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Impact of School Mid Day Meal Program on the Nutritional status of Children in a rural area of South Karnataka, India

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A B S T R A C T

School Mid Day Meal (MDM) was introduced by Government of India in year 1995 by the name National Programme of Nutritional Support to Primary Education (NP-NSPE) as a Centrally Sponsored Scheme. The aim of the initiative was to enhance school enrollment, student retention, student attendance and improve nutritional status of children. To compare the nutritional status of children aged 6-12 years in 4 Primary Schools two years before and after the introduction of the MDM Programme. Children enrolled in 4 Government Lower Primary Schools in Sarjapura PHC area were studied. Children belonged to the age group of 6 to 12 years. The CDC (Center for Disease Control, Atlanta, USA) growth charts were used to calculate the weight for age percentile, and height for age percentiles. Comparison of nutritional status of boys before and after the introduction of the MDM program revealed improved nutritional status. Percentage of stunting and grade 3 malnutrition had reduced in all age groups except among 6 years. The inter gender comparison of the heights before and after the MDM programme showed, a greater proportion of girls were stunted before the MDM programme. Post MDM there was reduction in the proportion of stunting and in addition was a reduction in the proportion of children with undernutrition (grade 2 and grade 3). The improvement in the nutritional status post MDM in girls was more.

Introduction

The Mid Day Meal (MDM) Programme in India was first introduced in the year 1925 for disadvantaged children of Madras Municipal Corporation. At a national level the scheme was introduced in the year 1995

by Ministry of Human Resource Development, Department of School Education and Literacy by the name National Programme of Nutritional Support to Primary Education (NP-NSPE) as a

Centrally Sponsored Scheme. The objectives of this programme were enhancing school enrollment, student retention, improving student attendance and improving nutritional status of children^{1, 2}. The NPNSPE was revised in September 2004. Currently, the NPNSPE is the world's largest school feeding programme reaching out to about 12 crore children in over 9.50 lakh schools across the country¹. The MDM programme was introduced in the state of Karnataka in the year 2003. A study on the impact of the MDM in rural Karnataka showed an improvement in the nutritional status of school children³. However, in our study we compared age to age the nutritional status of children enrolled in school at two distinct and different point in time that is Pre MDM era (Year 2001) and Post MDM ear (Year 2005). In Post MDM subjects except 6 years old (who are in 1st std) the rest of the subjects were *exposed* to MDM for a period not less than 6 months, with older children in 2nd std and beyond were *exposed* to MDM for periods between 6 months to 24 months.

Methodology

Children in the age group of 6 – 12 years enrolled in 4 Government Lower Primary Schools in Sarjapura PHC under the jurisdiction of Block Education Officer, Anekal Taluk, Bangalore District were studied. The permission of the School Head Masters was obtained for record review and the purpose of the study was explained to them. The MDM programme was introduced in these schools in the year 2003. We reviewed the anthropometric data collected from the School Health Register (SHR) for the years 2001 and 2005. The CDC (Center for Disease Control) growth charts⁴ were used to calculate the weight for age percentile, and height for age

percentiles. From these charts the 50th percentile was considered as the expected value. If the weight-for-age of a particular child was $\geq 80\%$ of the expected it was considered to be Normal. Similarly 70 – 79% of the expected was grade 1 malnutrition, 60 – 69% of the expected was grade 2 malnutrition, 50 – 59% of the expected was grade 3 malnutrition and $<50\%$ of the expected was grade 4 malnutrition. Similarly Height-for-age was graded as $\geq 89\%$ of expected to be normal, 85 – 89% as stunting and $<85\%$ as severe stunting.

The proportion of children with under nutrition was calculated for each age category in the 6 to 12 years age group, first separately for males and females and then for the entire study population. A comparative analysis was done to detect the impact of the MDM program on the nutritional status of the children.

Microsoft Excel and standard statistical software packages were used to analyze the data. Independent samples 't' test was performed to assess any significant changes in the nutritional status.

