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IMPACT OF MID-DAY MEAL PROGRAMME ON THE NUTRITIONAL STATUS OF PRIMARY SCHOOL CHILDREN

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Abstract

Children have the right to get the primary education, as stated in the Indian Constitution. The government has proposed an amendment to allow as children between the ages of 6 and 12 to get free and compulsory education. The Government of India has launched a multifaceted programme called the Mid-Day Meal Scheme. It addresses difficulties with access to education, inadequate nutrition, and food security. The population in this particular research study includes all children aged 6–11 and studying in Primary Schools of Utter Pradesh. 509 subjects were chosen. 263 boys and 246 girls were selected through random sampling. According to the Waterlow Classification, children are more wasted, stunted and wasted and stunted than normal students in physical health. Waterlow Classification indicates low levels of physical health of primary school children. The average weight of urban boys and girls was more than the rural boys and rural girls. The overall height of all boys and girls is considered below ICMR standards of height. There was found a significant difference in height and weight between boys and girls of urban and rural areas.

***Keywords**: Mid-Day Meal, Primary School, Anthropometric Measurement, Water- low Classification.*

Introduction: All children have the right to get a primary education, as stated in the Indian Constitution. Even while it hasn't always been a complete success, it has consistently made great progress. Therefore, the government has proposed an amendment to allow children between the ages of 6 and 12 to get free and compulsory education. The Government of India has created a multifaceted programme called the Mid-Day Meal Scheme to address difficulties with access to education, inadequate nutrition, and food security. The department of elementary education and literacy, ministry of human resources development, Government of India, introduced this programme on August 15, 1995, across the country. An attempt was made in September 2002 to reform the mid-day meal programme, which served 450 kcal. and

8–12gm. of protein to all students in grades I–V in government and government-aided schools. With all of those positive outcomes, the scheme was expanded in October 2007 to include the upper primary classes (grades VI to VII). On working days, it offers both primary and upper Primary classes a free lunch. With a clear goal to promote school children's nutrition in both rural and urban settings. This programme is the world's largest school lunch programme.

The early years of school are a time of rapid physical and intellectual development for children. Children contribute to the essential human potential and are the backbone of the economy and development of the country. Importantly, proper nutrition is essential at this time because it influences factors like health, productivity at work, and brain development. For the sake of learning, maturation, and physical development, their nutritional state and health are monitored. Anthropometric measurements, particularly weight and height, are a good indicator of a child's physical development, and children's height and weight are an effective indicator of their nutritional status.

Chethana & Archana (2018) conduct a study on the effect of the mid-day meal programme on the nutritional status of school children. This study revealed that for some children from low-income families, it was preferable since the school lunch might start to take the place of the family meal rather than just be an addition to it.

Nutan & Preja (2014) also conducted a study on the nutritional status of the mid-day meal consuming rural School Going Girls (7-10 years). The subjects are divided into categories under socio-economic status based on their family structure, occupation, and educational standing of their parents. The 24- hour recall method and interviews were used to study the food intake pattern. Anthropometric measurements and a clinical evaluation survey were used to physical health assessment. All food groups' average dietary intake and mean nutrient consumption were found to be lower than the required nutrients. Priya & Dhevi (2015) conducted a study on the nutritional status of school children in rural, semi urban and urban areas of Tamilnadu. The study revealed that Malnutrition affects a child's physical and intellectual development. Children in rural areas consumed significantly fewer calories on average than those in urban areas. The study shows that children from rural areas and those from lower socioeconomic strata are less nourished than their urban counterparts. This distinction emphasizes the need for a unique strategy to tackle malnutrition.

Need and significance of the study: In Uttar Pradesh, 39 percent of children aged 0 to 4 years are stunted, 19 percent are wasting, and 37 percent are underweight, according to a report published in 2019 by the Comprehensive National Nutrition Survey. The Mid-Day Meal programme is a student welfare scheme for school- going children. Numerous studies demonstrate that the Mid-day Meal Scheme has a favorable effect on enrollment, retention, and attendance at school. The goals of MDM include addressing young children's nutritional deficiencies. This study's main objective was to comprehend the Mid-day Meal Scheme's role in enhancing children's nutritional status.

