

## ORIGINAL ARTICLE

## NUTRITIONAL STATUS OF PRIMARY SCHOOL CHILDREN IN ABBOTTABAD

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**Background:** In Abbottabad district, with the vast poverty stricken rural majority and 80% literacy rate, primary-level education faces great influx of students. This study was carried out to see the nutritional status of children 5–10 years of age attending primary schools of Abbottabad. **Methods:** This was a descriptive, cross-sectional study carried out in June 2009 on 400 schoolchildren of 5–10 years of age from three randomly selected primary schools of Abbottabad. After informed consent by the parents/teachers, a semi-structured Performa/questionnaire was filled for each child. Anthropometric measurements were recorded. Correlation of age of the child with height, and weight was calculated. **Result:** The nutritional status of the study children was particularly optimum; 90% children were in optimal nutritional status and had sound skeletal growth irrespective of their socioeconomic background. There was a significant correlation of nutritional status and skeletal growth of children with parents' socioeconomic status. There was a direct correlation between height and weight of children, and their age. **Conclusion:** Anthropometric measurements indicate a high majority of children in healthy status despite the overall poor setup.

**Keywords:** Nutrition, Malnutrition, Child health, Stunting, BMI, Risk factors, Abbottabad

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## INTRODUCTION

Nutritional status being an important component of Primary Health Care (PHC), is one of the goals of Millennium Development Goals (MDGs) and a fundamental indicator of the Socioeconomic Status (SES) of Pakistan.<sup>1</sup> Globally, most of the 20 million severely malnourished children are in South Asia and in sub-Saharan Africa, about 1 million of which die every year, the majority is never brought to health facilities. Only a strong community based appropriate care is possible through active case finding, or through sensitising and mobilising communities to access decentralised services themselves. It requires very careful monitoring as nutrient adequacy is hard to achieve. Children who already are suffering from severe acute malnutrition need treatment.<sup>2</sup>

In countries experiencing 'nutrition transition', overweight and obesity are increasing problems in school-age child. Malnutrition is a major health problem in developing countries affecting 20% of all in the developing world, causing 50% of all child deaths globally. The main nutritional problems faced by a school-age child include wasting, stunting, underweight, anaemia, iodine deficiency and vitamin A deficiency.<sup>3</sup>

Malnourished children have lowered resistance to infection, early death from common childhood ailments, e.g., diarrhoeal diseases and respiratory infections. Those who survive, frequent illness saps their nutritional status, putting them into a vicious cycle of recurring sickness, faltering growth and diminished learning ability. More than 70% of children with

protein-energy malnutrition live in Asia, 26% in Africa, and 4% in Latin America and the Caribbean.<sup>4</sup>

In Bangladesh, one-third of the population is <15 years of age, and 50% of children under age 5 are malnourished. School based health and nutrition activities has improved school entry and attendance.<sup>5</sup>

A study on the nutritional status of school-aged children living in an urban squatter settlement in Islamabad revealed a high prevalence of malnutrition among these children. The prevalence of malnutrition was significantly higher among older children and those from larger, poorer households. These high levels of malnutrition contribute to about half of the 740,000 child deaths that occur every year in Pakistan. The study recommended the inclusion of school-aged children in the Pakistan National Nutrition Survey.<sup>6</sup> Malnutrition is a significant problem in older children, a fact that is often overlooked by policy makers and programme managers. Though little is known about the state of nutrition in this older group, studies conducted in the 1980s indicate that malnutrition is a significant problem in this population, with prevalence ranging from 47–70% in male school children in rural Pakistan.<sup>6</sup>

There has been significantly increased level of child malnutrition in areas affected by the 2005 earthquake in Northern Pakistan. Children living in smaller households had decreased odds of being stunted and underweight than those living in larger households.<sup>7</sup>

Abbottabad district has a large number of Primary, Secondary, and High Schools operating in the district; 43% of its population is below the age of 15 year. The high-income group parents can afford private

schools while the low-income group parents enrol their children in the public schools.<sup>8</sup>

Few comprehensive studies have been conducted to assess the nutritional status of primary school children in NWFP, Pakistan. The aim of this study was to have an insight of nutritional status of the children at primary schools of Abbottabad.

### SUBJECTS AND METHODS

A descriptive, cross-sectional study was conducted during the 3<sup>rd</sup> and 4<sup>th</sup> week of June 2009. A total of 400 school-age children of 5–10 years of age from ten randomly selected Primary Schools of Abbottabad were included in the study. Basic Teaching Public School (Basic), Pakistan Public Academy (PPA), and Modern Age School System (MSS) were selected by random ballot from the list of schools in Abbottabad. After informed consent by the parents and teachers, a structured questionnaire was filled out for each child. Anthropometric measurements were performed by the investigators. Data were processed using SPSS-16. All enrolled primary school children of age 5–10 years were randomly chosen. Children or their parents who were not willing to participate in the study were excluded. Sample size was calculated to be 400 children.

