



The Impact of Mid-Day Meal Scheme on the Nutritional and Educational Status among Rural School Children in Bihar, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: <https://doi.org/10.9734/ejnfs/2024/v16i81503>

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here:

<https://www.sdiarticle5.com/review-history/120440>

Original Research Article

Received: 22/05/2024

Accepted: 24/07/2024

Published: 31/07/2024

ABSTRACT

In India, in particular in rural regions, the Mid-Day Meal Scheme (MDMS) has been crucial in treating malnutrition and improving access to education for schoolchildren. The Mid-Day Meal Scheme's implementation and efficacy in the Bihar district of Arwal are both investigated in this

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Cite as: Pal, Ankit, Ananda KR, Sunil Kumar, Sanjay Kumar Gupta, and Anamika Sharma. 2024. "The Impact of Mid-Day Meal Scheme on the Nutritional and Educational Status Among Rural School Children in Bihar, India". *European Journal of Nutrition & Food Safety* 16 (8):149-55. <https://doi.org/10.9734/ejnfs/2024/v16i81503>.

study. this study highlights how significantly the Mid-Day Meal Scheme has improved the nutritional and academic outcomes of rural schoolchildren in Bihar while also highlighting areas that need more focus for programme improvement.

A representative sample of rural schools was used to gather data using a quantitative methodology. By using many sorts of indicators, including attendance, dropout rates, and academic achievement, the study evaluated the nutritional and educational status of children.

The result illustrate the benefits of the programme by showing improvements in height, weight, classroom hunger, enrollment, retention, attendance, and a decrease in dropout rates. On the other hand, assessments regarding academic ability and attention span were less favourable. When parents and instructors were asked about their opinions of the classroom hunger and attendance, both groups of people said that things had much improved. On the subject of academic achievement and attention span, differences were identified. The report highlights the need for additional study to fully comprehend the Mid-Day Meal Scheme's long-term effect.

Keywords: Mid-day meal scheme; educational indicators; rural school children; malnutrition.

1. INTRODUCTION

One of the most important programmes the Indian government has implemented to address the problems of undernutrition and lack of access to education among schoolchildren, especially in rural regions, is the Mid-Day Meal Scheme (MDMS). The elementary school lunch programme in India is commonly referred to as the mid-day meal programme. On August 15, 1995, P.V. Narasimha Rao, a former Indian prime minister, introduced the Mid-day Meal Scheme (MDM) for the first time in India to combat school hunger and enhance the nutritional quality of primary school students [1]. On all working days, children in elementary schools between the ages of 4 and 14 will receive a free lunch as part of the programme. The main goal of the programme is to promote primary school enrollment and attendance by eliminating hunger in the classroom, fostering better socialisation among kids from all castes and religions, and tackling malnutrition [2]. For individuals with the lowest socioeconomic levels and parents with the least education, the MDM Program's effects were more noticeable [3,4].

The programme increased enrollment, helped students stay in school longer, and reduced dropout rates. To be more successful, however, the plan still needs to be standardised in terms of management, rudimentary infrastructures, materials and grains, fuel, utensils, kitchen stores, serving locations, health and hygiene, security, and safety, according to Taranam [5]. In terms of child malnutrition as well as access to high-quality education, Bihar, a state in eastern India, confronts major difficulties. Due to a number of socioeconomic problems, including poverty, ignorance, and restricted access to

nutrient-rich food, the state has a sizable population of rural schoolchildren who are at risk for malnutrition. The analytical study uses a quantitative methodology and data gathered from a representative sample of rural schools [6,7].

Through several types of indicators, including school attendance, dropout rates, weight, height and academic achievement, the study's design includes evaluating the nutritional and educational status of children. However, despite pertinent material on various parts of the Mid-Day Meal Scheme all across the country, there was very little information on the Mid-Day Meal Scheme's carrying out in Bihar, specifically the Arwal region. The current study thus focuses on how the Mid-Day Meal Scheme is implemented and operates in the Arwal district [8].

2. MATERIALS AND METHODS

It was considered that the variable manifestations had already occurred and that no variable could be modified; hence, an ex-post facto research methodology was adopted in this study. Inferences about the relationships between variables are made based on the simultaneous changes of the independent and dependent variables, without any direct involvement. The district consisted of five blocks. Three blocks were chosen at random. A group of rural schools was chosen at random from each block. Thus, out of a total of 270 subjects, 120 were from rural schools, 30 were instructors, 90 were parents, and 30 were anganwadi volunteers. Under these two facets, the MDM programme's performance was evaluated. The two main components of the MDM Programme's effect were assessed using the nutritional and educational status of rural schoolchildren [9].

