Impact of Mid-day Meal Scheme on Body Mass Index of School Children in India

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Abstract

This paper is based on the field study conducted on 500 school children studying in Class VI to VIII in Union Territory Chandigarh, to analyse the impact of Mid-day Meal scheme on body mass index. Mid-day Meal scheme has been introduced in India to enhance enrolment, attendance, retention and educational attainment of school going children. A large number of school children belonging to the lower income groups depend on cooked Mid-day Meal. With regards the pattern of consumption of Mid-day Meal, among those who never took and discontinued taking the meal, the proportion of girls is more than that of boys, while in case of continuous consumption, the proportion of boys is more than that of girls. The higher the classes that the children are studying, the lesser the proportion of them availing Mid-day meal. The predominant majority of the children are suffering from under weight (low body mass index); among the underweight children, the proportion of boys is more than that of girls. The larger proportion of children belonging to Below Poverty Line (BPL) category is suffering from low body mass index, when compared to the children belonging to Above Poverty Line (BPL) category. Repetition of more or less same type of food menu should be avoided by enhancing quality to achieve the set objectives of Mid-day Meal scheme.

Introduction

Healthy children are more able than sick or malnourished ones to go to school and learn (World Bank, 2014). The decision to send a child to school, like other household investment decisions, can be made by cost-benefit framework (Dreze and Kingdon, 2001).

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Most of the children from low socio-economic background suffer from under nutrition, they more often drop out from schools at an early age, which shows direct impact on their personality development and it indirectly affects human capital formation of the nation. Poor enrolment and higher school dropout rate are attributed to the poor nutritional status of the children compounded by poor socio-economic conditions, child labour and lack of motivation (Ayeni and Adelabu, 2012).

Mid-day Meal scheme aimed at having duel effects—such as (i) reducing cost of education by providing free meals, through which enrolment, attendance, retention and educational attainment of children could be increased, (ii) enhancing learning abilities of children by supplementing nutritional support, as the problem of malnutrition, anemia, deficiency in Vitamin A and Iodine is very common among children in India. In addition to that, Mid-day Meal scheme also aimed at achieving social equity by creating a common platform for different socio-religious and economic groups to have meals together.

Right to life under article 21 of the Indian constitution supports children's right to food also. Considering the importance of providing food at free of cost, the Government of India initiated the National Programme of Nutritional Support to Primary Education (NP-NSPE) as a centrally sponsored scheme on August, 15 1995. Due to extension of this scheme to upper primary school children in 2007, it is called National Programme of Mid-day Meals in Schools. The scheme aimed to make hot cooked Mid-day Meal (lunch) available to school children studying in Class I to VIII in government, government-aided schools, special training centers (STC), Madrasas and Maktabs supported under the Sarva Shiksha Abhiyan (SSA).

Next to public distribution system, cooked Mid-day Meal scheme is the second largest food security programme in India. This scheme is aimed to support one-third of the daily nutrient requirements of school going children. Central and state governments having shared financial liability for the implementation of the scheme. The coverage of the scheme among number of schools and number of beneficiaries has increased considerably. During 2013–14, about 10.45 crore children were covered under this scheme among 11.58 lakh schools across the nation (Government of India, 2014).

In addition to food grains, Mid-day Meal involves two other major inputs viz. cost of cooking and provision of essential infrastructure. Cooking cost per child is not static; it keeps on being revised by the government in accordance with price index. Cooking cost is borne by central and state governments/north eastern states/ UTs in different proportions (Centre and the North Eastern states on 90:10 bases and with other States/UTs on 75:25 bases). Cooking cost for upper primary classes is kept more than

primary classes due to requirement of larger quantities for the former.

The nutritional content in Mid-day Meal is to supplement 480 calories worth of food for primary class studying children and 720 calories worth of food for upper primary class studying children, while in case of dailyprotein supplementation it is 12 grams and 20 grams for primary and upper primary, respectively. The daily requirement of food items is, rice/wheat 100 grams, pulses 20 grams, vegetables 50 grams, oil and fat 5 grams, salt and condiments, as per requirement for primary classes, while for upper primary classes, rice/ wheat 150 grams, pulses 30 grams, vegetables 75 grams, oil and fat 7.5 grams, salt and condiments, as per requirement (Government of India, 2015).

