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IMPACT OF MID-DAY MEAL SCHEME ON THE NUTRITIONAL STATUS AND ACADEMIC ACHIEVEMENT OF SCHOOL CHILDREN IN ALIGARH CITY

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ABSTRACT

Children are the most vulnerable group that suffers from malnutrition and nutritional deficiency. Under nutrition during any period of childhood, even for relatively short term episodes, can have negative effects on the cognitive development thus leads to poor school performance among children. The research question is- does the mid-day meal scheme have an impact on the nutritional status and academic achievement of school children (6-14 years) in Aligarh city? This was a Cross-sectional study Conducted at six government primary schools Mid Day Meal (MDM)) and six public primary schools (Non-Mid Day Meal (NMDM)) of urban areas of Aligarh city in which children of similar socio-economic status were studied. Simple random sampling was used for selection of children. Study variables taken were height, weight and general physical examination and academic achievement record. Results of the study indicated that the nutritional status and academic achievement of MDM school children was poorer than NMDM school children. The age of children was found similar at the time of admission and fee structure were found to be almost same in both the schools. The study reveals poor nutritional status and academic achievement of school children receiving mid day meal (MDM) every day. The reason for poor result for schools providing Mid Day Meals could be irregular attendance of children in school, less amount of Mid Day Meal, poor quality of food items in Mid Day Meals, less number of appointed teachers, combined teaching of different standard, lack of class room etc. All these parameters need to be further studied and evaluated for these impact on academic achievement.

KEY WORDS: Nutrition ,NMDM , MDM ,Aligarh

Children are the most vulnerable segment that suffers from various kinds and grades of malnutrition and nutritional deficiency. Childhood inadequacies will certainly have irreversible and serious consequences in the adulthood. Under nutrition during any period of childhood, even for relatively short term episodes, can have negative effects on the cognitive development thus leads to poor school performance among children. Primary school children (6-14 years) form about 20% of the total population. Free and compulsory education up to the age of 14 years is the constitutional commitment. It is estimated that about 40% of children dropout of primary school. National Nutrition Monitoring Bureau (NNMB,2000) indicate that about 70% of these children are undernourished and there is about 30% deficit in energy consumption and over 75% of the children have dietary micronutrient deficit of about 50%.

Nutrition support to primary education is considered as a means to achieve the objective of providing free and compulsory universal primary education of satisfactory quality to all the children below the age of 14 years by giving a boost to universalisation of primary education through increased enrolment, improved school attendance and retention and promoting nutritional status of primary school children.(Afridi and Farzana,2007)

The National Program of Mid Day Meal in schools, the largest school feeding program in the world, cover nearly 9.70 crore children studying at the primary stage of education in class I-V in 9.50 lakhs government (including local body) and government aided schools and the centres run under Education Guarantee Scheme (EGS). The program was extended with effect from 01.10.2007 to children in the upper primary stage of education (class VI-VIII) in 3,479 Educationally Backward Blocks (EBBs). The present study was carried out to find out the impact of mid day meal scheme on the nutritional status and academic achievement of school children (6-14 years) in Aligarh city.(CART,2007).

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MATERIALS AND METHODS

To assess the impact of program a set of six schools with mid day meal scheme and six schools without mid day meal scheme with comparable socio-economic background were used. The study was carried out among 600 school children (300 Mid Day Meal (MDM) school children and 300 Non-Mid Day Meal (NMDM) school children) aged 6 to 14 years studying in IInd to Vth class in the selected government primary and private primary schools of Aligarh city.

In every school, boys and girls were randomly selected from each class for anthropometry, clinical examination and academic achievement. The nutritional status of children was assessed by anthropometry (height and weight) and clinical examination and the academic achievement was based on marks obtained by the children in annual examination in the preceding year.

RESULTS

The objective was to determine the impact of mid day meal scheme on the nutritional status and academic achievement of school children (6-14 years) in Aligarh city.

Table 1: Comparison of mean height and weight of MDM and NMDM school boys with ICMR standard on the basis of age

			MDM Boys				NMDM Boys			
Age (years)	ICMR height standard (cm)	ICMR weight standard (kg)	Mean height (cm)	Diff	Mean weight (kg)	Diff	Mean Height (cm)	Diff.	Mean weight (kg)	Diff
6	116.1	20.7	116.0	.1	17	3.7	115.5	.6	18	2.7
7	121.7	22.9	113.5	8.2	15	7.9	118.6	3.1	19	3.9
8	127	25.3	122.7	4.3	17.7	7.6	130.3	-3.3	25.3	0
9	132.2	28.1	124.3	7.9	19.3	8.8	126.8	7.9	21.8	6.3
10	137.5	31.4	129.8	7.7	21.4	10	134.2	3.3	26.0	5.4
11	140	32.2	133.9	6.1	24.3	7.9	140.2	-2	28.6	3.6
12	147	37	138.3	8.7	26.5	10.5	145.2	1.8	30.6	6.4
13	153	40.9	149.4	3.6	29.5	11.4	154.1	-1.1	36.3	4.6
14	160	47.0	155.6	4.4	31.1	15.9	155.7	4.3	39.4	7.6

Results on the height of boys (Table,1) indicated that the MDM boys were found shorter than boys of ICMR standard by 0.1 cm to 8.7 cm across all ages. The maximum difference was found in age group of 12 years. In case of NMDM boys the differences ranges from 0.6 cm to 7.9 cm from 6 to 14 years. Data indicated that the NMDM boys were also found shorter than ICMR standard at all ages except at age of 8 years, 11 years and 13 years.

