

Opinion and nutritional status of children consuming mid day meal (MDM) in schools in Delhi

Babita Upadhyay¹ and K Geeta²

^{1,2}Banasthali University

^{1,2}Department of Food Science and Nutrition, Niwai, Rajasthan.

Abstract: Background MDM Scheme is one of the biggest programme launched by Government of India which provides meal to children at schools. This study was conducted to analyse the opinion of the children and care taker and also to assess the nutritional status of the children availing mid day meal in schools. **Material and methods:** An analytical cross sectional study was conducted in Government primary and middle school (NDC schools) in south Delhi. A total of 600 students, 355 boys and 245 girls studying in 1st to 8th standards were selected randomly from primary and upper primary classes (age- 4 years to 15 years). A self prepared structured questionnaire were used to collect information about family profile and opinion regarding MDM. Anthropometry data (Height, weight and MUAC) were collected by measuring with standard techniques and BMI for age was calculated. WHO, (2006) criteria was used to assess nutritional status. **Result:** The study reveals that majority of the children belong to upper lower (52%) and lower middle (41.47%) class according to KSSS, (2012). All most all children (97.83%) were satisfied with the MDM scheme and wanted to continue (97.33%) the scheme. Majority of the children (83%) consume MDM daily. Out of the cyclic menu, majority of the children (57.5%) liked the taste of Aloo puri and rice and dal was disliked by as high as 98.83 % of the children. 87.33 % beneficiaries preferred to eat mid day meal during their recess time. As high as 96.83 % of the beneficiaries were satisfied with quantity of food served. Results revealed that 67.16% of the children were normal, 13.163% were undernourished and 19.33% were overweight as per BMI for age. Under the family profiles variables, father's occupation found significant ($p \leq 0.05$) association with nutritional status.

Keywords: MDM programme, nutritional status, family profile, opinion, enrolments and dropouts.

1. INTRODUCTION

Education and nutrition plays an important role for overall growth of children in school age. The Government of India has launched several programs to address the causes of malnutrition among children. Mid Day Meal (MDM) scheme was initiated on the philosophy that "when children have to sit in class with empty stomach, they cannot focus on learning." This scheme is important for improving enrolment, attendance and retention of primary schools and also it addresses the nutritional needs. This scheme has become an effective means to check high dropout rates of children from lower economic section of the society. Mid day meals seeks to provide for each school child roughly a third of the daily nutrient requirement in the form of hot fresh cooked meal. It is important to know that it is not merely the long term effects of school meal on the nutritional status but its short term effects are better attention, memory and learning ability (Singh M, 2010). Many children reach school with an empty stomach in the morning, since a good early morning breakfast is not part of household routine in many of the poor families and also in families where both parents are working to run the family smoothly. There are many factors affecting the nutritional status like socioeconomic factors (family income, education, and occupation of parents etc), environmental factors (place of residence, availability of adequate food and safe water etc), and other associated factors to health and hygiene (Von et al, 2009).

The socio-economic factors like income and occupation may be few of the main reasons of poor nutritional status of children in our country. Child under nutrition in developing countries is usually a consequence of poverty and its attributes of low family income, large family size, poor education, poor environment and housing, inadequate access to foods, to safe water and to health care services (Gopalan, 2000). A review was carried out using demographic and health survey data from 36 developing countries to address the question of whether the socioeconomic determinants of child nutritional status differ across urban and rural areas. The study found that little evidence of differences in the nature of the socioeconomic determinants or in the strength of their associations with child nutritional status across urban and rural areas. They concluded that better nutritional status of urban children was probably due to the cumulative effect of a series of more favourable socioeconomic conditions, which, in turn, seems to lead to better caring practices for children and their mothers (Lisa et al, 2004).

With this background, this study was conducted to garner information regarding opinion of beneficiaries/care taker on relevance and functioning of the MDM scheme and also to analyse associated factors.

2. MATERIALS AND METHODS

Research settings: An analytical cross sectional study based on school survey was conducted in Government primary and middle NDMC schools in Delhi.

Selection of local: There are a total of 174 New Delhi Municipal Council (NDMC) schools in Delhi, out of which, 10 schools were selected to recruit the subjects for the proposed study.

