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Performance of mid day meal (MDM) on nutritional status of school going children in Muzaffarpur town of Bihar

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Abstract

Background: Due to poverty, one-third of school children are malnourished in developing countries. Malnourished children are underdeveloped both physically and cognitively, which makes schooling difficult for them. Midday Meal Scheme is a school meal programme of the government of India designed to improve the nutritional status of school-age children nationwide. It has been reported that MDM has catered to the nutritional needs of school children.

Objectives: The study aimed to assessing the performance of Mid-Day Meal on nutritional status of school going in Muzaffarpur Town of Bihar.

Methods: Present study was carried out among 110 children in the age group 6-10 years randomly selected from 5 Govt. schools from Muzaffarpur Town. BMI-for-age was measured and determined by using WHO anthro Plus software and using WHO reference 2007 values. For performance of MDM scheme according to respondent, the Likert scale range was used. Nutritive value of the diets, consumed by the children were calculated by using the Diet Cal Software and compared with recommended dietary allowance (RDA) values given by ICMR (2010).

Result: The thinness of nutrition was present in 50.91% of Boys and 41.82% of girls. The mean score (3.73), Variance (1.24) and SD (1.11) shows that respondents agree with lack of hygienic condition. Respondents agree with issue on lack of oil/ingredients/vegetables in meal, the mean (4.10), variance (0.70) and SD (0.84) clearly show their agreement. But respondents do not decide with the issue on lack of meal, it is clearly show by the mean (2.94), variance (1.52) and SD (1.23).

Conclusion: In conclusion there were statistically significant differences. Children had higher prevalence of malnutrition, so there is an urgent need to change the diet plan, re-evaluate the subsidies and supervision of MDM Scheme.

Keywords: MDM, nutritional status, malnutrition, school going children

Introduction

Growth and development of any country is reflected by the growth and development of its children. In our country, children constitute a major bulk of the population, i.e. 32.4% of the children are aged less than 14 years. A child's growth is the most important indicator of health, which is influenced and measured by adequate intakes of food and nutrients and a decreased susceptibility to disease.

School children constitute a major segment of the community whose health and nutritional status will indicate the changing trend of nutritional profile of a region. They are the inheritors of our past and seeds of our future. The main nutritional problems facing the school children include growth retardation, stunting, underweight, anemia and vitamin A deficiency. According to Who malnutrition though continues to be a major health problem in South East Asian regions. Studies have reported a large section of children especially the urban and rural poor in India are suffering from varying grades of malnutrition. It has been estimated that about two third of children do not take adequate nutrition that leads to malnutrition, besides, macro and micro nutrients deficiencies continue to affect the physical and mental health of children.

Due to poverty, one-third of school children are malnourished in developing countries. Malnourished children are underdeveloped both physically and cognitively, which makes schooling difficult for them.

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To mitigate the impacts of poverty and improve school participation among these children, various interventions have been introduced across the globe. School participation includes enrolment, attendance, and retention of the beneficiary children. The provision of free school meals (Midday Meal) is the most popular and widely followed intervention for improving school participation.

The Midday Meal Scheme is a school meal programme of the government of India designed to improve the nutritional status of school-age children nationwide. The objectives of this programme were enhancing school enrollment, student retention, improving student attendance and improving nutritional status of children. The programme supplies free lunches on working days for children in primary and upper primary classes in government, government aided, local body, Education Guarantee Scheme, and alternate innovative education centres, Madarsa and Maqtabs supported under Sarva Shiksha Abhiyan, and National Child Labour Project schools run by the ministry of labour.

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 NPNSPE was revised in September 2004. Currently, the NPNSPE is the world's largest school feeding programme reaching out to about 120,000,000 children in over 1,265,000 schools across the country.

School meals help to subsidise school costs and mitigate classroom hunger. These two factors are the two basic reasons for low attendance and learning in schools. However, the impact of school meals on the improvement of primary education and nutritional status is still debated. This research study will examine the performance of Mid-Day Meal (MDM) on nutritional status of school going children in Muzaffarpur town of Bihar.

Methodology

Present study was conducted on school going children in the age group of 7-9 years from 5 schools (P.S Zeromile Bazarsamiti, P.S. new Police line Daudpur, P.S. Mithanpura, P.S. Khabra Harijan tola, and P.S. Bhikhanpura) randomly selected from different areas of Muzaffarpur town of Bihar. 22 students (11 boys and 11 girls) from each school were

selected by random sampling. Thus sample consisted of 110 (55 boys and 55 girls) school going children. Anthropometric method was used for nutritional assessment.

