

## Utilization and Satisfaction of Services Provided for Children under the Integrated Child Development Services Scheme in a Block of West Bengal, India

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### ABSTRACT

**Background:** The Integrated Child Development Services (ICDS) scheme is a community-based program in India for the betterment of health and nutrition of children aged 0-6, pregnant and lactating mothers, and women aged 15-44 years. This study aimed to investigate the pattern of the utilization of services and the level of satisfaction of mothers regarding the services provided to their children in a block of West Bengal, India.

**Methods:** This descriptive cross-sectional study was conducted from August 2016 to November 2018, and simple random sampling was used to select ICDS centres. The centres' were evaluated for determining the rate of utilization of the services. For evaluating satisfaction, a face and content-validated, pre-tested questionnaire was used. The first part of questionnaire was for collecting the socio-demographic profile of mothers. The second part was concerned about determining satisfaction regarding various services provided by centers to children below 6 years of age on a 5-point Likert scale. About 10% of children enrolled in each ICDS centre were selected, and their mothers were surveyed for satisfaction regarding supplementary nutrition services, informal education, immunization, and other health-related services and infrastructures. The data were expressed in number and percentages and the test of association between categorical variables was done using a chi-square test. The GraphPad Prism 6.01 (GraphPad Software, USA) was used for statistical test.

**Results:** Among the surveyed 62 ICDS centres, service utilization rates were 98.04% for immunization, 90.56% for supplementary nutrition, 82.52% for informal education, 40.27% for health check-ups, and 13.32% for referral services regarding different health problems. A total of 89.63% of the mothers were satisfied with the supplementary nutrition, 83.46% with immunization and health-related services, 77.42% with informal education, and 56.5% with infrastructures.

**Conclusion:** Using supplementary nutrition and informal education exceeded expectations, but immunization, other health-related services, and referral services need improvement to achieve the program's goal. ICDS center infrastructure needs improvement, and a holistic approach is necessary to meet the satisfaction of mothers regarding different services. .

**Keywords:** Child Development, Child Health, Community Health Services, Immunization, India

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## Introduction

The healthcare and educational services provided to women and children, especially to the lower strata of society are the biggest challenge in developing countries (1). About 90% of the chronically undernourished children of the world live in Asia and Africa. India is an Asian country with the highest number of children in the world (2). Each year, around 1.8 million children under five die in India. Children living in rural, remote, or urban slums are the most vulnerable because of their poor access to healthcare, poor nutrition due to either financial conditions or lack of proper education, and unhygienic living places (3).

In the early 70s in India, various nutritional support programs started by government-run and non-governmental organizations. However, those programs were not adequate to meet the growing demand for nutritional support for children. In 1974, a national policy on children began by the Government of India which emphasized on strengthening health and nutrition of the children, not because they are vulnerable but because they are the future human resources of the country (4). In 1975, the government started the national program titled - Integrated Child Development Services (ICDS) (5). With the experience from initial piloting of the project, it was implemented all over India in phases (6).

Since its inception, the benefits of the program have reached almost all rural areas of the country. However, even after more than four decades since the launch of this program, every third of the Indian children (< 5 years of age) suffer from malnutrition (7). Although child immunization is closely related to the program, it cannot satisfactorily cover child vaccination reflected as unvaccinated status of every third child (between 12 and 23 months) in India (8).

The under-five mortality rate and maternal mortality is still high in India (9).