Subject selection: 600 students (355 boys and 245 girls) from primary and upper primary classes in the age group of 4 years to 15 years were selected randomly for the study. Some of the parents of subjects, who were not able to give answers, were also contacted. Out of total of 600 students, 60 students were selected from each of 10 selected schools by using cluster sampling method.

A self prepared and pretested questionnaire cum interview schedule was used for collecting socio demographic profile. Data for opinions regarding MDM was also collected using pretested structured questionnaire cum interview schedule. Anthropometric measurements like height and weight were taken with standard techniques and BMI for age was calculated. WHO growth standard, cut off were used for the categorization of the children for their nutritional status. Content validity of the tool was obtained from expert in related field and modified based on their suggestions and opinion. School enrolment, attendance and dropouts data were collected from school records.

3. RESULT

Socio demographic profile of the subjects

Table 1 depicts number and percentage of the children in the selected demographic variables. The distributions of the subjects on the basis of age showed that 41.66% were of 4 to 10 years and 58.33% of the subjects were of 10 to 15 years. Present study revealed that majority of the children lived in nuclear family (73.23%). 80% children were having <4 siblings. As regards for siblings, 62.6 % studied in same school and 36.66% siblings studied in different schools. About 94.5% subjects were Hindu and only 5.5% subjects belonged to other community. Data for qualification of their parents showed that 76% to 85 % were educated only <10th class and some were illiterate also, and 15.33% to 23.83% had education >10th class.

Only 15.33% fathers of the subjects had skilled or professional jobs which included the jobs of driver, policeman, teacher, business etc. And 84% fathers and 98.66% mothers were semi and unskilled worker or they had other type of jobs like labourers, farming and some were working as sweepers also. 96.15 % of the families were earning < Rs 11000 per month and only 3.8% families were earning > Rs 11361- Rs 30375. The source of income of the family was 59.66% from business/other source and 40.33% parents were on salary basis (Table 1). Table 2 reveals socioeconomic level of the subjects and showed that most of the beneficiaries belong to upper lower (52%) and lower middle (41.47%) as per Kuppaswamy Social Economic Status Scale (KSSS, 2012).

TABLE 1. Socio demographic profiles of the subjects (n=600)

Variables	Category	Boys N (%)	Girls N (%)	Total N (%)
Age of the subjects (years)	Primary (4-10yrs)	146(24.33)	104(17.33)	250(41.66)
	Upper Primary (10-15yrs)	209(34.83)	141(23.5)	350(58.33)
	Total	355 (59.16)	245(40.83)	600(100)
Family type	Nuclear	256 (42.66)	180 (30)	436 (73.23)
	Joint	96 (16)	64 (10.66)	160 (26.66)
	Total	352(58.06)	244(40.66)	596(99.33)
No of siblings	<4	283 (47.16)	194 (32.33)	477 (79.49)
	≥4	69 (11.5)	51 (8.5)	120 (20.00)
	Total	355(59.46)	245(40.84)	600(100)
Siblings in school	Same	210 (35.23)	166 (27.85)	376 (63.08)
	Others	142 (23.82)	78 (13.08)	220 (36.9)
	Total	352(59.06)	244(40.93)	596(100)
Religion	Hindu	334 (55.66)	233 (38.83)	567 (94.49)
	Others	21 (3.5)	12 (2)	33 (5.5)
	Total	355(59.16)	245(40.83)	600 (100)
Father education	<10 th	264 (44.29)	189 (31.71)	453 (76)
	>10 th	88 (14.7)	55 (9.2)	143 (23.92)
	Total	352(59.06)	244(40.93)	596(100)
Mother education	<10 th	304(50.66)	206 (34.33)	510 (85.00)
	>10 th	51 (8.5)	39 (6.5)	90 (15.00)
	Total	355(59.46)	245(40.8)	600(100)
Father occupation	Skilled	60 (10.06))	32 (5.3))	92 (15.36)
	Semi/unskilled	292 (48.99))	212 (35.57))	504 (84.56))
	Total	352(59.06)	244(40.87)	596(100)
Mother occupation	Skilled	03 (0.50))	01 (0.16))	04 (0.67))
	Semi/unskilled	349 (58.5))	243 (40.77))	592 (99.27))
	Total	352(59.06)	244(40.93)	596(100)
Income/month	>Rs 11000	15 (2.5)	08 (1.33))	23 (3.8)
	< Rs 11000	340 (56.76)	236 (39.39)	576 (96.15)
	Total	355(59.46)	244(40.8)	599(100)
Source of income	Salaried	153 (25.6)	89 (14.9)	242 (40.50)
	Business/other	199 (33.33)	156 (26.13)	355 (59.46)
	Total	352(58.93)	245(41.03)	597(100)