Objective of the study

1. To compare the physical health status between rural boys and urban boys.
2. To compare the physical health status among rural and urban girls.
3. To study the nutritional health among rural and urban children.

Ho1: There is no significant difference between in physical health between rural and urban boys.

Ho2: there exists no significant difference in physical health between rural and urban girls.

Ho3: There is no significant difference between rural and urban school children in the reference of their nutritional health.

Methodology: It was a cross-sectional research conducted on 509 children who regularly eat MDM. Height, weight, and the mid-upper arm circumference (MUAC) were measured anthropometrically and compared to ICMR reference values. Three days in a weak were used to study daily nutritional intake and eating habits. It was a cross-sectional research conducted on 509 students who regularly eat lunch. Height & weight were measured anthropometrically and compared to ICMR reference values. Three days in a weak were used to study daily nutritional intake and eating habits.

Sample: All the primary school students of district Bareilly constitutes the population of the present study. The population in this particular research study includes all children aged 6–11 and studying in primary schools which is regulate by U.P. Government. Selection of participants for the investigation, 509 subjects were chosen. 263 boys and 246 girls were selected through random sampling.

Tools Used

Following tools were used for data collection:

Table- 01

S.No.	Variable	Measuring Instrument
1.	Physical Health	a)Anthropometric Measurement. b) Water-low classification.
2.	Nutritional Health	a) 24 Recall Method. b) Food Frequency Questionnaire.

Assessment of Physical Health

Assessment of Anthropometric measurements includes height and weight. Then mean values are compared with ICMR standard. The height of the students was measured by using soft measuring tape. Then the weight of the individual was measured using digital SECA weighing machine. Recorded height and weight was compared with Standard values. Standard norms of height and weight for boys and girls are represented in the tabular form:

Table- 02: ICMR Standard Height & Weight for boys and girls.

Age years	Boys		Girls	
	Weight (kg.)	Height (cm.)	Weight (kg.)	Height (cm.)
6	20	116	19	114
7	23	121	21	120
8	25	127	24	126
9	28	132	28	132
10	31	137	32	138
11	32	140	33	142
12	37	147	38	148

Assessment of Nutritional Health

By using the 24-hour recall method of the diet survey for three consecutive days, data on eating patterns were gathered. Every meal eaten over the course of three days was covered by the recall. For assessment of nutritional health 24 hr. recall method and food frequency questionnaire were used.

Table -03: Quantity of the food items used in the Mid-Day meal of primary school of Utter Pradesh

Sr. No.	Item	Quantity used per day per student
1	Rice/ wheat flour	100gms.
2	Pulses	20gms.
3	Vegetables	50gms.
4	Oil	5ml.

Results and Discussion

First objective of study is to compare the physical health among rural and urban boys. The ‘t’ value were computed in table-04

Table – 04: Comparison between Rural boys and urban boys based on Height as per ICMR standard

Age In Years	ICMR height standard (cm.)	Rural boys		Urban boys		‘t’ value
		M	σ	M	σ	
9	132	122.20	7.44	120.03	7.38	1.12
10	137	124.31	6.48	128.8	10.78	2.64**
11	140	132.94	10.32	135.84	10.31	1.17

Boys from rural and urban areas are compared in terms of their height according to age in table -4 the computed‘t’-value (1.12) between 9-year-old boys from rural and urban areas was not found significant. Boys from rural areas were found to have a better mean height (122.20) than their urban counterparts. While both urban and rural male groups fall short of the ICMR recommended height, There was a substantial difference in the computed 't' value (2.64) between urban and rural boys 10 years old. The average height of urban boys was found to be superior than that of rural boys (128.8). Boys from rural and urban areas were found to be shorter than the ICMR height guideline. Among 11-year-old boys from rural and urban areas, the computed "t" value (1.17) was not significant. The average height of boys in rural areas was found to be lower (132.94) than that of boys in urban areas (135.84). Boys from both urban and rural areas were found to be shorter on average than the ICMR height requirement.

