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The Nutritional Status of School-Aged Children in an Urban Squatter Settlement in Pakistan

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Abstract: A study was carried out to determine the nutritional status of school-aged children living in an urban squatter settlement in Islamabad, Pakistan. 200 children were selected through systematic random sampling from 1479 children aged 5-10 years living in 1147 households. Measurement of height and body weight revealed a high prevalence of malnutrition among these children. The prevalence of underweight (< 2 standard deviations below the NCHS standard for weight-for-age) was 29.5%, wasting (< 2 SD below standard weight-for-height) 13% and stunting (< 2 SD below standard weight-for-height) 35%. Overall 44% of the children had one or more of underweight, wasting or stunting. Severe malnutrition (< 3 SD below the standard value) was present in 15.4% of the children. The prevalence of malnutrition was significantly higher among older children and those from larger, poorer households. The study recommends the inclusion of school-aged children in the Pakistan National Nutrition Survey.

Key words: School-aged, children, Pakistan, malnutrition

Introduction

Malnutrition is a major public health problem in Pakistan, a South Asian nation with over 130 million people. Half of its children aged five years or less are stunted, over a third (38%) are underweight, and a quarter of all births are low birth weight (Bhutta, 2000). These high levels of malnutrition contribute to about half of the 740,000 child deaths that occur every year in Pakistan (UNICEF, 1996).

In view of the scale of the problem in children under five, nutritional programmes in Pakistan during the last few decades have been targeted at this age group. However, malnutrition is a significant problem in older children as well, 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 prevalences ranging from 47-70% in male school children in rural Pakistan (Wahab *et al.*, 1993; Ahmad and Gilani, 1998).

The situation among school-aged children in urban squatter settlements in Pakistan is even less well known. These settlements contain a large proportion of the rapidly growing urban population, with high levels of malnutrition already documented in the under-five child population (Fikree *et al.*, 2000).

Given the potential for both short and long term health and behavioural consequences of malnutrition in school-aged children (Brown and Sherman, 1995; Haas *et al.*, 1996; Martorell, 1995), a nutritional study was conducted in 1999 in a peri-urban squatter settlement near Islamabad, the capital city to assess the magnitude of the problem. This paper describes the nutritional status, and associated socio-demographic characteristics, of children aged 5-10 years in the squatter settlement.

Materials and Methods

A descriptive cross-sectional design was used for the study, employing a combination of quantitative and qualitative research methods. These included anthropometric measurements of the children, structured and semi-structured interviews with their mothers about socio-economic status and feeding practices, and focus group discussions with mothers, fathers and mother-in-laws.

An electronic weighing scale, which was standardised daily with a standardised weight, was used to measure the weight of children. A standard height scale was used for measuring height. Time and resource constraints dictated that only 200 households

containing children aged 5-10 years could be studied. As there were just over a thousand households in the area, systematic random sampling of every fifth household was carried out. The household for the starting point was randomly selected. If there were no children aged 5-10 years in a household, the next fifth household was selected. If there were more than one child in a household, the children were allotted numbers, and one child randomly selected by drawing lots.

The squatter settlement chosen was Muslim Colony at Noorpur Shahan, 7 kms north of Islamabad. A mazaar or shrine in memory of a renowned 16th century Sufi mystic, Syed Abdul Latif Shah Mashadi, is located nearby. Most of the residents have been displaced by economic hardships, natural calamities or war in their home villages in Kashmir, the North-West Frontier Province or Punjab. Besides being broadly representative of other squatter settlements in Islamabad, the area was also chosen because it was accessible and familiar to the principal researcher (RMAM) who had previously worked in the Federal Government Services Hospital which provides preventive and curative services to the residents of Islamabad and its surrounding areas. The population of the community was 5914, living in 1147 households. The number of children aged 5-10 years was 1479.

Quantitative data were analysed using the SPSS statistical software. Qualitative data analysis involved content analysis, identification of themes, summarising, interpretation and presentation as outlined by Bernard, 1995.

Results

Socio-economic context: Most of the houses in the area are built of mud brick with tin roofs. There is no piped water supply, the only source being a few communal standpipes. Cooking is with wood-fired stoves outside the house during summer and inside during winter. There is no power supply to the community, although a few of the better-off households share the use of a generator.

The average household size was 5 members. The majority of households (67%) surveyed reported a monthly income of less than Rs 3000 (approximately US\$70). The great majority (95%) of mothers worked as housewives, with the rest working as domestic helps, cooks, or seamstresses. The occupations of fathers included daily labour (40%), salaried work (26%), and small business or trade (18%). The mean maternal age was 33 years (median 34 years), with about half between the ages of 25 and 34 years. The great majority of mothers (84%) had no schooling at

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Table 1: Nutritional status of children aged 5-10 years

Z score	Weight-for-age	Height-for-age	Weight-for-height
> 0	17 (8.5)	22 (11)	58 (29.5)
0 to -1	46 (23)	42 (21)	55 (27)
-1 to -2	78 (39)	66 (33)	61 (30.5)
-2 to -3	47 (23)	47 (23.5)	17 (8.5)
-3 to <-4	12 (6.5)	20 (11.5)	9 (4.5)
Total	200 (100)	200 (100)	200 (100)

Note: Figures in parentheses are row percents.

Table 2: Age and malnutrition

Age group (years)	No. of children malnourished	Total
5-6	30 (44%)	69 (100%)
6-7	19 (35%)	55 (100%)
7-8	20 (47%)	43 (100%)
8-9	10 (59%)	17 (100%)
9-10	9 (56%)	16 (100%)
Total	88 (44%)	200 (100%)

Malnutrition defined as < -2SD for any indices, Percentages are row percents, Chi square for linear trend: 9.7, p value < 0.01

all, compared to 53% of fathers.