TABLE 2. Categorization of the subjects as per their socio economic status*

Socioeconomic class*	Frequency	Percentage
Upper class	01	0.16
Upper middle	16	2.67
Lower middle	248	41.47
Upper lower	311	52.00
Lower class	22	3.67
Total	598	99.97

*Modified kuppuswamy socio economic status scale (KSSS, 2012)

Opinion regarding MDM scheme: The opinion wise analysis of the beneficiaries responses towards different aspects of mid day meal is given in Table 3. All children (100%) have reported that they consumed MDM.

TABLE 3. Opinion of beneficiaries regarding MDM

Information /observations	Number and percentage of Response	
Student take MDM	Yes	600 (100)
	No	-
Suitable timings for MDM distribution	Prior to recess	146 (24.33)
	During recess	454 (75.66)
How often take MDM	Daily	498 (83)
	Every alternate day	102 (17.00)
Recipe like most	Allo puri	345 (57.5)
	Puri chole	120 (20.00)
Recipe dislike most	Rice dal	593 (98.83)
Preferable lunch for school	Mid day Meal	524 (87.33)
	Home based	76 (12.66)
Quantity of meal is adequate for lunch	Yes	581 (96.83)
	No	19 (3.16)
MDM cause any side effects	Yes	18 (3.00)
	No	582 (97.00)
Like taste of meal	Yes	584 (97.33)
	No	16 (2.66)
Reason of regularity in school	MDM	220 (36.66)
	Study	380 (63.33)
Satisfied with scheme	Yes	587 (97.83)
	No	13 (2.16)
Want to continue this scheme in your school	Yes	584 (97.33)
	No	16 (2.66)

Table 3 depicts that majority of the children (75.66%) wants meal during recess and 24.33% wants prior to recess because they reach school empty stomach. 83% children have reported that they eat school meal on daily basis during lunch time. This showed that there is regular supply of cooked meal in all NDMC schools in Delhi. Some children also expressed that they sit together in the class and share meals (brought from home) with their friends and other class mates. Children have different taste preferences with different menu but majority of the children (57.5%) likes the taste of Allo puri and 98.83% children have reported that they disliked rice dal among the MDM menu. 96.83 % beneficiaries were satisfied with quantity of food served specially child who belongs to poor families and 97% children did not report that MDM causes any side effects. Majority of the children (97.33%) likes the taste of meal served in school and 36.66 % beneficiaries expressed that they were regular in the school because of mid day meal. All most all (97.83%) children reported that they are satisfied and are very happy with the scheme and wanted to continue (97.33%) with few modifications like adding some new recipes in the menu.

Table 4 and figure 1 reveals that 9871 children was enrolled from 2011-2016 in 10 schools of NDMC schools and the total dropout was 697 thus the dropout rate is 7.06%. Girl's dropout rate was higher (8.92%) as compared to the boys (5.54%). Table 3 and figure 2 shows that maximum of the dropouts (387) have been seen in year 2011-12. In the year 2015-16 there was a higher enrolment (2210) as compared to any other years. Figure 2 shows sharp decrease in drop outs from the year 2011 to the year 2012 and 2013 and thereafter, however, the rate is low, it has stagnated. The decrease in drop outs might be due to increasing concern in improving mid day meal scheme and also due to more awareness regarding the scheme among the population.

TABLE 4. School Performance –enrolments and dropouts of beneficiaries

Year		2015-16	2014-15	2013-14	2012-13	2011-12	Total
Total	Enrolments	2210	1908	1919	1837	1901	9871
	Dropouts	76	63	55	116	387	697
Boys	Enrolments	1318	1059	984	1026	1059	5446
	Dropouts	44	03	19	62	174	302
Girls	Enrolments	924	860	963	861	817	4425
	Dropouts	32	60	36	54	213	395

