 1st Jan 2024 to 30th March 2024.
Methods: A cross-sectional study was conducted with the participation of four government elementary schools in Nawab Shah Sindh. The sample size of 265 was established by using the WHO calculator. The appropriate purposive sampling technique was used. The study was approved by the Ethics Study Committee of the High Institute. Descriptive statistics, namely in the form of percentages and figures, were employed to illustrate the qualitative data. The chi square test was used to find any significant differences between the groups.
Results: After increasing significantly with age from the lowest at age 7-8 (grade 2) (9.3%, 4.4%, respectively), the prevalence of overweight and obesity peaked at age 10–12 (grade 4) (P=0.003). Females showed higher rates (12.5%, 8.8%, respectively) compared to boys (9.8%, 7.5%, respectively) (p <0.0001). Offspring of mothers in the high to moderate socioeconomic class and with low to medium levels of education demonstrated a significantly higher risk of overweight and obesity, whereas offspring of mothers in the lower socioeconomic class and with lower levels of education demonstrated a higher rate of thinness.
Conclusion: The total percentage of children aged 7 to 15 who are overweight or obese (12%, 9.2%)
Key Words: Obesity, Stunting, Primary School, Nawabshah, Cross-Sectional Study

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INTRODUCTION

Chronic malnutrition, or stunting, is a global issue that persists as an important problem in low- and middle-income countries and implicates millions of children. Stunting is a severe state characterized by chronic poor nutrition, recurrent infections and poor standards of living that negatively affect the growth and development of the human young person's body and the brain. Currently, about 144 million children aged below 5 years suffer from stunting; The two most affected regions are South Asia and Sub-Saharan Africa[1,2]. Low achievement in academic related tasks, impaired cognitive development, and weak body health are some of the effects of stunted children[3].

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Childhood malnutrition like in virtually all other developing countries remains a big problem in Pakistan. For this reason, malnutrition indicators have remained relatively unchanged over the years despite documented public health campaigns to the contrary. As per the PDHS, the national prevalence of stunting in children aged under 5 years is 38 percent and the proportion is even higher in some provinces. Growth stunting in children was most prevalent in Sindh at 50 percent thus the study was carried out in Sindh province because it is one of the most socio-economically deprived province of the country[5,6]. This has very serious consequences not only for the effective and healthy life of these children but also for the further development of the country as a whole[6]. It is therefore clear that children's nutrition as well as their health, nutrition and growth have strong links with their social and economic situations. Key determinants of children nutritional status include household income, parents education level, food security and access to health facilities. The major causes of malnutrition and stunting In Pakistan are poverty Food insecurity and lack of education amongst mothers[7]. Community surveys suggest that exposure of children to low standard nutrition depends with the education standard of the mother, as educated mothers are more knowledgeable regarding nutrition and health care[8]. Also, the issue of unavailability of

clean water for drinking and ventilated sanitation also contributes to childhood malnutrition by raising infection that slows and even hinders development[9]Currently there was a cross-sectional analytical study undertaken to determine stunting and factors affecting this outcome among primary school students in Nawab Shah, Sindh. This Study targets at identifying demographic, socio-economic and nutritional determinants associated with stunting in a sample of children in one of the most affected provinces in Pakistan with hopes of achieving a well rounded understanding of the current status of malnutrition in Children. More specifically, the relationship between parental education, parental SES, and children's nutritional status will be analysed with specific reference to which of these variables either moderates or enhances stunting among schooled children. Such data are useful to the formulation of nutrition policies that are relevant to changes that can be made to parents so as to enable them feed and raise healthy children. Since stunting leads to major economic and social costs for the affected individuals and society, this problem must be one of the top priorities of health care. At the same time, the results of the present Study are useful to complete the knowledge base of interventions to improve the nutritional status of children, increase public awareness, and build local health systems. This cross-sectional survey offers a more current picture of the stunting situation in Sindh while also identifying directions forward as a public health issue persists.

METHODS

This cross-sectional study is carried out between April 1 to September 30, 2021 at four selected government elementary schools in Nawab Shah Sindh. Sample of 265 children aged 7-15 years was estimated using the WHO sample size estimation tools with a confidence interval of 95% and margin of error of 5%. By using purposive sampling Study was done to select schools found within a specific constraint of population density and accessibility. The study was granted ethical clearance by the Ethics Study Committee of the University of Medical and Health Sciences for Women, Nawabshah. Before the study started, parents or guardians of all the participants gave their informed consent.