The Problem, Objectives and Methodology of Research

The Problem

The larger number of school children belonging to lower income groups depend on cooked Mid-day meal. In addition to solving the problem of classroom hunger, Mid-day Meal scheme is aimed to supplement nutrition, which is deficient at home. That the larger number of school going children do not seem healthy is a matter of discourse.

Objectives

1. To study the consumption pattern of Mid-day Meal of the school going children.
2. To analyse the body mass index of the Mid-day Meal beneficiary children in Chandigarh.
3. To suggest policy measures for better implementation of Mid-day Meal scheme.

Data Sources Both: primary and secondary source of data were taken into consideration for this study. Primary data was collected by using structured questionnaire through conducting household survey.

Sampling Method: Clustered, systematic random sampling method was used

Sample Size: 500 school going children (both boys and girls) studying in Class VI to VIII were taken into consideration, from each family one child was taken into consideration.

Selection of the Study Area

Chandigarh city was selected for the study, because it occupies third rank in per capita income among Indian cities. Besides it attracts a large number of migrant poor people from different parts of India. As children of poor people generally study in government schools, hence it is felt important to know the impact of Mid-day Meal on school going children in the city.

Rationale of Selection of the Sample Respondents

Though Mid-day Meal is entitled to all the school going children studying in Class I–VIII, the children studying in

higher end classes (VI, VII and VIII) were taken into consideration, since they have a large number of years experience with consumption of Mid-day Meal.

Reference Period: The field survey was carried out during 2015.

Tools: Weighing Machine, Height Measuring Scale and Questionnaire.

Results and Discussion

Geographical Distribution of the Sample Respondents

Based on the concentration of residents and school going children, three larger slum clusters from the three administrative regions of the city were chosen for selecting 500 sample respondent school going children. About 40% respondent children were selected from economically weaker sections colony *Dhanas*, 40% respondents from 4 number colony industrial area and the remaining 20% respondents were selected from Janata colony sector 25.

Gender, Class Studying and Consumption Status of Mid-day Meal

Table 1 reveals that the predominant majority 87.2% of the children continued Mid-day Meal from the date of joining the respective school, while 5.2% discontinued and the remaining 7.6% had never taken the meal. Among never taken and discontinued, the proportion of girls were found to be more than boys, while among the continuing children, the proportion of boys were more than girls. Boys were more interested and habituated in availing Mid-day Meal when compared to girls; hence it is better to give more focus on girls.

The higher the class the children, the lesser the proportion of them availing Mid-day Meal. In the case of continuation of Mid-day Meal, the larger proportion 90.8% of the children studied in Class VI, about 87.6% and 80.8% studied in Class VII-VIII, respectively.

The study reveals that, the lower the class of the children studying, the lesser the freedom to avoid Mid-day Meal due to fear from the teachers and parents. The children studying in higher classes are more experienced with consumption of low quality Mid-day Meal; so those children studying in higher classes, by convincing their parents, can bring food or pocket money from their home. This is the reason that Class VI children are undernourished as compared to Class VII and VIII students. It can be concluded that, more the dependency on MDM more will be the vulnerability. In the study area, the cultural factors (the larger proportions of the children prefer vegetarian food in the school, because school is a sacred institution) are responsible for not introducing non-vegetarian food in the school, to reduce malnourishment.

Table 1
Gender, Class Studying and Consumption Pattern of Mid-day Meal

Consumption Status	Classes			Gender		Total (col 5+6)
	VI	*VII*	*VIII*	*Boys*	*Girls*	
Never taken	10 (5.0)	10 (5.6)	18 (14.4)	17 (6.8)	21 (8.4)	38 (7.6)
Continuing	179 (90.8)	156 (87.6)	101 (80.8)	221 (88.4)	215 (86.0)	436 (87.2)
Discontinued	8 (4.0)	12 (6.7)	6 (4.8)	12 (4.8)	14 (5.6)	26 (5.2)
Grand Total	197 (100)	178 (100)	125 (100)	250 (100)	250 (100)	500 (100)

Source: Field Survey Data.
Note: Figures in parenthesis are percentage to vertical totals

Income Category and Consumption pattern of Mid-day Meal

The higher the income level, the lesser the probability of availing Mid-day Meal. Among the never taken, the majority 10.75% of the children belonged to above poverty line (APL) category households, when compared to only 5.50% from below poverty line (BPL) category households. While 6.41% children did not belong to any economic category since their parents' economic category is not determined/ ration cards were not issued. In case of continuation of Mid-day Meal, the larger majority 90.25% of the children belonged to below poverty line, while 84.40% belonged to above poverty line, the remaining 84.61% children did not belong to any economic category. It can be interpreted that the children from poor families are more interested in consumption of Mid-day Meal.

