

Nutritional Status of Rural Children (9 to 11 years) From Different Agro-climatic Zones of Punjab

J. K. Gulati, S. Jaswal, G. Grewal and D. Vig

INTRODUCTION

The health and nutritional status of the children is an index of the National investment in the development of its future manpower. The national policies and schemes for children have received supreme importance in national development programmes. These have laid down programmes to provide optimum conditions for balanced growth of the country's children, the highest priority being given to child health (UNICEF, 1990). Most of the work that has been conducted on nutritional status of children is limited to infants and preschool children only. There is dearth of information on nutritional status of school going children particularly from rural areas of Punjab. Whatever data is available on this age group is confined to one small area or location only. But none of the studies is available on inter-zonal differences in nutritional status of children (9-11 yrs.) particularly children living in different agro-climatic zones of Punjab.

Keeping in view the urgency of the above work, All India Coordinated Research Project in Home Science initiated the present study as a part of a larger research project, with the following objectives.

1. To study the nutritional status of rural children (9 to 11 years) from different agro-climatic zones of Punjab.
2. To compare the nutritional status of rural Punjabi children with international and national standards.
3. To examine the inter-zonal differences in nutritional status of children.

METHODOLOGY

Sample: The study was conducted on 526 subjects in the age group of 9 to 11 years (males = 280, females = 246) selected from the randomly selected villages of four agro-climatic zones of Punjab.

Locale: Villages were located in the following four agro-climatic zones of Punjab and the areas of the districts falling under these zones:

Zone 1: *Sub-mountain undulating zone:* Pathankot, Ropar, Gurdaspur, Hoshiarpur, Balachaur and Patiala.

Zone 2: *Undulating plain region:* Nawan-shahar, Tanda, Gurdaspur, Rajpura, Machhiwara block of Ludhiana.

Zone 4: *Western and western plain region:* Amritsar, Faridkot, Bhatinda, Sangrur, Ferozepur and Moga.

Zone 0: *Central plain region:* Ludhiana, Nabha, Sirhind, Malerkotla, Kapurthala, Beas, Batala and Jalandhar.

Procedure: Children were measured for their height and weight for the anthropometric assessment of their nutritional status.

Data Analysis: Data was analysed to derive computation of indices like height for age to assess long term malnutrition, weight for age (short term malnutrition) and weight for height. Data was compared with international (NCHS) and national (ICMR) standards. Chi-square test was applied to find significance of inter-zonal differences in frequencies in various grades of nutritional status.

RESULTS AND DISCUSSION

The anthropometric assessment of nutritional status of rural male and female children (9-11 years) as per different types of classifications is being discussed here:

Long-term Nutritional Status of Males (Height For Age)

Assessment of height for age also known as Waterlow's classification is used to determine long-term malnutrition in children.

Figure 1 presents the Height for age of rural boys from different agroclimatic zones of Punjab. It indicates that when males aged 9-11 years were compared with NCHS standards, majority of the boys were nutritionally normal (56% to 61%) followed by mild under-nutrition (27 to 38%) in their long-term nutritional status. Five to thirteen percent were found moderately under-nourished,

