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INCIDENCE OF STUNTING AND OBESITY IN PRIMARY SCHOOL STUDENTS OF LAHORE

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ABSTRACT

Objective: To investigates the prevalence of stunting in primary school children of Lahore

Method: A cross-sectional study was conducted in four government primary schools of Lahore. Sample size of 530 was calculated using WHO calculator. A purposive convenient sampling technique was used. The study was approved by The Ethics Research Committee of High Institute. Descriptive statistics in the form of number and percentage were used to represent qualitative data. Chi square test was used to detect significant difference between groups.

Results: The prevalence rate of obesity and overweight were least at 6-7 years (grade 2) (9.3%, 4.4% respectively) and significantly increased with age to be the highest at the age of 8-9 years (grade 4) (P=0.003). Higher rates were found between girls (12.5%, 8.8% respectively) than boys (9.8%, 7.5% respectively) (p <0.0001). Rate of overweight and obesity was significantly observed between children whose mothers had low to middle level of education, and of high to moderate socioeconomic level, while thinness rates was higher among children from low educated mothers and low socioeconomic level.

Conclusion: The overall prevalence of overweight and obesity among children aging from 5 to12 years (11%, 8.2%)

Keywords: Obesity, Stunting, Primary school

INTRODUCTION

Health of children is a concern falls under the domain of public health as they are a considerable part of whole population in the world.[1] The mental and physical development of children depends upon their nutritional status. The outcomes of malnutrition among children are Wasting, Stunting, Under/

overweight, and Obesity.[2] Stunting is a collective progression of decreased growth that mostly take place in early years and continues into age of schooling.[3] It is linked with 1.4% productivity loss responsible for the loss of 1% height in adults.[4] Calling stunting, a public health burden is not wrong as it is linked with the insufficient mental growth which leads to deficient academic performance. Reasons behind this relationship are complicated socio-economic and environmental factors along with the lack of awareness regarding nutrition.[1]

Following in the footsteps of India and Pakistan possessing the lagging peak numeric values of children facing the issue of stunted growth in the South Asian region. Furthermore, malnourishment continues to persist as a prevalent problem across all age groups in Pakistan, with minimal advancements observed in recent years. In the province of Punjab, the rate of stunting was recorded at 36% in the year 2011, and although there was a marginal decrease to 33.5% in 2014, this still remains a worrisome statistic for the most extensive and highly developed province in the nation. Punjab contributes to over 52% of the national income and is home to approximately 56% of the country's population. Given the substantial occurrence of stunting in one of Pakistan's most prominent provinces, the aim of this research study is to comprehensively examine the prevalence of stunted growth in elementary school going students in Punjab.

Methodology: A comprehensive cross-sectional investigation was carried out in practical application in government primary schools located in Lahore, encompassing a sample size of 530 individuals as determined by the WHO calculator. The study obtained ethical approval from The Ethics Research Committee of High Institute, and all participants, including students and their parents, provided informed consent with a focus on the study's purpose, ensuring the preservation of privacy and confidentiality.

To obtain demographic and socioeconomic data, a self-reported pre-designed questionnaire was administered, encompassing variables such as age, gender, grade level Dwelling location, parental educational and occupational details, household size, number of rooms, and monthly earnings. These particulars were employed to calculate a socio-economic score.

Anthropometric measurements, adhering to Gibson's criteria (2005), encompassed body weight measured in kilograms and height measured in meters for each student. Z scores for height for age, weight for age (WA), and BMI for age (BMA) were computed using SPSS software, referencing the WHO Growth Reference for School-Aged Children and Adolescents. Stunting was classified as HA measures below -2 SD, with severe stunting defined as below -3 SD. Underweight was identified by WA measures below -2 SD, severe underweight below -3 SD, and obesity by BMI > +2 SD. Overweight and thinness were indicated by BMI > +1 SD and BMI < -2 SD, respectively, while severe thinness was defined by BMI <-3 SD underneath the median values of WHO.

Patterns such as the regularity of daily consumption of the primary meal, adherence to intake of breakfast, consumption of snacks, intake of fast food, and eating at school were subject to examination. The data analysis made use of the Statistical Package for Social Sciences (SPSS, version 25), presenting qualitative data by means of descriptive statistics in terms of numbers and percentages. The Chi-square test was employed to discern noteworthy disparities between groups, while maintaining a significance level of p-values ≤ 0.05 for all statistical analyses.

RESULTS

The research encompassed a sample of 530 children attending primary school, who were equally distributed among the different grades ranging from 1 to 5. The average age of the participants was measured at 8.6 years. The gender distribution was balanced, with boys representing 50.5% of the sample and girls accounting for 49.5%. A significant majority, amounting to 80.8%, were assigned to the low socioeconomic status category. Additionally, 8.2% were identified as obese, 11.1% as overweight, while 3.94% and 0.59% were classified as thin and severely thin, respectively. These valuable findings offer a comprehensive overview of the demographic and nutritional characteristics of the sample, serving as a foundation for the subsequent analysis of stunting prevalence and associated factors among primary school children.

