



## MANPOWER AND FOOD RESOURCES IN MID DAY MEAL PROGRAMME: AN IN DEPTH STUDY IN UPPER PRIMARY SCHOOLS OF KOLKATA

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### ABSTRACT

**Introduction:** To prevent malnutrition mid day meal programme is the world's biggest supplementary school lunch programme and is being implemented all over India for primary and upper primary school students. In resource limited country like India, the implementation of Midday meal programme needs explicit evaluation from time to time at all levels of its execution.

**Objective:** To assess the various resources available for the mid day meal programme and their adequacy in upper primary schools of Kolkata.

**Methodology:** An institution based observational study with cross sectional design was conducted in upper primary schools (Government, Government aided school) in Kolkata. The study was conducted over a period of 2 years from November 2016 to October 2018. A sample total of 52 schools were then selected by simple random sampling. All analyses were conducted with the SPSS software (SPSS Inc. Released 2007. SPSS for windows, version 16.0. Chicago, SPSS inc.).

**Result:** Among 52 schools satisfactory manpower and food resources were seen among 31(59.6%) and 18(34.6%) of schools respectively. Out of these 52 schools 53.8% was Govt. aided school and 46.2% was Govt. schools. and There were no significant difference of man power [ $(X^2, df, P) = .92, 1, .337$ ] and food security [ $(X^2, df, p) = .032, 1, .86$ ] in between Govt. and Govt. aided schools.

**Conclusion:** I am of the opinion that if these loopholes and lacunae are identified and put forward to all the stakeholders of MDMP then the latter will take stringent steps for a radical improvement in the implementation of this programme.

### KEYWORDS :

#### Introduction:

Malnutrition has become an urgent global health issue. Good health, cognitive behavior depends on proper nutrition which also affects productive potential. In India 35.7% are underweight, 38.4% are stunted and 21% are wasted<sup>[1]</sup>. So it can be said that malnutrition is one of the most wide spread conditions affecting child health<sup>[2]</sup>. So, many initiatives have been taken to prevent malnutrition. To prevent malnutrition some programmes emphasize the use of locally available ingredients in supplementary foods, while others provide pre-cooked or ready-to-mix food or pastes (typically based on a regional staple such as peanuts) that can be consumed from the packet or as a spread. The Mid-Day Meal programme is the world's biggest supplementary school lunch programme and is being implemented all over India for primary and upper primary school students. However in resource limited country like India, the implementation of Midday meal programme needs explicit evaluation from time to time at all levels of its execution. My study aims at examining the status of its operational feasibility. With this background I conducted this study since I strongly felt that the idiosyncrasies, deficiencies and the lacunae of the midday meal programme identified by me will help the concerned authorities, health managers and policy makers to take fitting steps to make it highly effective, completely flawless and exceedingly successful. Objective of my study was to assess the various resources available for the mid day meal programme and their adequacy in upper primary schools of Kolkata.

#### Methodology:

An institution based observational study with cross sectional design was conducted in upper primary schools (Government, Government aided school) in Kolkata. The study was conducted over a period of 2 years from November 2016 to October 2018. List of upper primary schools of Kolkata were collected from the Project Director MDM

office of West Bengal. Total number of upper primary schools present in Kolkata is 515. It was decided that 10% of total schools would be included in the study for feasibility and practical considerations of data collection by single researcher; A sample total of 52 schools were then selected by simple random sampling. From each school, In charge of MDM was selected for data collection. Upper primary schools have been selected from Kolkata by simple random sampling from the total list of upper primary schools present in Kolkata. Those schools that receive supply of cooked Mid-Day Meal from central kitchen were excluded. Permission was obtained from A.I.I.H.&P.H., Kolkata to conduct the study on evaluation of MDM specially emphasized on food safety measures. The study protocol was prepared after consultation with the Department of Preventive and Social Medicine, A.I.I.H. &P.H., Kolkata Interview schedule was prepared and administered in local language. Approval was obtained from ethics committee of the institute. Written consent from Director of Mid Day Meal Programme and Nodal Officer of Kolkata district were taken. Purpose of the study was explained to school Mid May Meal authority and Permission was taken from school Headmaster. The purpose of the study was explained to all the study participants and they were assured of confidentiality. After obtaining informed written consent and assent (as applicable) data were collected using Predesigned, pretested, structured schedule and check list.