Table-5: Comparison between Rural boys and urban boys on the basis of Weight as per ICMR standard.

Age In Years	ICMR weight standard (kg.)	Rural boys		Urban boys		‘t’ value
		M	σ	M	σ	
9	28	23.10	3.64	22.22	3.28	0.95
10	31	24.14	3.32	26.80	5.72	2.96**
11	32	28.36	5.02	29.62	4.71	1.09

** significant on .05 level of significance.*

Table-5 shows a comparison of the weights of boys in rural and urban areas. In 9-year-old boys, the computed 't'-value between rural and urban boys was 0.95, which is not statistically significant. Those from rural areas were heavier on average (23.10) than boys from urban areas (22.22). While both groups of boys (rural and urban) were found to be under the ICMR weight standard. There was a substantial difference between rural and urban 10-year-old boys according to the computed 't' value (2.96). The average weight of urban boys (26.80) was higher than that of rural boys (24.14). Boys from rural and urban areas were found to weigh less than the ICMR weight requirement. 11-year-old boys from rural and urban areas had an estimated 't' value of 1.09, which was not significant. The average weight of rural boys was found to be lower than the average weight of urban boys (28.36). (29.62). Boys from both rural and urban areas were found to weight less on average than the standard weight suggested by ICMR standard.

Second objective of the study is to compare the physical health among rural and urban girls. The 't' value were computed describe in table -5.

Table-6: Comparison between Rural girls and Urban girls on the basis of Height as per ICMR standard.

Age In Years	**ICMR Height standard (cm.)**	**Rural girls**		**Urban girls**		**'t' value**
		M	**σ**	**M**	**σ**	
9	132	121.02	9.03	118.05	6.51	1.08
10	138	122.75	17.33	131.81	13.64	2.51*
11	142	130.78	11.97	132.99	10.30	1.03

** significant on .05 level of significance.*

According to age-appropriate ICMR guidelines, Table-6 compares the height of girls in rural and urban areas. Among 9-year-old girls, the computed 't' value between rural and urban girls is 1.08; this value was not significant. Girls from rural areas had a higher average height (121.02) than those from urban areas (118.05). While both groups of girls (rural and urban) were found to be shorter than the height recommended by ICMR. There was a marked significant difference between urban and rural 10-year-old girls as computed "t" value (2.51) is significant at .o5 level of significant. Urban girls' mean height (131.81) was higher than that of rural girls (122.75). Girls from rural and urban areas were found to be shorter than the standard height suggested by ICMR. There was no significant difference found between 11-year-old females from rural and urban areas according to the determined'-value (1.03). The average height of rural girls was found to be lower (130.78) than that of urban girls (132.99). Both urban and rural girls' average heights were found to be below than the standard height suggested by ICMR.

Table-7: Comparison between Rural girls and Urban girls on the basis of Weight as per ICMR standard.

Age In Years	ICMR Weight standard (Kg.)	Rural girls		Urban girls		't' value
		M	σ	M	σ	
9	28	22.36	9.41	22.45	11.12	0.03
10	32	21.55	3.91	25.47	4.48	4.19**
11	33	24.16	3.95	26.05	4.65	1.84

