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Assessment of nutritional status among primary school children availing mid-day meal: A study in Odisha

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Abstract
The Mid-Day Meal (MDM) program in Odisha has been instrumental in addressing the twin challenges of malnutrition and low school attendance among primary school children. Implemented as part of a nationwide initiative, the program aims to provide free, nutritious meals to children in government and government-aided schools. This initiative not only enhances the nutritional intake of children but also encourages higher attendance and retention rates in schools. The MDM program has also facilitated social equity by breaking down caste and economic barriers, as children from diverse backgrounds share meals together. Additionally, the initiative has provided employment opportunities for local women, who are often hired as cooks and helpers, thereby contributing to rural economic empowerment. Despite its successes, the program faces challenges such as ensuring food quality, timely delivery, and maintaining hygiene standards. Addressing these issues is essential for the continued success and sustainability of the MDM scheme. This study was based on primary data and Buckley Primary School, Cuttack, Odisha was selected for the study. The total sample size was taken 50 primary school children. Data collected with the help of Questionnaire, data analysed by using mean and frequency percentages, and data presented by tables. This study revealed that many school going children are getting benefit from mid-day meal scheme, with proper nutritious food. Children belonging from low-income group were encouraged to study and gain knowledge by coming to school. Awareness must be done among parents so that they can send their children to school rather than keeping their children at home, as school provides both knowledge as well as food to the children. Continued efforts to improve and expand the program can further enhance its benefits, ensuring that all children in Odisha have access to both education and nutrition.

Keywords: Education, nutrition, awareness, employment, MDM

Introduction
Nutritional status is a critical determinant of an individual's overall health and well-being. It encompasses the balance between the intake of nutrients through diet and the body's ability to utilize these nutrients for optimal functioning. Adequate nutrition is essential for the growth, development, and maintenance of the human body. It plays a pivotal role in preventing various diseases and promoting longevity. The components of a balanced diet, including carbohydrates, proteins, fats, vitamins, and minerals, contribute to the intricate biochemical processes that sustain life. One of the key indicators of nutritional status is the Body Mass Index (BMI), a measure that relates weight to height. A healthy BMI reflects a proper balance between energy intake and expenditure. However, nutritional status goes beyond mere weight; it involves assessing the body's internal environment, ensuring that it receives the right mix and quantity of nutrients. Poor nutritional status can lead to a range of health issues. Malnutrition, whether due to undernutrition or overnutrition, can result in deficiencies or excesses of specific nutrients. For example, inadequate intake of essential vitamins and minerals can impair immune function, stunting growth, and causing developmental delays. On the other hand, excessive calorie consumption can lead to obesity, increasing the risk of chronic conditions such as diabetes, cardiovascular diseases, and certain cancers. Socioeconomic factors, cultural practices, and individual dietary choices significantly influence nutritional status. Access to diverse and nutritious food, education on healthy eating habits, and awareness of the importance of nutrition are crucial in maintaining optimal nutritional status across populations. Pregnant women, infants, and the elderly are particularly vulnerable groups where nutritional status can have profound effects. Proper prenatal nutrition

is vital for fetal development, and adequate nutrition in older adults contributes to healthy aging. In conclusion, understanding and addressing nutritional status are fundamental aspects of public health. Promoting awareness, implementing effective nutritional education programs, and ensuring access to quality food are essential steps toward improving and maintaining optimal nutritional status for individuals and communities. By prioritizing nutrition, we can pave the way for healthier, more vibrant lives. The quality and quantity of education depends on the nutritional status of the children, especially in the age group of 6-14 years. This close link between health and educational outcomes stimulated the Government of India to launch the National Programme of Nutritional Support to primary education, popularly called the Mid-Day Meal scheme in August 1995. The Mid-Day Meal (MDM) program is a school meal scheme in India aimed at improving the nutritional status of school-age children nationwide. Launched in 1995, it provides free lunches on working days for children in primary and upper primary classes in government, government-aided, local body, Education Guarantee Scheme (EGS), and Alternative & Innovative Education (AIE) centers, Madarsa and Maqtabs supported under Sarva Shiksha Abhiyan, and National Child Labour Project (NCLP) schools run by the Ministry of Labour.

Objectives of the Study

- To study the Socio-Economic status of the primary school children availing mid-day meal in schools.
- To study the types of food given in the mid-day meal program.
- To know the amount of food given to the Primary School Children.