#### Operational Definition:

**Satisfactory manpower** – It was assessed based on 4 criteria and scored from 0 to 5. Score equal to median of attained score was considered satisfactory.

**Satisfactory food resources**- It was assessed based on 5 criteria and scored from 0 to 21. Score  $\geq$  Median of attained score was satisfactory food resources.

**Result:**

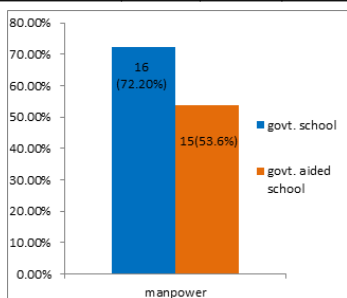
**Background characteristics of schools and Mid day meal in-charges:**

Among 52 schools 53.8% was Govt. aided school and 46.2% was Govt. schools. 48.1% schools were up to secondary level and 50% schools were up to higher secondary level. Logo of MDM was painted on the entry gate in 69.2% of total study schools. 75% schools have menu board. Among 24 Govt. schools total eligible students for MDM was 2767. Among them 78.93% attended the schools on the day of visit and MDM was availed by 78.8% of total students. Among 28 Govt. aided schools total eligible students was 5972, among them 85.1% attended the schools on the day of visit and MDM was availed by only 56.7% of total students. MDM is served in all upper primary school from class VI to class VIII standard.

There was one MDM in charge in position in each of the schools studied (n = 52). In 30(57.7%) schools the MDM charge was under one person. In 22(42.3%) schools the charge was rotated between different staff members. 90% MDMI who were allotted permanently were teachers, 6.7% of them were Headmaster or Headmistress and 3.3% of them were group C staffs. 77.3% MDMI who were allotted rotationally were teachers, 18.2% of them were Group C staffs and 4.5% were Headmaster or Headmistress. In Govt. schools 75% of MDMI were males, 25% were females where as in Govt. aided schools 53.6% were males and 46.4% were females. 66.7% MDMI from Govt. schools were post graduate and 75% MDMI from Govt. aided schools were post graduate. MDMI from Govt. aided schools were more experienced than Govt. Schools. 21.4% of MDMI from Govt. aided schools had > 5yrs experience. But only 4.2% MDMI from Govt. aided schools had more than 5 yrs experience. None of the MDMI in charges had received any training for conducting this duty. MDM was monitored by teachers and student's cabinet in 79.2% of Govt. schools and only 21.5% of Govt. Aided schools.

**Table 1: Distribution of study schools according to some important characteristics of manpower (N=52)**

Characteristics(Score) Unsatisfactory- < Median of attained score Satisfactory= Median of attained score	Govt. school (n=24)	Govt. Aided schools (n=28)	Total schools (n=52)	Significance Test (Chisquare)
	No(%)	No(%)	No(%)	No(%)
Sufficiency of CCH (Score) Yes(1) No(0)	7(29.2) 17(70.8)	15(53.6) 13(46.4)	22(42.3) 30(57.7)	1.6,1, .202
Category of staff involved in food testing(score) Teachers(1) Both teachers and CCH(2) CCH only(1)	8(33.3) 16(66.7) -----	9(32.1) 17(60.7) 2(7.2)	17(32.7) 33(63.4) 2(3.8)	.49,1, .48
Inspection by Govt. within last month(score) No(0) Yes(1)	8(33.3) 16(66.7)	17(60.7) 11(39.3)	25(28.8) 27(42.3)	3.9,1, .049
Supervision by any other staff(score) No(0) Yes(1)	11(45.8) 13(54.2)	12(42.9) 16(57.1)	23(44.2) 29(55.8)	.05,1, .83
Manpower Satisfactory(Median of attained score -5) Unsatisfactory(< Median of attained score -5)	16(72.2) 8(27.8)	15(53.6) 13(46.4)	31(59.6) 21(40.4)	.92, 1, .337



**Fig: 1.1 shows that 72.2% of Govt. school and 53.6% Govt. aided school had satisfactory manpower**

Out of these 52 schools, 94.4% of CCH from Govt. schools and 83.3% of CCH from Govt. Aided schools were appointed by head master or headmistress. Rest was appointed by N.G.O. Food tasting before serving Mid-day-meal was done by all Govt. and Govt. aided schools.