** significant at .05 level.*

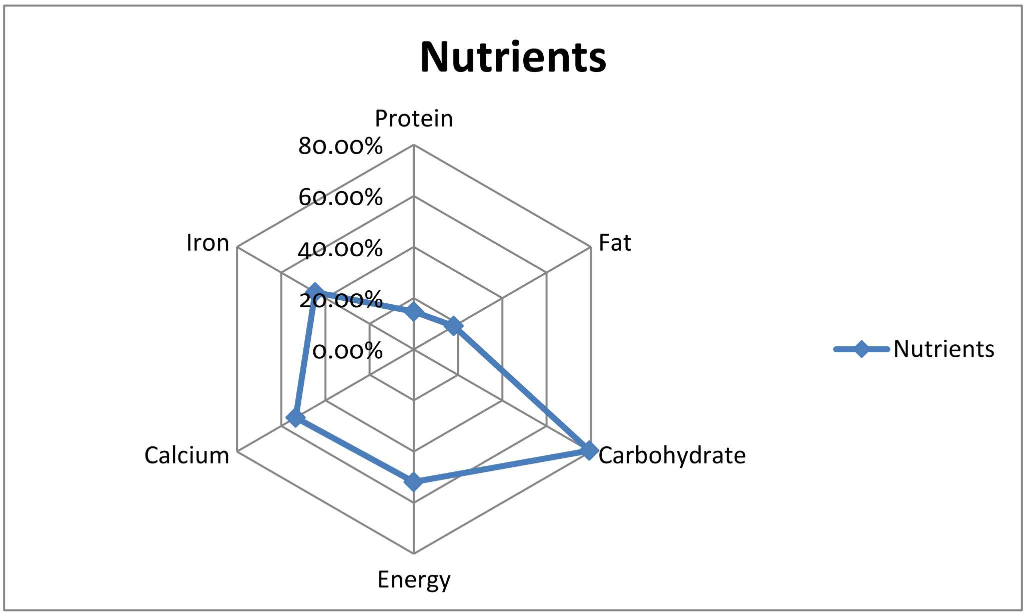
Table-7 revealed the weight of girls in rural and urban areas. among 9-year-old girls, the calculated 't'-value between rural and urban girls was 0.03. Girls from rural areas were found to weight less on average (22.36) than girls from urban areas (22.45). Both the rural and urban girls were found to be under the ICMR weight criterion. There was a substantial difference between urban and rural 10-year-old girls according to the computed "t" value (4.19). The average weight of urban girls (25.47) was found to be higher than that of rural girls (21.55). Girls from rural and urban areas were found to weight less than the ICMR weight standard among 11-year-old girls from rural and urban areas, the computed "t" value (1.84) was not significant. The average weight of rural girls (24.16) was found to be lower than the average weight of urban girls (26.05). Both urban and rural girls' average weights were found to be below the ICMR weight criterion.

Third objective of study is to compare the nutritional health between rural and urban children. Described in table 9-

24- Hour recall method: As a part of the goal of the current study, the 24-hour recall method was used to evaluate the nutrient consumption of primary school students.

Table- 09: Percentage of children according to deficient nutrient intake with in last 24 hrs.

Sr. No.	Nutrients	Total Students
1.	Protein	14.73%(75)
2.	Fat	18.07%(92)
3.	Carbohydrate	79.37%(404)
4.	Energy	51.86%(264)
5.	Calcium	53.43%(272)
6.	Iron	44.59%(227)



The 24-recall technique was used to calculate how much of the vital nutrients pupils had consumed. The aforementioned table-09 displays the percentage of children who are lacking in six essential nutrients and was evaluated on a six-dimensional grid. The respondents' daily nutrient consumption is best represented by the grid. The table-09 and grid display the percentage deficiency matrix for respondents. 14.73 percent children claimed that they did not get enough protein on a daily basis. Not all of the respondents' diets were high in fats. Additionally, 18.07% of the respondents didn't consume the required amount of fat. One nutrient that was lacking in 79.37 percent of respondents was carbohydrate. 51.86 percent of respondents reported not meeting their daily energy needs. Protein, fat, and carbohydrates are combined to meet the daily energy needs. The development and growth of stature depend on calcium. 44.59 percent of those surveyed did not consume the daily required quantity of iron, while 53.43 percent had calcium deficiency.

Food Frequency Questionnaire

The frequency with which primary school students consume various food groups was ascertained using the food frequency questionnaire.