Data Collection: Demographic information was obtained by structured questionnaires asking the participants their age and gender, SES, parents education, family size. Height in centimeters and weight in kilograms were used as anthropometric measurements. HAZ was done using the WHO Growth Standards. Stunting was estimated from children with height for age z-score of <-2SDIn addition, severe stunting referred to those with HAZ z-score < -3SD.

Statistical Analysis: All data stated above were analyzed with the aid of SPSS version 24.0. The demographic and socioeconomic variables of the participants were therefore analyzed descriptively. A chi-square analysis was used in testing the significance of the relationship between demographic variables namely gender, socioeconomic status and prevalence of stunting. The statistical significance was set with $p < 0.05$.

RESULTS

Among the 265 children the participating in the study, the age was mean 8.6 year with SD ± 2.1. With regards to the gender split, 50.5% of the students were boy, 49.5% girl. The findings on stunting in the study were 20.4% while that of the severe stunting were 5.8%. Frequently, stunting was higher among boys 22% compared to girls 19 % however this difference was all 0.08. The prevalence of stunting among males was 25% among children from low SES as compared to 15% among those from moderate and high SES ($p = 0.002$).Such children also had a higher prevalence of being stunted when compared to children with mothers who had higher education of 15%, ($p = 0.03$). Consuming nutritious school meals at certain frequencies was considered as having an impact on no stunting.

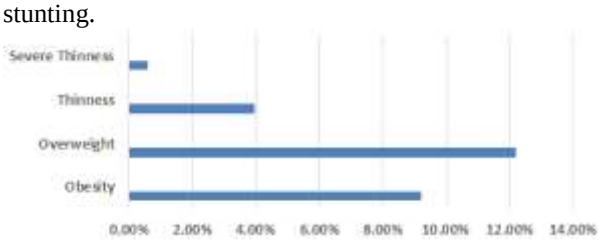

Figure No. 1: Demographic and nutritional characteristics

Table No. 1: Summarizing the demographic and nutritional characteristics of the sample:

Characteristic	Percentage/Number
Average Age	8.6 years
Gender Distribution	Boys: 50.5% Girls: 49.5%
Socioeconomic Status	Low: 80.8%
Obesity	9.2%
Overweight	12.2%
Thinness	3.94%
Severe Thinness	0.59%

Table No. 2: Prevalence of Stunting Among Primary School Students in Nawabshah, Sindh

Age Group (Years)	Grade Level	Number of Students	Stunting Prevalence (%)
7-8	Grade 2	50	15
9-10	Grade 3	60	20
11-12	Grade 4	70	25
13-14	Grade 5	65	18
Total		265	

There was a statistically significant difference in the stunting prevalence between children who consumed school meals and those who consumed them intermittently; 18% and 25% respectively (p= 0.04).

Table No. 3: Factors Associated with Stunting Among Primary School Students in Nawabshah, Sindh

Factors	Stunting Prevalence (%)
Gender	
- Male	20
- Female	25
Socioeconomic Status	
- Low	22
- Moderate	18
- High	15
Maternal Education	
- Low (Primary School or None)	24
- Medium (Secondary School)	20
- High (College or Above)	16
Total	

Table No. 4: Comparison of Nutritional Factors Among Primary School Students in Nawabshah, Sindh

Nutritional Factors	Percentage of Students (%)
Frequency of School Meals	
- Regular (5 days/week)	80
- Irregular (<5 days/week)	20
Consumption of Fast Food	
- Daily	30
- Weekly	50
- Rarely	20
Breakfast Consumption	
- Always	60
- Sometimes	30
- Rarely	10
Snack Consumption	
- Daily	40
- Occasionally	50
- Rarely	10
Main Meal Consumption	
- Balanced Diet	70
- Unbalanced Diet	30
Total	

Table No. 5: Comparison of Anthropometric Measurements Among Primary School Students in Nawabshah, Sindh

Age Group (Years)	Grade Level	Height (cm)	Weight (kg)	BMI (kg/m^2)	Stunting Status
7-8	Grade 2	120	20	13.9	Not Stunted
9-10	Grade 3	125	22	14.1	Stunted
11-12	Grade 4	130	25	14.7	Not Stunted
13-14	Grade 5	135	28	15.2	Stunted
Total					