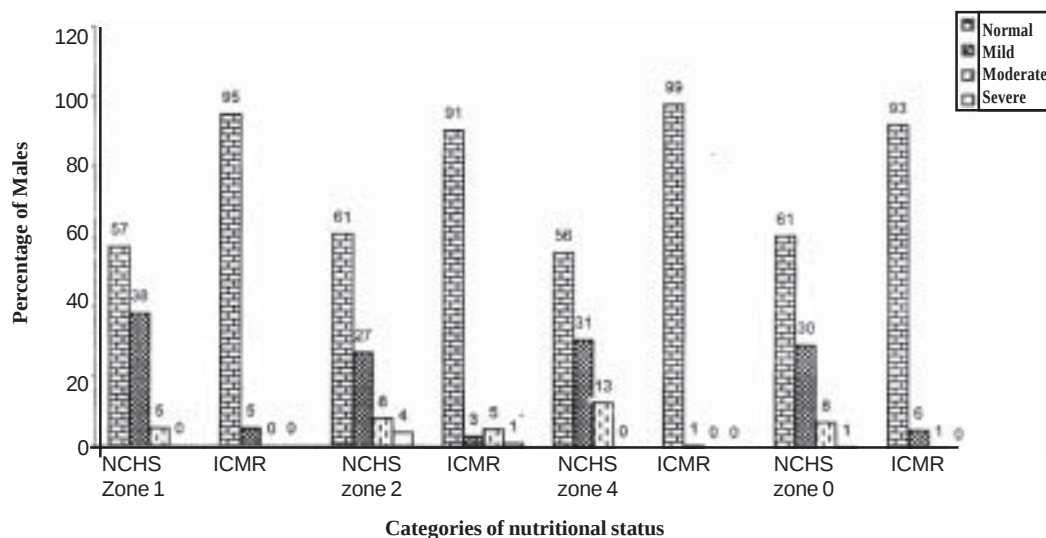


Fig. 1. Long term Nutritional Status of Rural Males (9-11 yrs.) from different agro-climatic Zones of Punjab-comparison with NCHS & ICMR standards: Height for Age

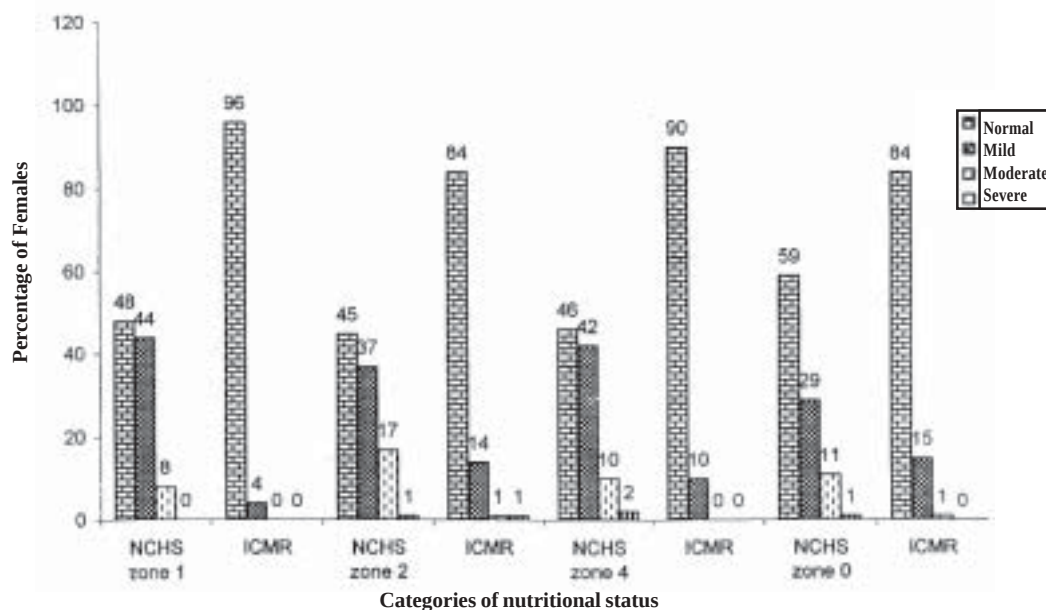


Fig. 2. Long term Nutritional Status of Females (9-11 yrs.) from different agro-climatic zones of Punjab comparison with NCHS & ICMR standards : Height for Age

whereas severe under-nutrition was found only in Undulating plain region (4%) and Central plain region (1%). As per ICMR standards, most of the boys from all the zones were found to be

nutritionally normal while only 1 percent to 6 percent of them were either mildly or moderately under-nourished. However, severely under-nourished males were found only in Undulating