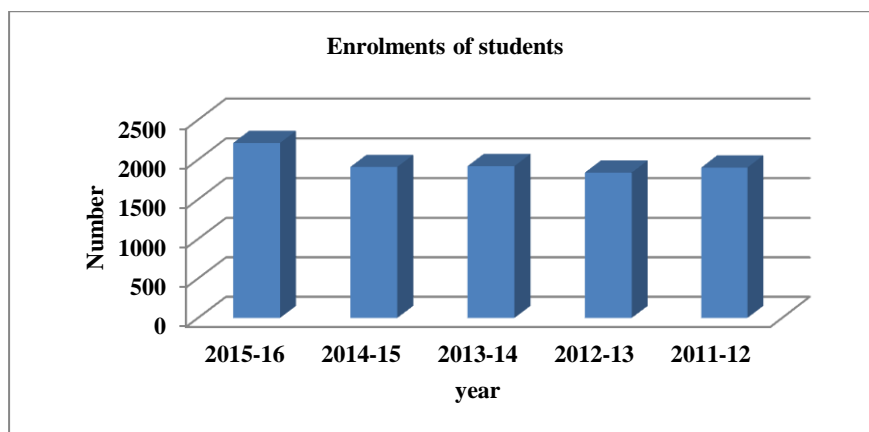


Fig.1. Trends of enrolments of the children

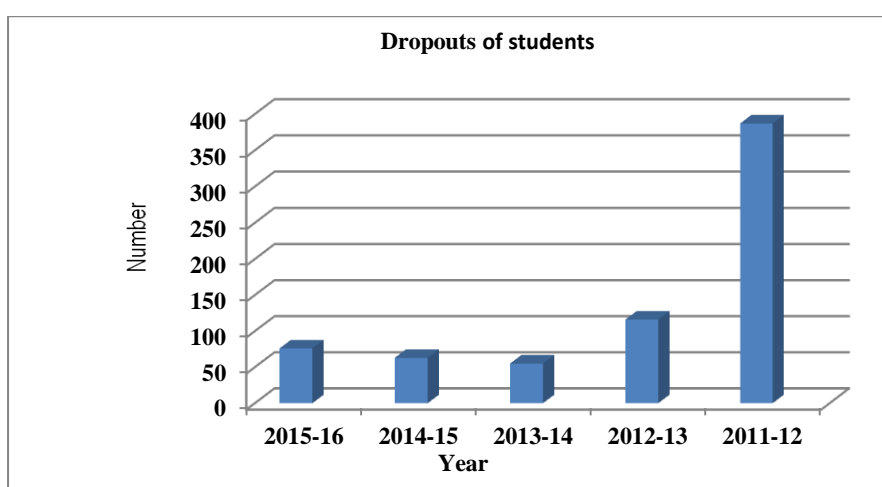


Fig.2. Trends of dropouts of the children

Nutritional status of the beneficiaries

Table 5 depicts categorization of the subjects for their nutritional status under different variables of family profiles. Family type was classified as “nuclear setup” and “joint family” and further subjects were classified as normal (-1SD to +2SD), underweight (<-2SD) and overweight (> + 1SD). Chi square test for association was applied to analyse the significance of difference. Results showed that 73.15% of the subjects live in nuclear set up and 26.84% in joint family. Nutritional status of children was better in nuclear set up as 50% of are normal as compared to 17.11 % in joint set up. However, this difference was not statistically significant. Similarly, subjects were classified for each variables and also for their nutritional status. Children having <4 siblings had better nutritional status (55.18%) than the children having >4 siblings (12.50%) and 14.76% children was obese in families who had <4 siblings but there was no significant ($p \leq 0.05$) difference found.

Majority of the children (63.96%) had their siblings in the same school. Percentage of underweight and overweight children were lesser whose father were educated >10th class, however non-significant. Similar findings were there in case of mother’s education also. Better nutritional status (66.77%) of children was seen in semi/unskilled mother, however underweight and overweight children were less whose mother were skilled worker but data was not statically significant. Significantly lower percentages of children were underweight whose fathers were skilled worker (Table 5).

Table 6 and figure 3 depicts nutritional status of children in different socio economic class as per KSSSS, 2012. Data showed that only one child was found to be overweight in upper class. Better nutritional status (37.12% and 27.42% normal children were found in upper lower class and lower middle, respectively. There was no significant difference found in nutritional status of children as per socioeconomic class. Figure 3 depicts a comparative view of the nutritional status in different socioeconomic class.