The overall number of indicators was eleven, with six coming from the second aspect and five from the first. There were signs of the two negatives (classroom hunger, morbidity) and the three positives (height, weight, and morbidity) in the first component. Enrollment, retention, attendance, academic performance, and span of attention were the five positive indicators for the second component, while dropout was the one negative sign. Three continuums—increase, no change, and decrease—were used to categorise the answers. Scores of 3, 2, and 1 were given to the replies Increase, No Change, and Decrease for positive indications, and 1, 2, and 3 were given in the opposite order for negative indicators. In order to gain a comprehensive understanding of the various indicators, the total score and mean score were computed [10,11].

3. RESULTS AND DISCUSSION

Responses from parents were used to gauge how the MDM programme was believed to affect the nutritional and educational status of rural schoolchildren. The reported changes in several metrics, as well as the overall score, mean score, and ranking for each category, are all summarised in Table 1.

3.1 Nutritional Status

The majority of parents claimed that the MDM programme had caused their children's weight (66.66%) and height (88.88%) to grow, which reflects the nutritional status of the children. Parents reported seeing a favourable effect in the classroom, with 92.22% reporting a considerable decrease in hunger. A more evenly distributed response was seen for morbidity, with 50% of parents reporting no change. 55.55 percent of parents said that the ailment has recovered [12].

The results of this study illustrate how parents in rural Bihar felt that the Mid-Day Meal Programme had improved their children's nutritional and academic performance. The MDM Programme appears to have had a big impact on these factors based on the favourable changes seen in measures including height, weight, classroom hunger, enrollment, retention, attendance, and dropout rate reduction.

3.2 Educational Status

A sizable portion of parents felt that the MDM programme had a positive influence on their kids'

educational condition. 81.11% of parents believed that enrollment rates had grown, while 67.77% said that retention rates had improved. Parents reported good changes in attendance, which substantially improved, according to 88.88% of them. 70% of parents reported a decrease in the dropout rate. However, only 81.11% of parents commented positively on its effect on academic performance, and only 71.11% of parents positively commented on the span of attention. They obtained enough food for growth and development owing to the substantial reduction in classroom hunger. Based on the stated rise in enrollment and retention rates, offering midday meals to students serves as a financial incentive for parents to register them in school and keeps them there.

Regular attendance is necessary for good learning and educational advancement; hence, an improvement in attendance rates is a crucial outcome. The decline in dropouts indicates that the MDM Programme may help lessen the likelihood that young students will leave school early. It is noticeable that academic performance and attention span garnered relatively fewer positive reactions from parents, despite the positive effects perceived in most parameters being promising.

According to teachers' reports, Table 2 shows how the Mid-Day Meal (MDM) Programme has affected the nutritional and academic levels of rural schoolchildren.

3.3 Nutritional Status

The MDM Programme improved the nutritional status of rural schoolchildren, in the opinion of the teachers. The majority of educators saw a rise in the kids' weight (83.33%) and height (86.66%). These results were in line with Naik's [13] research in Karnataka, which discovered that the stakeholders perceived the MDM programme was responsible for the children's weight gain and other health improvements. 96.66% of instructors reported seeing improvements, and there was a considerable drop in classroom hunger.

Responses to morbidity were conflicting, with 53.33% of the teachers reporting no change. 50% of teachers said that their health had recovered. The MDM program's performance in these areas is demonstrated by the positive changes seen in indicators including height,

weight, classroom hunger, enrollment, retention, and attendance that are in line with the program's goals.

3.4 Educational Status

Teachers reported beneficial effects of the MDM programme in terms of the children's educational condition. 90% of teachers reported greater

retention rates, while 93.33% reported higher enrollment rates. Teachers reported good changes in attendance, which significantly improved, according to 96.66% of them. 56.66% of teachers reported a decrease in the percentage of dropouts. However, only 83.33% and 90% of teachers, respectively, reported that the effects had a beneficial effect on students' academic performance and attention span.