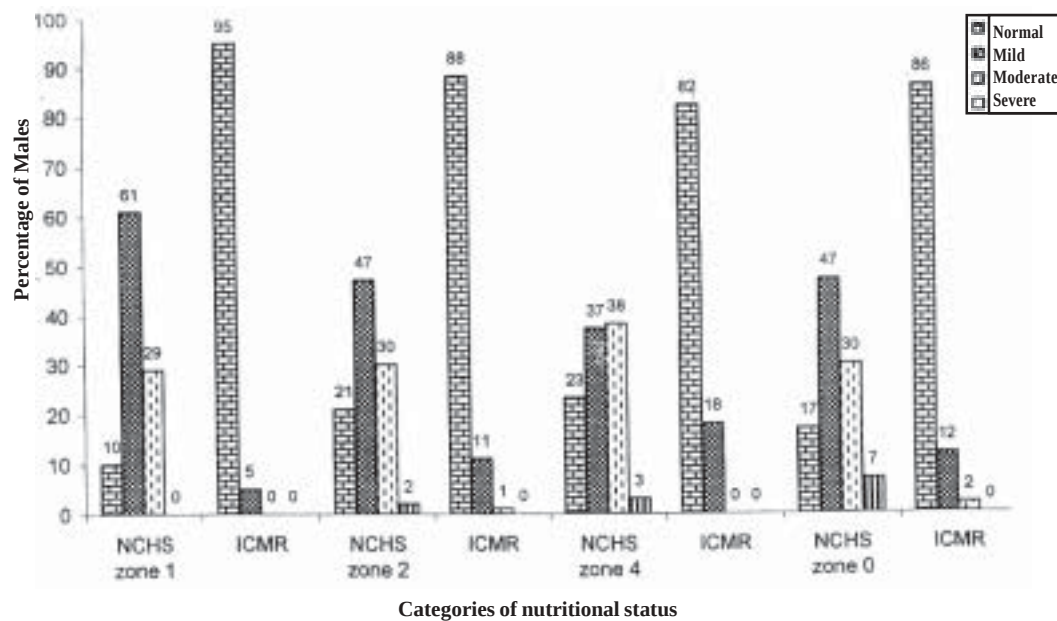


Fig. 3. Short term Nutritional Status of Rural Males (9-11 yrs.) from different agro climatic zones of Punjab comparison with NCHS & ICMR standards: Weight for Age

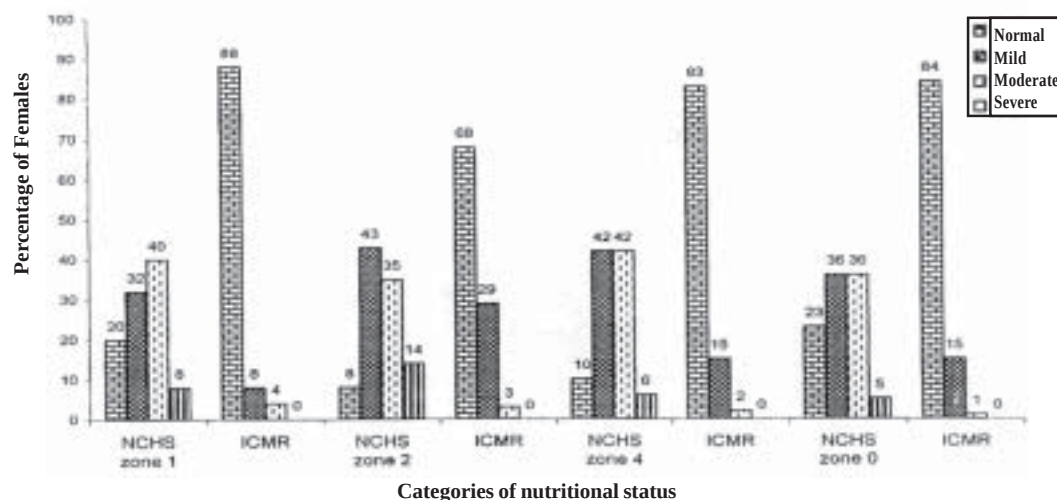


Fig.4. Short term Nutritional Status of Rural Females (9-11 yrs.) from different agro-climatic zones of Punjab comparison with NCHS & ICMR standards: Weight for age

plain region (1%). The results depicted that majority of males were nutritionally normal when compared with Indian and American standards. Under-nutrition in the boys was prevalent mainly in the category of mild form when compared with American standards. Inter zonal differences were found to be non-

significant for both the standards.