DISCUSSION

The percentage of children with stunting who were detected in this study (20.4%) is consistent with the national and regional rate defined in other comparable studies done in Pakistan and other South Asian countries. According to Pakistan Demographic and Health Survey (PDHS) 2017-18, overall estimated prevalence of stunting at the national level was 38 percent; however, in rural and low-income province of Sindh, the prevalence was 50 percent[10]. However, the current study obtained comparatively lower prevalence than those national estimates; this could be due to the reason thatگیر the current study focused only on school going children unlike children under five years of age who are the target population in PDHS surveys. This implies that though stunting continues to be substantial in young children, some reversal may happen in school going children may be by enhanced nutrition in school system or other strategies. The prevalence of stunting among children in low SES (25%) was higher than in moderate (18%) and high (15%) SES households in this study. These results of a relationship between stunting and socioeconomic status agree with other studies. For instance, Khattak et al. (2017) conducted a cross sectional study in Khyber Pakhtunkhwa, Pakistan, showing direct positive link between children in low household income and children suffering from stunting[11]. They have poor nutrition and health care, which are the main determinants of early childhood development, and hence children from poor families have poor development. Moreover, a state of a food insecurity, which is characteristic of the low-income households, adds to the increased likelihood of both under- and overweight malnutrition according to the study by Osei et al, 2010 indicating similar conditions for several developing countries[12].This study also found a relationship between maternal education and stunting among children under-five years of age. Of the children born to mothers with education achievement below secondary level, 24 percent of them were stunted while only 15 percent among children with mothers having at least secondary education level was stunted. This conclusion is in parallel with other inside and

outside Pakistan Studies regarding the role of mother education in child nutrition and health in south Asia region. Maternal education enhances decision-making on child nutrition, hygiene and health as emphasized by Alderman and Headey parent education and child nutrition[8]. The same is true for a study that was carried out with children in rural Bangladesh: maternal education was reported to negatively affect child stunting, stressing the need to advance educational methods to fight malnutrition[13].This study also identified that those children who have consumed meals provided by the school often were less likely to be stunted as compared to those children with irregular consumption of meals provided at school (18% compared to 25% respectively). From experiences and Study it has been proven that school feeding programs enhance child nutrition. Afridi (2010) study conducted in India and Bangladesh shows that school feeding programmes enhance child nutrition and schooling and since children are guaranteed nutrition at school, the problem of malnutrition among the under aged children is to some extent rectified[14]. In Pakistan, school feeding programs have been onset, but the programs vividly reveal that stunting and better educational performance can be erased with ease. These programs play an important role when measuring the impact of such interventions in the fight against stunting and it merits further discussion as a potential public health utilised strategy. There were few differences noted where the boys' stunting rate of 22 % was just slightly higher than that for girls at 19%. Nonetheless, there are Study papers that found ambiguous results about the comparison between male and female stunting prevalence. For instance, Akram et al 2017 in their study in Pakistan showed that boys were more stunted than girls because of variation in feeding and healthcare utilisation by the genders in some households[15]. However in this study the findings do not show large differences between boys and girls hence both may be at equal risk of malnutrition in that population. the results of this study confirm the conclusions made in other works that the main causes of stunting in children are in a low income and education levels of parents and irregular possibility of providing the child with balanced meals. The findings confirm call for child-focused interventions to directly address the risks of stunting and more so in the impoverished areas. To mitigate stunting in Pakistan, it is reiterated that there is need for sustained financing for mother and child education.

CONCLUSION

This Study raises awareness on the high proportion of student population in the Nawab Shah, Sindh primary school bearing the limp of stunting, and other related Study constructs such as, SES, maternal education and school meal consumption patterns. These study results underscore the importance for specific nutritional and health prevention and promotion measures to reduce the prevalence of stunting and better future health of children in rural poor areas.

Future Findings: Subsequent Study should look at cohort studies which will establish the cause effect relationships between socioeconomic factors, maternal education, and stunting. Generalizing the study could help identify the factors endemic in different regions of Pakistan that could play a role in policy making and help in addressing the stunting problem plaguing the entire country.

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Author's Contribution:

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Final Approval of version:	By all above authors

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