Result and Discussion

Health records of 634 children were assessed. Of these 340 records were for the year 2001 and 294 were for the year 2005 (Table 1).

Comparison of nutritional status of boys before and after the introduction of the MDM program it was found that nutritional status of children improved. Proportion of children with stunting (figure 1) and proportion of children with grade 3 malnutrition (figure 2) had reduced in all age groups except among 6 years. The height of girls in all the age groups was found to be greater after the introduction of

MDM. (figure 3), except among 6 year olds. However, there were fewer girls with grade 3 malnutrition after introduction of MDM. (figure 4).

The inter gender comparison of the heights before and after the MDM programme showed that a greater proportion of girls were stunted before the MDM programme. Overall, there were fewer children with stunting after the programme. It was further seen that the proportion of females with stunting had reduced more than the boys (Table 2). Similarly, it was also seen that a greater proportion of girls was underweight compared to boys, both before and after the introduction of the MDM (Table 2). Overall the proportion of underweight children had reduced after the introduction of the MDM. Overall, the boys showed a greater decrease in malnutrition. The girls showed a greater reduction in grade 3 malnutrition after the introduction of the MDM (Table 2). There was an improvement in the mean height and weight in both genders after the introduction of MDM (Table 3).

The independent sample 't' test showed a significant change in the height and weight of all children after the introduction of the MDM. There was a significant change in the height and weight of girls after the MDM. Among boys this change was significant for their weight only (Table 4).

The nutritional status of all age groups showed improvement except that of age group 6. This can be explained by the fact that the 6 year olds at school entry have not had adequate exposure to the benefits of the supplementary nutrition that the MDM provides. In all age groups except 6 years there was a reduction in the percentage of male children with stunting and all age groups except 6 years showed a reduction

in grade 3 malnutrition. All age groups except 10 years showed a reduction in grade 2 malnutrition. The probable reason why the 10 year age group had a rise in grade 2 malnutrition could be due to transition.

Most of the female children showed a reduction in grade 3 malnutrition except in the 6 year olds. It was seen that both before and after the MDM, girls showed a higher percentage of stunting than boys; however the percentage of improvement post MDM in boys and girls was the same in majority of the age groups.

Overall there has been an increase in the proportion of children with grade 2 malnutrition, but this could be attributed to the improvement in the nutritional status of those previously grade 3. There has been an overall decrease in the proportion of children with grade 1 malnutrition which could be due to improvement in nutritional status.

In this study, there was a significant change in the nutritional status of children after the MDM. A study of the impact of the MDM in Karnataka in 1999³ showed an improvement in the attendance, scholastic performance, as well as the nutritional status of school children. The proportion of children with <70% of weight for age was marginally lower in MDM schools than their counterparts in non-MDM schools. The per cent of normals was also marginally higher in MDM areas (3.0%) as compared to non-MDM areas (1.3%) ($p < 0.05$)³. The annual report of the Department of Public Instruction, Government of Karnataka, states that there is a 2% to 10% improvement in attendance across the state following introduction of the MDM and children are more attentive and active inside and outside the classroom⁵.

Table.1 Age and gender distribution of study population

Age (yrs)	2001		2005	
	Boys	Girls	Boys	Girls
6	10 (6.5)	22 (11.8)	24 (16.0)	23 (16.0)
7	22 (14.4)	18 (9.6)	29 (19.3)	15 (10.4)
8	24 (15.7)	26 (13.9)	18 (12.0)	13 (9.0)
9	24 (15.7)	31 (16.6)	21 (14.0)	25 (17.4)
10	15 (9.8)	35 (18.7)	21 (14.0)	24 (16.7)
11	37 (24.2)	36 (19.3)	23 (15.3)	36 (25.0)
12	21 (13.7)	19 (10.2)	14 (9.3)	8 (5.6)
Total	153	187	150	144

(Note: Figures in parentheses indicate percentages of column totals)

Table.2 Proportion of children with under nutrition (stunting and underweight) before and after the Mid Day Meal