Methodology

A cross sectional and descriptive design were used to assess the Assessment of nutritional status among primary school children availing mid-day meal. The study was focussed on Cuttack, Cuttack district in Odisha. Cuttack, one of the oldest cities in Odisha, is a fascinating blend of history, culture, and modernity. Located at the confluence of the Mahanadi and Kathajodi rivers, it is often referred to as the "Silver City" for its exquisite silver filigree craftsmanship. Founded in the 10th century by King Anangabhima Deva III, Cuttack served as Odisha's capital for nearly a millennium and remains a hub of trade, culture, and judicial administration. The city's historical landmarks, such as the 14th-century Barabati Fort and the Netaji Birthplace Museum, reflect its rich heritage. It is also known for its grand festivals like Durga Puja and Bali Yatra, which celebrate the city's vibrant traditions and maritime history. Primary school going children aged between 6-9 years was selected for the study. Buckley Primary School, Mission Road, Cuttack was selected as area of the study. The selection of the respondents was based on Purposive Random Sampling. The process of selecting the sample was done by taking children according to their Roll no of attendance sheet of class 2 and class 3 students. Total 50 students were selected as population of the study. Collection of the data was done by survey method. A questionnaire was used to collect necessary information from the respondents. The analysing of collected data was done with the help of some appropriate statistical procedure like mean, percentage.

Results and Discussion

To study the socio-economic status of the primary school children availing mid-day meals in school

Table 1: Socio-Economic Status of Primary School Children

S. No.	Particulars	Frequency N=50	Percentage (%)
1.	**Sex**		
	Male	24	48
	Female	26	52
2.	**Age (years):**		
	7-8	18	36
	8-9	32	64
3.	**Education**		
	Class 2	17	34
	Class 3	33	66
4.	**Nature of Family**		
	Joint family	8	16
	Nuclear Family	40	80
	Extended Family	2	4
5.	**Occupation of Family**		
	Maid Servants	28	56
	Vendor	12	24
	Autorickshaw Driver	10	20
6.	**Family income group**		
	Rs.1000-Rs. 5000/Month	11	22
	Rs.5000-Rs. 10,000/Month	37	74
	Above Rs. 20,000/ Month	2	4

From the above table 1- it was found that there were 48% male respondents, 52% female respondents. 36% respondents belonged to the age group between 7-8 years old, 64% respondents belonged to the age group of 8-9 years old. There were 34% respondents from class 2, 66% respondents from class 3. 16% respondents belonged to joint family where as 80% respondents belonged to nuclear family and 4% belonged to extended family respectively. 22% respondents belonged to family income group of Rs.1000-Rs.5000 rupees per month, 74% respondents belonged to Rs.5000-10,000 rupees per month and 4% respondents belonged to above Rs. 20, 000 rupees per month.