TABLE 5. Association of family profile with nutritional status of MDM beneficiaries

Variables	Category	Normal N (%)	Underweight N (%)	Overweight N (%)	Total N (%)	Chi 2
Family type	Nuclear	298 (50.00)	57 (9.56)	81 (13.59)	436 (73.15)	0.64 NS
	Joint	102 (17.11)	22 (3.69)	35 (5.87)	160 (26.84)	
	Total	400 (67.11)	79 (13.25)	116 (19.46)	596 (100)	
No of siblings	<4	330 (55.18)	60 (10.06)	88 (14.76)	478 (79.92)	3.20 NS
	≥4	75 (12.50)	19 (3.18)	28 (4.69)	122 (20.06)	
	Total	400 (66.88)	79 (13.24)	116 (19.46)	600 (100)	
Siblings preference for school	Same	239 (40.10)	56 (9.39)	81 (13.59)	376 (63.96)	7.24 NS
	Others	163 (27.37)	23 (3.85)	35 (5.87)	220 (36.33)	
	Total	402 (67.44)	79 (13.24)	116 (19.46)	596 (100)	
Religion	Hindu	383 (63.83)	73 (12.24)	109 (18.28)	567 (94.49)	0.73 NS
	Others	20 (3.33)	06 (1.00)	07 (1.17)	33 (5.49)	
	Total	403 (67.16)	79 (13.24)	116 (19.46)	600 (100)	
Father education	<10 th	296 (49.66)	65 (10.90)	92 (15.43)	453 (76.33)	3.46 NS
	>10 th	104 (17.44)	14 (2.34)	24 (4.02)	143 (23.83)	
	Total	400 (67.10)	79 (13.25)	116 (19.46)	596 (100)	
Mother education	<10 th	341 (56.83)	68 (11.40)	101 (16.94)	510 (85.00)	0.47 NS
	>10 th	65 (10.83)	11 (1.84)	10 (2.51)	86 (15.00)	
	Total	406 (67.66)	79 (13.25)	111 (19.23)	596 (100)	
Father occupation	Skilled	63 (10.57)	13 (2.18)	16 (2.68)	92 (15.33)	0.03*
	Semi/unskilled	338 (56.71)	66 (11.07)	100 (16.77)	504 (84)	
	Total	401 (67.28)	79 (13.25)	116 (19.45)	596 (100)	
Mother occupation	Skilled	02 (0.33)	01 (0.16)	06 (1.00)	04 (0.66)	0.55 NS
	Semi/unskilled	398 (66.77)	78 (13.08)	110 (18.45)	592 (98.66)	
	Total	401 (67.16)	79 (13.24)	116 (19.45)	596 (100)	
Income/month	>Rs 11000	16 (2.68)	04 (0.67)	02 (0.33)	23 (3.66)	0.30 NS
	< Rs 11000	384 (64.42)	75 (12.58)	114 (19.12)	573(96.14)	
	Total	401 (67.18)	79 (13.25)	116 (19.45)	596 (100)	
Source of income	Salaried	159 (26.5)	29 (4.86)	53 (8.89)	242 (40.33)	0.34 NS
	Business/other	242 (40.16)	50 (8.39)	63 (10.57)	354(59.66)	
	Total	401 (67.33)	79 (13.25)	116 (19.45)	596 (100)	

NS (non significant) , * significant at P≤0.05

TABLE 6. Association of socioeconomic status with nutritional status

Class	Nutritional status				Chi2
	Normal N (%)	Underweight N (%)	Overweight N (%)	Total N (%)	
Upper class	-	-	01 (0.16)	01 (0.16)	0.24 NS
Upper middle	13 (2.17)	02 (0.33)	01 (0.16)	16 (2.67)	
Lower middle	164 (27.42)	34 (5.68)	48 (8.36)	246(41.47)	
Upper lower	222 (37.12)	28 (4.68)	61 (10.20)	311 (52.00)	
Lower class	3 (0.50)	15 (2.50)	04 (0.66)	22 (3.67)	
Total (598)	402(67.16)	79 (13.16)	115 (19.33)	596(100)	

