Does Anganwadi impact on the nutritional status of Children?

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Abstract- *Background and objective: Anganwadi Centres (commonly known as ICDS) started in the year 1975 mainly to fulfil the nutritional requirement of children along with essential integrated health services. The objective of this paper is to assess the impact of Anganwadi centres on nutritional status of children and their wellbeing.*

Methods: *The cross-sectional data collected through National Family Health Survey is used to analyse the impact of Anganwadi centres along with primary data collected in Odisha. A multi-stage sampling technique was used in the recruitment of respondents from the community. Both bivariate and multivariate analyses have been carried out for this paper.*

Results: *Over the years the proportionate of children accessing supplementary food from theAnganwadi/ ICDS is decreasing. Further, recent data shows that, percentage of children receiving food is high among poor households as compared to better off households. However, both bivariate and multivariate analysis result shows that there is no difference in nutritional status of children between ICDS covered area and non-covered area. The primary survey result shows the ICDS is partially effective in child healthcare and growth monitoring.*

Conclusion: *There is no significant positive impact of supplementary nutrition through Anganwadi centres on under-nutrition status of children. However, the programme is effective in growth monitoring and facilitating better healthcare for children. Government of India should take steps for ensuring quality services and promoting Anganwadi food as supplementary to home food instead of complementary to home food. Then all children will access the quality supplementary food and it would impact in improving nutrition and overall health status of children.*

Introduction

The nutritional status of children has not improved as expected with rapid economic development even if there are many policies to improve nutritional status of children. ICDS is one of the most important supplementary nutrition programmes for improving nutritional status of children below six years. It is expected that if all children access supplementary nutrition from the ICDS centres, then it will fill the unmet need for nutrition among children. But persistent

high level of under-nutrition among children below six years reveals that the programme may not effective as expected. However, the findings from earlier studies give mixed result.

A study covering rural, urban and tribal area in multi-states shows that, the reduction in prevalence of severe malnutrition is comparatively more significant in ICDS covered population than in other population group[i].Another study argues, the benefit of the supplementary nutrition is seen to be limited in very young children aged 1/2 to 2 years. Their attendance at ICDS/ Anganwadi Centre (AWC) and intake of supplementary nutrition are poor[ii]. Improper storage facilities, poor quality and shortages of supplementary nutrition, erratic food supplies, bad communication, pilferage and other such logistic problems in certain states have been noticed and these factors causes low impact of ICDS on child under nutrition. There are program gaps in coverage of supplementary nutrition to rural area, particularly its regular supply to the beneficiaries[iii]. A quick review of AWC by NITI Aayog in 2014 shows that, 31% of AWCs are not intervening on children's malnutrition[iv].

Further the programme aims to provide disease treatment along with supplementary nutrition, so that the programme will make a better impact in the nutritional status of children. The literature shows, morbidity and mortality have been found to be higher in non-ICDS areas, and declines have been observed in ICDS areas[v]. NITI Aayogreport in 2014 highlighted that, 22.5% of AWCs do not have the required medicines for the children. The incidence of vaccine preventable diseases was not found to have declined in ICDS areas, despite increased immunization.

In India, despite substantial funding of its early childhood development program, which has a large supplementary feeding component, levels of child malnutrition have fallen only slightly[vi]. The impact of being included in the program and receiving supplementary feeding is insignificant on child stunting measures, though the program can break the intractable barriers of child stunting only when the child successfully receives not only just the supplementary feeding but also his caregiver collects crucial information on nutritional awareness and growth trajectory of the child[vii].

From the literature evidences, it can be concluded that the ICDS programme is has limited impact on child under nutrition in some areas whereas it has no impact in other areas. So, it is highly essential to examine the current situation, whether the ICDS programme is effective in declining under-nutrition among children and if not effective, then what are the factors need to be addressed for its effective implementation.

Methods

Study site and participants

This study has used data for all India level and focusing on access to supplementary nutrition and nutritional status among children. For the qualitative data, some in-depth interviews and observational methods have been used for this paper.