Table-10: Rural and Urban children based on frequency of food groups intake. (Rural N-341, Urban N-168)

		Frequency of intake							
Sr.no	**Food Groups**	**Daily**		**Weekly**		**Twice a month**		**Monthly**	
		R	**U**	**R**	**U**	**R**	**U**	**R**	**U**
1	Pulses and legumes	25%	75%	60%	20%	10%	5%	5%	-
2	Cereals	100%	100%	-	-	-	-	-	-
3	Milk and Milk product	7%	8%	32%	19%	8%	1%	18%	-
4	Green leafy Vegetables	63%	90%	32%	8%	5%	2%	-	-
5	Fats and Oil	35%	35%	23%	23%	-	-	-	-
6	Meat, Fish and Poultry	15%	25%	35%	49%	7%	9%	13%	11%

The frequency of food consumption by the groups of rural and urban people is shown in table 10 above. Only 5% of respondents in rural areas reported eating pulse and legumes just once per month, compared to 25% who eat them daily, 60% eat them once per week, and 10% who eat them twice per month. Daily consumption of pulses and legumes among students in urban areas is 75%; weekly consumption is 20%. And just 5% twice per month. All primary school children in both rural and urban areas receive cereal, however only 7% of rural students receive milk and milk products on a daily basis and 32% of urban students receive milk and milk products along with green leafy vegetables on a weekly basis. 90% of urban children and 63% of rural children frequently eat green and leafy vegetables during the midday meal that is provided in primary schools. In both rural and urban elementary schools, 35% of students eat fat and oil during lunch. Meat, fish, and poultry are consumed by students in urban primary schools at a rate of 25% daily, 49% weekly, and 11% monthly. On the other hand, primary school students in rural areas consume 15% of meat, fish, and poultry daily, 35% weekly, 7% twice a month, and 13% monthly. A study of Mint that was published June 1, 2007, provides strong support for the researcher's conclusions in this particular study about the inadequate nutrient intake among youngsters in rural and urban areas. The report states that protein consumption dropped from 59 gm. to 57 gm. /day. Intake of calories has decreased in both rural and urban population. Protein consumption in urban population fell from 58.5 gm. /day to 57 gm./day. In rural area, Consumption of fat declined from 36.0 to 35.5 gm. per day and from 50.0 to 47.5 gm. per day in urban areas. In a different study**, Yadav P. and Kumar A. (2014).** Mid-day meal provides protein for only 5 to 9 year old children but not enough protein for 10 to 12 year old children. Expert's recommendations that one third of the RDA of nutrients must be provided by the MDM were met. All of the youngsters surveyed had iron and energy intakes that were below the RDA by 1/3. In general, the MDM has few micronutrients.

Conclusion: The researcher concludes in the compression of physical health status of rural and urban students of primary school. It is evident from the above data that the students in the rural areas have moderate category they have less weight than the standard according to their height. Wasting depends on the food consumption on an individual. The water low classification does not consider stunted only children as malnourished since height is determined by genetic factors as well. It is concluded that the average height of urban boys and girls of 9 years old is found lower than rural boys. On the other hand, average height of 10 and 11 years old urban boys and girls is higher than rural boys and girls but overall height of all boys and girls is considered below than ICMR standards of height. The literacy rate of rural women is less than the urban women. Therefore, they have lack of awareness towards health. Nutritional supplements are easily available for the urban boys in comparison to rural boys. Hospitality in urban area is better than rural area. It is revealed that the average weight of urban boys and girls of 9 years old is found less than rural boys. On the other hand, the average weight of urban boys and girls of 10 and 11 years old is more than rural boys. The overall weight of boys and girls in rural and urban area is below than ICMR standards. The literacy rate of rural parents is less than the urban parents. Therefore, they have lack of awareness towards health of boy and girls. The orthodox family discriminate between boys and girls in rural families therefore they do not provide proper supplement. Hospitality in urban area is better than rural area.

Educational implication

- The physical health of rural children is poor. Therefore it is a need to provide nutrition education to them.
- The nutritional health analysis shows sign of deficiencies among rural children. The frequency of essential food to take like milk and complex carbohydrate which also poor among rural children in study. Therefore, their energy requirement is not fulfilled by their daily diet. After doing this detailed study, it is recommended that the

supplementary meal provide by the government under mid-day meal scheme by which the deficiency of nutrients can be fulfilled.

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