



CODEN [USA]: IAJPB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1977125>Available online at: <http://www.iajps.com>

Research Article

**ANALYSIS OF INCREASE IN CHILDHOOD OBESITY WITH
RESPECT TO HIGH RATES OF UNDER NUTRITION IN
PAKISTAN****¹Dr. Hafiza Misbah Razzaq, ¹Dr. Sana Asghar, ²Dr. Shuja Ikram**¹Allama Iqbal Memorial Teaching Hospital, Sialkot²Islam Medical College, Sialkot**Abstract:**

Introduction: The rising number of overweight and obese children and adolescents has been well documented in many developed countries. Several studies have provided robust evidence that being overweight in childhood increases the risk of atherosclerosis, a risk that continues in to adulthood.

Aims and objectives: The basic aim of the study is to analyze the increase in childhood obesity due to high rates of under nutrition in Pakistan.

Material and methods: This study was conducted at Allama Iqbal Memorial Teaching Hospital, Sialkot in 2018. The data was collected from local population of Pakistan. Data on demographic, lifestyle, socioeconomic and health-related variables were collected using a questionnaire validated in local languages. Physicians at mobile examination centres performed a standardized physical examination. Mothers were proxy respondents for children aged under 12 years. Trained technicians performed anthropometric examinations.

Results: About 27.9% (95% CI) (26–30%) of children were underweight: 29% boys versus 27% girls ($p=0.39$), and 14.6% (13–16%) were stunted: 15.5% boys versus 13.8% girls ($p=0.36$). The pattern with age was similar to that seen in the NHSP, remaining fairly stable until the age of 11–12 years (prevalence of 16%) and then decreasing with a prevalence of underweight and stunted children among those aged 13–14 years, respectively (prevalence of 9%).

Conclusion: It is concluded that the rapidly rising burden of obesity with persistent levels of under nutrition among children is a unique and complex challenge and represents a major threat to the healthcare services. Thus, there is a clear need to focus health policies on combating this rising epidemic of energy imbalance, which is shifting the pendulum towards overweight and obese children in Indo-Asian countries, while paying attention to the needs of the ones who are still undernourished.

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Please cite this article in press Hafiza Misbah Razzaq et al., *Analysis of increase in childhood obesity with respect to high rates of under nutrition in Pakistan.*, Indo Am. J. P. Sci, 2018; 05(12).

INTRODUCTION:

The rising number of overweight and obese children and adolescents has been well documented in many developed countries. Several studies have provided robust evidence that being overweight in childhood increases the risk of atherosclerosis, a risk that continues in to adulthood. This problem of atherosclerosis might be compounded in Indo-Asian children; muscle-thin, fat-rich babies have been shown to be particularly susceptible to insulin resistance in the presence of accelerated growth during childhood [1]. This problem of atherosclerosis might be compounded in Indo-Asian children; muscle-thin, fat-rich babies have been shown to be particularly susceptible to insulin resistance in the presence of accelerated growth during childhood. Traditionally, a deficiency in macro- and micronutrients has been the major problem among children in low-income countries [2]. Nevertheless, owing to progressive urbanisation and the associated changes in lifestyle, the energy balance is shifting. Childhood obesity is becoming an equally challenging, yet under-recognised, problem in many emerging countries [3]. Data on nutritional transitioning in children from low-income developing countries including those in Indo-Asia are scarce, however [4]. Previously we reported results from the NHSP showing that a quarter of the population aged 15 years or over was overweight or obese using Asian-specific thresholds. In this paper we report the trends in nutritional status for children aged 5 to 14 years obtained from two surveys in Pakistan, the NHSP (conducted during 1990–1994) and the Karachi Survey (2004–2005) [5].

Aims and objectives

The basic aim of the study is to analyze the increase in childhood obesity due to high rates of under nutrition in Pakistan.

MATERIAL AND METHODS:

This study was conducted at Allama Iqbal Memorial Teaching Hospital, Sialkot in 2018. The data was collected from local population of Pakistan. Data on demographic, lifestyle, socioeconomic and health-related variables were collected using a questionnaire validated in local languages. Physicians at mobile

examination centres performed a standardized physical examination. Mothers were proxy respondents for children aged under 12 years. Trained technicians performed anthropometric examinations.