		2001		2005	
		Boys	Girls	Boys	Girls
Height for age	Normal (≥ 89%)	83 %	73.8 %	93.3 %	87.5 %
	Stunting (85-89%)	16.3 %	25.7 %	6.7 %	12.5 %
	Severe Stunting (< 85%)	0.7 %	0.5 %	0 %	0 %
P value				-	0.003
Weight for age	Normal (≥ 80%)	12.4 %	11.8 %	34 %	29.1 %
	Grade 1 Malnutrition (70-79%)	41.2 %	37.4 %	38.7 %	34.0 %
	Grade 2 Malnutrition (60-69%)	39.2 %	32.0 %	24.0 %	31.3 %
	Grade 3 Malnutrition (50-59%)	7.2 %	18. %7	3.3 %	5.6 %
P value				0.048	0.003

(Note: P value for change in height of ALL children was 0.004 and change in weight for ALL children was 0.00)

Table.3 Improvement in nutritional status after the Mid Day Meal as assessed by the independent sample ‘t’ test

	Parameter	P value	Significance
All children	Height	0.004	Significant
	Weight	0.00	Significant
Females	Height	0.003	Significant
	Weight	0.003	Significant
Males	Height	-	Not significant
	Weight	0.048	Significant

Figure.1 Height of Male Students before and after the introduction of MDM

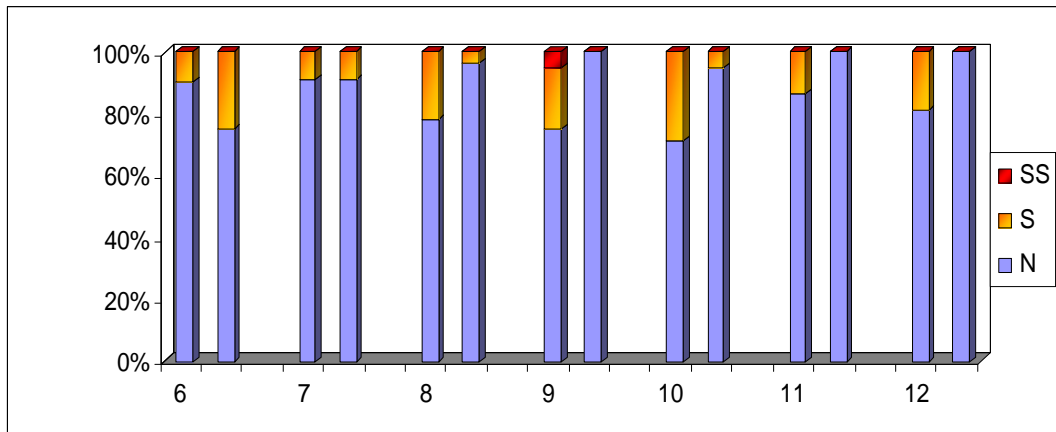


Figure.2 Weight of Male Students before and after the introduction of MDM

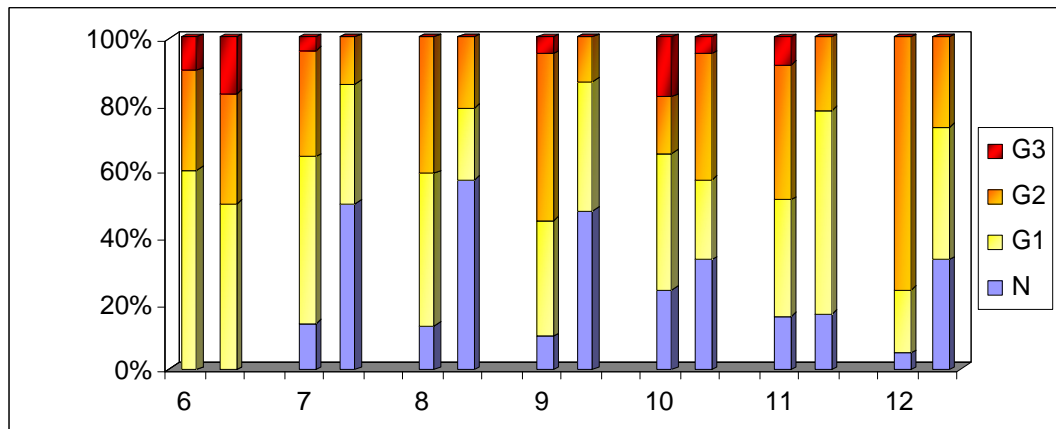


Figure.3 Height of Female Students before and after the introduction of MDM

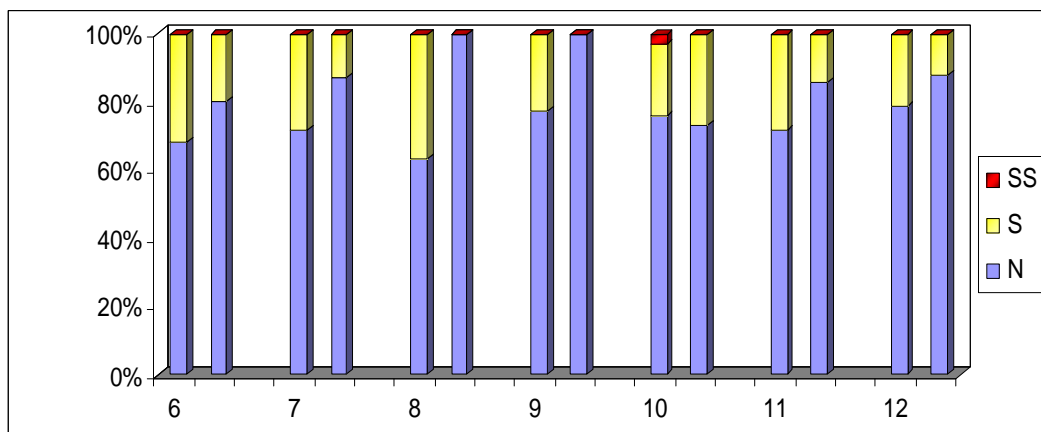
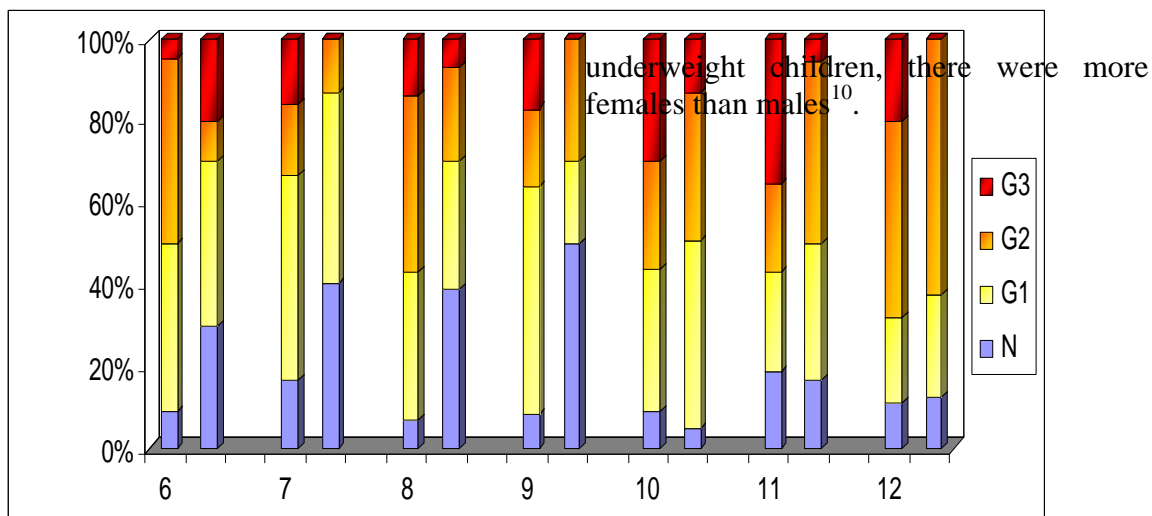