Among 52 schools only 34.6% of schools had satisfactory food resources.

**Variation in MDM menu:**

100% Govt. schools and 84.6% of Govt. aided schools changed their menu daily. 91.6% of Govt. schools served vegetables twice a week but 42.9% Govt. aided schools served vegetables daily and 39.3% Govt. aided schools served vegetables twice a week. 95.8% of Govt. schools and 82.1% Govt. aided schools served eggs twice a week. 17.9% Govt. aided schools served eggs thrice in a month. Verities of menu were more satisfactory in Govt. schools than Govt. aided schools.

**Procurement, quality and handling of rice grains:**

Good quality rice was supplied in 91.7% of Govt. schools but only 35.7% of Govt. aided schools. Rice supply was regular in 100% of Govt. schools but only 67.9% of Govt. aided schools. Buffer stock was maintained in 50% of Govt. schools and 78.6% of Govt. aided schools. 195.3% of Govt. schools and 78.6% Govt. aided schools placed rice bag in wooden plank. 78.6% of Govt. aided schools had enough space for storage grain in school premises but only 45.8% of Govt. schools had enough space for storage grain in school premises. 95.8% Govt. schools had no rodent in the places of storage of rice but only 21.4% of Govt. aided schools were free from rodents in the places of storage of rice.

**Use & storage of oils & condiments MDM:**

Double fortified salt was not used by any study schools. 54.2% Govt. schools and 71.4% of Govt. aided schools kept salt in covered container and 70.8% of Govt. schools and 67.9% of Govt. aided schools kept the container in dry area. 85.7% of Govt. aided schools used AGMARK oil always but only 44.4% of Govt. schools used AGMARK oil always. Use & storage of oils & condiments MDM was more satisfactory in Govt. aided schools than Govt. schools.

**Sufficiency of food for MDM:**

It was shown that food was short rarely in 87.5% of Govt. schools and 32.1% of Govt. aided schools. Food was short frequently in 17.9% of Govt. aided schools. Food was in excess frequently in 25% of Govt. schools and 46.4% of Govt. aided schools. Food was never in excess in 25% of Govt. aided schools.

**Maintenance of food inventory:**

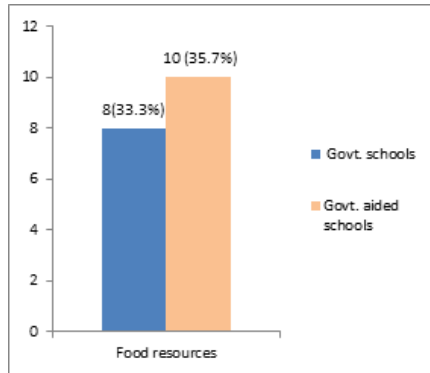
Maintained record of inventory was seen in 75% of Govt. schools and 92.3% of Govt. aided schools. It was maintained everyday in 95.8% of Govt. schools and 84.6% of Govt. aided schools. Record of inventory was maintained more in Govt. Schools than Govt. aided schools.

Out of these 52 schools 66.7% Govt. schools and 21.4% Govt. aided schools had history of interruption in the MDM. Duration of interruption is more in Govt. schools than Govt. aided schools. 12.5% of Govt. schools had history of diarrhea after having MDM, whereas only 3.6% Govt. aided schools had history of health problem after having MDM. Health problems, interruption of MDM were more in Govt. schools than Govt. aided schools.