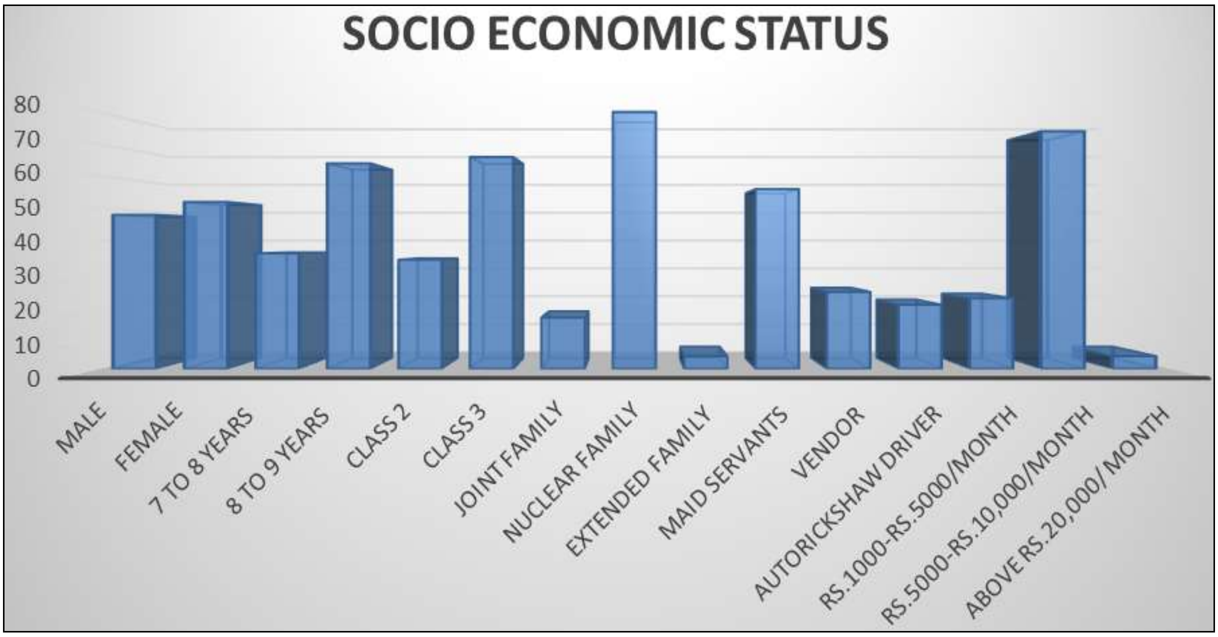

Fig 1: Socio-Economic Status of Primary School Children

To study the types of food given in the mid-day meal program

Table 2: Types of Food

	Daily		Once a Week		Twice a Week		Once in a Month	
	Frequency (N=50)	Percentage	Frequency (N=50)	Percentage	Frequency (N=50)	Percentage	Frequency (N=50)	Percentage
Cereals (Rice)	50	100	-	-	-	-	-	-
Pulses (Dal)	-	-	4	8	46	92	-	-
Vegetables	2	4	3	6	45	90	-	-
Fruits	-	-	-	-	3	6	47	94
Non-Veg Products -Egg	-	-	1	2	48	96	1	2
Milk and Milk Products -Paneer	-	-	1	2	3	6	46	92

Table 2 of the study presents a detailed overview of the types of food provided to primary school children under the Mid-Day Meal (MDM) program at Buckley Primary School, Cuttack. Cereals, specifically rice, form the cornerstone of the children's daily diet, with all 50 children (100%) receiving rice every day. This ensures a consistent and reliable source of carbohydrates essential for energy and growth. Pulses, particularly dal, are another critical component, provided daily to 92% of the children and once a week to the remaining 8%. This frequent inclusion helps meet their protein needs, vital for growth and development. Vegetables are mainly served twice a week to 90% of the children, with 4% receiving them daily and 6% once a week, introducing necessary vitamins and minerals to their diet. Fruits are the least frequently served item, with 94% of children receiving them once a month and only 6% twice a week, suggesting potential areas for improvement in nutritional diversity. Eggs, an important source of high-quality protein, are included twice a week for 96% of the children, with minimal inclusion for the rest. Milk products, represented by paneer, are provided once a month to 92% of the children, with only 6% receiving them twice a week and 2% once a week, indicating a need for more regular inclusion to ensure essential nutrients like calcium and vitamin D for bone health and development.

To know the amount of food given to the primary school children

Table 3: Amount of Food Given to Primary School Children

Days of the week	Meal	Quantity
Monday	Rice, Dalma	100 gram rice, 25 gram Dal, 55 gram Vegetables and Condiments
Tuesday	Rice, Soya Curry	100 gram rice, 12gram soya
Wednesday	Rice, Boiled Egg, Veg Mix Curry	100 gram rice, 1 boiled egg, 55 gram vegetables
Thursday	Rice, Dalma	100 gram rice, 55 gram vegetables
Friday	Rice, Dalma, Kheer/ Sweets	100 gram rice, 55 gram vegetables, 10gram kheer
Saturday	Rice, Boiled Egg, Mix Curry	100 gram rice, 55 gram Vegetables, One Boiled Egg

Table 3 of the study provides a comprehensive overview of the Mid-Day Meal program's food distribution to primary school children at Buckley Primary School. Each day, the meal comprises a fixed quantity of rice and a specific accompaniment, measured in grams. Rice, as the staple food, is included daily in a consistent portion of 100 grams, serving as the primary source of carbohydrates for energy. To complement the rice, a variety of protein-rich dishes are incorporated. Dalma, a traditional dish made from dal and vegetables, is served on multiple days (Monday, Thursday, and Friday) to provide plant-based protein and fiber. On Tuesday, soya curry, rich in vegetarian protein, is the featured accompaniment. Animal-based protein is included with boiled eggs on Wednesday and Saturday. To ensure a consistent supply of vitamins, minerals, and fiber, vegetables are included almost every day in portions of 60 grams, either as part of dalma or a mix curry. The plan also includes thoughtful additions to enhance taste and variety. On Friday, a small portion of kheer or sweets introduces a dessert option, offering a touch of indulgence and variety to the week. This structured meal plan ensures that children receive a balanced diet with consistent quantities throughout the week, aimed at meeting their nutritional needs while providing some variety. However, compared to the Recommended Dietary Allowance (RDA), the quantity of food provided appears to be less, indicating a potential area for improvement in the program to ensure children meet their full nutritional requirements.

Conclusion

The survey of primary school children showed that the mid-day meal program is largely beneficial, with most children reporting positive impacts on their well-being, physical growth, and concentration in class. Key findings include balanced gender representation, a majority from nuclear families, and varied family income levels. Additionally, over half observed improvements in their physical growth and academic focus. However, the data suggest areas for improvement, such as increasing the quantity and variety of food to better meet the Recommended Dietary Allowance and ensuring more consistent inclusion of fruits and dairy products to enhance the program's nutritional value. By addressing these gaps, the program can better support the holistic development of all participating children.

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