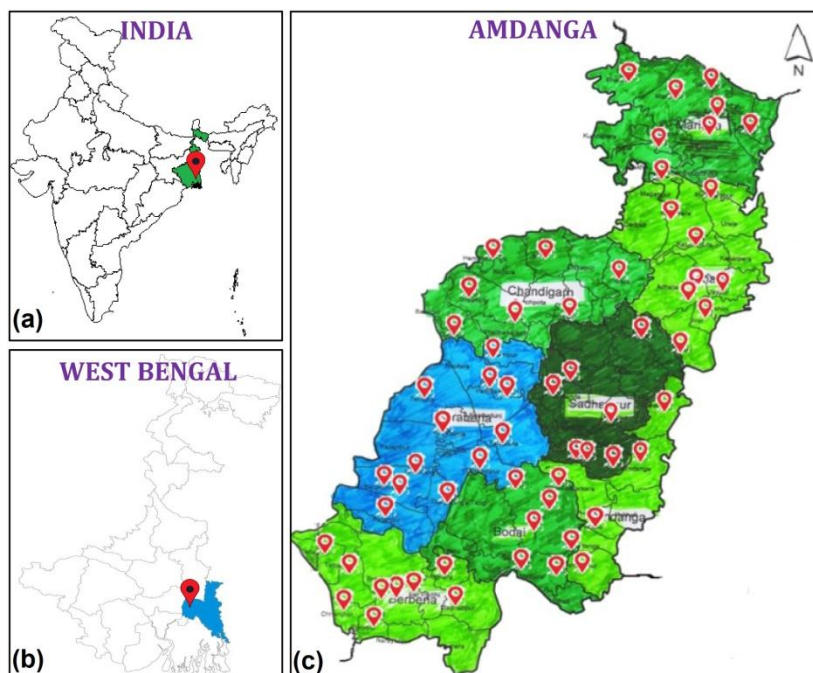
Malnutrition is a worldwide problem nowadays. Not only India, but most of the developing countries are also facing huge economic and social problems which in other ways hinder the overall development of those countries (10). Hence, a health program like ICDS was launched and implemented by the government of India. The experience and output of the program may help other developing countries to plan and implement such or modified health programs following their health system. Furthermore, the positive and negative findings of ICDS after four decades of implementation in India obtained in this research will help other developing countries to plan any health program as such so that they should not face the problem, or they will be able to combat the problems timely and properly.

In this context, the authors aimed to find the current utilization of services provided in ICDS for children and the satisfaction of mothers regarding the services. The result would help stakeholders to gain insight into the current utilization pattern and level of satisfaction and the possible strengthening of the nationwide program to increase its acceptability among the vulnerable.

## Methods

### *Type and settings*

This descriptive cross-sectional study was conducted from November 2017 to April 2018 on the Amdanga community development block of North 24 Parganas district, in the state of West Bengal, India. The study area is shown in Figure 1.



**Figure 1.** (a) Study area – West Bengal in Indian map, (b) Study district – North 24 Parganas in map of West Bengal, (c) Study block – Amdanga and selected ICSD centres (n = 62)

It is the rural field practice area of the Department of Community Medicine, R. G. Kar Medical College and Hospital, Kolkata, West Bengal, India. The data on the utilization was collected from the ICDS centers, and the survey was conducted on mothers by visiting their houses.

#### *Minimum sample size*

To observe the utilization of services, visit to individual ICDS center of Amdanga block was necessary. But, as it is one of the largest blocks in the district, it was hard to reach areas with more than 230 ICDS centres. The Sample size was calculated for the required number of ICDS centers using the formula with finite correction:

$$n = \frac{Z_{1-\alpha/2}^2 P(1-P)N}{d^2(N-1) + Z_{1-\alpha/2}^2 P(1-P)}$$

Where, N = Total number of ICDS centers in Amdanga, P = prevalence: the proportion of ICDS centers where determined services for children were not utilized completely by all the children, 31.5% of which was adopted from a study by KP Asha (11).  $Z_{1-\alpha/2} = 1.96$ , considering 95% confidence level; d = absolute precision, which was taken as 10. With this input, the minimum

sample size was 62 ICDS centers.

To determine satisfaction, mothers of 10% of children aged 0 – 6 years enrolled in each selected ICDS center were chosen. They were chosen because it is mothers who are directly involved in the utilization of services of the ICDS. Finally, 475 mothers were recruited for the study.

#### *Sampling technique*

To select ICDS centers, the list of total ICDS centers in Amdanga was collected from the Child Development Project Office of Amdanga block, and then 62 ICDS centers were selected by simple random sampling method using a random number table with a computer program.

For the survey, initially, a sampling frame was prepared from the register of the respective centers. From this sampling frame, 10% of children were selected randomly by a simple random sampling method. Then, the mothers of selected children were visited in the house for interview. If more than one child of a mother were selected, the mother was considered one and another mother was selected by the same method from the same sampling frame. If a selected child had no mother, then, the child was excluded, and another child was

selected from the same sampling frame by the same method, and his/her mother was considered for an interview.