Long-term Nutritional Status of Females (Height for Age)

When the height for age of the females was compared with NCHS standards (Fig. 2), it

clearly depicted that although majority of the girls from all agro-climatic regions were found to be nutritionally normal (45% to 59%), yet 29 percent to 44 percent of the girls were mildly under-nourished. The incidence of mild under-nutrition was higher in girls as compared to boys in all zones except in central plain zone. Only 1 to 2 percent of the females were severely under-nourished. As per ICMR standards, like boys, most of the females from various zones under study were found to be nutritionally normal. The highest percentage of well nourished girls was found in Sub mountain region (96%) and lowest in both Undulating plain region and Central plain region (84%). Very small percentage of the females from both Undulating plain region and Central plain region were found to be moderately under-nourished whereas none was found to be severely under-nourished. Inter-zonal differences were non-significant for both American and Indian standards.

Short-term Nutritional Status of Males (Weight for Age)

Short-term nutritional status of the 9 to 11 year old boys assessed as per Gomez's classification has been shown in Figure 3. While comparing their weight with NCHS standards, very small percentage of boys in different zones were found to be nutritionally normal. The lowest percentage of adequately nourished boys was in Zone 1 (10%) and the highest was in Zone 4 (23%). Majority of the males i.e. 37 percent (zone 4) to 61 percent (zone 1) were mildly under-nourished, followed by 29 percent to 38 percent being moderately under-nourished. Severe form of under-nutrition in males was found maximum in Central Plain Zone (7%). However, as per ICMR standards, majority of the males (88% to 95%) from all the zones were found to be nutritionally normal while 5 percent to 18 percent were mildly under-nourished. It was interesting to note that none of the males from all the four zones was severely under-nourished as per short term nutritional status. Differences across different regions were non-significant for NCHS as well as ICMR standards.

Short-term Nutritional Status of Females (Weight for Age)

Figure 4 presents the short-term nutritional

status of female children (9-11 years). When their weight was compared with NCHS standards, it was found that majority of the girls from different zones were either were moderately under-nourished (36% to 43%) or mildly under-nourished (32% to 43%). The short-term nutritional status of the girls gave the worst picture in the Undulating Plain region, because, severe under-nutrition was maximum in this zone (14%), while the percentage of adequately nourished girls was the lowest i.e. only 8 percent. However, as per ICMR standards majority of the girls were nutritionally normal. The highest percentage of adequately nourished girls was found in Sub Mountain area (88%) and the lowest in Undulating Plain Zone (68%). The latter region also showed maximum under-nutrition (29%) though in mild form only, whereas, none of the females was observed to be severely under-nourished in any of the Zones as per Indian standards. On the whole, short-term nutritional status of the boys was better than the girls. Inter zonal differences were significant for ICMR standards ($P < .1$) but were non significant for NCHS standards.

WEIGHT FOR HEIGHT

Males: Comparison of the weight of boys corresponding to their height according to NCHS standards given in figure 5 revealed that majority of the boys were found to be mildly under-nourished. The boys inhaling from zone 1 represented highest percentage of mildly undernourished and minimum of moderately undernourished boys (14%) in the age group of 9 to 11 years. Whereas, the percentage of adequately nourished boys was minimum in zone 4 i.e. Westren Plain Zone. As per ICMR standards all the boys under study (100 %) were nutritionally normal in zone 1 and zone 2, while 92% in zone 4 and 85% in zone 0 were found to be normal in their nutritional status. None of the males was found moderately or severely under-nourished. Inter zonal differences were significant at .05 level.