**Table 2: Distribution of Schools under study according to their food resources (n=52)**

Characteristics (score) <Median score=unsatisfactory ≥ Median score=Satisfactory	Govt. school (n=24)	Govt. Aided schools (n=28)	Total school (n=52)	X <sup>2</sup> ,df, p
	No (%)	No (%)	No (%)	
Variation of food Unsatisfactory(<5) Satisfactory(=5)	2(8.3) 22(91.7)	6(21.4) 22(78.6)	8 (15.4) 44(84.6)	1.7,1, .192

Attainable score range- 21(0-21), Attained Score range-10-20, Median of attained score-16 Variation of food was satisfactory in 91.7% of Govt. schools and 78.6% of Govt. aided schools. Procurement, Quality and handling of rice grains were satisfactory in 94.4% of Govt. schools and 85.7% of Govt. aided schools. Use & storage of oils & condiments MDM was well maintained in only 44.4% of Govt. schools and 71.4% of Govt. aided schools. Record of inventory was well maintained in 94.4% of Govt. schools and 67.9% of Govt. aided schools. Food which was served in MDM was sufficient in only 12.5% of Govt. schools and 50% of Govt. aided schools. There was no significant difference of food resources in Govt. schools and Govt. aided schools.(Table:2)



**Fig: 1.2 shows comparison of satisfactory food resources between Govt. schools and Govt. aided schools.**

#### Discussion:

##### MDM menu:

In the present study, it was found that 100% Govt. schools changed their menu daily but only 84.6% of Govt.aided schools changed their menu daily. 95.8% of govt. schools and 82.1% Govt.aided schools served eggs twice a week. 17.9% Govt.aided schools served eggs thrice in a month. **In Vadodara Gujarat** study results revealed that the cyclic menu with ration allocation provided by the MDM office of Rural Vadodara was not followed by all the schools. <sup>[3]</sup> **In a study in Telangana**, Hyderabad egg is served twice a week and Banana is given to students who do not eat eggs. There is no variation in the Menu. <sup>[4]</sup> **In a study in rural and urban areas of Meerut**, Govt. menu was not being followed, there were 13 (17%) schools, where the same menu is repeated more than twice a week. <sup>[5]</sup> **In a study in Himachal Pradesh**, we found that the majority (79 percent) of the respondents responded that the menu did not remain the same. Only 20.84 percent of the respondents responded that the menu sometimes remained the same. <sup>[6]</sup> **In a study in Odisha**, it was found that one egg was given in the meal on a fixed weekly menu. Under a common menu in all the primary schools of Odisha, rice and dal were provided on Monday & Thursday, rice and the soyabodi curry was given on Tuesday & Friday and rice and egg curry on Wednesday & Saturday. <sup>[7]</sup>

##### Procurement, quality and handling of rice grains:

In the present study, Good quality rice was supplied in 91.7% of Govt. schools but only 35.7% of Govt. aided schools. Rice supply was regular in 100% of Govt. schools but only 67.9% of Govt. aided schools. Buffer stock was maintained in 50% of Govt. schools and 78.6% of Govt.aided schools. 195.3% of Govt.schools and 78.6% Govt. aided schools placed rice bag in a wooden plank. 78.6% of Govt.aided schools had enough space for storing grain in school premises but only 45.8% of Govt. schools had enough space for storing grain in school premises. 95.8% Govt. schools had no rodents in the place of storage of rice but only 21.4% of Govt. aided schools were free from rodents in the place of storage of rice. A Study had been done in **Vadodara Gujarat**. They found that none of the schools had shelves in their storerooms for safe food storage. Only 3 schools stored grains in drums covered with lids while others (n=7) stored in gunny bags which had a chance of spoilage by the insects. <sup>[3]</sup> A study was conducted by **Nutrition foundation of India in Delhi**. They found that storage area was there in most of the service units but there were no shelves or platforms. The dry ingredients (rice, dal etc.) were stored in gunny bags and were mostly kept on the floor. Although there were no special pest control measures, the risk of ingredients getting stale or damaged by the pests was less because the rations were stored for a very short period. <sup>[7]</sup> In a study in **Nalgonda district**, it was found that 50 percent

of the schools were receiving poor quality of rice from the government, 41.7 percent of the schools were receiving average quality of rice and only 8.3 percent of the schools received good quality of rice for MDM scheme in the school. Maximum schools (83.3 percent) were not receiving food grains (rice) on-time; only 16.7 percent were receiving rice at the school on-time<sup>[8]</sup>