Weight and height were recorded to the nearest 0.1 kg and 0.1 cm, respectively, for each child in light clothing without shoes. The BMI was calculated as weight in kilograms divided by height in metres squared. Quality control for the survey included a visit to the field by expert consultants, duplicate examination by field supervisors, calibration protocols and retraining exercises. Information was collected for each child on their age, gender and educational status. Children under 9 years of age were interviewed in the presence of their parent or guardian. Information on physical activities was collected through questions related to the amount of time in the past 7 days the child had spent in organized and other strenuous physical activity at school, if the child was at school during that period, and the amount of time they spent in similar activities out of school. Diet was measured by a limited food-frequency questionnaire that measured the number of servings of fruits and vegetables a child ate per day and whether they ate sweets. Weight and height measurements were obtained in the same way as in the NHSP.

Statistical analysis

The data of respiratory function were compared between the smoker and non-smoker groups using the independent t-test for normally distributed data or the Mann-Whitney U test for other distributions. Differences were considered statistically significant at $p < 0.05$.

RESULTS:

About 27.9% (95% CI) (26–30%) of children were underweight: 29% boys versus 27% girls ($p=0.39$), and 14.6% (13–16%) were stunted: 15.5% boys versus 13.8% girls ($p=0.36$). The pattern with age was similar to that seen in the NHSP, remaining fairly stable until the age of 11–12 years (prevalence of 16%) and then decreasing with a prevalence of underweight and stunted children among those aged 13–14 years, respectively (prevalence of 9%).

Table 01: Age-specific and age-standardized nutritional status

Age (in years)	Boys			Girls		
	(Underweight) –2 SD below weight for age n (%)	(Stunted) –2 SD below height for age n (%)	(Overweight or obese) >85 th percentile BMI for age n (%)	(Underweight) –2 SD below weight for age n (%)	(Stunted) –2 SD below height for age n (%)	(Overweight or obese) >85 th percentile BMI for age n (%)
5–6n=334	30.0 (55)	14.5 (26)	3.7 (07)	32.2 (47)	14.1 (21)	5.4 (08)
7–8n=371	31.7 (57)	18.2 (32)	3.2 (05)	25.9 (51)	17.5 (33)	4.4 (08)
9–10n=333	29.9 (48)	20.3 (32)	4.1 (08)	31.1 (53)	11.9 (20)	7.1 (12)
11–12n=343	29.6 (58)	13.7 (27)	5.6 (11)	27.4 (41)	15.2 (23)	6.6 (1.0)
13–14n=294	21.4 (28)	9.8 (13)	7.4 (10)	13.1 (20)	8.9 (13)	10.5 (17)
5–14n=1675	29.0 (246)	15.5 (130)	4.6 (41)	26.9 (212)	13.8 (110)	6.4

DISCUSSION:

Using normative data from children in the United States as a reference, over a 10-year period in urban areas, there was a slight reduction in the prevalence of underweight children and those with stunting, and a marked increase in overweight and obese children 3.0 versus 5.7% ($p < 0.001$) [6]. Physical activity was inversely correlated with being overweight or obese (odds ratio, 95% CI, 0.51, 0.32–0.80 for those engaged in 30 minutes or more physical activity compared with those who engaged in less than 30 minutes' activity) [7].

In both surveys, the prevalence of under nutrition decreased whereas the number of overweight or obese children increased with age. Our study therefore highlights the unique challenge faced by school-aged children in Pakistan: a rapid increase in the proportion of children with over nutrition in the presence of a persistently high burden of under nutrition [8].

The high prevalence of under nutrition in terms of macronutrient as well as micronutrient deficiencies is a well-recognized problem among children under 5 years of age in the Asian developing countries, ranging from 16.0% in the People's Republic of China to 64.0% in Bangladesh.⁶ The etiologies of these conditions are multi-factorial and are often attributed to poor maternal nutritional, poor access to healthcare and low birth weight. Adequate feeding, however, can lead to catch-up growth, which negates some of these adverse influences. Our analyses show that a substantial proportion of the population is still underweight even during school years and adolescence in Pakistan [9]. Moreover, the relatively

static nature of these estimates from the recent Karachi survey indicates that no substantial improvement in nutritional status has been made. In part, this could be attributed to poor sanitation and the associated frequent diarrhea and an inability to properly digest food, which are consistent with other reports from Indo-Asia. Our findings emphasize the need to implement evidence-based strategies for improving nutritional indicators in this region [10].

CONCLUSION:

It is concluded that the rapidly rising burden of obesity with persistent levels of under nutrition among children is a unique and complex challenge and represents a major threat to the healthcare services. Thus, there is a clear need to focus health policies on combating this rising epidemic of energy imbalance, which is shifting the pendulum towards overweight and obese children in Indo-Asian countries, while paying attention to the needs of the ones who are still undernourished.

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