Nutritional status: Overall, 44% of the children in the study could be classified as having one or more of underweight, wasting, or stunting. Just over 15% of the study children were severely malnourished, having a z score less than - 3 standard deviations (SD) for any index. Table 1 shows the distribution of nutritional indices in the study children.

Weight-for-age: Almost one third of children (30%) were underweight, as judged by a z score for weight-for-age less than -2 SD. Twelve children (6%) were severely underweight (z score < - 3 SD).

Height-for-age: Over a third of the children (35%) had a z score for height-for-age less than - 2 SD. Twenty children (10%) were severely stunted (z score < - 3 SD).

Weight-for-height: Wasting, as defined by a z score less than - 2 SD for weight-for-height, was present in 13% of the study children. Nine children (5%) were severely wasted (z score < - 3 SD).

Socio-demographic correlates of malnutrition:

Age: Interestingly, the prevalence of malnutrition in any form (underweight, stunting or wasting) was higher among older children than younger ones, as shown in Table 2.

Family income: As expected, there was a linear trend between nutritional status and monthly family income, with malnutrition being present in 49% of families in the lowest bracket (< Rs 3000) compared to 33% in the Rs 3000-6000 bracket and 29% in the > Rs 6000 bracket (chi square for linear trend: 4.9, p value < 0.03).

Family size: While malnutrition was more commonly observed in large families, this relationship was not statistically significant.

Gender: There was no significant or consistent association between nutritional status and gender. Although proportionately more girls than boys were stunted (37% vs 33%), more boys than girls were underweight (31% vs 28%) and wasted (14% vs 12%). However, none of these differences were statistically significant.

Discussion

The study found a high prevalence (44%) of malnutrition, including severe malnutrition (15%), among the surveyed school-

aged children in the squatter community near Islamabad. Although there has not been any research in Pakistan directly comparable to the present study, a few studies conducted in school-aged children allow a broad comparison with respect to the prevalence of malnutrition.

The study prevalence is comparable to the 47% prevalence of malnutrition found in a 1993 study among children aged 5-10 years in rural Peshawar, Pakistan, although the latter used the Gomez classification based on weight-for-age (Wahab *et al.*, 1993). Similarly high prevalences of malnutrition have been observed among school-aged children in low-income developing countries such as India and Indonesia (Chhabra *et al.*, 1996; Hadju *et al.*, 1995).

The Pakistan National Nutritional Survey 1990-94 provides data only for children under five years of age. The survey found that 38% of these children were malnourished, between 30 to 40% were underweight, and equal proportions (14%) stunted or wasted (Pakistan Medical Research Council, 1998). Our figures, in broad terms, indicate a continuation of these levels of malnutrition in older children as well and would suggest that malnutrition in under-fives does not disappear magically when children cross the 'critical' threshold of 5 years.

Indeed, older children in our study were more likely to be malnourished than younger ones. Within the 7-10 year age bracket, 36% were underweight, 39% stunted and 20% wasted, compared to 26% who were underweight, 32% stunted and 8% wasted in the 5-7 year age bracket. Overall, 51% of children in the older group were malnourished compared to 40% in the younger group. Thus, while generally children below the age of five are considered to be a nutritionally vulnerable group, older, school-age children may be as nutritionally vulnerable.

Due to time and resource constraints, the present study did not attempt to explore causative factors responsible for the high prevalence of malnutrition. However, similarly high rates of stunting and wasting that have been observed in younger children in a Karachi study were strongly associated with intrauterine growth retardation (IUGR), and thus raises the role of maternal nutritional status as an aetiological factor (Fikree *et al.*, 2000). At the same time, the heavy burden of infectious diseases in these children also needs to be considered in the aetiology of malnutrition in Pakistani children. This is indicated by the finding from a low-income urban community in Mahmoodabad that the average child suffered from two episodes each of diarrhoea and acute respiratory infections every year (Qureshi *et al.*, 1989). Socio-cultural reasons may also be important. In one study, mothers of marasmic children in squatter settlements in Karachi generally attributed their children's condition to a supernatural causation, and did not readily make the connection between food intake and nutritional status (Mull, 1991) and thus may not be aware of the need for nutritional rehabilitation in these children.

As mentioned earlier, malnutrition in the older age group has serious short- and long-term implications. One, the cognitive and behavioural development of these malnourished children are likely to be impaired, leading to educational failure (Brown and Sherman, 1995). Two, there is evidence that malnutrition in childhood will impair the capacity for physical work later in adulthood (Haas *et al.*, 1996; Martorell, 1995). Finally, the health consequences of malnutrition in terms of impaired immune function and vulnerability to development of chronic, degenerative diseases in adult life are well known.

Fortunately, nutritional supplementation even at this relatively late stage in childhood may ameliorate some of these effects. Thus, children participating in school breakfast programmes in the United States showed marked improvements in academic performance which was associated with reduced absenteeism (Kennedy and Davis, 1998).

While the determinants of malnutrition were not explored to any great extent in this study, the strikingly high rate of illiteracy observed among mothers is of concern. There is now strong evidence and consensus that maternal education can have a very

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large effect on reducing child mortality and malnutrition (Cleland and Ginneken, 1982; Caldwell and McDonald, 1982).

A number of recommendations follow from this study. One, the National Nutrition Survey in Pakistan should include older children aged 5 years and above. Two, the nutritional component of school health programmes needs to be strengthened, with particular consideration being given to nutritional supplements. Three, ongoing efforts to develop and popularise low-cost nutritional home supplements should be encouraged and expanded. Finally, there needs to be much more effort and priority given to address Pakistan's high levels of female illiteracy.

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