Height was measured by using Stadiometer in centimeters placed on plain floor. An electronic weighing scale was used to measure the weight in kilograms.

Nutritional status of all the selected children was assessed by measuring body height (cm), weight (kg) which was compared with the World Health Organization (WHO) 2007 classification, based on BMI-for age (z-score).

Malnutrition was calculated with the help of Anthro Plus software (developed by WHO 2007), as Severe thinness ($< -3SD$), Thinness ($\geq -3SD \text{ & } <-2SD$), normal ($> -2SD \text{ & } < +1SD$), Overweight ($> +1SD \text{ & } \leq +2SD$) and Obesity ($> +2SD$) for BMI-for-age.

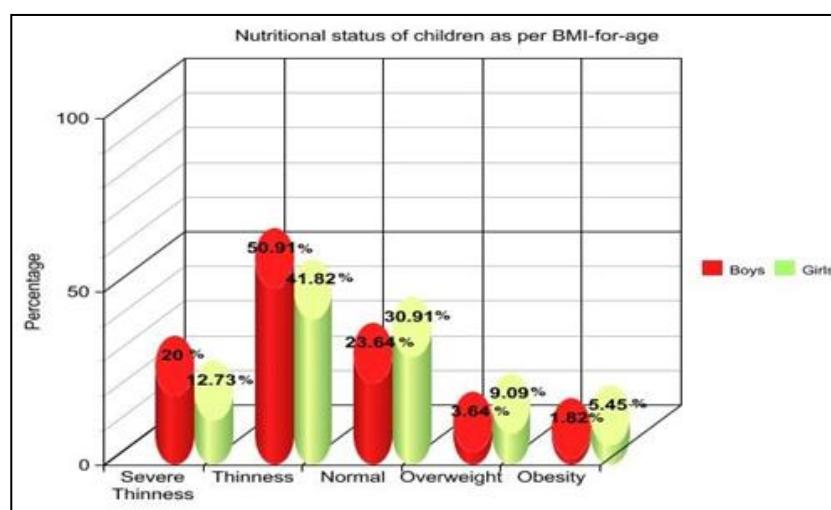
Data was collected by interviewed schedule. Nutrients consumed i.e. protein, and calories, were calculated by using the Diet Cal Software and compared with recommended dietary allowance (RDA) values given by ICMR (2010).

For performance of MDM scheme according to respondent, the Likert scale ranges from 'strongly agree' to 'strongly disagree' (5=strongly agree 4=agree 3=undecided 2=disagree 1=strongly disagree) so as to not limit the response of respondents to some limited ranges. In interpreting the results for the likert questions, the mean scores less than 2.45 implies respondents do not agree; scores 2.45-3.44 shows undecided and greater than 3.44 indicates agreement among respondents on the issues raised rounding results to the nearest two decimal places.

Results & Discussion

Table 1: Nutritional status of children as per BMI-for-age

BMI-for-age	Boys		Girls		Total (n= 110)	
	n	%	n	%	n	%
Severe Thinness $< -3SD$	11	20.00	07	12.73	18	16.36
Thinness $\geq -3SD \text{ & } <-2SD$	28	50.91	23	41.82	51	46.36
Normal $> -2SD \text{ & } < +1SD$	13	23.64	17	30.91	30	27.27
Overweight $> +1SD \text{ & } \leq +2SD$	02	03.64	05	09.09	07	06.36
Obesity $> +2SD$	01	01.82	03	05.45	04	03.64
Total	55	100	55	100	110	100