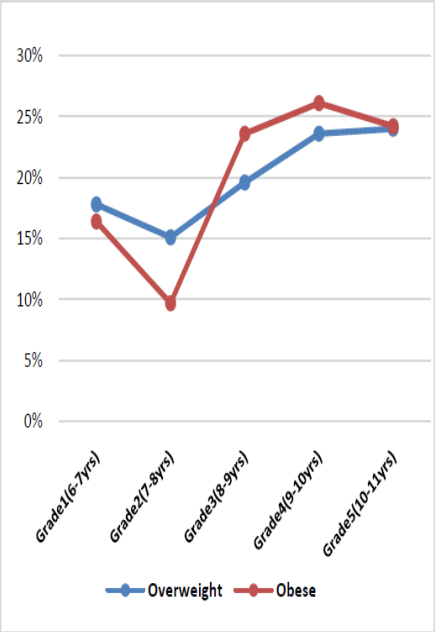

Figure 1| Data of Overweight and obese students

The prevalence rate of obesity and overweight were least at 6-7 years (grade 2) (9.3%, 4.4% respectively) and significantly increased with age to be the highest at the age of 8-9 years (grade 4) (P=0.003). Higher rates were found between girls (12.5%, 8.8% respectively) than boys (9.8%, 7.5% respectively) (p <0.0001). Rate of overweight and obesity was significantly observed between children whose mothers had low to middle level of education, and ofhigh to moderate socioeconomic level, while thinness rates was higher among children from low educated mothers and low socioeconomic level (Table 1).

Table 1| BMI for Age Z-Score of the Studied Primary School Children in Relation to Sociodemographic Characteristics

Characteristics	Severe thinness (n=12)		Thinness (n=80)		Normal weight (n=1545)		Overweight (n=225)		Obese (n=165)		Total (n=2027)	X^2	*p-value*
	No	%	No	%	No	%	No	%	No	%	No		
Age :													
- 6-7 years	0	0	12	3	324	80.4	40	9.9	27	6.7	403		
- 7-8	0	0	18	4.9	299	81.5	34	9.3	16	4.4	367		
- 8-9	2	0.5	12	2.8	338	77.7	44	10.1	39	9	435	37.9	0.002*
- 9-10	6	1.4	17	4	307	72.1	53	12.4	43	10.1	426		
- 10-11	4	1	21	5.3	277	69.9	54	13.6	40	10.1	396		
Gender:													
- Boys	9	0.9	47	4.6	791	77.2	100	9.8	77	7.5	1024	9.6	0.04*
- Girls	3	0.3	33	3.3	754	75.2	125	12.5	88	8.8	1003		
Residence:													
- Rural	5	1.1	27	6	376	84.1	24	5.4	15	3.4	447	46.45	<0.0001*
- Urban	7	0.4	53	3.4	1169	74	201	12.7	150	9.5	1580		
Mother education													
- Low	3	0.3	37	4.2	598	76.8	91	11.7	50	6.4	779		
- Middle	9	0.9	41	3.8	801	74.9	116	10.8	103	9.6	1068	141.5	0.04*
- High	0	0	2	1.1	148	82.2	18	10	12	6.7	180		
Father education:													
- Low	2	0.3	32	4.4	553	76.5	92	12.7	44	6.1	723		
- Middle	9	0.8	43	3.7	886	76.5	115	9.9	105	9.1	1158	*10.1*	0.12
- High	1	0.7	5	3.4	106	72.6	18	12.3	16	8.2	146		
Father Job													
- Unemployed	2	1.6	7	5.6	93	74.4	15	12	8	6.4	125		
- Worker	4	0.54	26	3.5	561	76.1	77	10.4	69	9.3	737	MCET	0.1
- Employee	5	0.7	17	2.6	483	75.3	77	12	59	9.2	641	33.2	
- Professional	1	0.19	30	5.7	408	77.8	56	10.6	29	5.5	524		
Mother Job:													
- Working	1	0.6	4	2.3	130	76	20	11.7	16	9.4	171	1.47	0.6
- Not working	11	0.6	76	4.1	1415	76.2	205	11	149	8	1856		
Birth order:													
- 1-3	8	0.7	50	4.3	871	75.5	120	10.4	105	9.1	1154	5.88	0.2
- ≥4	4	0.5	30	3.4	674	77.2	105	12	60	6.9	873		
Socio-economic status:													
- Low	10	0.6	69	4.2	1272	77.7	175	10.7	112	6.8	1638	MCET	0.004*
- Moderate	2	0.6	10	2.8	252	70	46	12.8	50	13.9	360	21.5	
- High	0	0	1	3.4	21	72.4	4	13.8	3	10.3	29		

DISCUSSION

Childhood represents a crucial period for the development of nutrition, during which the occurrence of stunting, indicating long-term malnourishment or excessive weight gain, may lead to inadequate physical and cognitive growth, as well as the emergence of obesity and chronic diseases in later life. The present investigation has demonstrated a prevalence of 11.3% for stunting and 1.15% for severe stunting, surpassing that of certain other nations. It has been observed that girls have a higher likelihood of experiencing stunting, which suggests their vulnerability to socioeconomic factors. Factors associated with stunting encompass the age of the respondent, residing in rural areas, the level of education attained by the mother and father, as well as their employment status the prevalence of excessive weight and obesity among children aged 5 to 12 years is documented to be 11% and 8.2%, correspondingly. respectively, whereas the incidence of thinness exceeds the national average at 4.53%. The investigation has established a noteworthy association between excessive weight and low maternal education, as well as between the omission of breakfast and an increased risk of overweight or obesity. Frequent consumption of snacks has been found to correlate with thinness, obesity, and regular snack intake. The act of consuming four or more meals per day has displayed a significant association with obesity in both boys (37.9%) and girls (58.9%). In contrast to certain studies, the number of meals has been deemed significant in this particular context.

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