Data Source

Here, quantitative data from secondary sources have been used. National Family Health Surveys (NFHS) have been carried out in regular intervals in India. Four rounds of NFHS (NFHS-1, NFHS-2, NFHS-3 and NFHS-4) data have been used for this paper. However, focus has been given to fourth and third round of National Family Health Surveys (NFHS)as these rounds collect data on child nutritional status and access to ICDS programme. NFHS collect data on three anthropometric measures are used for assessing child nutritional status. Height-for-age is used for measuring stunting, weight-for-height for wasting and weight-for-age for underweight. Weight-for-age is a composite index of height-for-age and weight-for-height. Here weight-for-age (under-weight) is taken as the measures for under-nutrition status of children. It considers both acute and chronic malnutrition. Children whose weight-for-age is below minus two standard deviations from the median of the reference population are classified as underweight.

Further, primary data was collected for quantitative &qualitative information. Field survey data from Odisha have been used to assess the information regarding utilization of services and perception of beneficiaries at the community/village level.

Analytical methods

Different analytical methods are used here to showing the relationship between access to ICDS services and nutritional status among children. The percentage, bivariate analysis and logistic regressions are used for this study.

Binary Logistic Regression is used to assess the net effect of supplementary food (given through ICDS) on under-nutritional status of children. The equation used in this analysis is given as follows:

$$\text{Log } \{P/ (1-P)\} = b0 + b1X1 + b2X2 + b3X3 + \ldots bkXk$$

Where b0 is constant,
X1, X2,…..are the independent variables
b1, b2,……are the coefficients of X1, X2,……..
P is the estimated probability of child under-weight
The qualitative information is analysed through content analysis and descriptive methods.

Results

There is very slow progress in nutritional improvement among children from NFHS-1 (1992-93) to NFHS-5 (2019-21)[viii, ix, xxi]. NFHS data shows, over the last 25 years the percentage of under-weight children declined by only 18 percent point (Table-1). It means, India can achieve less than 1% decline in under-weight annually. Similarly, the status of stunting among children has declined by 14 percent point over 25 years. However, the surprising results come for the children wasted. There is increasing rate of wasted children. The current situation on child under-nutrition calls for in-depth analysis of the impact of supplementary nutrition given through the ICDS programme in India.

Under this backdrop, here an in-depth analysis of access to ICDS programme among children is discussed. The role of ICDS centres in providing supplementary nutrition and its effect on under-nutrition has been analysed.

Access to Anganwadi services

National Family Health Surveys data provide evidences on access to Anganwadi/ ICDS services among the children below six years. The data reflects that, fifty four percent of children are receiving any services from the Anganwadi Centres[xii]. It indicates, around half of the children are not getting any ICDS services in India. There is no significant difference in access to services among children belonging to different social groups and economic classes (Table 1). Overall, forty eight percent of children are getting supplementary nutrition and forty percent of children are getting health check-ups from the ICDS programme. Though there is low access to supplementary food and health check-ups among children belonging to general caste and richer section; but the difference is minimal. Sixty four percent of mothers received counselling after the child was weighed at the ICDS centres. There is no substantial difference between social groups and economic classes in receiving counselling after child was weighed. This might happen dueto increasing availability of weight machines and growth charts[xiii] in most of Anganwadicentres and women have an interest for the nutritional monitoring for their children and receiving counselling at the Anganwadi centres.

Table-1: Percentage of children who received services from an AWC by socio-economic background in India

Background Characteristics	Received any benefits	Supplementary Food	Health check-ups	Counseling after child (0-59 months) was weighed
Wealth Index				
Poorest	55.6	47.8	36.7	58.7
Poorer	61.1	54.8	45.1	64.1
Middle	59.9	54.6	46.2	66.4
Richer	52.3	47.4	41.0	66.4
Richest	35.8	31.1	26.9	65.2
Caste/Tribe				
SC	59.6	53.2	43.9	64.7
ST	64.2	60.4	51.0	62.8
OBC	52.6	45.6	37.3	63.9
Others	46.4	41.1	34.1	63.6
Total	54.0	48.1	39.7	63.9

Source: Computed from NFHS unit level data

The ICDS programme should give more focus to deprived children belonging to scheduled caste[xiv] (SC) and scheduled tribe (ST) as more proportion of these children are prone to

malnutrition as compared to other children. So, it is important to see whether the children belonging to these deprived groups access the services more than others. For this purpose, logistic regression has been carried out. The result drawn from the fourth round of National Family Health Survey shows more proportionate of children belonging to scheduled castes and scheduled tribes access the service than other children, after controlling important social and economic factors (Table 2).