Gender and Weekly Number of Days of consumption of Mid-day Meal

About 60% of the boys and 54% of girls availed Mid-day Meal on all six days of the week. In case of non-consumers of Mid-day Meal, the proportions of girls were found to be more than boys. Girls had a fear, that consumption of Mid-day Meal may spoil their health. The study reveals that certain proportion of the respondent children were disinterested in consuming Mid-day Meal on all the working days; due to repetition of more or less same type of low quality food menu.

Body Mass Index (BMI)

Body mass index is an approximate measure to know whether someone is overweight/underweight/normal weight. It can be calculated by dividing their weight in kilograms by the square of their height in meters.

Body Mass Index (BMI)=Weight in Kgs/Height in meters square. Body mass index is measured in accordance with World Health Organisation norms. Underweight (BMI below 18.5), Normal weight (BMI 18.5 to 24.9), Overweight (BMI 25.0 to 29.9), Obese (BMI 30 and above).

Body Mass Index Status of the Respondent Children

Table 2 reflects that a large proportion 42.2% of the children's body mass index is in the range of 16 to 19 (low BMI), while lesser proportion 1.8% of the children's body mass index is in the range of 22 to 25 (normal BMI), while only one student 0.2% is overweight (obese).

Gender, Class Studying, Economic Status of the Parents, Consumption Pattern of Mid-day Meal and Body Mass Index Status

Table 3 shows that the predominant majority i.e., 82.8% of the children are suffering from under weight, only 17% of the children were of normal weight, while 0.2% were overweight. As far as the body mass index of the gender is concerned; the large majority of boys 88.8% are suffering with underweight, when compared to 76.8% girls. In case of having normal weight, the proportion of 22.8% of girls is larger than the proportion of 11.2% of boys, whereas only one girl was overweight. Boys are more dependent on Mid-day Meal when compared to girls, but surprisingly

Table 2

Body Mass Index (BMI) of the Respondent Children (BMI=Weight in kgs/ Height in Metres Square)

Body Mass Index Range	Number of Children	Percentage
10–13	15	3.0
13–16	202	40.4
16–19	211	42.2
19–22	62	12.4
22–25	9	1.8
25 and above	1	0.2
Total	**500**	**100.0**

Source: Field survey data

boys are suffering from the problem of low body mass index. It indicates that the impact of Mid-day meal scheme is positive in reducing classroom hunger, but fails to reduce anemia.

Among the non-consumers of Mid-day Meal, 84.21% are facing the problem of underweight, 13.15% were of normal weight, while 0.2% were overweight. Among the Mid-day Meal continuing children, the greater majority 83.71% are suffering from underweight, while only 16.29% were of normal weight. Among those children who discontinued Mid-day Meal rephrase the larger majority of 65.38% children were underweight, while only 34.61% were of normal weight. There is no much difference in health status between consumers and non-consumers of Mid-day Meal. The consumption of Mid-day Meal shows no positive impact on maintaining health standards.

That the larger proportions of 88.32% of children studying in Class VI were underweight when compared to the other classes. About 81.35% children studying in Class VII were underweight, while 76.19% children studying in Class VIII were underweight. The larger proportion of 23.01% of children studying in Class VIII were of normal weight when compared to the other two classes. Only one student, who is studying in Class VIII, is suffering from overweight. The larger proportion the children studying in Class VI is the consumer of Mid-day meal, but interestingly the higher proportion of them are suffering from low body mass index when compared to their peers (Children studying in Class VII and VIII). The study reveals that more the dependency on Mid-day Meal, the lesser will be the impact on recovery from anemia.

Among the children suffering from underweight, the larger proportion of 48.30% belongs to Below Poverty Line (BPL) category. Among the children having normal weight, the larger proportion of 42.35% belong to Above Poverty Line (APL) category.