### Study tool

Two semi-structured questionnaires were used to collect data. The first questionnaire was used to collect data regarding the information related to the infrastructure of the centre, supplementary nutrition, pre-school education, and various health services. The second questionnaire was used for surveying mothers and was divided into two parts. The first part was dedicated to collecting the socio-demographic profile of mothers. The second part concerned determining satisfaction regarding various services provided by centers to children below 6 years of age. Response to each question was measured on a 5-point Likert scale.

The questionnaires were prepared in English and translated into Bengali, and the face and content validity were checked by two public health experts in the department. They were pre-tested among a sample of 10 Anganwadi workers (AWW) from ten ICDS centers, and 30 mothers enrolled in those centers. Sampling frame was made by excluding those 10 ICDS centers.

### Data collection

To facilitate the collection of information and ensure the reliability of data, the purpose and procedure of the study were explained to the two supervisors of the ICDS project, and their help was

sought. Then each ICDS center was visited. In each center, the AWW explained the purpose of the visit, and the mother was interviewed through a pre-designed and pre-tested schedule regarding infrastructure and various services provided to children below 6. Records and registers were reviewed in each center.

Mothers of the selected children in each center were interviewed at home. The interview included their satisfaction level regarding services related to supplementary nutrition, immunization, health check-up, and pre-school education provided to children.

### Statistical analysis

Descriptive statistical analysis was done to observe the variables in terms of absolute number, percentage, and mean with standard deviation (SD). The test of association between categorical variables was done using a chi-square test. P-value < 0.05 was considered to be statistically significant. The Microsoft Excel 2010 (Microsoft Inc, USA) and GraphPad Prism 6.01 (GraphPad Software, USA) used for descriptive and analytical statistical test respectively.

### Results

62 ICDS centers were surveyed, in which 301 infants of 0-6 month's old, 2256 toddlers of > 6 months to 3 years old, and 2194 children of > 3 to 6 years old were enrolled. Sex-wise distribution is shown in Figure 2.

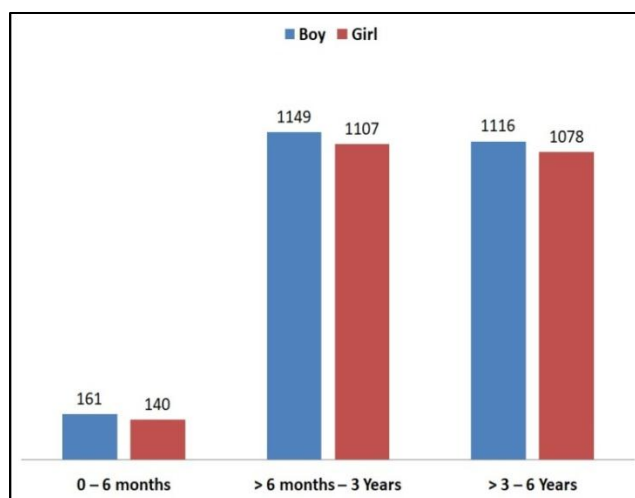


Figure 2. Sex-wise distribution of enrolled children in 62 ICDS centers

Expected and actual utilization is shown in Figure 3. Supplementary nutrition needs a minimum expected utilization of 40%. However, it was utilized by nearly 90.56% of the children. In addition, education targets at least 50% utilization;

however, the utilization was 82.52%. In contrast, immunization, health check-up, and referral are targeted at 100% utilization by the affected population, which are 98.04%, 40.27%, and 13.32% respectively (12).