Females: Figure 6 clearly indicates that when compared with NCHS, majority of the females in Sub mountain undulating zone and Central plain region (61% and 56%) were found to be mildly malnourished, while in zone 2 and zone 4 majority of the girls (46% & 47%) were nutritionally normal, whereas, the percentage of

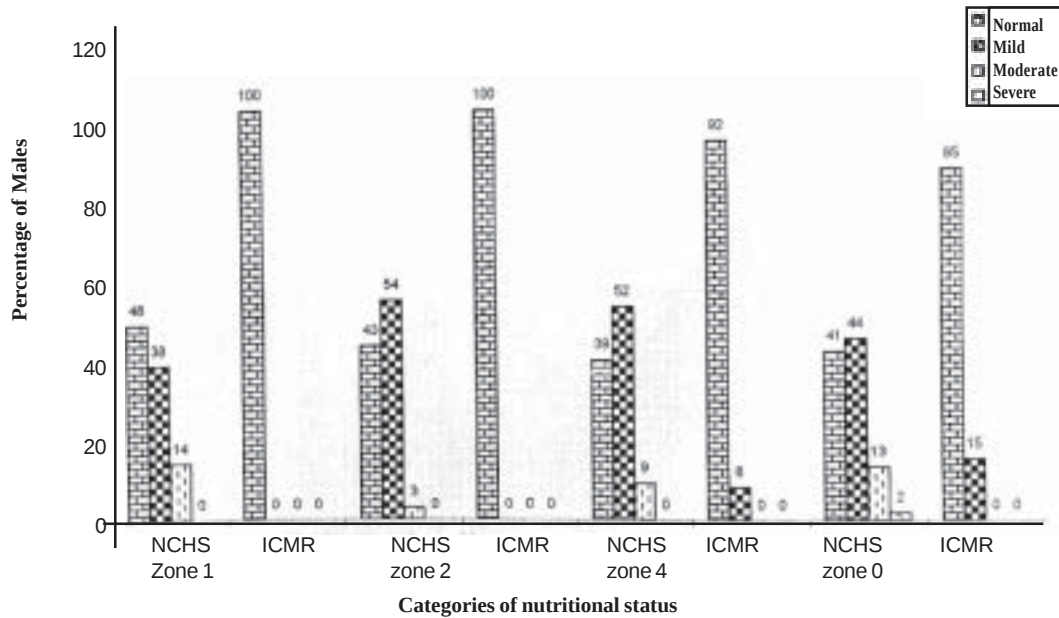


Fig. 5. Long-term Nutritional Status of Rural Males (9-11 yrs.) from different agro-climatic zones of Punjab comparison with NCHS & ICMR standards: Weight for Height