Table-2: Odds ratio for utilization of ICDS services by children's background factors, India

Background factors	Exp B	Sig	S E
Caste			
Others®			
SC	1.443	.000	.013
ST	1.660	.000	.016
OBC	1.183	.000	.011
Religion			
Hindu®			
Muslim	0.817	.000	.012
Others	1.064	.001	.019
Place of Residence			
Urban®			
Rural	1.887	.000	.010
Mother's Education			
Illiterate®			
Primary	1.485	.000	.013
Secondary	1.598	.000	.010
Higher	0.989	.000	.016
Sex of the Child			
Male®			
Female	1.033	.000	.008
Wealth			
Poor®			
Middle	1.143	.000	.011
Rich	0.806	.000	.012

Source: Based on analysis of NFHS data files

From the above analysis, it may be concluded that more proportionate of children belonging to deprived sections of the society are accessing supplementary food as compared to better off sections of society. In other components of service, there is not much difference between social groups and economic classes to access the ICDS services. The level of utilization among the poor is not satisfactory as less than 50 per cent children utilize any of the service from the ICDS. This need to be reviewed in detail to know the reason for not using any ICDS services among 50% of children. Further, it is also essential to know whether those using ICDS services among them less proportionate of children are malnourished as compared to those who are not using. A

detailed analysis has been carried out to know the impact of ICDS centres on child nutritional status.

Impact of ICDS services on child nutrition

The main purpose of the ICDS programme is to reduce child malnutrition. Since the NFHS had obtained measurements of weights and heights for children, the survey data allow us to see if the level of undernourishment varies by availability of AWC in the village/ urban neighbourhood. Here, the percent of children under-weight (weight for age below minus two standard deviations from the WHO international reference population median) is analysed in reference to those who access services and those who don't access the services from the ICDS programme. Further, as income is a major factor influencing undernourishment, the comparisons are made within standard of living categories (used as proxy for income).

The bivariate analysis shows, there is no significant impact of ICDS programme on child malnutrition. Among the children belonging to low standard of living,54.1 per cent are undernourished where ICDS centres exist as compared to 55.6 per cent where ICDSis not exist. Child under nutrition is not substantially different between the areas covered by ICDS centres and the areas not covered by ICDS centres.

Thus, there was no significant impact of ICDS programme on improving children's nutritional status. Further, nutritional status is also influenced by household conditions and socio-demographic factors. This calls for assessing the net effect of the presence of an AWC; with other socio-economic factors constant. To this end, logistic regression has been employed, with being undernourished as the dichotomous dependent variable and various socioeconomic variables included as independent variables (control factors). After controlling the effect of background socio-economic factors, more children are malnourished who access to ICDS services as compared to those who don't access the ICDS service (Table 3). The difference is significant, but quite narrow (odds ratio 1.090).

Table-3: Odds ratio for assessing impact of ICDS services on child malnutrition

	Exp B	**Sig**	**S E**
Access to service			
No®			
Yes	1.090	.000	.010
Caste			
Others®			
SC	1.226	.000	.016
ST	1.383	.000	.019
OBC	1.148	.000	.013
Religion	.992	.565	
Hindu®	.825	.000	

Muslim			.014
Others			.023
Place of Residence			
Urban®			
Rural	.925	.000	.013
Mother's Education			
Illiterate®			
Primary	0.833	.000	.015
Secondary	0.665	.000	.012
Higher	0.427	.000	.021
Sex of the Child			
Male®			
Female	0.950	.000	.009
Wealth			
Poor®			
Middle	.721	.000	.013
Rich	.543	.000	.014

The field survey data from the field reflects that children belonging to poor households are going to Anganwadi centres at morning and they are not getting morning snacks. Very few Anganwadi centres provided morning snacks occasionally. So, children at the Anganwadi centres are hungry till lunch time. If children get morning snacks as per the provision and get main meal in right time, then they can get adequate calorie and protein at the Anganwadi centres as per the provision. Moreover, there is malpractices in distribution of food at the Anganwadi centres. As per the current provision, egg need to be provided for four days in a week, but in actual practice egg is provided only two to three days. The Anganwadis in the hard to reach areas are providing eggs for two days as there is less chance of checking food quality by the monitoring officials.The quantityas well as quality of supplementary food is not provided as per the provision of ICDS programme.

