

Original article:

Prevalence of stunting and thinness among school-age children of working and non-working mothers in rural areas of Aligarh District.

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ABSTRACT

Introduction: The present study is an attempt to explore the impact of maternal employment status in the prevalence of stunting and thinness among rural school-age children of Aligarh district.

Methodology: The present study was conducted in rural field practice areas of department of community medicine, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh. 350 school-age children were selected to conduct the study. Assessment of nutritional status of school-age children was done on the basis of two anthropometric indices- Height for Age and BMI for age.

Results : The overall prevalence of stunting (stunted +severely stunted) among children of working and non-working mothers were 63.8% and 77.1% respectively. The overall prevalence of thinness (thin+ severely thin) among the children of non working and working mothers was 91.9% and 57.5% respectively. Significant association was found between maternal employment status and in the prevalence of stunting and thinness.

Conclusion: The nutritional status of school age children was unsatisfactory in regard of their height for age and BMI for age.

Key Words: stunting, thinness, school age.

INTRODUCTION

Children are considered to be the most important natural resource and biggest human investment for the development in every community. Approximately twenty percent of the population in every country constitutes school-age children (5-15years). About 200 million children belong to this group and majority of them reside in underprivileged areas in rural India [1]. Quality of life of school children continues to be poor in India, the condition is still worse in rural areas [2]. In the developing countries, the growing children by and large are deprived of good nutrition on account of their poor socio-economic status, ignorance and

lack of health promotional facilities. This nutritional deprivation results in relative stunting of growth [3]. Stunting (low height for age), appeared to be a persistent phenomena beyond the 3rd year of life among rural children and it had the significant impact at 10+ years of age. Majority of rural children enter adolescence with poor nutritional status [4]. Thinness i.e. low BMI for age is one of the biggest problems of children residing in rural or tribal areas in our country than their urban counterparts [5]. Maternal employment status has potential implications for virtually all aspects of children's growth and development, and nutrition outcomes are no exception. The quality of

children's diets and their subsequent physical health may depend significantly on whether and how much their mothers work outside the home. On the one hand, employed mothers may have less time available to supervise their children's activities and to prepare their meals. On the other hand, the additional income they bring into the household may help to ensure a stable supply of good quality food. The present study is an attempt to explore the impact of maternal employment status in the prevalence of stunting and thinness among rural school-age children of Aligarh district.

AIMS AND OBJECTIVES :

1. To find out the prevalence of stunting and thinness among rural school-age children with the help of WHO anthroplus software.
2. To examine the impact of mothers' working status on the prevalence of stunting and thinness of children.

MATERIAL AND METHODS

The present cross-sectional study was undertaken in the rural field practice areas of Department of Community Medicine, Jawaharlal Nehru Medical College, A.M.U. Aligarh under Rural Health Training Centre. Four villages namely- Jawan, Chota Jawan, Tejpur and Sumere.

Following approvals were obtained for conducting the study-

1. Permission from the chairman, Department of Community Medicine, Jawaharlal Nehru Medical College, A.M.U. Aligarh.
2. Permission from the in-charge, Rural Health Training Centre, Jawan Block, Aligarh.

Period of the Study: April 2010 to September 2010.

Sample Size Estimation: The sample of 350 school age children was drawn with the help of following formula-

$$n = \frac{4pq}{L^2}, \text{ Where } n = \text{sample size}$$

p = prevalence of under nutrition (65%)

$$q = 100 - p$$

L = allowable error in prevalence (8% non response error was calculated)

Study Variables: Stunting and thinness were the dependent variables and mothers' working status was the independent variable.

Sampling Frame: Spin the bottle method was used to select the households. Mothers as well as their children were interviewed to get the information related to child and his/her socio-demographic profile. If any household having more than one child of the age group 6-12 years then only the eldest one was selected.

- **Inclusion Criteria-** (a) Male as well as female children (b) Children who had completed 6 years of age on the date of interview and were not more than 12 years of age.
- **Exclusion Criteria-** (a) Children having physical deformities of limbs and spine. (b) Children who were suffering from diseases and having mental defects

Prevalence of Stunting and Thinness: To find out the prevalence of stunting and thinness among the rural school age children, the measurements of height and weight of the subjects were taken. Height was measured to the nearest 0.1 cm using calibrated stadiometer and weight was measured in the upright position to the nearest 0.1 kg using calibrated salter weighing balance. As suggested by Gibson [6], measurements by themselves are incomplete unless they are associated with other measurement. So for the purpose of present study, Height for Age z-score and BMI for age z-score of the subjects were calculated with the help of anthroplus software to find out the prevalence of stunting and thinness among the studied group. Weight for Age is inadequate for monitoring growth beyond childhood due to its inability to distinguish between relative height and body mass in an age period where many children are

experiencing the pubertal growth spurt and many appear as having excess weight (by weight for age) when in fact they are just tall. So, BMI for age complements with height for age in the assessment of thinness, overweight and obesity and stunting among school-aged children is recommended by WHO [7].