Figure.4 Weight of Female Students before and after the introduction of MDM



Another study of the impact of the MDM among school children in Northern India showed that the MDM did not make any appreciable and significant impact on improving the nutritional status of the children. However the dropout rates among girls had reduced.⁶

The undernutrition among girls was higher than boys during pre and post MDM period. However, the percentage improvement in nutritional status post MDM was higher in girls. Prevalence of underweight in most regions is similar to both the sexes except in South Asia. In South Asia, 47 percent of girls are underweight compared 44 percent of boys⁷.

Child nutrition surveys have shown Indian girls to be more wasted and underweight compared to boys⁸. States such as West Bengal also show a higher proportion of undernutrition among girl children⁹. Among South East Asian countries like Philippines also more males than females have been found to be of normal weight, among overweight children, there were more males than females and among

School MDM may be further strengthened especially given its positive impact on nutritional status of girl children. School age (pre pubertal and pubertal) is a critical stage in the physical development of girls. School MDM has potential to impact the growth and development of children (especially girls)¹¹.

Conclusions

The following conclusions can be drawn from the present study. Firstly, following the introduction of MDM there was a reduction in the proportion of children with stunting as well as a reduction in the proportion of children with both grades 3 and 4 under nutrition.

Secondly, under nutrition among girls was high both before and after the introduction of MDM. And thirdly, the improvement in the nutritional status after the introduction of MDM was more among girls when compared to boys in a majority of the age groups.

Limitations

The anthropometric assessment was obtained from school health records. Few of the records were incomplete and illegible.

Recommendations

As evident by the findings of our study, the MDM has had a positive impact on the nutritional status of school children. Hence the program should be sustained with periodic evaluations and requisite improvements. The school health records should be maintained accurately and should be complete in terms of age, anthropometric assessment and morbidity. This would enable adequate follow up and assessment of nutritional status.

Nutritional assessment for the same cohort of children both before and after the introduction of the MDM should be done to look for significant differences in nutritional status.

It was observed that the nutritional status of 6 yr olds in 2005 had deteriorated as compared to that of 6 yr olds in 2001. This finding warrants further investigation and appropriate intervention.

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Interest of conflict – No conflict of interest, No sponsors

References

1. National Programme of Nutritional Support to Primary Education, 2006 [Mid-Day Meal Scheme]

GUIDELINES Ministry of Human Resource Development [Department of School Education & Literacy] September, 2006.

2. K. Park. Textbook of Preventive and Social Medicine, 19th Edition, M/s Banarsidas Bhanot, Jabalpur 2005. p.465, 527-8.
3. Laxmaiah A, Rameshwar Sharma KV, Rao H et al. Impact of mid day meal program on educational and nutritional status of children in Karnataka. *Indian Pediatrics* 1999;36, 1221-8.
4. Ghai OP, Gupta P, Paul VK, editors. *Essential Pediatrics*. 6th edition. Delhi: CBS Publishers and Distributor; 2004. P.4-43, 102.
5. Annual Report 2005-2006. Department of Public Instruction, Government of Karnataka.
6. Seetharaman S. Impact of mid day meal on the nutritional status of school going children.
7. Progress for Children. A report card on malnutrition, Number 4, May 2006. Nutrition and the MDGs. UNICEF.
8. Alain Marcoux. The “Feminization of hunger” - What do the surveys tell us? Sustainable Development Department (SD), Food and Agricultural Organization of the United Nations.
9. Ghosh S. *The Female Child in India- A Struggle for Survival*. Nutrition Foundation of India, October 1987.
10. A.J.G. Ferrer. Gender and nutritional status among children under Se Ven in the coastal Barangays of BuenaVista, Guimaras, Philippines.
11. Making the Case for Nutrition Interventions through Schools. WHO/FAO/Education International 1998. WHO Information Series on School Health – Document 4: Healthy Nutrition: An Essential Element of a Health-Promoting School. Geneva: WHO.