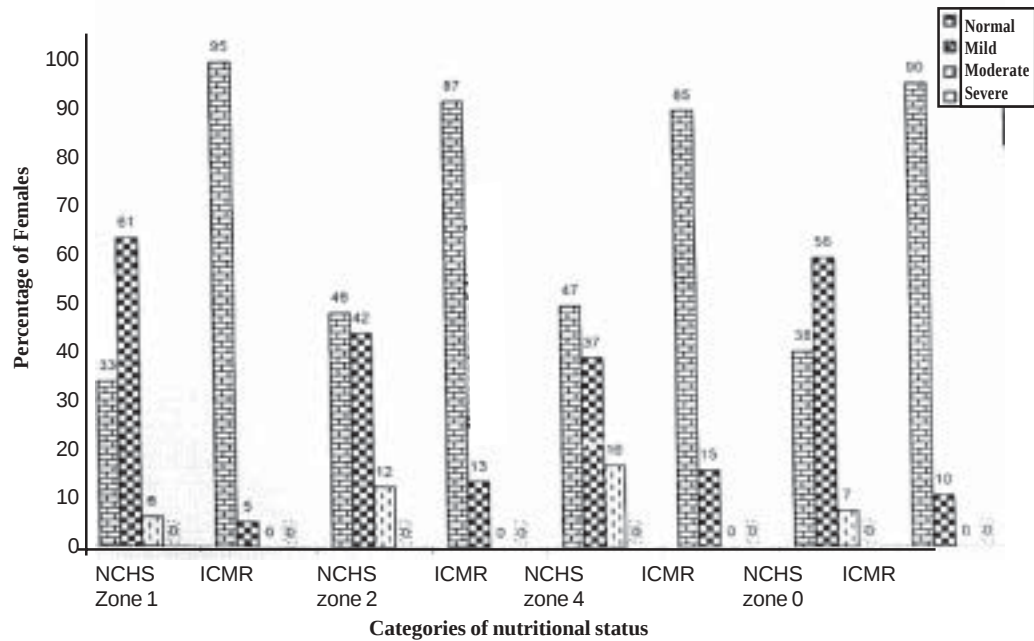


Fig. 6. Long-term Nutritional Status of Rural Females (9-11 yrs.) from different agro-climatic zones of Punjab-comparison with NCHS & ICMR standards: Weight for Height

mildly malnourished girls was also not very low in these zones. However, when the present data was compared with ICMR standards, majority of the females in all the four zones were

nutritionally normal. None of the females was severely malnourished when compared with NCHS or ICMR standards. Inter zonal differences were found to be nonsignificant.

CONCLUSION

Comparison of the present data with American standards indicated that in long-term nutritional status majority of the boys were mildly under-nourished whereas majority of the girls were nutritionally normal. However, as per Indian standards, majority of the boys and girls were nutritionally normal. As per International standards, moderate level of long-term under-nutrition was more prevalent in males of western and western plain region and in females from undulating plain zone. Severe under-nutrition in males was mainly observed in undulating plain region, while only very small percentage of females in almost all zones were severely undernourished. As far as short term nutritional status was concerned, majority of the males were mildly undernourished, while majority of the females were moderately undernourished. The comparison of weight for height indices also depicted similar results in both the gender groups i.e. majority of the males were mildly under-nourished, while the females were mainly suffering from moderate level of under nutrition. When the present data was compared with ICMR standards, majority of the males and females in this age group were found to be nutritionally normal in all the four agro-climatic zones, followed by mild and moderate levels of under-nutrition. The severe form of short-term under-nutrition was prevalent in very small percentage and which was mostly found in undulating plain zone in females and in central plain region in males, as compared to other zones. Inter-zonal differences were significant in both the sex groups with respect to short-term under-nutrition.

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ABSTRACT The study was conducted to assess the nutritional status of 9 to 11 years old children from different agro-climatic zones of Punjab. Data was collected from 526 subjects (males = 280, females = 246) randomly drawn from randomly selected villages located in four agroclimatic zones i.e zone 1: sub-mountain undulating region; zone 2: undulating plain region; zone 4: western and western plain region and zone 0: central plain region of Punjab. The selected children were measured for height and weight for anthropometric assessment of their nutritional status. The data was analysed to compute various indices like height for age (to assess long term malnutrition), weight for age (short term malnutrition) and weight for height. Chi-square test was applied to project significance of inter-zonal differences in frequencies in various grades of nutritional status. When data was compared with NCHS standards, majority of the males and females were found to be nutritionally normal in their long term nutritional status. In short term nutritional status, majority of the males were mildly undernourished, while majority of the females were moderately undernourished. The computation and comparison of weight for height indices depicted that majority of the males were mildly undernourished, while the females were mainly suffering from moderate level of under nutrition. When present data were compared with ICMR standards, majority of the males and females in this age group were nutritionally normal in all the four agroclimatic zones. The severe form of malnutrition was most prevalent in undulating plain zone as compared to other zones. Inter-zonal differences were significant in both the sex groups with respect to short term malnutrition while long term malnutrition was observed only among females.

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