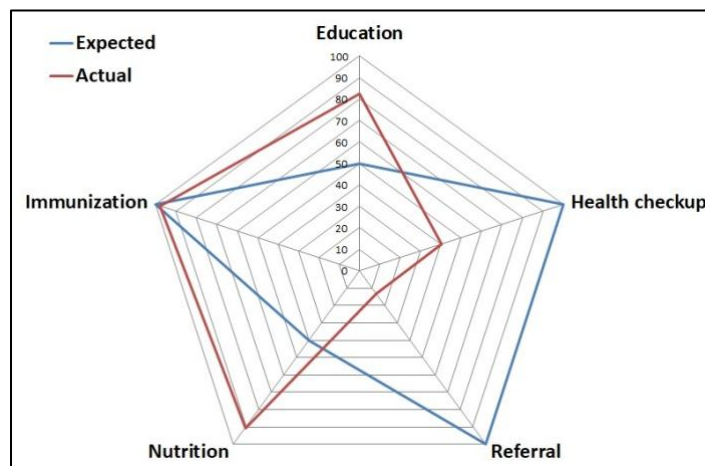


Figure 3. Expected and actual utilization of services provided in ICDS centers surveyed (n = 62)

A total of 475 mothers with a mean age of  $26.31 \pm 4.29$  whose children were enrolled in ICDS centers were surveyed for satisfaction. The demographic profiles of the mothers are shown in Table 1.

89.63% of the mothers were satisfied with the supplementary nutrition services provided to their

children, Table 2.

Overall satisfaction with informal education among mothers was 77.42%, Table 3.

Satisfaction with immunization and health-related services was 83.46%, Table 4.

The lowest satisfaction (56.50%) was found in the infrastructures of ICDS centers, Table 5.

**Table 1.** Social and demographic characteristics of the mothers participated in the survey (n = 475)

Variable	Categories	Number (%)	P
Age	18 - 24 years	204 (42.95)	0.002
	25 - 39 years	271 (57.05)	
Religion	Hindu	208 (43.79)	0.007
	Muslim	267 (56.21)	
Caste	General	281 (59.16)	< 0.0001
	OBC	96 (20.21)	
	SC	89 (18.74)	
	ST	9 (1.89)	
Type of family	Nuclear	318 (66.95)	< 0.0001
	Joint	157 (33.05)	
Education	Deprived	26 (5.47)	< 0.0001
	Below secondary	153 (32.21)	
	Secondary	184 (38.74)	
	Higher secondary	74 (15.58)	
	Graduate and higher	38 (8.00)	
Occupation	Homemaker	436 (91.79)	< 0.0001
	Skilled worker	39 (8.21)	
Monthly family income	< 5000 INR	42 (8.84)	< 0.0001
	5000 – 10000 INR	322 (67.79)	
	> 10000 INR	111 (23.37)	
Social class	Upper	18 (3.79)	< 0.0001
	Upper middle	96 (20.21)	
	Middle	130 (27.37)	
	Lower middle	160 (33.68)	
	Lower	71 (14.95)	

OBC: Other backward classes, SC: Scheduled caste, ST: Scheduled tribe, INR: Indian rupees.

**Table 2.** Satisfaction regarding supplementary nutrition among mothers (n = 475)

Item	Highly satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Highly dissatisfied
	N (%)				
Quantity of food	328 (69.05)	112 (23.58)	0	35 (7.37)	0
Quality of food	277 (58.32)	137 (28.84)	0	61 (12.84)	0
Content of food	209 (44.00)	160 (33.68)	0	106 (22.32)	0
Storage of cooked food	106 (22.32)	326 (68.63)	0	43 (9.05)	0
Regularity of the provision of food	343 (72.21)	113 (23.79)	0	11 (2.32)	8 (1.68)
Child's nutritional status assessment and growth monitoring	330 (69.47)	101 (21.26)	17 (3.59)	27 (5.68)	0
Weight measurement	95 (20.00)	366 (77.05)	0	14 (2.95)	0
Counseling regarding feeding of the child	113 (23.79)	290 (61.05)	0	72 (15.16)	0
Overall*	1801 (47.39)	1605 (42.24)	17 (0.45)	369 (9.71)	8 (0.21)

\* Overall score is calculated by adding the values across the column and dividing them by "item number (8) × sample size (475)".