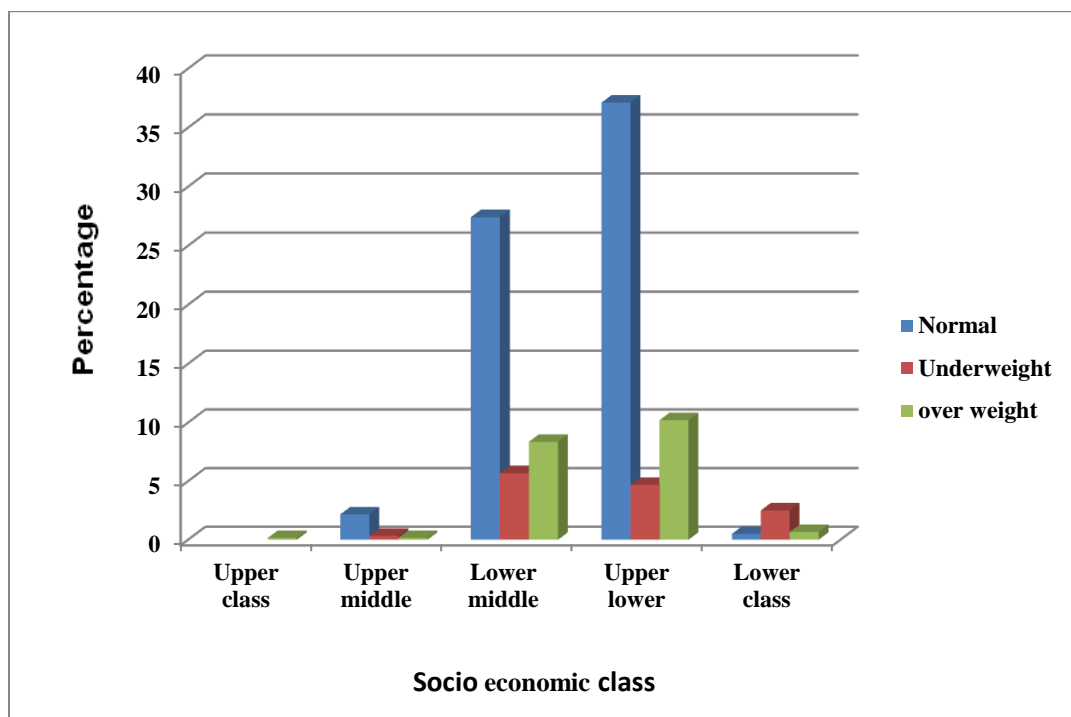


Fig . N. Socioeconomic and nutritional status of the children

4. DISCUSSION AND CONCLUSION

In present study majority of the beneficiaries were living in nuclear set up and majority of the parents of the beneficiaries were not even qualified till high school and the same was found by Molla and Sheikh, (2015) and Gupta et al, (2017). This higher trend of living in nuclear set up might be the reflection of urbanization and migration of the families from rural area to urban area in search of employment. The occupational status of the parents showed that the majority of them were casual labourers and unskilled or semiskilled worker that belonged to upper lower class and lower middle class. Similar findings have been reported in a study conducted in Chandigarh by Thakur, (2013). A study conducted by Singh and Badiger, (2016) reported that about 98.30 % of rural school children preferred continuation of the mid day meal programme followed by 96.70% children reported that they were happy with quantity and quality of the mid day meal and 91.70 % reported that the menu of the mid day meal should be changed periodically to include seasonal foods. Similar findings have been analysed in the present study. Rana et al, (2005) reported that 88.00% of children were willing for continuation of programme.

Mid Day Meal programme is associated with a better educational and nutritional status of school children. Study conducted by Parikh et al, (2008) concluded that mid day meal Services resulted in major improvement in female enrolment in 2002-03. Many parents reported that the availability of mid day meal made it easier for them to persuade their children to go to the school in morning. Present study concluded that mid day meal is helpful in encouraging poor children to attend school more regularly and similar findings have been reported by Gupta, (2009).

Most of the study conducted to assess the impact of MDM on nutritional status showed that the programme serves as a substitute for home food rather than a supplement. In our study we have also noticed that many children reached school with an empty stomach in the morning. And they use to eat mid day meal as a first meal of the day. Poor enrolment and high rate school dropouts are attributed to poor socio-economic conditions, child labour, poor motivation and poor nutritional status of children. Since economic conditions of the family has much significance in maintaining nutritional status of the children showed by many studies but in our study there was no significant association between family profile and nutritional status of children having mid day meal scheme except for father occupation was found. Hence the study suggest the need for continuance of the mid day meal scheme with some modifications, since it is necessary to improve the nutritional status of school children.

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