A semi-structured Performa/questionnaire was filled out for each child. The Performa contained child's personal data, parental profile, eating profile and anthropometric measurements besides investigator's request and consent form.

Indices calculated were Weight for Age (W/A), and Height for Age (H/A). All instruments/equipment were calibrated to the set standards on daily basis and the same instruments were used for all data collection.

Data collection tools included Questionnaire Form, Electronic Weighing Scale, and Standard Height Scale. Data were analysed using SPSS-16. For categorical variables, frequencies and percentages were calculated. Continuous variables were described in terms of Mean±SD. Correlation of age of the child with height, and weight was calculated.

### RESULTS

Data of total 408 students of age between 5 to 10 years were collected. Out of these, 259 (63.48%) were boys and 149 (36.52%) were girls. From the Basic Teaching Public School (BSS) total was 92 (22.55%), 65 (70.65%) boys and 27 (29.35%) girls. From Modern Age School System (MSS) total 182 (44.61%), 103 (56.59%) boys and 79 (43.41%) girls responded. From Pakistan Public Academy (PPA) a total of 134 (32.84%) students were included, out of them there were Ninety-one (67.91%) boys and 43 (32.09%) were girls. Their anthropometric data is given in Table-1.

There were 70 (76.1%) students within normal range (above 90% of predicted height for age) in BSS, 164 (90.1%) in MSS, and 93 (69.4%) in PPA. Total 327 (80.1%) students were within normal range of height for age. Only 1 (0.7%) child was severely stunted, and was from PPA. There were 50 (54.3%) students above 90% predicted weight for age in BSS, 115 (63.0%) in MSS, and 63 (47.01%) in PPA. There were no students in BSS and MSS who were severely underweight but in PPA 4 (2.98%) students were severely underweight (below 60% of predicted value). Thus the children in MSS had the most normal level of nutrition and weight ( $p=0.01$ ) (Table-2).

There was a significant association of father's education level with W/A of the child. The overall health status was >90% where the father was a graduate or above. A matriculate father was also effective in maintaining the optimum nutritional status of his child. Illiterate fathers had an association with children leading to malnutrition. (Figure-1).

Mothers with education up to graduation who mainly stay a home were more capable of maintaining the nutritional status (W/A) of their children up to 90% and above. Surprisingly, the highly professional and educated mothers had relatively malnourished children. (Figure-2).

There was a linear correlation of father's occupation to health (W/A) of his child. The men in Services had better buying power to purchase necessary food items for their children; closely following are the businessmen. However the unemployed fathers obviously had difficulty maintaining their children's health. (Figure-3).

Table-1: Anthropometric data of the subjects (n=408)

| Parameter   | BSS          |             |              | MSS          |              |              | PPA          |              |              |
|-------------|--------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|             | Male         | Female      | Total        | Male         | Female       | Total        | Male         | Female       | Total        |
| Number      | 65           | 27          | 92           | 103          | 79           | 182          | 91           | 43           | 134          |
| Age (Year)  | 7.69±2.00    | 7.44±1.79   | 7.64±1.94    | 8.75±1.35    | 8.83±1.29    | 8.78±1.32    | 7.65±1.87    | 7.56±1.80    | 7.62±1.84    |
| Height (Cm) | 125.82±15.29 | 125.38±12.7 | 125.69±14.54 | 132.68±10.65 | 133.41±10.00 | 132.98±10.37 | 124.33±15.67 | 121.35±14.88 | 123.37±15.43 |
| Weight (Kg) | 23.40±8.07   | 22.07±5.40  | 23.03±7.41   | 26.96±7.27   | 27.29±6.88   | 27.09±7.42   | 24.14±9.24   | 21.42±6.29   | 23.27±8.48   |

Table-2: Nutritional status of children

| Parameter | BSS           |               |                   |              | MSS           |               |                   |              | PPA           |               |                   |              |
|-----------|---------------|---------------|-------------------|--------------|---------------|---------------|-------------------|--------------|---------------|---------------|-------------------|--------------|
|           | Normal (≥90%) | Mild (75–89%) | Moderate (60–74%) | Severe (<60) | Normal (≥90%) | Mild (75–89%) | Moderate (60–74%) | Severe (<60) | Normal (≥90%) | Mild (75–89%) | Moderate (60–74%) | Severe (<60) |
| H/A       | 70 (76.1)     | 21 (22.8)     | 1 (1.1)           | 0 (0.0)      | 164 (90.1)    | 18 (9.9)      | 0 (0.0)           | 0 (0.0)      | 93 (69.4)     | 35 (26.1)     | 5 (3.7)           | 1 (0.7)      |
| W/A       | 50 (54.34)    | 30 (32.6)     | 12 (13.04)        | 0 (0.0)      | 115 (51)      | 53 (29.3)     | 14 (7.69)         | 0 (0.0)      | 63 (47.01)    | 49 (36.56)    | 18 (13.43)        | 4 (2.98)     |