**Table 3.** Satisfaction regarding informal education among mothers of children (n = 475) enrolled in ICDS centres

Item	Highly satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Highly dissatisfied
	N (%)				
Counseling for importance of pre-school education	140 (29.48)	273 (57.47)	39 (8.21)	23 (4.84)	0
Adequacy and use of pre-school kits	136 (28.63)	148 (31.16)	0	139 (29.26)	52 (10.95)
Activeness of Anaganwadi worker in organization of various types of activities	244 (51.37)	166 (34.95)	9 (1.89)	56 (11.79)	0
Duration of pre-school education	159 (33.47)	205 (43.16)	78 (16.42)	33 (6.95)	0
Overall*	679 (35.74)	792 (41.68)	126 (6.63)	251 (13.21)	52 (2.74)

\* Overall is calculated by adding the values across the column and dividing it by "item number (4) × sample size (475)".

**Table 4.** Satisfaction regarding immunization and health-related services among mothers of children (n = 475) enrolled in ICDS centres

Item	Highly satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Highly dissatisfied
	N (%)				
Counseling for common illnesses of children and their treatment	153 (32.21)	263 (55.37)	0	44 (9.26)	15 (3.16)
Counseling for immunization of children	336 (70.74)	115 (24.21)	0	24 (5.05)	0
Referral of children for immunization	313 (65.89)	150 (31.58)	0	12 (2.53)	0
Monitoring of children for completing immunization course	315 (66.32)	122 (25.68)	0	38 (8.00)	0
First aid of children for minor ailments	101 (21.26)	303 (63.79)	35 (7.37)	36 (7.58)	0
Referral of child to local hospital from center	26 (5.47)	158 (33.26)	244 (51.37)	47 (9.90)	0
Home visit by Anaganwadi worker	128 (26.95)	292 (61.47)	0	46 (9.68)	9 (1.90)
Overall*	1372 (41.26)	1403 (42.2)	279 (8.39)	247 (7.43)	24 (0.72)

\* Overall is calculated by adding the values across the column and dividing it by "item number (7) × sample size (475)".

**Table 5.** Satisfaction regarding infrastructure among mothers of children (n = 475) enrolled in ICDS centres

Item	Highly satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Highly dissatisfied
	N (%)				
Building of center	61 (12.84)	148 (31.16)	0	146 (30.74)	120 (25.26)
Place of cooking	88 (18.53)	90 (18.95)	0	174 (36.63)	123 (25.89)
Place of eating	107 (22.53)	236 (49.68)	0	67 (14.11)	65 (13.68)
Arrangements for storage of raw food material	91 (19.16)	155 (32.63)	0	139 (29.26)	90 (18.95)
Source of water for drinking, cooking, and washing utensils	97 (20.42)	233 (49.05)	0	103 (21.68)	42 (8.85)
Provision for children's hand washing	75 (15.79)	250 (52.63)	0	116 (24.42)	34 (7.16)
Cleanliness of center	53 (11.15)	260 (54.74)	0	130 (27.37)	32 (6.74)
Toilet and urinal facilities	33 (6.95)	170 (35.78)	0	126 (26.53)	146 (30.74)
Overall*	605 (15.92)	1542 (40.58)	0	1001 (26.34)	652 (17.16)

\* Overall score is calculated by adding the values across the column and dividing them by "item number (8) × sample size (475)".

## Discussion

The authors studied 62 ICDS centers in Amdanga community development block of North 24 Parganas district, West Bengal, India, to determine the level of utilization and satisfaction with services provided under the ICDS. In addition, 475 mothers whose children were under the ICDS were surveyed for their level of satisfaction. Supplementary nutrition and informal education were used at a rate higher than the target. Immunization had a low deficiency of approximately 2%. However, health check-up and referral services were utilized at a lower rate than the target. The underlying reason may be multifactorial on both the part of the service provider and the study population. However, in the current study, the authors did not study the reason for lower utilization.

Sivkumar et al. carried out a study in Kerala and observed that approximately 75% of the children were being provided supplementary nutrition (13). A utilization of approximately 92 – 95% regarding supplementary nutrition was reported from Rajasthan by Rathore et al. (14). In addition, Rajpal et al. found a higher utilization of ICDS services for pregnant women in rural areas, but the supplementary nutrition for children was utilized by approximately 42.4% (15). Being consistent with all the reports which showed a higher than target utilization, the authors also found a 90.6% utilization of supplementary nutrition in this study. A high utilization of informal education was also observed, which may be attributed to concurrent educational and nutritional services, universal accessibility, better information education and communication practices, and satisfactory services. However, it should be emphasized that concentrating on only the supplementary nutrition and informal education would not make ICDS a successful one (16).