Age Estimation of the Children and Mothers'

Working Status: A self-prepared structured interview schedule was used to determine the age of the child and mothers' working status. Knowledge of exact date of birth of the child for the proper interpretation of anthropometric data is crucial but not always easy to obtain, especially in rural areas. So, an indigenous calendar was prepared consisting of festival and local events for the estimation of the age of the child. Mothers were categorized into two groups according to their working status- working mothers and non –working mothers. Working mothers were those who were involved in self employment at home or outside the home for raising the family income and non-working were those who stayed at home and were not involved in any type of income raising activity. The income generating activities of mothers included- tailoring at home, working as an anganwadi worker/AASHA, working as a labor in fields, bidi maker and craft work.

Statistical Analysis: Statistical analysis of the data was performed using the statistical package for social sciences for windows SPSS (Version 16.0). To test the significance of association between dependent variables (stunting and thinness) and independent variable (mothers' working status), chi-square test was used.

RESULTS

The findings of the present study showed that the prevalence of stunting among 350 school-age children was 40.3% whereas 27.7% school children were found severely stunted. The overall prevalence of stunting (stunted +severely stunted) was 68% in the area of study. 32% children were found normal for their height for age (table-1). In the present study, there were 52.6% boys and 47.4% were girls. The prevalence of stunting was higher (42.8%) among girls than boys (38%). The overall prevalence of stunting (stunted+ severely stunted) among boys and girls was 69% and 75.9% respectively. The findings further revealed that the prevalence of thinness was 49.7% and 29.7% school children were found severely thin. The prevalence of overall thinness (thin+ severely thin) was 79.4% and only 20.6% children were found normal for their BMI for age (table-1).

**Table-1 Prevalence of Stunting and Thinness among School Age Children
(WHO, 2007 Standards)**

Anthropometric Indices	z-Score	Frequency (n)	Proportion (%)
Height for Age			
• Normal	-2SD to +2SD	97	32.0
• Stunted	<-2SD	141	40.3
• Severely Stunted	<-3SD	112	27.7
BMI for Age			
• Normal	-2SD to +1SD	72	20.6
• Thin	<-2SD	174	49.7
• Severely Thin	<-3SD	104	29.7

On the basis of employment status, mothers' were categorized in two groups- working and non-working. It was found that majority of children (63.7%) were belonged to non-working mothers and only 36.3% children were having the working mothers. The findings of the present study revealed that out of total 223 children of non-working

mothers, majority (38.1%) of them were severely stunted and only 21.3% children of working mothers were under the category of severely stunted. The overall prevalence of stunting (stunted +severely stunted) among children of working and non-working mothers was 63.8% and 77.1% respectively (table 2).

Table-2 Maternal Working Status and Prevalence of Stunting among School-Age Children (WHO, 2007 Standards)

Mother's Working Status	Nutritional Status (Height for Age z score)							
	Normal (-2SD + 2SD)		Stunted (<-2SD)		Severely Stunted (<-3SD)		Total	
	n	(%)	n	(%)	n	(%)	N	(%)
Non-working	51	22.9	87	39.0	85	38.1	223	100.0
Working	46	36.2	54	42.5	27	21.3	127	100.0
Total	97	27.7	141	40.3	112	32.0	350	100.0

Majority (36.2%) of children, whose mothers were working, found under the normal category for height for age. The findings of the present study revealed the significant association ($\chi^2=12.635$, d.f. = 2, $p<0.01$) between mothers' working status and height for age of school-going children.

Table-3 Maternal Working Status and Prevalence of Thinness among School-Age Children (WHO, 2007 Standards)

Mother's Working Status	Nutritional Status (BMI for Age z score)							
	Normal (-2SD + 1SD)		Thin (<-2SD)		Severely Thin (<-3SD)		Total	
	n	(%)	n	(%)	n	(%)	N	(%)
Non-working	18	8.1	120	53.8	85	38.1	223	100.0
Working	54	42.5	54	42.5	19	15.0	127	100.0
Total	72	20.6	174	49.7	104	29.7	350	100.0

The findings of the study further revealed that the highest prevalence of thinness (53.8%) and severe thinness (38.1%) were found among the children of non-working mothers. On the other hand, only 15% children of working mothers were severely thin. It was shocking to mention that only 8.1% children of non-working mothers were under the normal

category for BMI for Age and majority (42.5%) of working mothers' children were normal. The overall prevalence of thinness (thin+ severely thin) among the children of non working and working mothers was 91.9% and 57.5% respectively (table 3). There was highly significant association ($\chi^2=63.354$, d.f. =2, $p<0.01$) between mothers'

working status and BMI for age of school-going children.