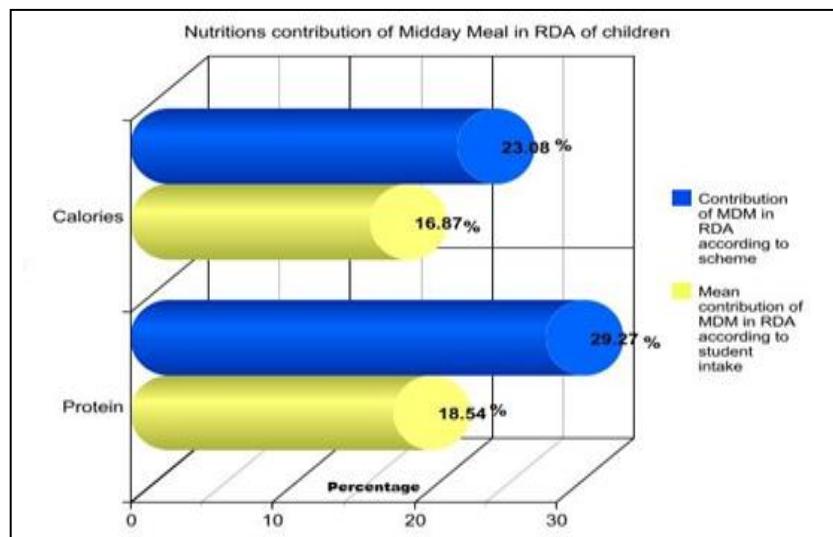
Graph 1

Table 1 showed that 23.64% of boys were normal while 30.91% of girls were normal. In similar way, the thinness of nutrition was present in 50.91% of Boys and 41.82% of girls.

The severe thinness level of malnutrition i.e. 20% in boys and 12.73% in girls was observed. 3.64% Obesity was found in children.

Table 2: Nutritional contribution of Midday Meal in RDA of children

Nutrients	RDA (ICMR 1993)	MDM/day	Contribution of MDM in RDA according to scheme (%)	Mean Intake by student	Mean contribution of MDM in RDA according to student intake (%)
1. Calories	1950 kcal	450 kcal	23.08%	329 kcal	16.87%
2. Protein	41 g	12 g	29.27%	7.6 g	18.54%



Graph 2

MDM contributes 23.08% of calories and 29.27% of protein in RDA of children but in this study it was found that contribution of MDM in RDA only 16.87% of calories and

18.54% of protein. It is clear from table-2 that large difference between MDM scheme intake and actual intake of primary school children.

Table 3: Performance of MDM scheme according to respondents

Performance of MDM	Mean	Variance	S.D	Rank of severity
Lack of test	4.05	0.76	0.87	2 nd
Lack of good hygienic condition of MDM kitchen	3.73	1.24	1.11	4 th
Lack of oil/ ingredients/vegetables in Meal	4.10	0.70	0.84	1 st
Less amount of Meal	2.94	1.52	1.23	5 th
Provide irregular Meal	3.97	1.07	1.04	3 rd

The mean score (4.05), variance (0.76) and SD (0.87) of the respondents in table-3 shows that the school going children do not like test of MDM. The mean score (3.73), Variance (1.24) and SD (1.11) shows that respondents agree with lack of hygienic condition. Respondents agree with issue on lack of oil/ingredients/vegetables in meal, the mean (4.10), variance (0.70) and SD (0.84) clearly show their agreement. But respondent do not decide with the issue on lack of meal, it is clearly show by the mean (2.94), variance (1.52) and SD (1.23). With regard to provide irregular meal the mean (3.97), variance (1.07) and SD (1.04), shows that respondents agree with this issue.

Conclusion

The present study was conducted with the objective to assess the performance of Mid-Day Meal (MDM) on nutritional status of school going children in Muzaffarpur town of Bihar. The result of nutritional anthropometry of school children revealed weight and height of the Government school children less than the recommended weight and height of WHO. The prevalence of obesity, overweight, thinness and severe thinness 3.64%, 6.36%, 46.36% and 16.36% respectively. The

nutritional status of children was poor. Children had higher prevalence of malnutrition. This analysis indicates that the malnutrition among children depends on both better sanitary conditions and on dietary intake. The diet of school going children was deficient in all the food groups ultimately resulted in the low intake of all the nutrients.

Mid-day meal programme has been found to be a substitute rather than a supplement for the home meal. It provides nearly one-fourth of energy and fat and one-third of protein towards daily nutrient intake of children but only meets the one-sixth of energy and one-fifth of protein towards the recommended dietary allowances. The contribution of micronutrients through mid-day meal programme was negligible; it varies from one-fifth to one-fourth. Hence it may be concluded that the consumption of foods was inadequate and nutrients were found to be limiting nutrients in the MDM diets of school children So there is an urgent need to change the diet plan, re-evaluate the subsidies and supervision of MDM.

Recommendations

1. The menu should be revised from time to time because it sustains interest in children.

2. Inclusion of green leafy vegetables, fruits and milk products in the mid-day meal programme to meet the micronutrient deficiency of school children.

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