The weight of MDM and NMDM boys increased with increase in age from 6 to 14 years except at age of 7 years in MDM boys and age of 9 years in NMDM boys. The weight in the age group 6 to 14 years ranged from15 kg to 31.1 kg in MDM boys with a total gain of 16.1 kg. In NMDM boys the total weight gain 21.4 kg and the weight ranged from 18 kg to 39.4 kg. In both schools boys the weight was found lower than the ICMR standard across all ages.

It was observed (Table, 2) that the overall weight gain was higher in NMDM girls than the MDM girls but lower than the ICMR standard. Data analysis showed that the girls of MDM schools were shorter than the ICMR well to do Indian girls at all ages except at age of 6 and 12 years (higher by 1.7 cm and 1.6 cm, respectively). However, in NMDM girls the

Table2: Comparison of mean height and weight of MDM and NMDM school girls with ICMR standard on the basis of age

			MDM Girls				NMDM Girls			
Age (years)	ICMR height standard (cm)	ICMR weight standard (kg)	Mean height (cm)	Diff.	Mean weight (kg)	Diff.	Mean height (cm)	Diff.	Mean weight (kg)	Diff.
6	114.6	19.5	116.3	-1.7	15.2	4.3	116	-1.4	16	3.5
7	120.6	21.8	117.3	3.3	16.6	5.2	119	1.6	16.7	5.1
8	126.4	24.8	122.5	3.9	18.5	6.3	126.5	-0.1	25	-0.2
9	132.2	28.5	123.4	8.8	19.3	9.2	126.8	5.4	22.3	6.2
10	138.3	32.5	131.7	6.6	21.4	11.1	136.9	1.4	26.6	5.9
11	142	33.7	136.4	5.6	24.2	9.5	138.6	.3.4	26.2	7.5
12	148	38.7	149.6	-1.6	27.1	11.6	147.2	.8	32.5	6.2
13	150	44.0	146.2	3.8	31.1	12.9	151.5	-1.5	35.6	8.4
14	155	48.0	152.0	3	34.9	13.1	153.7	1.3	39.4	8.6

difference ranges from o.8 cm to 5.4 cm and the maximum difference was found in age group of 9 years. At the age of 6, 8 and 13 years the of NMDM girls was noticed higher than the ICMR standard by 1.4 cm ,0.1 cm and 1.5 cm, respectively. In MDM girls the weight ranges from 15.2 kg to 34.9 kg with a total weight gain of 19.7 kg. The mean weight of NMDM school girls in the age group 6 to 14 years ranges from 16 kg to 39.4 kg a total weight gain of 23.4 kg.

Table 3: Difference in the prevalence of stunting (height-for-age) between MDM and NMDM school children

	MDM School Children			NMDM School Children			
Height-for-age	Boys	Girls	Pooled	Boys	Girls	Pooled	Pooled difference Z test
Normal	34 (24.65)	41 (25.32)	75 (25.00)	62 (45.92)	69 (41.81)	131 (43.60)	P<05
Stunted	73 (52.89)	75 (46.29)	148 (49.33)	49 (36.29)	60 (34.59)	109 (35.33)	P<05
Severely stunted	31 (22.48)	46 (28.39)	77 (25.67)	24 (17.79)	36 (20.65)	58 (19.31)	P<05
Total prevalence	138 (100)	162 (100)	300 (100)	135 (100)	165 (100)	300 (100)	

In table, 3 MDM school children, 24.65% of boys and 25.32% girls were found normal as per their height-for-age. However, in the stunted category the percentage of stunted boys was noticed higher (52.89%) than those of stunted MDM girls (46.29%) whereas (22.48%) boys were found less severely stunted than those of girls (28.39%). In case of NMDM school children, 45.92% of boys and 41.81% of girls were found in normal category. Similar to the case of MDM children higher percentage of NMDM boys (36.29%) was found stunted than NMDM girls (34.59%) but the percentage of girls was found higher (20.65%) than boys (17.79%) in severely stunted category. Comparing the status of stunting between MDM and NMDM school children it was observed that more 75% MDM children were stunted (75.37% of boys and 74.68% of girls) in NMDM school children in NMDM school children more than 50% of children are stunted with 54.08% of boys and 55.24% of girls. Statistically significant difference regarding prevalence of stunting between MDM and NMDM school children was observed with the help of 'Z' test of difference of proportion between pooled MDM and NMDM school children are found statistically significant($p<0.05$) in all the categories.