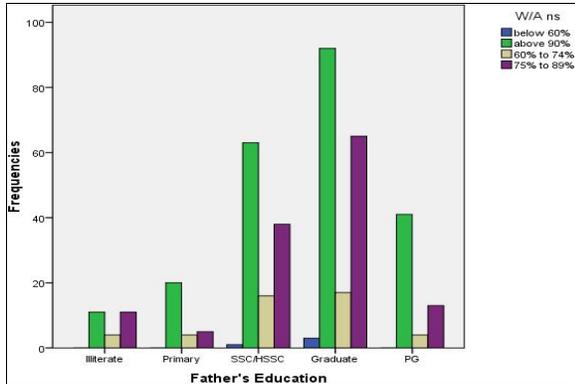


Figure-1: Association of father's education with nutritional status of the child

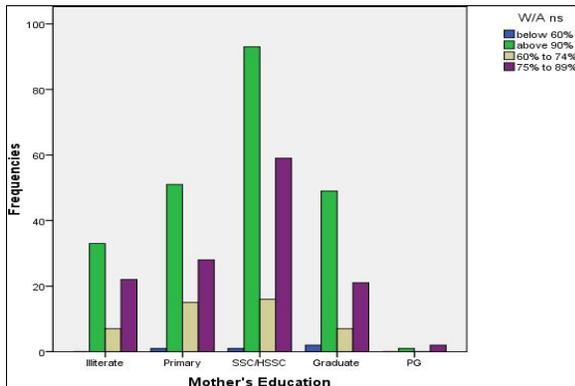


Figure-2: Association of mother's education with nutritional status of the child

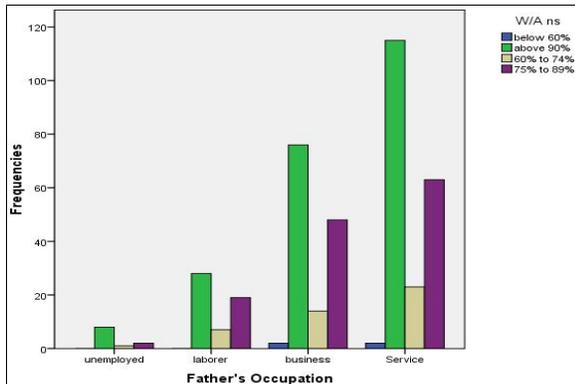


Figure-3: Association of father's occupation with nutritional status of the child

## DISCUSSION

This study is an assessment of nutrition among the children of 5–10 years of age studying in primary schools of Abbottabad. The nutritional status of our study children, however, was particularly optimum which is in consistence with the other authors.<sup>3,6,7</sup>

Parents who were moderately educated and with high income were more capable to accomplish their domestic or productive tasks had taller, healthier children. This information is consistent with the earlier

studies.<sup>3,6,7</sup> Studies done in Islamabad<sup>2</sup> and Abbottabad<sup>6,9</sup> showed a gross malnutrition in school children while in our study more than 90% children were in optimal nutritional status and had sound skeletal growth despite their socioeconomic status. However, because of a better profession father's income for household purchases was positively associated with high status of the child.

The men in Services have good resources and better buying power to purchase necessary food items for their children and hence the effect seen here. Closely following are the businessmen. This is in contrast to Khuwaja *et al*<sup>3</sup> who reported the father being a government employee had chances to have children with low nutritional status compared to children of landlords. This was probably due to social and cultural reasons in the southern Pakistan having strong landlord system. About 58.6% men in our study were earning more than Rs. 25,000 per month. This makes them more able to have a significant influence on the nutritional status of their children. However the unemployed fathers obviously have difficulty maintaining their children's health.

Father's education and occupation were important factors for chronic malnutrition. Illiterate fathers have an association with children leading to malnutrition. In societies where the women's education level is low, male education gains importance. More emphasis should be given to educate both parents for a better nutrition of their children. There was a significant correlation of father's education level with the nutritional status of the child. The overall nutritional status was >90% where the father was a graduate or above. A matriculate father was also effective in maintaining the optimum nutritional status of his child.

Matriculate or intermediate qualified housewife mothers' input in child-feeding decision making and assistance in upbringing of her child evident in her activities were also positively associated with optimum child nutrition. However, mothers with extremes of educational levels tended to have malnourished, growth retarded, or stunted children. Mothers with education up to graduation who mainly stay a home are more capable of maintaining the nutritional status of their children up to 90% and above. Surprisingly, the highly professional and educated mothers have relatively malnourished children which may be due to their pursuit of career, longer time out of home due to duty hours, and chronic tiredness and over fatigued working curriculum.

The strong positive association between child age and H/A indicates that stunting was less prevalent in older children than in younger ones; this association was not different with gender. This age pattern of stunting differs from what is usually observed in

deprived environments. In our study, majority (80.15%) of children were in good nutritional status, and boys were taller than girls of the matched age.

## CONCLUSION

Considering weight, there is appreciable malnutrition prevailing among the primary school children of Abbottabad. Most of them belong to low-income, and unemployed parents. However considering height of the children, most of them were within normal standards of skeletal growth.

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