The mothers showed a high level of satisfaction with the service provided. However, the infrastructure of the ICDS centres needs special attention as there was the lowest satisfaction in infrastructure when compared with other domains. The building structure, the condition of the

cooking place, overall cleanliness, the availability of urinals and toilets, provision of handwashing of children, and water safety were not satisfactory.

A previous study conducted in two districts of West Bengal revealed that the quantity and quality of food provided to children were considered satisfactory up to 88% and 72.7% by mothers respectively. In addition, about 63% of the mothers surveyed believed that the scheme was beneficial to their children (17). Jain et al. reported 61% and 45.90% satisfaction with quantity and quality of food in Punjab (18). Furthermore, a study conducted by Davey A et al. in Delhi found that 52.5% of respondents were dissatisfied with services provided by the Anganwadi Centre. Difficulty to access AWC, inadequate space available at the centers, poor quality of food, and irregular informal education were also the causes of dissatisfaction (19). Difference in satisfaction level depends on several factors. Where ICDS centres cater to the children with adequate nutritional supplementary foods cooked hygienically and informal education is provided empathically, the satisfaction would be high. Moreover, ease of access to service from a good location would further promote higher utilization. Further studies should be conducted to ascertain the predictor factors for satisfaction.

Although the ICDS was implemented only in India, the experience can help in planning a similar program in developing countries for the overall improvement of children's nutrition. A program with a long duration helps stakeholders to determine the required fund, logistics, and administrative and social challenges. This experience would enrich the knowledge base of the countries in planning such programs. Hence, the authors hope the outcomes of this study would help international public health experts (20).

### *Limitation*

This study had some limitations for generalizability of the result for the state or for the country. Moreover, it was conducted in a single community development block; future study involving multiple blocks would provide more



generalizable results. The authors recruited 10% of the mothers for the survey. This is the minimum level required for a scalable survey. Recruiting more participants would increase the power of the study. The authors had also limited time and manpower for this non-funded researcher-led study. Furthermore, although the survey was conducted after explaining the study aim and the participants were requested to provide their fair response, any social desirability or biases were beyond control (21). These factors should be considered while interpreting the results of this study.

### Conclusion

In a community development block in West Bengal, India, the supplementary nutrition and informal education services provided under ICDS were utilized more than expected. However, utilization of immunization, health check-up, and referral services were below the target level. The mother of the enrolled children were generally satisfied with the services provided under the ICDS. The lowest satisfaction belonged to infrastructures like the building, place of cooking, source of water, cleanliness of the premises, toilet facility, eating place, or provision of hand washing for children. The finding of this study would help to gain insight into the existing pattern of utilization of services and satisfaction among the parents of the children under ICDS. Further studies should be conducted to involve multiple districts and states for a more generalizable result. Accordingly, the stake holders can reallocate resources to strengthen the services and address the

satisfaction level for a proper implementation and achieving results in near future.

### Acknowledgments

This study involves an audit of data from the official register for which permission from the concerned authority was taken before handing the data. We thank the concerned officer for approving the data audit. The survey part of the study was conducted with only adult women (age > 18 years of age). A women expert surveyor collected the data with a pre-tested questionnaire. Participants in this study were recruited after obtaining written informed consent in the local language (Bengali or Bangla). We thank all the participants and the surveyor for extending their help in conduct of the study. This study was approved by Institutional Ethics Committee (Reference number: RKC/5079). The authors declare that the study was conducted according to the guidelines laid by the WMA Declaration of Helsinki, updated in 2013.

### Conflict of interests

The authors declared no conflict of interest.

### Authors' contributions

R. D; Concept, methodology, data collection, data analysis, interpretation, visualization, literature search, editing manuscript, approving the final version of the manuscript to be published, M. R and J. C. S; Data management, interpretation, literature search, editing manuscript, approving the final version of the manuscript to be published, H. M; Data analysis, interpretation, visualization, literature search, drafting manuscript, approving the final version of the manuscript to be published.

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