Table 1. Perceived Effect of MDM programme on nutritional and educational status of rural school children reported by the parents

S.no	Parameter	Response Categories			Total score	Mean score	Rank
		Increase	No change	Decrease			
I. Nutritional status							
1	Height	80 (88.88%)	10	0	260	2.88	II
2	Weight	60 (66.66%)	20	10	220	2.44	IV
3	Classroom hunger	0	7	83 (92.22%)	263	2.92	I
4	Morbidity	9	36	45(50%)	216	2.40	V
5	Recovery from disease	50 (55.55%)	35	5	225	2.50	III
II. Educational status							
1	Enrolment	73 (81.11%)	9	8	245	2.72	II
2	Retention	61 (67.77%)	20	9	233	2.58	IV
3	Attendance	80 (88.88%)	5	5	255	2.83	I
4	Drop outs	0	27	63 (70%)	243	2.7	III
5	Academic performance	10	73 (81.11%)	7	183	2.03	VI
6	Span of attention	15	64 (71.11%)	11	184	2.04	V

Table 2. Perceived Effect of MDM Programme on Nutritional and Educational Status of Rural School Children Reported by the Teachers (N=30)

S.no	Parameter	Response Categories			Total score	Mean score	Rank
		Increase	No change	Decrease			
I. Nutritional status							
1	Height	26 (86.66%)	4	0	86	2.86	II
2	Weight	25 (83.33%)	5	0	85	2.83	III
3	Classroom hunger	0	1	29 (96.66%)	89	2.96	I
4	Morbidity	0	14	16 (53.33%)	76	2.53	IV
5	Recovery from disease	15 (50%)	15	0	75	2.5	V
II. Educational status							
1	Enrolment	28(93.33%)	2	0	86	2.86	III
2	Retention	27 (90%)	3	0	87	2.90	II
3	Attendance	29 (96.66%)	1	0	89	2.96	I
4	Drop outs	0	13	17 (56.66%)	77	2.56	IV
5	Academic performance	3	2	25 (83.33%)	38	1.26	V
6	Span of attention	3		27 (90.0%)	36	1.20	VI

High percentages of teachers who reported experiencing less hunger in the classroom indicate that midday meals are meeting the children's nutritional needs, lowering hunger, and improving their general wellbeing. However, the teachers' generally less favourable comments about students' academic performance and attention span raise important concerns. Academic performance and attention span were also influenced by other socioeconomic characteristics, such as teaching quality, facilities, involvement of parents, and other factors.

3.5 Comparison of Effect Reported by Mothers and Teachers

A comparison of the responses of mothers and teachers was done in order to compare their responses and better understand how the MDM Programme was speculated to affect the nutritional and educational status of rural schoolchildren. The mean scores for various nutrition-related characteristics as reported by mothers and teachers are shown in Fig. 1, whereas the mean scores for educational status are shown in Fig. 2.

Fig. 1 shows that both mothers and teachers reported a significant reduction in classroom hunger (2.92 for mothers and 2.96 for teachers), proving that the MDM Programme was successful in reducing childhood hunger. Afridi et al. [14] reported similar results, concluding that

the MDM initiative considerably reduced student hunger.

3.6 Educational Status

Fig. 2 shows that parents and teachers both believed that there was an enormous effect on attendance (2.83 for parents and 2.96 for instructors). This shows that both participants believed the MDM Programme had a good effect on rural schoolchildren's attendance rates. Numerous multifaceted investigations conducted across the nation and in different regions of the world have shown similar findings [15] Mathur, 2005; [16], Dreze and Goyal, 2003; Laxmaiah et al., 1999).

However, there were some differences in the views of parents and teachers about academic performance and attention span. Parents noticed a moderate improvement in their children's academic performance and attention span, which they reported as having a medium extent of effect (2.03 and 2.04, respectively). Teachers, on the other hand, reported a smaller extent of effect for academic performance (1.26) and span of attention (1.20), indicating that they thought the improvement was less pronounced than what parents saw. Mothers and teachers understood children differently when it comes to academic achievement and attention spans depending on a number of factors, such as subjective interpretations, different expectations, or different assessment methodologies used by each stakeholder.