Table 3
Gender, Class studying, Consumption pattern of Mid-day Meal and Body Mass Index Status

Body Mass Index Status (1)	Consumption Status			Total (col 2,3,4)	Gender		Total (col 5,6)	Classes			Total (col 7,8,9)	Economic status of the parents			Total (col 10,11,12)
	Never Taken (2)	Continuing (3)	Discontinue (4)		Boys (5)	Girls (6)		6th (7)	7th (8)	8th (9)		APL (10)	BPL (11)	Economic Status undecided (No Ration Card (12)	
Below 18.5 (Under Weight)	32 (84.21)	365 (83.71)	17 (65.38)	414 (82.8)	222 (88.8)	192 (76.8)	414 (82.8)	174 (88.32)	144 (81.35)	96 (76.19)	414 (82.8)	159 (38.40)	200 (48.30)	55 (13.28)	414 (82.8)
18.5 to 24.9 (Normal Weight)	5 (13.15)	71 (16.28)	9 (34.61)	85 (17.0)	28 (11.2)	57 (22.8)	85 (17.0)	23 (11.67)	33 (18.64)	29 (23.01)	85 (17.0)	26 (30.58)	36 (42.35)	23 (27.05)	85 (17.0)
25.0 to 29.9 (Over Weight)	1 (2.63)	0 (0.0)	0 (0.0)	1 (0.2)	0 (0.0)	1 (0.4)	1 (0.2)	0 (0)	0 (0)	1 (0.79)	1 (0.2)	1 (100)	0 (0.0)	0 (0.0)	1 (0.2)
Total	**38 (100)**	**436 (100)**	**26 (100)**	**500 (100)**	**250 (100)**	**250 (100)**	**500 (100)**	**197 (100)**	**177 (100)**	**126 (100)**	**500 (100)**	**186 (100)**	**236 (100)**	**78 (100)**	**500 (100)**

Source: Field Survey Data.
Note: Figures in parenthesis are percentage to vertical totals

Weekly Number of Days Mid-day Meal consumption and Body Mass Index

Table 4 shows that the majority of children around 58.21% are the consumers of Mid-day meal during all the six days per week, among them 84.56% were suffering with low body mass index, the remaining 15.43% had normal body mass index. Among weekly five days MDM consumers, 89.28% were suffering with low body mass index, the remaining (10.71%) children had normal weight. Among 4,3,2,1,0 days consumers 77.4%, 78.37%, 78.94%, 94.11%, 76.56% children, respectively, are suffering with low body mass index. It can be concluded that, interestingly both lesser number of day's consumers of Mid-day Meal and larger number of days consumers of Mid-day Meal are suffering from low body mass index. Hence Mid-day Meal has shown no major impact in enhancing nutritional standards among the consumers.

Table 4
Number of Days Consumed Mid-day Meal and Body Mass Index

Status of Body Mass Index	Number of days consumed Mid-day Meal per week							Total Number of children
	6	***5***	***4***	***3***	***2***	***1***	***0***	
	Number of Children							
Below 18.5 (Under Weight)	241 (84.56)	25 (89.28)	24 (77.41)	29 (78.37)	30 (78.94)	16 (94.11)	49 (76.56)	414 (82.8)
18.5 to 24.9 (Normal Weight)	44 (15.43)	3 (10.71)	7 (22.58)	8 (21.62)	8 (21.62)	1 (5.88)	14 (21.87)	85 (17.0)
25.0 to 29.9 (Over weight)	0 (0.0)	0 (0.0)	0 (0,0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.56)	1 (0.2)
Total	**285 (100.0)**	**28 (100.0)**	**31 (100.0)**	**37 (100.0)**	**38 (100.0)**	**17 (100.0)**	**64 (100.0)**	**500 (100.0)**

Source: Field survey data
Note: Figures in parenthesis are percentage to vertical totals

Conclusion

Mere implementation of Mid-day Meal Scheme will not give fruitful results unless necessary timely measures are initiated to bridge the existing drawbacks. Mid-day Meal scheme has played a greater role in reducing classroom hunger but failed to control the problem of anemia and under weight. Food menu should be

maintained in accordance with the interests of the children, without compromising on nutritional values. Girls are more health sensitive; hence, confidence among them can be enhanced by providing hygienic food. There should not be more time lags between preparation of food and food served, to save nutritional values. Food should be prepared in the school itself for better supervision and be made available in fresh, which will attract large number of children. Government should increase per head allocation of money, keeping inflation under consideration, so that quality food can be made available. Parents' and children's views should be taken into account while fixing menu, timings of serving food, etc. Create confidence among the parents by maintaining taste, hygiene and quality, only then will the proportion of children's intake of MDM can be increased. Education department should take timely feedback from the stakeholders of the Mid-day Meal scheme for better implementation and to achieve the very objectives of the scheme.

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