Children belonging to different social groups are accessing the supplementary food. However, there is a difference in access to average nutrient quantity among children belonging to different social groups. There is shortage of food at home and nutrients among the scheduled tribe children followed by children belonging to scheduled caste, other backward caste and others respectively. More than 300 kilo calorie per day is shortage among children belonging to scheduled caste and scheduled tribe, while there is around 200 kilo calorie and 50 kilo calorie shortage among children belong to other backward caste and others respectively. In the below sections, a detailed analysis of access to food and nutrient among children from home food and supplementary food is discussed in the lens of equity approach.

Differential in nutrient intake among children by social groups

The availability and access to food is different among children belonging to different social groups. Most of the children belonging to scheduled caste and scheduled tribe are not getting adequate food due to shortage of food grains at the at the household level. This is mainly due to the unavailability of agricultural land among these social groups. However, this is unlikely the case for children belonging to other backward caste and others. Along with the access to food at the household level, the food provided through the supplementary nutrition programme is determining the nutritional status of children.

Supplementary food is served to these children through the Anganwadi centres at the community level. Along with the Anganwadi food, children are taking food at the home. Here the nutritive value of total food consume in a day is calculated. Total intake of protein is 31.5g per day as shown in Table 4. The average daily protein intake among children belonging to different social groups is adequate. However, the average energy intake among children is not adequate. Overall, average intake of energy is 1083Kcal. Average daily calorie intake is lower than the RDA norm of 1350kcal. Thus, there is a shortage of average daily energy intake is around 267Kcal.

Table 4: Average protein and energy intake among pre-school children

Background factors	Total Protein intake (g/d)	Protein Deficiency (RDA norm)	Total Energy intake (Kcal/d)	Energy Deficiency (RDA norm)	N
SC	30.4	-	1032	318	88
ST	28.2	-	977	373	95
OBC	33.4	-	1147	203	50
Others	37.3	-	1296	54	53
Total	31.5	-	1083	267	286

Note: RDA norm (20.1g protein/day; 1350 Kcal energy/day; - indicates no deficiency)

It may happen that, the supplementary food quantity and quality was better earlier, so that children belonging to poor households' access it more and it makes a positive impact on their nutritional status. But, now the provision of services may not as far with the earlier standard, so that it has negative impact on nutritional status among the children.

Conclusion: The access to supplementary nutrition is declined in the last decade (from 2005 to 2015) as revealed by national family health survey data. Presently, around 48 percent of children are assessing supplementary food from the ICDS centres in India. Further, just 20 percent of children in the pre-primary age group are assessing supplementary nutrition on regular basis as per the provision of ICDS. The bivariate &multivariate analysis result shows that, there is no difference in under-nutritional status of children who access the supplementary food and who don't access the food.

Further, an in-depth analysis has been done to assess the impact of supplementary nutrition on nutritional status of children in poor households, as they have thrust of need for supplementary food. The result reveals that, there is no significant difference in nutritional status between those access and those who don't access food from ICDS among children belonging to poor households. Thus, there is no direct impact of ICDS on child malnutrition.

The qualitative and observational information through the field survey reflects why this programme in not significantly effective in reducing the under-nutrition among children. First, there is complete absence of nutrition education at the community level. The Anganwadi workers are not visiting to the beneficiary's households. Second, the children are taking food at the Anganwadi canter at the time of lunch and they skip their lunch at home. Technically, the Anganwadi food should be additional/ supplementary to home food, so that children will get adequate nutrition particularly protein and energy according to RDA norm. Third, morning snacks is also absent in most of the Anganwadi centres. Fourth, there is malpractices in distribution of food at the Anganwadi centres. Both quantity and quality of supplementary food is not provided as per the provision. This calls for urgent action by the government for proper monitoring and regular supervision of supplementary nutrition programme.

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