Table 4: Difference in the prevalence of wasting (weight-for-height) between MDM and NMDM school children

	MDM School Children			NMDM School Children			
Weight-for-height	Boys	Girls	Pooled	Boys	Girls	Pooled	Pooled difference Z test
Normal	18 (13.04)	38(23.45)	56 (18.66)	28 (20.74)	39 (23.63)	67 (23.00)	P<05
Wasted	46 (33.33)	74 (45.67)	120 (40.00)	70 (51.85)	79 (47.87)	149 (49.67)	P<05
Severely thin	74 (53.60)	50 (30.86)	124 (41.33)	37 (27.40)	47 (28.48)	84 (28.00)	P<05
Total prevalence	138 (100)	162 (100)	300 (100)	135 (100)	165 (100)	300 (100)	

Table, 4 indicates that in MDM school children only 18.66% children were found to be normal as per their weight-for-height as compared to NMDM school children (23.00%). Comparing the prevalence of wasting between MDM and NMDM schools it was noticed that MDM children were falling more than (81.33%) under thin category as compared of NMDM children (77.67%). Discussing the severe thinness category, 41.33% of MDM children were found severely thin where the percentage of boys was higher than girls. In NMDN school the percentage of severely thin girls was higher than boys. The results of Kanani and Gopaldas,(1998) Gopaldas,(2003) and were found similar to the results of present study. Statistically significant difference regarding prevalence of wasting between MDM and NMDM school children was also studied and found statistically significant ($p<0.05$) in all the pooled categories of prevalence of wasting by applying 'Z' test of difference of proportion.

By summing up the discussion of the present study in the light of various studies it can be concluded that the nutritional status of non-recipients of mid day meal was found better than those of regular beneficiaries of the program, thus, the program is not fulfilling its purpose of improving nutritional status of school children.

Marks obtained by each child in the preceding annual examination were collected from the school record and were distributed as per the grades normally adopted in schools for the purpose of analysis. It was found (Table,5) that a majority of MDM school children (67.33%) obtained marks between 40 to 69% that is grades 'B' and 'C' where in NMDM school 78.33% children obtained marks between 55 to ≥ 70% that is grades 'A' and 'B'. Thus we conclude that the academic achievement of NMDM school children was higher as compared to NMDM school children for that 'Z'test for difference of proportion was used and found it

Table 5: Comparison in the academic achievement of MDM and NMDM school children

		Academic achievement record (%)				
		A(≥70)	B (55-69)	C(40-54)	D(30-39)	E(≤29)
MDM	Boys (46.00)	16 (11.59)	31 (22.46)	48 (34.78)	41 (29.71)	2 (1.46)
	Girls (54.00)	20 (12.34)	44 (27.16)	79 (48.76)	18 (11.11)	1 (0.6)
	Pooled (100.00)	36 (12.00)	75 (25.00)	127 (42.33)	59 (19.66)	3 (0.01)
NMDM	Boys (45.00)	76 (56.29)	36 (26.66)	15 (11.11)	10 (7.44)	1 (0.40)
	Girls (55.00)	53 (32.12)	70 (42.42)	30 (18.18)	10 (6.06)	2 (1.22)
	Pooled (100.00)	129 (43.00)	106 (35.33)	45 (15.00)	20 (6.66)	3 (0.01)
Pooled Difference 'Ztest'		P<.05	P<.05	P<.05	P<.05	P<.05

was statistically significant ($p<0.05$) in all the pool categories of academic achievement between MDM and NMDM school children.

DISCUSSION

The observations of the present study suggest that the mid day meal is not making any appreciable impact on the nutritional status and academic achievement of MDM school children. Majority of MDM children are stunted and thin. The results of the present study related to stunting and wasting were found similar to that Kanani and Gopaldas(1998) where more MDM beneficiaries were affected from stunting than non-recipients, but above findings were found contrary to Laxmaiah et al.,(1999) who found that the percentage of stunted children was lower in MDM school (50.8%) as compared to NMDM school (54.1%).

The academic achievement of MDM children is not increasing with the increase in class. The results of our study found similar to that of Jacoby,(1996) and Dreze and Khera,(2008) study who concluded that the MDM program did not make any appreciable and significant impact on the educational outcomes of children. There were could be various reasons that were observed during the study which was responsible for poor results of Mid Day Meal on nutrition status and academic achievement of school children. There may be following parameters (to be studied) for poor nutritional status and performance, they may be irregular attendance of recipients in the school because of their involvement in family occupation, the amount of Mid Day Meal was not sufficient from nutritional point of view: feeling of hunger prevents them to concentrate on their studies, poor quality of food items were used in Mid Day Meal and also there were no use of soyabean ana seasonal vegetables etc.

CONCLUSION

Statistically the mean height and weight of MDM school children in the present study are lower than that of ICMR (1990) standards. The nutritional status of the MDM school children under study was found to be lower than those of NMDM school children. The prevalence of stunting among MDM boys and girls were 75.37% and 74.68%, respectively and wasting was observed 86.93% for

boys and 76.53% for girls where as in NMDM boys the stunting was 54.08% and in girls it was 55.24%. In case of prevalence of wasting 79.25% and 76.35% NMDM boys and girls were found wasted, respectively. Significant difference in the prevalence of stunting and wasting for both MDM boys and girls were observed.

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