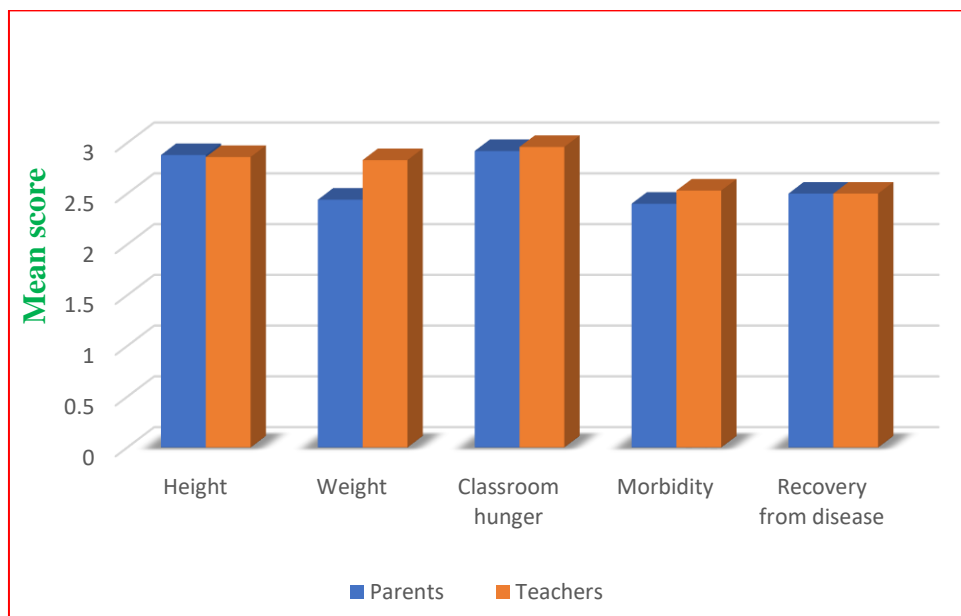


Fig. 1. Comparative effect of MDM programme on nutritional status of rural school children

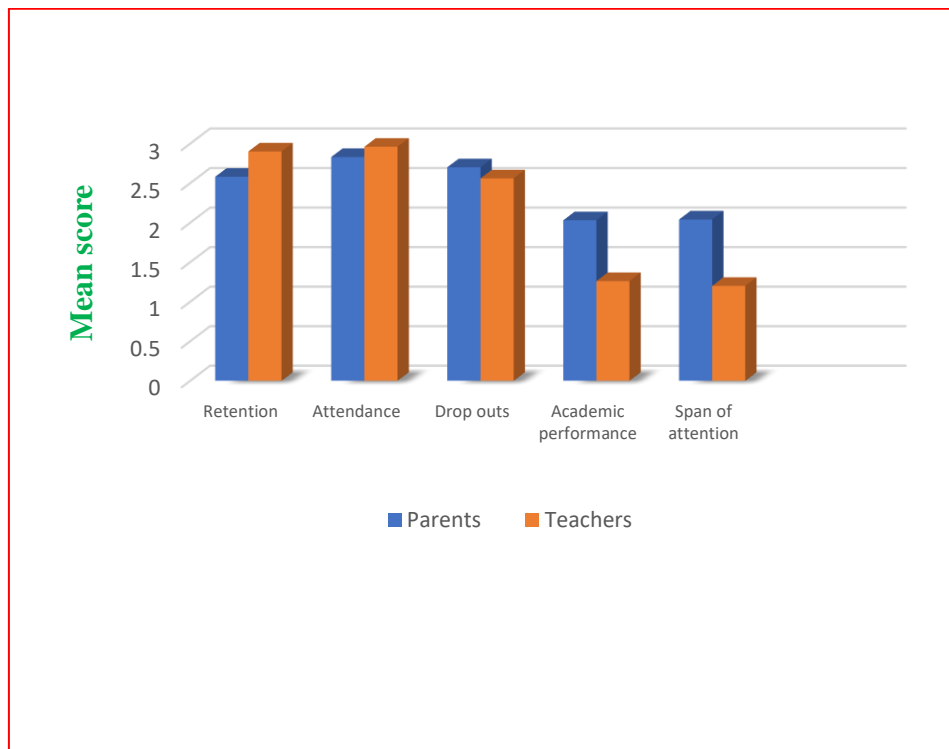


Fig. 2. Comparative effect of MDM programme on educational status of rural school children Nutritional Status

4. CONCLUSION

The Mid-Day Meal Scheme's effects on the nutritional and academic status of rural schoolchildren in Bihar were the subject of an analytical study. It is clear from a thorough examination of several factors that the Mid-Day Meal Scheme significantly improved the general wellbeing of rural schoolchildren. The Mid-Day Meal Programme has had beneficial effects on the academic standing of rural school children. Free meals have served as a significant incentive for kids to attend school frequently, lowering absence rates. Since more students are in class, they are more motivated and focused to participate in the learning process, which has a direct impact on academic success. Additionally, the programme has helped lower rural schoolchildren's dropout rates. The provision of free meals has inspired parents to send their kids to school and further their education by easing the financial load on families. It is crucial to remember that the current study concentrated on rural Bihar, so it is possible that the findings do not pertain to other locations. It is necessary to do additional research with a wider geographic scope to examine the long-term impacts of the Mid-Day Meal Scheme on the dietary and academic status of schoolchildren.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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