##### Maintenance of food inventory:

In the present study Record of inventory was seen in 75% of Govt. schools and 92.3% of Govt. aided schools. It was maintained every day in 95.8% of Govt. schools and 84.6% of Govt. aided schools. **In a study in Himachal Pradesh**, it was found that there was a 100 percent regular record of inventory of Mid Day Meal Scheme. <sup>[6]</sup>

##### Use & storage of oils & condiments MDM:

In present study Double fortified salt was not used by any study schools. 54.2% Govt. schools and 71.4% of Govt. aided schools kept salt in covered containers and 70.8% of Govt. schools and 67.9% of Govt. aided schools kept the containers in a dry area. 85.7% of Govt.aided schools used AGMARK oil always but only 44.4% of Govt.schools used AGMARK oil always. **According to Food safety guide line** only packed dals, salt, spices, condiments, and oil with AGMARK quality symbol should be purchased. Only "double fortified salt" should be used for cooking mid-day meals. All stored raw materials and ingredients must be kept under dry and cool and ventilated conditions. <sup>[9]</sup>

##### Time of serving MDM:

In the present study food was given timely in 100% study schools. Similar result was found in a study in Himachal Pradesh. <sup>[6]</sup>

**Strength of the study** was the questionnaire was adapted from Govt. guide line of food safety measures. **Limitations** of this study were conducted in an urban setting. So the findings may not be projected to rural areas which may have a different picture altogether. The study was cross sectional study; hence findings of a single observation were collected, recorded and analyzed. Follow up study could have elicited more elaborately about the functioning and performance of MDMI, CCH and whether the services could have had any impact on the society to which it caters to. However because of time constraints this was not possible. Some of the responses were self reported and recall based, hence answers may not be authentic.

##### Recommendation and conclusion:

**Insufficient numbers of cook cum helpers were found in the Govt.schools.** According to MDM guideline one CCH is engaged for 1 to 25 no of students, 2 CCH are engaged when no of students are 26-100, Then in every 100 or part there of 1 additional CCH may be engaged. Steps should be taken for recruitment of sufficient numbers of CCH as per MDM guidelines. **Significantly less no of inspections were found to be conducted by the Govt. aided schools.** Since regular monitoring of the scheme at the government level is an essential requirement for quality assurance, concerned stakeholders should be intimated and inspections regularized for improving MDM. **17.9% of Govt. aided schools served eggs thrice a month.** Eggs are known as the gold standard for measuring protein quality. One whole egg provides 6 grams of protein with only 70 calories. Eggs provide all 9 essential amino acids (EAA) as well as 9 non-essential amino acids. Provider School authority should be more careful about this matter. Eggs should be given twice a week according to MDM guide line. **Cooked food had never been tested in both Govt. and Govt. aided schools.** The objective of testing food is to avoid food contamination which refers to the presence in food of harmful chemicals and microorganisms which lead to illness. Step must be taken to prevent this food contamination. **Buffer stock was maintained improperly in most of the Govt. schools.** School authority must be vigilant to maintain the buffer stock. **Regularity of rice supply and good quality of rice is less in most of the Govt. schools.** It is very important to supply good quality of rice. Bad quality of rice leads to the dissatisfaction of beneficiaries and come in conflict with the objective of mid day meal programme. Measurement for pest control should be taken not only for maintenance of cleanliness but also to prevent damage of food grains. Both raw and cooked food should be protected from rodents by using wire mesh screens on open windows, doors and ventilators which may reduce the problem of pest entry. **Uncovered container was used for keeping salt in most of the Govt. schools.50% of them never use AGMARK oil and Double fortified salt.** MDM authority should be aware about this. Proper training

programme for implementation of mid day meal should be arranged for all staffs in all schools.

In the present study it was found that manpower, food resources were unsatisfactory. This study provides important information on the state of affairs of a flagship programme. Through this study I have been able to spot the drawbacks in the Mid-Day Meal Project. I am of the opinion that if these loopholes and lacunae are identified and put forward to all the stakeholders of MDMP then the latter will take stringent steps for a radical improvement in the implementation of this programme.

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