DISCUSSION

Malnutrition during the school aged years may even directly and indirectly compromise the health and survival of the future generation, as malnourished children approach adolescence and their reproductive years in a nutritionally and educationally disadvantaged position. Nutritional deprivation during the school aged years can further constrain the physical and cognitive development of school children, possibly limiting their educational achievement and attenuating the impact of educational interventions for social development [8]. The findings of the present study showed the unsatisfactory nutritional status of school age children in regard of their height for age and BMI for age. Stunting (low height for age) is associated with long term consequences, such as impaired intellectual achievement and school performance and also leads to reduction in adult body size and subsequently, reduced work capacity and obstetric complications [9]. In the present study 40.3% of school going children were found stunted and 27.7% were severely stunted. The overall prevalence of stunting was recorded 68% among 350 school age children, which was higher than the study conducted by Saluja et al [10] which reported that 43.8% children of primary school age were stunted in the Meerut city of Uttar Pradesh. An another study done in rural areas of Maharashtra by Patil and Wasnik [11] also indicated the lower prevalence of stunting i.e. 30.3% than the present study. As mentioned in WHO tech rep ser 854 [12], thinness (low body mass index for age) in school aged children can result in delayed maturation, deficiency in muscular strength and work capacity and reduced bone density later in life. In regard of BMI for age of school children, the findings of present study

indicated that 49.7% and 29.7% school age children were thin and severely thin respectively. The prevalence of overall thinness was found higher (79.4%) than the study conducted by Chakraborty et al [13] i.e. 62.2% and Srivastava et al [14] i.e 33.3% in the West Bengal and Uttar Pradesh respectively.

The present study was an attempt to determine the impact of mothers' working status on nutritional status of their children in regard of prevalence of stunting and thinness. Traditionally, a woman's place has been her home and a generation ago, her employment outside her home was looked down by the society. This situation has now changed and women have started seeking employment outside their homes because of their gross economic necessity, followed by their desire to raise their economic standards and to have an independent income. Women's participation in the economic activity is a mixed blessing. It increases the family income and it may give the women some economic independence and status in the society. It however also increases her work load and cuts into the time that she has to spend with her children. In the workplace, the biological qualities like motherhood, reproduction, lactation and child rearing etc are often turned into biological handicaps [15]. Nakahara S. et al [16] suggested that in many developing countries, the poor women had multiple roles and that often their time constraints were so severe, that their participation in the income-generating activities resulted in a reduced child care time, which in turn affected the children's health. In the present study, the prevalence of overall stunting (77.1%) and thinness (91.9%) was higher among children of non-working mothers and significant associations were found between maternal employment status and nutritional status of school age children. Powell and McGregor [17] supported the results of present

study as nutritional status of the children of working mothers was poorer than that of the children whose mothers stayed at home. Contrary to the findings of present study, Srivastava et al [14] stated that the risk of malnutrition was significantly higher among children of working mothers. Mukherjee et al [18] reported no significant relationship between the working status of mothers and prevalence of malnutrition in their children.

CONCLUSION

The nutritional status of school age children was unsatisfactory in regard of their height for age and BMI for age. The effect of mothers' employment status on the child's nutritional status was complicated, though it could be expected that the working mothers would be better able to provide for their families. The better nutritional status of children was found more readily in the households where the mothers were involved in income generating activities. It was observed that mothers' working status has a significant impact on nutritional status of school-age children as the prevalence of stunting and thinness was higher among children whose mothers were non working and lower prevalence was found in children whose mothers were engaged to raise the household income.

RECOMMENDATIONS

Rural women should be encouraged to become the part of income generating activities and they should also provided better opportunities for employment so they can raise their family income which in turn results in better nutritional status of children. Efforts should be made to impart nutrition

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education to address the entire the family not only mothers; it should be focused on communication which results in behavioral change. It will be helpful to reduce the rate of malnutrition among children. There is need to create awareness among women in rural areas regarding the existing schemes and programs initiated by government of India for their economic empowerment. Ministry of Women and Child Development, Government of India promote economic empowerment of women through policies and programs cutting across sectors, mainstreaming gender concerns, creating awareness about their rights and facilitating institutional and legislative support for enabling them to develop to their full potential. Support to Training and Employment Program for Woman (STEP), a central sector scheme launched in 1986-87, seeks to upgrade skills of poor and asset less women and provide employment on sustainable basis. The ten traditional sectors identified under STEP comprise of agriculture, animal husbandry, dairying, fisheries, handlooms, handicrafts, khadi and village industries, sericulture, waste land development and social forestry. The Rashtriya Mahila Kosh (National Credit Fund for Women), an another scheme of government of India was set up in 1993 against the backdrop of socio-economic constraints faced by poor women to access micro credit from the formal financial system in the country.

The RMK is now being restructured as a NBFC with a Corpus of RS 500 crore. Till 31.3.2011, 6, 87, 572 women beneficiaries have been sanctioned RS 307.52 crore.

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